FROM BEDSIDE HISTORY TO CLINICAL DIAGNOSIS

AETCM

COMPLETE EDITION

Case Taking Proforma for MBBS Students

Medicine · Paediatrics · Surgery · Orthopaedics · OBG · ENT · Ophthalmology

The complete MBBS case-taking proforma — 34 case sheets covering every clinical posting, from the general physical examination and systemic examination to surgical, orthopaedic, obstetric, gynaecological, ENT and eye cases — with blank lines for the patient's details, special tests, staging and diagnosis formats

- General physical examination
- CVS
- RS
- Abdomen
- CNS
- Rheumatology
- Paediatrics
- Newborn
- General Surgery
- Orthopaedics
- Obstetrics
- Gynaecology
- ENT
- Ophthalmology
- Lab values
- Fill-in proforma



By

Dr. Gireesh Kumar K.P.

For MBBS students in all clinical postings, interns and postgraduate aspirants

Case Taking Proforma for MBBS Students

Complete history-taking and clinical examination for every clinical posting

Medicine · Paediatrics · General Surgery · Orthopaedics
Obstetrics and Gynaecology · ENT · Ophthalmology



Dr. Gireesh Kumar K.P.

Academy for Emergency, Trauma & Critical care Medicine (AETCM)

Second Edition · October 2026

A note to students. Clinical teaching varies between institutions, and every department has its own preferred way of taking and presenting a case. Use this proforma as a framework, and adapt it to the format and emphasis taught by your professors and expected in your university examinations.

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Preface

Every clinician remembers the first long case — a patient on the ward, a blank sheet of paper and the quiet panic of not knowing where to begin. A good proforma removes that panic. It tells the student what to ask, in what order, what to look for, how to feel for it and what each finding means.

This book is a complete bedside case-taking proforma for MBBS students, arranged in the order of the clinical postings — Medicine, Paediatrics, General Surgery, Orthopaedics, Obstetrics and Gynaecology, ENT and Ophthalmology. Medicine begins with the general case sheet and general physical examination, followed by the cardiovascular, respiratory, abdominal, nervous and locomotor systems. Surgery and Orthopaedics cover the long and short cases most often given in university examinations, and Obstetrics, Gynaecology, ENT and Ophthalmology each have their own complete case format. A ready reckoner of adult laboratory values closes the book.

Each chapter keeps the classical sequence of a case sheet: bio data, presenting complaints, history of presenting illness, past, personal and family history, general examination, local examination by inspection, palpation, percussion, auscultation and measurement, special tests, and finally the differential diagnosis. Blank lines are left wherever the student is expected to record the patient's own details, so that the book can be used both as a study guide and as a working proforma on the ward.

Clinical examination is learnt only at the bedside. Use this proforma to organise your thinking, but let every finding come from the patient in front of you. Ask with patience, examine with consent and gentleness, and present with clarity — that is the art of case taking.



Dr. Gireesh Kumar K.P.
Academy for Emergency, Trauma & Critical care Medicine (AETCM)
October 2026

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HOW TO USE THIS PROFORMA

Headings followed by a dotted line (**Name**, **Age**, **Onset**…) are spaces to write the patient's own details. Bulleted points beneath a heading tell you what to ask or look for and what the finding suggests. Follow the order of each chapter when you present the case.

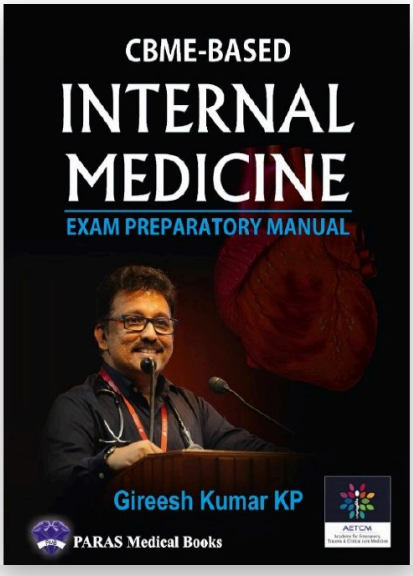
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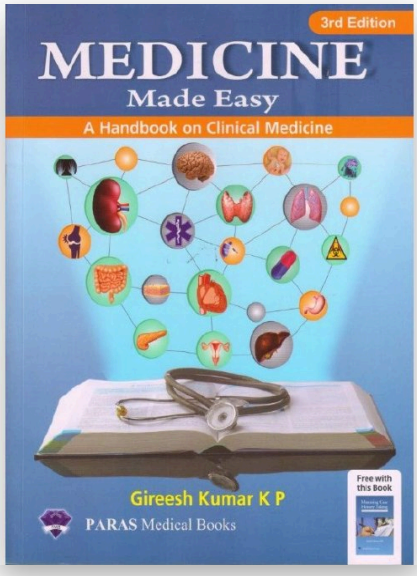
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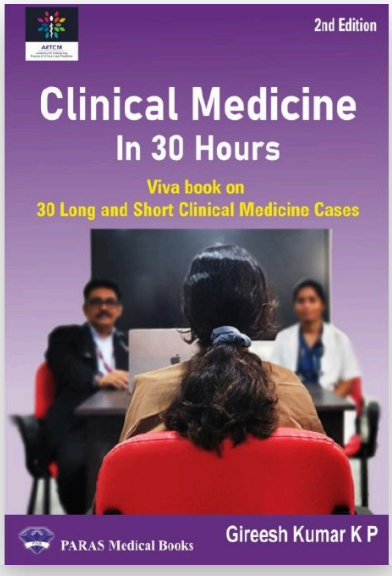
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PART I

Medicine

General medicine case sheet and systemic examination

1 General Medicine Case Sheet and General Physical Examination

2 Cardiovascular System

3 Respiratory System

4 Abdomen – Gastroenterology and Hepatology

5 Nervous System

6 Locomotor System – Rheumatology

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CHAPTER 1

General Medicine Case Sheet and General Physical Examination

The common history format for every medical case, followed by a complete head-to-toe general physical examination

Bio data

Name: .....

Age: .....

Sex: .....

Address: .....

Occupation

- Exposure to dust, silica, asbestos, chemicals, pesticides, animals – occupational lung disease, toxins, zoonoses

Religion / diet: .....

Socio-economic status

- Modified Kuppuswamy scale (urban) / B.G. Prasad scale (rural)

Date of admission: .....

Date of examination: .....

Informant and reliability: .....

Chief complaints

- Record in the patient's own words, in chronological order, with duration
- Example: "Breathlessness – 2 months; swelling of both legs – 15 days"

History of presenting illness

Analyse each symptom

- Onset – sudden / insidious
- Duration
- Progression – static / progressive / intermittent
- Site, character, radiation, severity
- Aggravating and relieving factors
- Associated symptoms
- Treatment taken and response

Review of systems

- **General** – fever, weight loss, loss of appetite, fatigue, night sweats
- **CVS** – chest pain, palpitation, breathlessness, orthopnoea, PND, syncope, pedal oedema
- **RS** – cough, expectoration, haemoptysis, wheeze, chest pain
- **GIT** – nausea, vomiting, dysphagia, abdominal pain, distension, altered bowel habits, haematemesis, melaena, jaundice
- **Genito-urinary** – frequency, dysuria, haematuria, oliguria, nocturia, frothy urine
- **CNS** – headache, seizures, weakness, numbness, giddiness, visual or speech disturbance, altered sensorium
- **Locomotor** – joint pain, swelling, morning stiffness, muscle weakness

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- **Skin** – rash, itching, pigmentation, ulcers
- **Endocrine** – heat / cold intolerance, polyuria, polydipsia, weight change

Past history

- Similar episodes in the past
- Diabetes, hypertension, tuberculosis, asthma, epilepsy, ischaemic heart disease, rheumatic fever, jaundice, STD, HIV
- Previous hospital admissions, surgeries, blood transfusions
- Drug allergy

Drug history

- Current medicines with dose and duration
- Steroids, NSAIDs, oral contraceptives, anti-tubercular drugs, anticoagulants
- Compliance; over-the-counter and alternative medicines

Personal history

- Diet – vegetarian / mixed
- Appetite, sleep
- Bowel and bladder habits
- Smoking – pack-years = (cigarettes per day ÷ 20) × years smoked
- Alcohol – type, quantity, duration (units / week)
- Tobacco chewing, substance use
- Sexual history where relevant

Menstrual and obstetric history (females)

- Age at menarche, cycles, LMP, menopause
- Obstetric score (G P L A)

Family history

- Diabetes, hypertension, IHD, TB, asthma, malignancy, bleeding disorders, inherited diseases
- Consanguinity

Treatment history

General physical examination

Consent and exposure

- Explain the examination, obtain consent, ensure privacy, chaperone for opposite-sex patients

General appearance

- Conscious, oriented to time, place and person
- Co-operative / comfortable / ill-looking / in distress
- Position of comfort – propped up (orthopnoea), leaning forward (pericarditis), lying still (peritonitis), restless (colic)
- Build – thin / average / obese
- Nourishment – poor / moderate / well nourished

Anthropometry

- Height (cm), weight (kg)
- BMI = weight (kg) ÷ height (m)² – Asian Indians: normal 18.5–22.9, overweight 23–24.9, obese ≥25 kg/m²
- Waist circumference – abnormal ≥90 cm in men, ≥80 cm in women
- Waist–hip ratio

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Head-to-foot examination

- **Hair** – texture, alopecia, flag sign
- **Face** – facies (mitral, moon, myxoedematous, Parkinsonian, myopathic, acromegalic, hippocratic)
- **Eyes** – pallor, icterus, xanthelasma, arcus, Kayser–Fleischer ring, exophthalmos, ptosis
- **Oral cavity** – teeth, gums, tongue (pallor, glossitis, coating, central cyanosis), oral thrush, ulcers, pigmentation
- **Neck** – JVP, thyroid, lymph nodes, carotid pulsation, webbing
- **Hands** – palmar erythema, Dupuytren's contracture, flapping tremor, Janeway lesions, Osler's nodes
- **Nails** – clubbing, koilonychia, leukonychia, splinter haemorrhages, pitting, onycholysis
- **Skin** – rash, purpura, pigmentation, spider naevi, scars, injection marks, xanthomas
- **Spine** – deformity, tenderness
- **Genitalia** – testicular atrophy, secondary sexual characters

PICCLE

- **P**allor – lower palpebral conjunctiva, tongue, nail bed, palm
- **I**cterus – sclera, under-surface of tongue, in daylight
- **C**yanosis – central (tongue, lips) / peripheral (nail bed, tip of nose, ear lobule)
- **C**lubbing – Schamroth window test; grades I–IV
- **L**ymphadenopathy – cervical, axillary, epitrochlear, inguinal, popliteal – site, size, number, consistency, tenderness, matting, fixity
- **E**dema – pitting / non-pitting; site (pedal, sacral, facial, generalised – anasarca)

Vital signs

- **Pulse** – rate, rhythm, volume, character, condition of vessel wall, radio-radial and radio-femoral delay, all peripheral pulses
- **Blood pressure** – both arms, supine and standing (postural drop ≥20/10 mmHg)
- **Respiratory rate** – rate, rhythm, type (abdomino-thoracic / thoraco-abdominal), use of accessory muscles
- **Temperature** – oral / axillary, pattern of fever
- **SpO_2** – on room air
- **Capillary blood glucose** where relevant

Jugular venous pressure

- Patient at 45°, head turned slightly to left, look at internal jugular vein
- Height above sternal angle (normal <4 cm; JVP = height + 5 cm in cm of water)
- Waveform – a, c, v waves; x and y descents
- Hepatojugular reflux

Systemic examination

- Examine the system of chief complaint in detail first (see the following chapters), then all other systems briefly
- Cardiovascular system
- Respiratory system
- Abdomen
- Central nervous system
- Locomotor system

Summary

- Age, sex, occupation, chief complaints with duration, positive history, positive findings on examination – in one paragraph

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Common causes of general examination findings

Sign	Common causes
Pallor	Anaemia (iron, B12 / folate deficiency, chronic disease, haemolysis, blood loss), shock, hypothyroidism
Icterus	Pre-hepatic (haemolysis), hepatic (viral hepatitis, alcohol, drugs, cirrhosis), post-hepatic (CBD stone, carcinoma head of pancreas); visible when serum bilirubin >2.5–3 mg/dL
Central cyanosis	Cyanotic congenital heart disease, severe lung disease, pulmonary oedema, methaemoglobinaemia; reduced Hb >5 g/dL
Peripheral cyanosis	Cold exposure, shock, low cardiac output, Raynaud's, arterial / venous obstruction
Clubbing	Lung – carcinoma, bronchiectasis, lung abscess, empyema, ILD; heart – cyanotic CHD, infective endocarditis; GI – cirrhosis, IBD, coeliac disease; thyroid acropachy; familial
Koilonychia	Iron deficiency anaemia
Generalised lymphadenopathy	TB, HIV, lymphoma, leukaemia, SLE, infectious mononucleosis, sarcoidosis
Pedal oedema	Cardiac (CCF), renal (nephrotic syndrome, CKD), hepatic (cirrhosis), nutritional (hypoproteinaemia), drugs (amlodipine), venous / lymphatic obstruction, hypothyroidism (non-pitting)

Grading of clubbing

Grade	Finding
I	Softening and fluctuation of nail bed (increased glossiness)
II	Obliteration of the angle between nail and nail bed (Lovibond angle >180°); Schamroth window lost
III	Parrot-beak / drumstick appearance – increased antero-posterior and transverse curvature
IV	Hypertrophic pulmonary osteoarthropathy – swelling of wrists and ankles, periosteal new bone

Types of fever

Pattern	Description	Examples
Continuous	Elevated throughout, fluctuation <1 °C	Typhoid, lobar pneumonia, UTI
Remittent	Elevated throughout, fluctuation >1 °C	Infective endocarditis, most bacterial infections
Intermittent	Returns to normal for some hours each day	Malaria, pyogenic abscess, septicaemia
Quotidian / tertian / quartan	Spikes every 24 / 48 / 72 hours	P. falciparum / P. vivax / P. malariae
Pel–Ebstein	Fever for days alternating with afebrile periods	Hodgkin lymphoma

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Abnormal patterns of breathing

- **Kussmaul breathing** – deep, sighing (metabolic acidosis – DKA, uraemia)
- **Cheyne–Stokes breathing** – waxing and waning with apnoea (heart failure, brainstem lesions, opioids)
- **Biot's (ataxic) breathing** – irregular with apnoea (medullary lesions)
- **Paradoxical abdominal movement** – diaphragmatic paralysis or fatigue

Presenting the case – model order

1. Name, age, sex, occupation, residence
2. Chief complaints with duration
3. History of presenting illness in chronological order, with relevant positives and negatives
4. Past, drug, personal, family, menstrual and socio-economic history
5. General physical examination – positive findings and vitals
6. Systemic examination – the system involved first, in the order inspection, palpation, percussion, auscultation
7. Summary, provisional diagnosis with reasons, differential diagnosis with points for and against
8. Investigations planned and management outline

Provisional diagnosis

- Anatomical diagnosis → pathological diagnosis → aetiological diagnosis → functional status → complications

Differential diagnosis

Investigations

- **Basic** – complete blood count, ESR, peripheral smear, urine routine, blood sugar, renal function, liver function, serum electrolytes, chest X-ray, ECG
- **Specific** – according to the provisional diagnosis

Treatment plan

- Non-pharmacological, pharmacological, follow-up and patient education

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CHAPTER 2

Cardiovascular System

Cardiac symptoms, pulse, JVP, precordial examination, murmurs and the diagnosis of valvular and heart failure cases

Chief complaints

Breathlessness

- Onset, duration, progression
- NYHA class: I – no limitation; II – breathless on ordinary activity; III – on less than ordinary activity; IV – at rest
- Orthopnoea – number of pillows; paroxysmal nocturnal dyspnoea (PND)

Chest pain

- Site, character (tightness, heaviness, burning), radiation (arm, jaw, back), duration
- Relation to exertion, relief with rest / nitrates
- Pericardial pain – sharp, relieved by sitting forward; aortic dissection – tearing pain radiating to back

Palpitation

- Onset and offset (sudden / gradual), regular / irregular, duration, associated syncope
- Ask the patient to tap out the rhythm

Syncope / presyncope

- Effort syncope – aortic stenosis, HOCM, pulmonary hypertension

Swelling of feet / abdomen

- Pedal oedema – evening, pitting; facial puffiness; abdominal distension (ascites)

Cough with frothy pink sputum / haemoptysis

- Pulmonary oedema, mitral stenosis

Fatigue, cold extremities:

Fever

- With joint pain – rheumatic fever; prolonged fever – infective endocarditis

Embolic phenomena

- Hemiplegia, limb ischaemia, visual loss, haematuria

Past history

- Rheumatic fever – migratory polyarthritis, chorea, sore throat in childhood
- Penicillin prophylaxis – regularity
- Hypertension, diabetes, dyslipidaemia, IHD, stroke, thyroid disease, CKD
- Congenital heart disease – cyanotic spells, squatting, recurrent chest infections in childhood
- Previous valve surgery, balloon valvotomy, PCI / CABG
- Dental procedures (endocarditis)

Personal history

- Smoking, alcohol, diet, physical activity

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Family history

- Premature coronary artery disease, sudden cardiac death, cardiomyopathy, congenital heart disease

Drug history

- Diuretics, digoxin, beta-blockers, ACE inhibitors / ARNI, anticoagulants (INR monitoring), antiplatelets, statins

General physical examination

- Position – propped up, orthopnoeic
- Facies – mitral facies (malar flush)
- Built – Marfanoid habitus, Turner, Down syndrome features
- PICCLE – central cyanosis (cyanotic CHD, pulmonary oedema), clubbing (cyanotic CHD, infective endocarditis)
- Peripheral signs of infective endocarditis – splinter haemorrhages, Osler's nodes, Janeway lesions, Roth spots, splenomegaly
- Peripheral signs of aortic regurgitation – Corrigan's sign, de Musset's sign, Quincke's sign, Duroziez's sign, Traube's sign, Hill's sign
- Xanthelasma, xanthomas, arcus (dyslipidaemia)
- Rheumatic nodules, erythema marginatum

Arterial pulse

Feature	What to note
Rate	Per minute; count for a full minute if irregular; pulse deficit (apex rate – pulse rate)
Rhythm	Regular / regularly irregular / irregularly irregular (atrial fibrillation)
Volume	Normal / high (AR, anaemia, thyrotoxicosis) / low (AS, shock)
Character	Slow rising (AS), collapsing / water-hammer (AR, PDA), bisferiens (AS + AR, HOCM), pulsus alternans (LV failure), pulsus paradoxus (tamponade, severe asthma)
Vessel wall	Thickened in atherosclerosis
Radio-radial delay	Aortic arch disease, subclavian stenosis
Radio-femoral delay	Coarctation of aorta
Peripheral pulses	Brachial, carotid, femoral, popliteal, posterior tibial, dorsalis pedis – both sides

Blood pressure

- Both upper limbs and one lower limb; pulse pressure
- Wide pulse pressure – AR, PDA, thyrotoxicosis, anaemia; narrow – AS, tamponade, shock
- Hill's sign – lower-limb systolic BP exceeds upper-limb by >20 mmHg (significant AR)

Jugular venous pressure

- Height and waveform (see general examination)
- Raised JVP – right heart failure, tricuspid regurgitation, tamponade, constrictive pericarditis, SVC obstruction (non-pulsatile)
- Large a wave – TS, pulmonary hypertension; cannon a waves – complete heart block; absent a wave – AF
- Large v wave (cv wave) – tricuspid regurgitation
- Kussmaul's sign – JVP rises on inspiration (constrictive pericarditis)

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Precordium – inspection

- Shape of chest – precordial bulge (cardiomegaly in childhood), pectus excavatum
- Apical impulse – site and visibility
- Other pulsations – parasternal, epigastric, suprasternal, carotid (dancing carotids in AR)
- Scars – sternotomy, thoracotomy (mitral valvotomy), pacemaker pocket
- Dilated veins

Palpation

Apex beat

- Definition – the lowermost and outermost point of definite cardiac impulse
- Normal – left 5th intercostal space, 1 cm medial to the midclavicular line
- Character – normal / tapping (MS) / heaving, pressure-overload (AS, hypertension) / hyperdynamic, volume-overload (MR, AR, VSD) / diffuse (cardiomyopathy)

Parasternal heave

- Grade I–III – right ventricular hypertrophy

Palpable heart sounds

- Palpable P2 – pulmonary hypertension; palpable S1 – mitral stenosis

Thrills

- Systolic / diastolic; area (apical diastolic thrill – MS; aortic systolic thrill – AS)

Percussion

- Cardiac borders (right border, left border); usually limited value
- Dullness in 2nd and 3rd left intercostal spaces – dilated pulmonary artery

Auscultation

Areas

- Mitral – apex; tricuspid – left lower sternal edge; pulmonary – left 2nd intercostal space; aortic – right 2nd intercostal space; Erb's (2nd aortic) – left 3rd intercostal space

Heart sounds

- S1 – loud (MS, short PR), soft (MR, long PR), variable (AF, complete heart block)
- S2 – splitting (physiological, wide fixed – ASD, reversed – LBBB / severe AS), loud P2 (pulmonary hypertension), soft A2 (calcific AS)
- S3 – volume overload, heart failure (normal in children / young adults)
- S4 – stiff ventricle (hypertension, AS, HOCM)
- Opening snap – mitral stenosis (short S2–OS gap = severe MS)
- Ejection click, mid-systolic click (mitral valve prolapse)
- Pericardial rub

Murmurs – describe

- Timing (systolic / diastolic / continuous), site of maximum intensity, grade (systolic I–VI, diastolic I–IV)
- Character (blowing, rumbling, harsh), pitch, propagation (axilla, carotids)
- Relation to respiration – right-sided murmurs increase on inspiration
- Effect of position – MS in left lateral position with bell; AR sitting forward in held expiration
- Dynamic manoeuvres – Valsalva and standing increase HOCM and MVP murmurs

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Other systems

- Respiratory – basal crepitations, pleural effusion
- Abdomen – tender hepatomegaly, pulsatile liver (TR), ascites, splenomegaly (endocarditis)
- CNS – hemiplegia (embolism), chorea
- Fundus – hypertensive retinopathy, Roth spots

Grading of murmurs

Grade	Systolic murmur (Levine)
1	Very soft, heard only with special effort
2	Soft but readily heard
3	Moderately loud, no thrill
4	Loud with a palpable thrill
5	Very loud, heard with stethoscope partly off the chest
6	Heard with stethoscope just off the chest

- Diastolic murmurs are graded 1–4

Clinical signs of severity of valvular lesions

Lesion	Signs of severe disease
Mitral stenosis	Short S2–OS interval, long mid-diastolic murmur, signs of pulmonary hypertension (loud P2, RV heave), tapping apex, low-volume pulse
Mitral regurgitation	Displaced hyperdynamic apex, S3, pansystolic murmur radiating to axilla, wide split S2
Aortic stenosis	Slow-rising low-volume pulse, narrow pulse pressure, soft or absent A2, reversed split S2, late-peaking murmur, S4, heaving apex
Aortic regurgitation	Wide pulse pressure (diastolic <50 mmHg), long diastolic murmur, Austin Flint murmur, S3, displaced apex, Hill's sign >60 mmHg

Peripheral signs of aortic regurgitation

Sign	Description
Corrigan's sign	Prominent carotid pulsation (dancing carotids)
de Musset's sign	Head nodding with each heartbeat
Quincke's sign	Capillary pulsation in nail beds
Traube's sign	Pistol-shot sound over the femoral artery
Duroziez's sign	To-and-fro murmur over femoral artery on partial compression
Müller's sign	Pulsation of the uvula
Hill's sign	Lower-limb systolic BP higher than upper-limb by >20 mmHg

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Revised Jones criteria for acute rheumatic fever (AHA 2015, high-risk populations such as India)

- **Major** – carditis (clinical or subclinical on echo), arthritis (poly- or monoarthritis), polyarthralgia, chorea, erythema marginatum, subcutaneous nodules
- **Minor** – monoarthralgia, fever ≥38 °C, ESR ≥30 mm/h or CRP ≥3 mg/dL, prolonged PR interval
- Diagnosis – evidence of preceding group A streptococcal infection + 2 major, or 1 major + 2 minor criteria

Modified Duke criteria for infective endocarditis (summary)

- **Major** – positive blood cultures with typical organisms; evidence of endocardial involvement on echocardiography (vegetation, abscess, new valvular regurgitation)
- **Minor** – predisposing heart condition / IV drug use, fever ≥38 °C, vascular phenomena (emboli, Janeway lesions), immunological phenomena (Osler's nodes, Roth spots, glomerulonephritis), microbiological evidence not meeting major criteria
- Definite IE – 2 major, or 1 major + 3 minor, or 5 minor

Framingham criteria for heart failure (summary)

- **Major** – PND, orthopnoea, raised JVP, basal crepitations, S3, cardiomegaly, acute pulmonary oedema, hepatojugular reflux, weight loss >4.5 kg in 5 days on treatment
- **Minor** – bilateral ankle oedema, nocturnal cough, dyspnoea on ordinary exertion, hepatomegaly, pleural effusion, tachycardia >120/min
- Diagnosis – 2 major, or 1 major + 2 minor

Clinical diagnosis – write in this order

1. Aetiology – rheumatic / congenital / ischaemic / hypertensive
2. Anatomical lesion – e.g. mitral stenosis, severity
3. Physiological state – rhythm (sinus / AF), pulmonary hypertension, heart failure (NYHA class)
4. Complications – infective endocarditis, embolism, rheumatic activity

Example: Rheumatic heart disease, severe mitral stenosis, atrial fibrillation, pulmonary hypertension, in congestive cardiac failure, NYHA class III, no evidence of infective endocarditis.

Investigations

- ECG, chest X-ray (PA view), 2D echocardiography with Doppler
- CBC, ESR, CRP, ASO titre, blood culture (3 sets) if endocarditis suspected
- Lipid profile, blood sugar, renal function, electrolytes, thyroid function, NT-proBNP, troponin
- Holter, treadmill test, coronary angiography as indicated

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CHAPTER 3

Respiratory System

Respiratory symptoms, inspection, palpation, percussion, auscultation and diagnosis of common chest cases

Chief complaints

Cough

- Duration (acute <3 weeks, chronic >8 weeks), dry / productive, timing (nocturnal – asthma, LVF; morning – bronchiectasis, smokers), postural variation

Expectoration

- Quantity, colour, consistency, odour, diurnal variation, relation to posture
- Mucoid – chronic bronchitis; purulent – infection; foul-smelling, copious, layering – bronchiectasis, lung abscess; rusty – pneumococcal pneumonia; pink frothy – pulmonary oedema

Haemoptysis

- Quantity (streaking / frank / massive >200 mL per 24 h), colour, frequency
- Differentiate from haematemesis and nasopharyngeal bleeding
- Causes – TB, bronchiectasis, carcinoma, mitral stenosis, pulmonary embolism

Breathlessness

- Onset, duration, progression, mMRC grade (0–4), episodic with wheeze (asthma), orthopnoea, PND

Chest pain

- Pleuritic (sharp, worse on breathing and coughing) – pleurisy, pneumothorax, pneumonia

Wheeze, stridor, hoarseness of voice:

Fever

- Evening rise with night sweats – TB

Constitutional symptoms

- Loss of weight, loss of appetite

Others

- Snoring and daytime sleepiness (OSA), swelling of feet (cor pulmonale)

Past history

- Tuberculosis – treatment taken, duration, compliance, DOTS category, completion
- Childhood pneumonia, measles, whooping cough (bronchiectasis)
- Asthma, allergy, atopy, eczema
- Diabetes, HIV, immunosuppression

Personal history

- Smoking – pack-years; biomass fuel exposure (chulha); alcohol
- Occupation – coal, silica, asbestos, cotton dust, farming (farmer's lung), birds (bird fancier's lung)
- Pets, travel history

Family history

- TB contact, asthma, atopy, cystic fibrosis

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Drug history

- Inhalers and technique, steroids, ACE inhibitors (cough), beta-blockers, amiodarone, methotrexate, nitrofurantoin

General physical examination

- Position, respiratory distress, use of accessory muscles, pursed-lip breathing
- Cyanosis, clubbing (bronchiectasis, lung abscess, empyema, carcinoma, ILD), CO_2 retention flap
- Lymph nodes – supraclavicular, cervical
- Pedal oedema, raised JVP – cor pulmonale
- Tracheal position also checked in the neck
- Horner's syndrome, wasting of small muscles of hand (Pancoast tumour)
- Respiratory rate, SpO_2, pulse (pulsus paradoxus in severe asthma)

Upper respiratory tract

- Nose – deviated septum, polyps; oral cavity – teeth, gums, tonsils; pharynx; sinus tenderness

Inspection

- Shape of chest – normal elliptical, barrel-shaped (COPD), pectus carinatum / excavatum, kyphoscoliosis
- Symmetry – flattening / drooping of shoulder (fibrosis, collapse), fullness (effusion, pneumothorax)
- Movements of chest – symmetry, reduced on the affected side
- Trachea – position from the front, suprasternal notch
- Apical impulse – visible / shifted
- Intercostal indrawing / fullness, scars, sinuses, dilated veins (SVC obstruction), drain sites
- Respiratory rate, rhythm, type of breathing

Palpation

- Confirm inspection findings, local temperature, tenderness
- **Trachea** – position (Trail's sign – prominent sternal head of sternocleidomastoid on the side to which trachea is shifted)
- **Apex beat** – position (mediastinal shift)
- **Chest expansion** – measure with tape at nipple level (normal 3–5 cm); hand method upper and lower chest
- Anteroposterior and transverse diameter – ratio (normal 5:7)
- **Vocal fremitus** (tactile) – compare both sides

Percussion

- Supraclavicular, clavicular (direct), infraclavicular, mammary, axillary, infra-axillary, suprascapular, interscapular, infrascapular areas – compare side by side
- **Resonant** – normal; **hyper-resonant** – pneumothorax, emphysema; **impaired / dull** – consolidation, collapse, fibrosis; **stony dull** – pleural effusion
- Shifting dullness, Traube's space, upper border of liver dullness (5th ICS right MCL), cardiac dullness (obliterated in emphysema)
- Tidal percussion – diaphragmatic movement

Auscultation

- **Breath sounds** – vesicular / bronchial (tubular, cavernous, amphoric) / diminished / absent
- **Vocal resonance** – increased (consolidation – bronchophony, egophony, whispering pectoriloquy) / decreased (effusion, pneumothorax, collapse with blocked bronchus)
- **Added sounds** – wheeze (rhonchi – monophonic / polyphonic), crepitations (fine end-inspiratory – ILD, pulmonary oedema; coarse – bronchiectasis), pleural rub, succussion splash (hydropneumothorax)
- Coin test – hydropneumothorax

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Summary of physical signs

Condition	Mediastinum	Percussion	Breath sounds	Vocal resonance	Added sounds
Consolidation	Central	Dull	Bronchial	Increased	Crepitations
Collapse (bronchus blocked)	Shifted to same side	Dull	Diminished / absent	Decreased	Nil
Fibrosis	Shifted to same side	Impaired	Bronchial	Increased	Coarse crepitations
Pleural effusion	Shifted to opposite side	Stony dull	Absent / diminished	Decreased	Rub above effusion
Pneumothorax	Shifted to opposite side	Hyper-resonant	Absent / diminished	Decreased	Nil
Cavity	Central / same side	Impaired	Cavernous / amphoric	Increased	Crepitations

Other systems

- CVS – loud P2, right ventricular heave (pulmonary hypertension, cor pulmonale)
- Abdomen – hepatomegaly (downward displacement in emphysema)
- CNS – features of CO_2 narcosis, TB meningitis

mMRC dyspnoea scale

Grade	Description
0	Breathless only with strenuous exercise
1	Breathless when hurrying on level ground or walking up a slight hill
2	Walks slower than people of same age or has to stop for breath at own pace
3	Stops for breath after walking about 100 metres or a few minutes on level ground
4	Too breathless to leave the house or breathless when dressing

Breath sounds – types

Type	Features	Seen in
Vesicular	Inspiration longer than expiration, no gap, low-pitched rustling	Normal lung
Bronchial – tubular	Expiration longer, gap between inspiration and expiration, high-pitched	Consolidation, fibrosis
Bronchial – cavernous	Low-pitched, hollow	Cavity with patent bronchus
Bronchial – amphoric	Low-pitched with high-pitched overtones (blowing over a bottle)	Large cavity, open pneumothorax
Diminished vesicular	Reduced intensity	Effusion, pneumothorax, obesity, emphysema, collapse

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Light's criteria – exudative pleural effusion (any one)

- Pleural fluid protein / serum protein >0.5
- Pleural fluid LDH / serum LDH >0.6
- Pleural fluid LDH >two-thirds of the upper limit of normal serum LDH
- Pleural fluid ADA >40 U/L in a lymphocytic exudate strongly suggests tuberculosis in India

CURB-65 – severity of community-acquired pneumonia

- **C**onfusion, **U**rea >7 mmol/L (BUN >20 mg/dL), **R**espiratory rate ≥30/min, **B**P systolic <90 or diastolic ≤60 mmHg, age ≥**65** years
- Score 0–1 – outpatient; 2 – consider admission; 3–5 – severe pneumonia, consider ICU

GOLD spirometric grading of COPD (post-bronchodilator FEV_1/FVC <0.70)

Grade	FEV_1 (% predicted)
GOLD 1 – mild	≥80%
GOLD 2 – moderate	50–79%
GOLD 3 – severe	30–49%
GOLD 4 – very severe	<30%

Common long cases in respiratory medicine

- Pleural effusion, consolidation (pneumonia), bronchiectasis, fibrocavitary pulmonary TB, COPD with cor pulmonale, interstitial lung disease, hydropneumothorax, collapse, carcinoma lung

Diagnosis – write in this order

- Site (side and lobe) → lesion (consolidation / effusion / fibrosis / collapse / cavity / pneumothorax) → aetiology → complications → functional state
- Example: Right-sided moderate pleural effusion, probably tuberculous, without respiratory failure

Investigations

- Chest X-ray PA and lateral, CBC, ESR, sputum (Gram stain, culture, AFB smear, CBNAAT / Xpert MTB/RIF), Mantoux test
- Pleural fluid analysis – protein, LDH, sugar, ADA, cell count, cytology (Light's criteria)
- Spirometry (FEV_1/FVC, reversibility), ABG, HRCT chest, bronchoscopy, CT-guided biopsy as indicated

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CHAPTER 4

Abdomen – Gastroenterology and Hepatology

GI and liver symptoms, stigmata of chronic liver disease, palpation of organs, ascites and the diagnosis of medical abdominal cases

Chief complaints

Abdominal pain

- Site, onset, character (colicky / burning / dull), radiation (back – pancreas; shoulder – diaphragmatic irritation), relation to food, aggravating / relieving factors

Abdominal distension

- Onset, progression, associated breathlessness, pedal oedema (ascites)

Jaundice

- Onset, duration, progression; colour of urine and stools (clay-coloured – obstructive); itching; fever with chills (cholangitis)

Vomiting, haematemesis, melaena

- Colour, quantity, number of episodes, relation to alcohol or NSAIDs, syncope

Dysphagia, heartburn, regurgitation:

Altered bowel habits

- Diarrhoea (frequency, blood, mucus, nocturnal), constipation, tenesmus, bleeding per rectum

Loss of appetite, weight loss, early satiety:

Features of hepatic decompensation

- Altered sleep rhythm, confusion, drowsiness (encephalopathy); bleeding tendency; swelling of legs and abdomen; decreased urine output

Past history

- Previous jaundice, blood transfusion, surgery, tattooing, injections (hepatitis B / C)
- Diabetes, TB (abdominal TB), peptic ulcer, gallstones, pancreatitis
- Previous variceal bleeding, endoscopic banding, paracentesis

Personal history

- Alcohol – type, quantity in grams per day (units × 8 g), duration, last drink
- Smoking, diet, high-risk sexual behaviour, IV drug use

Family history

- Liver disease (Wilson's disease, haemochromatosis), hepatitis B in mother / siblings, colon cancer, IBD

Drug history

- NSAIDs, hepatotoxic drugs (ATT, paracetamol, methotrexate, herbal), oral contraceptives

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General physical examination

- Built, nutrition, muscle wasting, sarcopenia
- Pallor, icterus, clubbing (cirrhosis, IBD), pedal oedema
- Lymph nodes – left supraclavicular (Virchow's node – Troisier's sign)
- Vital signs, flapping tremor (asterixis), fetor hepaticus

Stigmata of chronic liver disease

- **Hands** – palmar erythema, leukonychia, clubbing, Dupuytren's contracture, asterixis
- **Face and chest** – spider naevi (SVC distribution), parotid enlargement, gynaecomastia, loss of axillary and pubic hair
- **Others** – testicular atrophy, bruising, Kayser–Fleischer ring (Wilson's disease), xanthomas (PBC), scratch marks
- **Portal hypertension** – splenomegaly, ascites, caput medusae, dilated veins

Inspection of abdomen

- Exposure from nipple to mid-thigh (groin and genitalia examined with privacy), patient supine with one pillow, arms by the side
- Shape – flat / scaphoid / distended (fat, fluid, flatus, faeces, fetus)
- Umbilicus – position, shape (everted in ascites, inverted in obesity), hernia, Sister Mary Joseph nodule
- Flanks – full in ascites
- Movements with respiration
- Visible peristalsis, visible pulsation
- Skin – striae, scars, sinuses, pigmentation, Cullen's and Grey Turner's signs
- Dilated veins – direction of blood flow (away from umbilicus – portal hypertension; below upwards – IVC obstruction)
- Hernial orifices, external genitalia

Palpation

- Warm hands, patient relaxed with knees flexed; ask about pain and palpate the painful area last
- **Superficial palpation** – tenderness, guarding, rigidity, local rise of temperature
- **Deep palpation** – in nine regions for any mass

Liver

- Start in right iliac fossa, move upwards with respiration
- Span (by percussion) – normal 12–15 cm in the right midclavicular line
- Size below costal margin, surface (smooth / nodular), edge (sharp / rounded), consistency (soft / firm / hard), tenderness, pulsatility, bruit

Spleen

- From right iliac fossa towards left costal margin, along its long axis; confirm by bimanual palpation, in right lateral position
- Characteristics of spleen – notch, moves with respiration, cannot get above it, dull on percussion
- Size in cm along the long axis from the left costal margin (grades – mild / moderate / massive)
- Massive splenomegaly – chronic myeloid leukaemia, myelofibrosis, kala-azar, chronic malaria, thalassaemia

Kidneys

- Bimanual palpation, ballotable, can get above it, resonant band of colon in front

Gall bladder

- Murphy's sign; palpable gall bladder (Courvoisier's law)

Other masses

- Site, size, shape, surface, margin, consistency, mobility, movement with respiration, pulsatility

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Percussion

- Liver span, splenic dullness (Traube's space, Castell's sign)
- Shifting dullness – moderate ascites; fluid thrill – gross ascites; puddle sign – minimal ascites
- Dullness over masses

Auscultation

- Bowel sounds – normal / increased (obstruction) / absent (ileus, peritonitis)
- Bruits – renal artery, aorta, hepatic (hepatocellular carcinoma, alcoholic hepatitis)
- Venous hum (portal hypertension), friction rub (splenic / hepatic infarct)
- Succussion splash (gastric outlet obstruction)

Per rectal examination

- With consent and chaperone – perianal area, tone, mass, tenderness, stool colour (melaena), prostate / cervix

Other systems

- RS – pleural effusion (hepatic hydrothorax), basal crepitations
- CVS – raised JVP (cardiac cirrhosis), murmurs
- CNS – encephalopathy grade (West Haven), Wilson's disease features

Child–Pugh classification

Parameter	1 point	2 points	3 points
Bilirubin (mg/dL)	<2	2–3	>3
Albumin (g/dL)	>3.5	2.8–3.5	<2.8
INR	<1.7	1.7–2.3	>2.3
Ascites	None	Mild / controlled	Moderate–severe / refractory
Encephalopathy	None	Grade 1–2	Grade 3–4

- Class A – 5–6; class B – 7–9; class C – 10–15 points

West Haven grading of hepatic encephalopathy

Grade	Features
0 / minimal	Abnormal only on psychometric testing
1	Trivial lack of awareness, shortened attention span, altered sleep rhythm
2	Lethargy, disorientation to time, obvious asterixis, inappropriate behaviour
3	Somnolence to semi-stupor, responds to stimuli, confused, gross disorientation
4	Coma

Hepatomegaly – common causes

- **Soft, tender** – congestive heart failure, acute hepatitis, liver abscess
- **Firm, non-tender** – fatty liver, cirrhosis (early), lymphoma, leukaemia, storage disorders

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- **Hard, nodular** – hepatocellular carcinoma, metastases, macronodular cirrhosis
- **Pulsatile** – tricuspid regurgitation
- **With bruit** – hepatocellular carcinoma, alcoholic hepatitis

Splenomegaly – grading and causes

Size	Causes
Mild (up to 3 cm)	Viral infections, typhoid, infective endocarditis, SLE, acute malaria
Moderate (3–7 cm)	Portal hypertension, haemolytic anaemia, lymphoma, leukaemia, chronic malaria
Massive (>8 cm / crossing umbilicus)	CML, myelofibrosis, kala-azar, thalassaemia major, hyperreactive malarial splenomegaly

Serum–ascites albumin gradient (SAAG)

- **SAAG ≥1.1 g/dL (portal hypertension)** – cirrhosis, alcoholic hepatitis, cardiac ascites, Budd–Chiari syndrome, massive liver metastases
- **SAAG <1.1 g/dL** – tuberculous peritonitis, peritoneal carcinomatosis, pancreatic ascites, nephrotic syndrome
- Spontaneous bacterial peritonitis – ascitic fluid neutrophils ≥250 cells/mm³

Hepatomegaly vs right kidney

Feature	Liver	Kidney
Moves with respiration	Yes, downward	Slightly
Can get above it	No	Yes
Ballotable	No	Yes
Percussion	Dull, continuous with liver dullness	Resonant band of colon in front

Diagnosis

- Example: Decompensated chronic liver disease, probably alcohol-related, with portal hypertension (splenomegaly, ascites), Child–Pugh class C, with grade II hepatic encephalopathy
- Severity scores – Child–Pugh (bilirubin, albumin, INR, ascites, encephalopathy), MELD

Investigations

- CBC, peripheral smear, LFT, PT / INR, renal function, electrolytes, blood sugar
- Viral markers – HBsAg, anti-HCV, HAV / HEV IgM; autoimmune and metabolic work-up as needed
- Ultrasound abdomen with Doppler, upper GI endoscopy (varices), ascitic fluid analysis (SAAG, cell count, culture, protein)
- Stool – occult blood, ova and cysts; CT, MRCP, colonoscopy as indicated

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CHAPTER 5

Nervous System

Neurological history, higher functions, cranial nerves, motor, sensory, cerebellar examination and localisation

Bio data

Name: .....

Age: .....

Sex: .....

Handedness: .....

Occupation: .....

Chief complaints

Weakness

- Onset (sudden – vascular; gradual – compressive, degenerative), progression, distribution (hemi / para / quadri / monoparesis), proximal or distal
- Difficulty in combing hair, climbing stairs, getting up from squatting (proximal); holding slippers, buttoning (distal)

Sensory symptoms

- Numbness, tingling, burning, loss of sensation, girdle sensation (spinal cord), distribution (glove and stocking – neuropathy)

Bladder and bowel involvement

- Retention, urgency, incontinence

Headache, vomiting, blurring of vision

- Raised intracranial pressure

Seizures

- Type, frequency, aura, tongue bite, incontinence, post-ictal state, triggers

Altered sensorium, memory loss, behaviour change: .....

Cranial nerve symptoms

- Loss of smell, visual disturbance, diplopia, facial deviation, deafness, vertigo, dysphagia, nasal regurgitation, change of voice, slurred speech

Involuntary movements, tremor: .....

Unsteadiness of gait, falls: .....

Past history

- Hypertension, diabetes, heart disease (AF, RHD – embolic stroke), TB, syphilis, HIV, trauma, previous stroke / TIA

Personal history

- Smoking, alcohol, diet (vitamin B12 deficiency)

Family history

- Similar illness (muscular dystrophy, hereditary neuropathy, Huntington's chorea), consanguinity

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Drug history

- Antiepileptics, anticoagulants, antiplatelets, ATT (isoniazid neuropathy)

General physical examination

- PICCLE, vitals (pulse – AF; BP), neck stiffness
- Neurocutaneous markers – café-au-lait spots, adenoma sebaceum, ash-leaf macules, neurofibromas
- Skull and spine – deformity, tenderness, scars, short neck, low hairline
- Carotid bruit

Higher mental functions

- Consciousness – Glasgow Coma Scale (E4 V5 M6)
- Orientation – time, place, person
- Behaviour, appearance, mood
- Memory – immediate (digit span), recent, remote
- Intelligence, calculation, abstract thinking
- Speech – dysarthria, dysphonia, aphasia (fluency, comprehension, repetition, naming, reading, writing)
- Handedness and dominant hemisphere
- MMSE / MoCA where appropriate

Cranial nerves

Nerve	Examination
I – Olfactory	Smell each nostril separately (coffee, soap)
II – Optic	Visual acuity, colour vision, visual fields by confrontation, pupillary reflexes (direct, consensual), fundoscopy
III, IV, VI	Ptosis, eye position, extraocular movements, diplopia, nystagmus, pupils, accommodation
V – Trigeminal	Sensation over three divisions, muscles of mastication (masseter, temporalis, pterygoids), corneal reflex, jaw jerk
VII – Facial	Forehead wrinkling, eye closure, nasolabial fold, showing teeth, blowing cheeks; taste anterior two-thirds; UMN vs LMN facial palsy
VIII – Vestibulocochlear	Hearing, Rinne and Weber tests, nystagmus, vestibular tests
IX, X	Palatal movement, uvula, gag reflex, nasal voice, nasal regurgitation
XI – Accessory	Sternocleidomastoid and trapezius power
XII – Hypoglossal	Tongue – wasting, fasciculations, deviation on protrusion

Motor system

Bulk

- Inspection, measurement of limb girth at fixed points; wasting, hypertrophy, pseudohypertrophy (calf in DMD)

Tone

- Normal / hypotonia / hypertonia – spasticity (clasp-knife, UMN) or rigidity (lead-pipe, cogwheel – extrapyramidal)
- Clonus – ankle, patellar

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Power – MRC grading

Grade	Description
0	No contraction
1	Flicker of contraction
2	Movement with gravity eliminated
3	Movement against gravity
4	Movement against some resistance
5	Normal power

- Test shoulder, elbow, wrist, fingers, hip, knee, ankle; neck and trunk muscles; Beevor's sign

Co-ordination

- Finger–nose, finger–finger–nose, heel–knee–shin, dysdiadochokinesia, rebound phenomenon

Involuntary movements

- Tremor, chorea, athetosis, dystonia, myoclonus, fasciculations

Gait

- Hemiplegic (circumduction), spastic (scissoring), ataxic (broad-based), high-stepping (foot drop), waddling (proximal myopathy), Parkinsonian (festinant), Romberg's test

Reflexes

Superficial reflexes

- Corneal, conjunctival, abdominal (T8–T12), cremasteric (L1, L2), plantar (S1)

Deep tendon reflexes

Reflex	Root value
Biceps	C5, C6
Supinator	C5, C6
Triceps	C6, C7
Finger flexion	C8
Knee	L3, L4
Ankle	S1, S2

- Grade 0 (absent) to 4+ (with clonus); reinforcement (Jendrassik)
- Hoffmann's sign

Plantar response

- Flexor / extensor (Babinski sign); Chaddock, Oppenheim, Gordon

Sensory system

- **Spinothalamic** – pain (pin-prick), temperature, crude touch
- **Posterior column** – fine touch, vibration (128 Hz tuning fork), joint position sense, Romberg's sign
- **Cortical** – two-point discrimination, stereognosis, graphaesthesia, tactile localisation, sensory extinction
- Map sensory level (dermatomes) and distribution

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Cerebellar signs

- Nystagmus, scanning (staccato) speech, intention tremor, past-pointing, dysdiadochokinesia, hypotonia, pendular knee jerk, ataxic gait, titubation

Signs of meningeal irritation

- Neck stiffness, Kernig's sign, Brudzinski's sign

Skull and spine, peripheral nerves

- Thickened nerves (leprosy) – ulnar, greater auricular, common peroneal
- Spine – tenderness, gibbus, scoliosis

Autonomic nervous system

- Postural hypotension, sweating, bladder and bowel

UMN and LMN lesions

Feature	Upper motor neuron	Lower motor neuron
Wasting	Absent / disuse only	Marked
Fasciculations	Absent	Present
Tone	Increased (spasticity)	Decreased
Power	Reduced in pyramidal pattern	Reduced in distribution of nerve / root
Deep reflexes	Exaggerated	Diminished / absent
Plantar	Extensor	Flexor / absent
Clonus	Present	Absent

Glasgow Coma Scale

Component	Response	Score
Eye opening	Spontaneous / to sound / to pressure / none	4 / 3 / 2 / 1
Verbal	Oriented / confused / words / sounds / none	5 / 4 / 3 / 2 / 1
Motor	Obeys commands / localises / normal flexion / abnormal flexion / extension / none	6 / 5 / 4 / 3 / 2 / 1

- Total 3–15; ≤8 indicates severe impairment (consider airway protection)

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Localisation of hemiplegia

Site of lesion	Clues
Cortex	Monoplegia, cortical sensory loss, aphasia (dominant), seizures, neglect (non-dominant)
Internal capsule	Dense hemiplegia of face, arm and leg equally, with UMN facial palsy, no cortical signs
Midbrain (Weber's)	Ipsilateral 3rd nerve palsy + contralateral hemiplegia
Pons (Millard–Gubler)	Ipsilateral 6th and 7th (LMN) nerve palsy + contralateral hemiplegia
Medulla (lateral – Wallenberg)	Ipsilateral facial pain/temperature loss, Horner's, ataxia, IX–X palsy + contralateral body pain/temperature loss
Spinal cord (Brown-Séquard)	Ipsilateral weakness and posterior column loss + contralateral spinothalamic loss below lesion

Causes of paraplegia

- **Compressive** – Pott's spine, disc prolapse, tumours (secondaries, meningioma, neurofibroma), epidural abscess, trauma
- **Non-compressive** – transverse myelitis, subacute combined degeneration (B12), multiple sclerosis, NMO, tropical spastic paraparesis, motor neuron disease, lathyrism, fluorosis
- **Flaccid / LMN** – Guillain–Barré syndrome, acute anterior horn cell disease, cauda equina lesion, myopathy, hypokalaemic periodic paralysis

Facial palsy – UMN vs LMN

Feature	UMN (supranuclear)	LMN (Bell's palsy)
Upper face (forehead)	Spared (bilateral cortical supply)	Involved
Lower face	Involved	Involved
Bell's phenomenon	Absent	Present
Taste, hyperacusis	Normal	May be affected (depending on level)
Associated	Hemiplegia on same side as facial weakness	Isolated

Dermatome landmarks

- C4 – tip of shoulder; C6 – thumb; C7 – middle finger; C8 – little finger; T4 – nipple; T10 – umbilicus; L1 – inguinal ligament; L3 – knee; L5 – dorsum of foot and great toe; S1 – lateral foot and sole; S3–S5 – perianal (saddle)

Common long cases in neurology

- Hemiplegia, paraplegia, Parkinsonism, cerebellar ataxia, peripheral neuropathy, motor neuron disease, myopathy, Guillain–Barré syndrome, multiple cranial nerve palsies, meningitis

Diagnosis – write in this order

1. Anatomical (localisation) – level of lesion (cortex, internal capsule, brainstem, cord, root, plexus, nerve, NMJ, muscle) and side
2. Pathological – vascular, infective, inflammatory / demyelinating, neoplastic, degenerative, traumatic, metabolic
3. Aetiological

- Example: Right-sided spastic hemiplegia with upper motor neuron facial palsy and motor aphasia – lesion in left internal capsule – vascular (ischaemic stroke), probably cardio-embolic secondary to rheumatic heart disease with atrial fibrillation

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Investigations

- CBC, ESR, blood sugar, renal function, electrolytes, lipid profile, B12, VDRL, HIV
- CT / MRI brain or spine, CSF analysis, EEG, nerve conduction study, EMG
- ECG, echocardiography, carotid Doppler in stroke

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CHAPTER 6

Locomotor System – Rheumatology

Joint history, GALS screen, systematic joint examination and extra-articular features of rheumatological diseases

Chief complaints

Joint pain

- Onset (acute / insidious), duration, number of joints – mono (1), oligo (2–4), polyarthritis (≥5)
- Distribution – small / large joints, symmetrical / asymmetrical, axial involvement
- Pattern – additive / migratory (rheumatic fever) / intermittent (gout)
- Inflammatory (morning stiffness >30–60 min, better with activity) vs mechanical (worse with activity, evening)

Joint swelling, redness, warmth:

Morning stiffness

- Duration

Deformity, restriction of movement, functional disability:

Low back pain

- Inflammatory back pain – age <40, insidious, morning stiffness, improves with exercise, night pain (ankylosing spondylitis)

Extra-articular symptoms

- Fever, weight loss, fatigue
- Skin rash (malar, photosensitive, psoriatic), oral ulcers, alopecia
- Dry eyes and mouth (Sjögren), red eye (uveitis, scleritis)
- Raynaud's phenomenon, skin tightening, dysphagia (systemic sclerosis)
- Proximal muscle weakness (myositis)
- Breathlessness, chest pain (ILD, serositis), haematuria, frothy urine (nephritis)
- Diarrhoea (IBD), urethritis, dysentery (reactive arthritis)

Past history

- Sore throat (rheumatic fever), tuberculosis, gonorrhoea, psoriasis, IBD, recurrent abortions (APS), thrombosis

Family history

- RA, spondyloarthritis, psoriasis, gout, SLE

Drug history

- NSAIDs, steroids, DMARDs (methotrexate, hydroxychloroquine, sulfasalazine, leflunomide), biologics; drugs causing gout (thiazides) or lupus (hydralazine, procainamide)

Personal history

- Diet (purine-rich, alcohol – gout), occupation

General physical examination

- Built, gait, posture, pallor, lymphadenopathy, vital signs
- Skin – rash, psoriatic plaques, nail pitting, onycholysis, subcutaneous nodules (RA), tophi (gout), calcinosis, telangiectasia, Raynaud's, vasculitic ulcers, purpura

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- Eyes – dryness, red eye, uveitis
- Oral ulcers, parotid enlargement

GALS screening examination

- **Questions** – Do you have any pain or stiffness in muscles, joints or back? Can you dress yourself without difficulty? Can you walk up and down stairs without difficulty?
- **Gait** – symmetry, smoothness, turning
- **Arms** – hands behind head; hands by side, elbows straight; pronation and supination; fists; squeeze of MCP joints; pincer grip
- **Legs** – knee flexion / extension, hip internal rotation, patellar tap, squeeze of MTP joints, inspection of soles
- **Spine** – from behind (scoliosis, muscle bulk), side (lordosis, kyphosis), lateral neck flexion, Schober's test

Examination of each joint – look, feel, move, measure

- **Look** – swelling, redness, deformity, muscle wasting, skin changes, scars
- **Feel** – temperature, tenderness (joint line), synovial thickening, effusion, crepitus
- **Move** – active and passive range, pain on movement, stability
- **Function** – grip, gait, activities of daily living

Hands

- Inspection – symmetrical swelling of MCP and PIP joints (RA), DIP joints (OA, psoriatic arthritis)
- Deformities – ulnar deviation, swan-neck, boutonnière, Z-thumb (RA); Heberden's (DIP) and Bouchard's (PIP) nodes (OA); dactylitis (psoriatic, reactive arthritis); arthritis mutilans
- Squeeze test of MCP joints; grip strength; function (button, write, pick up coin)
- Carpal tunnel – Tinel's and Phalen's signs

Other joints

- Wrists, elbows (nodules, psoriatic plaques), shoulders, temporomandibular joints, cervical spine
- Hips, knees (effusion, Baker's cyst), ankles, feet (MTP squeeze, hallux valgus, tophi, plantar fasciitis, Achilles enthesitis)

Spine and sacroiliac joints

- Lumbar lordosis, kyphosis, occiput-to-wall distance, chest expansion (<2.5 cm in AS)
- Modified Schober's test – <5 cm increase on forward flexion is abnormal
- Sacroiliac joint tenderness and stress tests (FABER)

Disease activity

- Tender and swollen joint count (28 joints – DAS28)

Systemic examination

- RS – ILD (fine crepitations), pleural effusion
- CVS – pericardial rub, valvular lesions (aortic regurgitation in AS)
- Abdomen – hepatosplenomegaly (Felty's syndrome, Still's disease)
- CNS – mononeuritis multiplex, neuropathy, cord compression (atlanto-axial subluxation)
- Kidneys – oedema, hypertension (lupus nephritis, scleroderma renal crisis)

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Pattern recognition

Disease	Typical pattern
Rheumatoid arthritis	Symmetrical small-joint polyarthritis (MCP, PIP, wrist), spares DIP, morning stiffness >1 h, nodules
Osteoarthritis	Weight-bearing joints, DIP and first CMC joint, Heberden's and Bouchard's nodes, crepitus
Ankylosing spondylitis	Young male, inflammatory back pain, sacroiliitis, reduced spinal mobility, enthesitis, uveitis
Psoriatic arthritis	DIP involvement, dactylitis, nail pitting, asymmetrical oligoarthritis, arthritis mutilans
Gout	Acute monoarthritis of first MTP joint, tophi, hyperuricaemia
Reactive arthritis	Asymmetrical lower-limb oligoarthritis after urethritis / dysentery, conjunctivitis
SLE	Non-erosive polyarthritis in young woman with rash, oral ulcers, serositis, nephritis, cytopenias
Rheumatic fever	Migratory polyarthritis of large joints after streptococcal sore throat

ACR / EULAR 2010 classification criteria for rheumatoid arthritis (score ≥6/10 = definite RA)

Domain	Category	Score
Joint involvement	1 large joint / 2–10 large / 1–3 small / 4–10 small / >10 (≥1 small)	0 / 1 / 2 / 3 / 5
Serology	Negative RF and anti-CCP / low positive / high positive	0 / 2 / 3
Acute-phase reactants	Normal CRP and ESR / abnormal	0 / 1
Duration of symptoms	<6 weeks / ≥6 weeks	0 / 1

Inflammatory vs mechanical joint pain

Feature	Inflammatory	Mechanical / degenerative
Morning stiffness	>30–60 minutes	<30 minutes
Effect of activity	Improves	Worsens
Effect of rest	Worsens (gelling)	Improves
Swelling	Soft-tissue, warm	Bony
Systemic features	Fever, fatigue, raised ESR / CRP	Absent

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Synovial fluid analysis

Type	Appearance	WBC / mm³	Examples
Normal	Clear, viscous	<200	–
Non-inflammatory	Clear, yellow	<2000	Osteoarthritis, trauma
Inflammatory	Turbid, low viscosity	2000–50,000	RA, gout, spondyloarthritis
Septic	Purulent	>50,000 (mostly neutrophils)	Septic arthritis
Crystals	–	–	Gout – needle-shaped, negatively birefringent urate; pseudogout – rhomboid, positively birefringent CPPD

Extra-articular features of rheumatoid arthritis

- Skin – rheumatoid nodules, vasculitic ulcers; eyes – keratoconjunctivitis sicca, scleritis, episcleritis
- Lungs – ILD, pleural effusion, nodules (Caplan's syndrome); heart – pericarditis
- Blood – anaemia of chronic disease, Felty's syndrome (RA + splenomegaly + neutropenia)
- Nerves – carpal tunnel syndrome, mononeuritis multiplex, atlanto-axial subluxation

Diagnosis

- Example: Chronic symmetrical inflammatory polyarthritis of small joints of hands and feet with subcutaneous nodules and swan-neck deformities – rheumatoid arthritis, seropositive, active disease, without extra-articular features

Investigations

- CBC, ESR, CRP, RF, anti-CCP, ANA (IIF), anti-dsDNA, complements, HLA-B27, serum uric acid, ASO titre
- Synovial fluid analysis – cell count, crystals (polarised microscopy), Gram stain, culture
- X-rays of hands and feet, sacroiliac joints; ultrasound / MRI of joints
- Urine routine (proteinuria), renal and liver function before DMARDs

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PART II

Paediatrics

Paediatric case format and newborn examination

7 Pediatric Case Format

8 Newborn Examination

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CHAPTER 7

Pediatric Case Format

Antenatal to developmental history, immunisation, anthropometry and head-to-foot examination

Bio data

Name: .....

Age: .....

Sex: .....

Address: .....

Informant: .....

Presenting complaints: .....

History of presenting illness: .....

Past history

- H/o similar illness
- Measles, mumps, whooping cough, TB, jaundice
- Any h/o surgeries

Antenatal history

- UPT done … days after missing periods and was found to be positive. Done at home or hospital.

First trimester

First antenatal check-up at how many days after missing periods. Whether had regular ANC after that. Folic acid taken or not. At what period of gestation folic acid was started (should be started periconceptionally or at least immediately after missing periods; neural tube development occurs before 6 weeks, so no effect after 6 weeks). Booking visit routine blood and urine investigations done or not. Any abnormality seen in the report. Dating scan done or not; was it corresponding to period of gestation; single or multiple pregnancy; intra- / extrauterine; cardiac activity +/–. H/o vomiting (severity, any dehydration, medications taken). Any h/o bleeding / discharge PV (implantation bleed / abortions / ectopic), abdominal pain, UTI, fever, rash (TORCH infections). Any h/o exposure to radiation (congenital anomaly), drug intake (teratogenic effects). Was NT scan done? If so, when?

Second trimester

Iron and calcium was started. Started appreciating fetal movements by …… weeks (quickening important only if dates are not known or dating scan not done). OGTT or OGCT was done or not. Were results normal or not. Blood pressure – normotensive or not; pedal oedema. Bleeding PV (placenta praevia).

Third trimester

Fe and Ca continued or not. Fetal movements were adequate or not. Any bleeding or leaking PV. Growth scan – normal or not. Weight gain (normally 11 kg weight gain). Normotensive, euglycaemic (mention euglycaemic only if blood sugar estimation was done in the third trimester).

Natal history

- Hospital / home delivery
- Term / preterm
- Normal delivery / assisted delivery / caesarean delivery
- Indication is needed if it is assisted / caesarean delivery

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Postnatal history

- Did child breathe immediately after birth?
- Birth weight
- NICU admission needed or not?
- When were urine and meconium passed?
- When was breastfeeding initiated?
- H/o jaundice, seizure, poor feeding
- Umbilical stump fell after how many days?

Immunisation history

Age	Universal Immunisation Programme (UIP)
At birth	BCG, OPV-0, Hepatitis B birth dose (within 24 hours)
6 weeks	Pentavalent-1 (DPT, Hep B, Haemophilus influenzae type b), OPV-1, Rotavirus-1, fIPV-1, PCV-1
10 weeks	Pentavalent-2, OPV-2, Rotavirus-2
14 weeks	Pentavalent-3, OPV-3, Rotavirus-3, fIPV-2, PCV-2
9–12 months	MR-1, JE-1*, PCV booster, fIPV-3, Vitamin A (1st dose)
16–24 months	MR-2, JE-2*, DPT booster-1, OPV booster, Vitamin A (2nd dose, then every 6 months up to 5 years)
5–6 years	DPT booster-2
10 years	Td
16 years	Td

IPV was added to the programme in 2015 (now given as intradermal fractional IPV); MR replaced measles vaccine. *JE vaccine only in endemic districts.

Additional vaccines

1. Pneumococcal vaccine
   - Conjugated vaccine – can be given for less than 2 years old: 6, 10, 14 weeks and booster at 12–15 months (IAP)
   - Unconjugated vaccine – given after 2 years of age
2. Hepatitis A – 2 doses at 0 and 6 months
3. Varicella vaccine – 2 doses; 1st dose after 1 year of age (15 months), 2nd dose 3–6 months later (IAP)
4. Typhoid vaccine
5. Influenza vaccine
6. Japanese encephalitis
7. Meningococcal vaccine
8. Rotavirus vaccine

Development history

Development quotient (DQ) = developmental age ÷ chronological age × 100 (calculate for each domain below)

Gross motor development

Age	Milestone
3 months	Neck holding

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Age	Milestone
5 months	Rolls over
6 months	Sits in tripod position
8 months	Sitting without support
9 months	Stands with support
12 months	Stands without support
15 months	Walks
18 months	Runs
2 years	Climbs stairs 2 feet / step
3 years	Rides tricycle
4 years	Hops on one foot

Development quotient:

Fine motor development

Age	Milestone
4 months	Bidextrous reach
6 months	Unidextrous reach
9 months	Immature pincer grasp
12 months	Mature pincer grasp
15 months	Imitates scribbling
18 months	Scribbles
2 years	Draws vertical strokes
3 years	Draws circle
4 years	Draws cross
5 years	Draws triangle

Development quotient:

Social milestones

Age	Milestone
2 months	Social smile
3 months	Recognises mother
6 months	Recognises stranger
12 months	Comes when called
18 months	Copies parents in task
2 years	Asks for food, drink, toilet
3 years	Shares toys
4 years	Plays co-operatively in group

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Age	Milestone
5 years	Helps in household tasks

Development quotient:

Language milestones

Age	Milestone
3 months	Coos
6 months	Monosyllables
9 months	Bisyllables
12 months	1–2 words with meaning
18 months	8–10 words with meaning
2 years	2–3 word sentences
3 years	Asks questions
4 years	Says poems and stories
5 years	Asks meaning of words

Development quotient:

Dietary history

Time of meal	Type of food	Quantity	Calories	Proteins

Total ……. kcal ……. g

Calorie deficit = calories required – calories obtained

Protein deficit = protein required – protein obtained

Family history

- Any illness running in the family
- H/o TB

Family and socioeconomic status

Modified Kuppuswamy scale

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General examination

- Build and nourishment
- PICCLE

Vitals

- BP
- Pulse
- Respiratory rate
- Temperature

Anthropometry

Weight

- 3–12 months: (age in months + 9) / 2
- 1–6 years: (age × 2) + 8
- 7–12 years: (age × 7 – 5) / 2

Height (Weech formula)

- (Age in years × 6) + 77 cm (for 2–12 years)

Weight for height

- Weight of the child / ideal weight of a normal child of same height × 100

Upper segment – lower segment ratio

- Lower segment is measured from the upper border of the pubic symphysis to the floor (heel)
- Upper segment = height of the child – lower segment

Age	US : LS ratio
Newborn	1.7 : 1
3 years	1.3 : 1
7–10 years	1 : 1
Adult (after puberty)	0.9 : 1

Mid-parental height

- MPH for boys = (father's height + mother's height + 13 cm) / 2
- MPH for girls = (father's height + mother's height – 13 cm) / 2

Head circumference

2-monthly increase of (4 + 3 + 2 + 1 + 1 + 1)

Age	Head circumference
At birth	34 cm
2 months	38 cm
4 months	41 cm
6 months	43 cm
8 months	44 cm
10 months	45 cm
1st year	46 cm

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Age	Head circumference
2nd year (by 2 cm)	48 cm
3rd year (by 1 cm)	49 cm

Chest circumference

- Head circumference is more than chest circumference up to 1 year by 2 cm
- At 1 year of age it equals
- Then chest circumference becomes more than head circumference
- It is measured only up to 2–3 years of age
- Head > chest → hydrocephalus and malnutrition

Mid-arm circumference (measured between 6 months – 5 years)

- Measured in left arm
- Midway between olecranon process and acromion process
- Above 12.5 cm – normal
- 11.5–12.5 cm – moderate acute malnutrition
- Less than 11.5 cm – severe acute malnutrition (WHO)

Head-to-foot examination

Head – look for microcephaly, macrocephaly, fontanelle (bulging or sunken), asymmetry, head tilt (torticollis), scalp hair (flag sign, light-coloured hair), low hairline.

Face

Appearance – myopathic face, moon face, puffy face, haemolytic facies, Down syndrome facies

Nose – depressed nasal bridge

Eyes – microphthalmos, lid oedema, red eye, proptosis, enophthalmos, epicanthic fold, upslanting palpebral fissures, downslanting palpebral fissures, blue sclera, cataract, ectopia lentis, KF ring, strabismus

Ears – low-set ear, preauricular tags, tragus sign, deafness

Mouth – microstomia, macrostomia, long or short philtrum, cleft palate, drooling, dry mouth, delayed dentition, gum hyperplasia, macroglossia, microglossia

Lip – cleft lip

Jaw – micrognathia, prognathism

Neck – short neck, goitre, webbing of neck

Chest – shield-shaped chest, pectus excavatum, pectus carinatum, rickety rosary, Harrison sulcus

Spine – scoliosis, kyphosis, gibbus

Abdomen – any swellings, hernia

Genitalia – micropenis, microorchidism, macroorchidism

Upper limbs – clinodactyly, arachnodactyly, thumb sign, wrist sign, trident sign, polydactyly, Osler nodes, Janeway lesions, splinter haemorrhage, koilonychia, clubbing, cyanosis, palmar crease

Lower limbs – coxa valga, genu valgum, genu varum, genu recurvatum, pes planus

Skin – petechiae, purpura, ecchymosis, hypopigmentation, hyperpigmentation, café-au-lait spots, Mongolian blue spots, haemangiomas, erythema nodosum

Systemic examination

- Respiratory system
- Cardiovascular system
- Gastrointestinal system
- Nervous system

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Assessment of dehydration (WHO / IMNCI)

Sign	No dehydration	Some dehydration	Severe dehydration
General condition	Well, alert	Restless, irritable	Lethargic or unconscious
Eyes	Normal	Sunken	Sunken
Thirst	Drinks normally	Drinks eagerly, thirsty	Drinks poorly or not able to drink
Skin pinch	Goes back quickly	Goes back slowly	Goes back very slowly (>2 s)
Plan	A – home ORS	B – ORS 75 mL/kg over 4 h	C – IV fluids

Classification of malnutrition

System	Category	Criteria
WHO – wasting	Severe acute malnutrition (SAM)	Weight-for-height < –3 SD, or MUAC <11.5 cm, or bilateral pitting oedema
WHO – wasting	Moderate acute malnutrition	Weight-for-height –2 to –3 SD, or MUAC 11.5–12.5 cm
WHO – stunting	Stunted / severely stunted	Height-for-age < –2 SD / < –3 SD
WHO – underweight	Underweight / severely underweight	Weight-for-age < –2 SD / < –3 SD
IAP (weight for age)	Grade I / II / III / IV	71–80% / 61–70% / 51–60% / ≤50% of expected

Normal vital signs by age (approximate)

Age	Heart rate / min	Respiratory rate / min	Systolic BP (mmHg)
Newborn	120–160	40–60	60–80
Infant (1–12 months)	100–150	30–50	70–100
1–5 years	90–140	24–40	80–110
6–12 years	70–120	18–30	90–120
Adolescent	60–100	12–20	100–130

- Fast breathing (IMNCI): ≥60/min under 2 months; ≥50/min at 2–12 months; ≥40/min at 1–5 years

Dentition

- Temporary teeth erupt from 6 months (lower central incisors); all 20 by 2½ years
- Permanent teeth – first molar at 6 years; replacement of temporary teeth from 6–12 years
- Delayed dentition – no teeth by 13 months: rickets, hypothyroidism, hypopituitarism, Down syndrome, idiopathic

Common long cases in paediatrics

- Nephrotic syndrome, acute glomerulonephritis, cerebral palsy, congenital heart disease, thalassaemia / haemolytic anaemia, severe acute malnutrition, hepatosplenomegaly, tuberculous meningitis sequelae, rickets, Down syndrome

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CHAPTER 8

Newborn Examination

Maternal and perinatal history, gestational assessment, head-to-toe examination, primitive reflexes and danger signs of the neonate

Bio data

Name of baby / mother: .....

Age (hours / days): .....

Sex: .....

Date and time of birth: .....

Informant: .....

Presenting complaints

- Poor feeding, lethargy, fever / hypothermia, jaundice, breathing difficulty, convulsions, vomiting, abdominal distension, not passed meconium, bleeding, umbilical discharge

Maternal history

- Age, gravida, parity, blood group and Rh status, booking, number of ANC visits
- Illnesses in pregnancy – hypertension, diabetes, anaemia, fever, rash, UTI, thyroid disease, HIV / HBsAg / VDRL status
- Drugs, radiation, antenatal steroids, TT / Td immunisation
- Previous neonatal deaths, jaundice requiring exchange transfusion

Natal history

- Place and mode of delivery, indication for caesarean / instrumental delivery
- Gestational age, prolonged rupture of membranes (>18 h), maternal fever, foul-smelling or meconium-stained liquor
- Cried immediately after birth? APGAR at 1 and 5 minutes; resuscitation required

Postnatal history

- Birth weight, time of first breastfeed, colostrum given, prelacteal feeds
- Passage of urine and meconium (within 24–48 h)
- Jaundice – day of onset (within 24 h is pathological), NICU admission, phototherapy
- Vitamin K, BCG, OPV-0, hepatitis B birth dose given

Feeding history

- Exclusive breastfeeding, frequency, positioning and attachment, adequacy (6–8 wet nappies per day, weight gain)

General examination

- Activity, cry, colour (pink / pale / cyanosed / jaundiced / plethoric)
- Temperature (normal axillary 36.5–37.5 °C), heart rate (120–160/min), respiratory rate (40–60/min), CFT (<3 s), SpO_2, blood glucose
- Signs of respiratory distress – tachypnoea, grunting, nasal flaring, chest retractions (Silverman–Andersen / Downes score)
- Jaundice – Kramer's dermal zones (head to palms and soles)

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Anthropometry

Measure	Term newborn (approximate)
Weight	2.5–4.0 kg (LBW <2.5 kg; VLBW <1.5 kg; ELBW <1.0 kg)
Length	48–50 cm
Head circumference	33–35 cm
Chest circumference	2–3 cm less than head circumference

- Classify – preterm / term / post-term; SGA / AGA / LGA (on growth chart)

Gestational assessment

- New Ballard score – neuromuscular (posture, square window, arm recoil, popliteal angle, scarf sign, heel to ear) and physical maturity (skin, lanugo, plantar creases, breast, eye / ear, genitalia)

Head-to-toe examination

- **Head** – shape, moulding, caput succedaneum (crosses sutures), cephalhaematoma (limited by sutures), anterior and posterior fontanelles, sutures
- **Face** – dysmorphic features, facial palsy
- **Eyes** – red reflex, subconjunctival haemorrhage, discharge, cataract
- **Ears** – position, preauricular tags / pits
- **Mouth** – cleft lip and palate, natal teeth, tongue-tie, Epstein's pearls
- **Neck** – sternocleidomastoid tumour, webbing, cystic hygroma
- **Clavicles** – fracture (crepitus, asymmetrical Moro)
- **Chest** – shape, breast engorgement
- **Abdomen** – distension, umbilical stump (number of vessels – 2 arteries, 1 vein; discharge, redness), liver, spleen, kidneys, hernia
- **Genitalia** – males: testes descended, hypospadias, epispadias; females: labia, vaginal discharge / withdrawal bleeding; ambiguous genitalia
- **Anus** – patency and position
- **Spine** – neural tube defects, sacral dimple, tuft of hair
- **Limbs** – polydactyly, syndactyly, talipes (CTEV), Erb's palsy (waiter's tip)
- **Hips** – Ortolani and Barlow tests
- **Skin** – Mongolian spots, milia, erythema toxicum, haemangioma, petechiae, pustules

Systemic examination

- CVS – heart sounds, murmurs, femoral pulses (coarctation)
- RS – air entry, added sounds
- Abdomen – organomegaly, masses
- CNS – tone, activity, cry, fontanelle

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Primitive reflexes

Reflex	Appears	Disappears by
Moro	Birth	3–6 months
Rooting	Birth	3–4 months
Sucking	Birth (32–34 weeks)	Becomes voluntary by 4 months
Palmar grasp	Birth	3–4 months
Plantar grasp	Birth	9–12 months
Asymmetric tonic neck	Birth / 2 weeks	4–6 months
Stepping (walking)	Birth	2 months

Danger signs (IMNCI)

- Not able to feed, convulsions, fast breathing (≥60/min), severe chest indrawing, temperature ≥37.5 °C or <35.5 °C, movement only on stimulation or no movement, jaundice on palms and soles, umbilical redness extending to skin, many skin pustules

APGAR score

Sign	0	1	2
Appearance (colour)	Blue / pale all over	Body pink, extremities blue	Completely pink
Pulse (heart rate)	Absent	<100 / min	≥100 / min
Grimace (reflex irritability)	No response	Grimace	Cry, cough or sneeze
Activity (muscle tone)	Limp	Some flexion	Active movement
Respiration	Absent	Slow, irregular, weak cry	Good, strong cry

- Score at 1 and 5 minutes; 7–10 normal, 4–6 moderately depressed, 0–3 severely depressed

Physiological vs pathological jaundice

Feature	Physiological	Pathological
Onset	After 24 hours (day 2–3)	Within first 24 hours
Peak	Day 3–5 (term)	Any time, rising rapidly (>5 mg/dL per day)
Duration	<2 weeks term; <3 weeks preterm	Prolonged beyond these limits
Direct bilirubin	Normal	>2 mg/dL or >20% of total (cholestasis)
Associated	Well baby, feeding well	Sick baby, pallor, hepatosplenomegaly, pale stools

Kramer's zones (clinical estimate of serum bilirubin, mg/dL)

- Zone 1 – head and neck (~5); zone 2 – upper trunk (~10); zone 3 – lower trunk and thighs (~12); zone 4 – arms and legs (~15); zone 5 – palms and soles (>15)

Downes score for respiratory distress

- Respiratory rate, cyanosis, retractions, grunting, air entry – each 0–2; score >6 suggests impending respiratory failure

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Diagnosis

- Example: Term, appropriate-for-gestational-age male neonate, day 4 of life, with physiological jaundice, on exclusive breastfeeding

Investigations

- Serum bilirubin (total / direct), blood group of mother and baby, DCT, Hb, PCV, reticulocyte count
- Sepsis screen – CBC, CRP, micro-ESR, blood culture
- Blood glucose, calcium, chest X-ray, cranial ultrasound, newborn screening (TSH, G6PD), hearing screening (OAE)

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PART III

General Surgery

Surgical case sheets for the common long and short cases

9 General Surgical Case Sheet and Examination of a Swelling

10 Examination of Ulcer

11 Examination of Lymph Nodes

12 Thyroid Case Sheet

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15 Examination of Scrotal Swellings

16 Surgical Abdomen – Abdominal Lump, Acute Abdomen and Obstructive Jaundice

17 Peripheral Arterial Disease and Gangrene

18 Varicose Veins Examination

19 Salivary Gland Swellings

20 Oral Cavity Lesions – Carcinoma of Oral Cavity

21 Urological Case – Benign Prostatic Hyperplasia and Renal Swelling

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CHAPTER 9

General Surgical Case Sheet and Examination of a Swelling

The common surgical history format and the classical examination of any lump, sinus or fistula

Bio data

Name: .....

Age: .....

Sex: .....

Occupation: .....

Address: .....

Date of admission: .....

Chief complaints

- Swelling / pain / ulcer / discharge – with duration, in chronological order

History of presenting illness

Swelling

- Mode of onset – noticed accidentally / after trauma / spontaneously
- Duration and progression – rapid growth (malignancy, abscess, haemorrhage), static (benign)
- Pain – onset, character; painful swellings (abscess, inflammatory); sudden pain (haemorrhage, torsion, malignant change)
- Change in size with time, posture, exercise, coughing, menstruation, meals
- Discharge, ulceration, bleeding
- Other similar swellings in the body (multiple lipomas, neurofibromatosis, lymph nodes)
- Loss of function, pressure symptoms
- Constitutional symptoms – fever, loss of weight and appetite
- Symptoms of metastasis – bone pain, cough, haemoptysis, jaundice, headache

Past history

- Similar swellings, surgery for swelling, trauma, TB, diabetes, hypertension, asthma, bleeding disorder, drug allergy

Personal, family and treatment history

- Habits – smoking, alcohol, tobacco chewing
- Similar illness in family (neurofibromatosis, familial polyposis, MEN)

General physical examination

- Built, nourishment, PICCLE, vitals
- Regional and generalised lymph nodes

Local examination – inspection

- Number, site (in anatomical terms with reference to fixed bony landmarks), size, shape
- Surface – smooth / lobulated / nodular / irregular

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- Edge / margin – well defined / ill defined
- Skin over the swelling – colour, stretched, shiny, dilated veins, scars, sinuses, ulceration, puncta (sebaceous cyst)
- Visible pulsation, peristalsis, impulse on coughing
- Movement with respiration, deglutition, protrusion of tongue, muscle contraction

Palpation

- Local temperature, tenderness (compare with normal side, palpate with dorsum of hand)
- Confirm inspection findings – site, size (measure in cm), shape, surface, edge
- **Consistency** – soft / cystic / firm / hard / bony hard / variable
- **Fluctuation** – two-finger test (Paget's test for small swellings)
- **Transillumination** – cystic hygroma, hydrocele, ranula, meningocele
- **Slip sign** – lipoma; **lobulation** – lipoma
- **Compressibility** – reduces on pressure and refills slowly (haemangioma, lymphangioma)
- **Reducibility** – reduces completely and returns on coughing (hernia)
- **Pulsatility** – expansile (aneurysm) vs transmitted
- **Fixity** – to skin (pinch skin), to underlying structures (move in two planes, contract the muscle)
- **Plane of swelling** – intradermal / subcutaneous / subfascial / intramuscular / bony

Percussion and auscultation

- Percussion – dull (solid / fluid), resonant (gas-filled)
- Auscultation – bruit (vascular), bowel sounds (hernia)

Examination of regional lymph nodes

Examination of a sinus or fistula

- Definition – sinus: blind tract lined by granulation tissue opening on an epithelial surface; fistula: abnormal communication between two epithelial surfaces
- Number, site, opening (flush / raised / depressed), discharge (pus, sulphur granules – actinomycosis, caseous – TB, faecal, urine, saliva), surrounding skin, induration
- Probe test, relation to underlying bone / joint / viscera

Systemic examination

- All systems briefly; relevant system in detail

Common swellings and key signs

Swelling	Key features
Lipoma	Soft, lobulated, slip sign positive, not fixed to skin
Sebaceous cyst	Punctum, fixed to skin, mobile over deep tissue
Dermoid cyst	Along lines of embryonic fusion, not fixed to skin
Neurofibroma	Mobile at right angles to nerve, tingling on pressure
Haemangioma	Compressible, bluish, refills on release
Cystic hygroma	Brilliantly transilluminant, compressible, in posterior triangle of infant's neck
Abscess	Warm, tender, fluctuant, red skin
Ganglion	Over dorsum of wrist, firm cystic, related to tendon sheath / joint

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Classification of swellings by consistency

Consistency	Feels like	Examples
Soft	Lip	Lipoma, cystic swellings with lax wall
Cystic	Tense fluid	Hydrocele, ganglion, thyroglossal cyst
Firm	Tip of nose	Fibroadenoma, lymph node in lymphoma
Hard	Forehead	Carcinoma, calcified lesions
Bony hard	Bone	Osteoma, exostosis

Dermoid cysts – types

- **Sequestration dermoid** – at lines of embryonic fusion (external angular, midline of neck, root of nose)
- **Implantation dermoid** – after penetrating injury (fingers, palm)
- **Tubulodermoid** – from remnants of ectodermal ducts (thyroglossal, postanal)
- **Teratomatous dermoid** – ovary, testis, mediastinum

Sebaceous cyst – complications

- Infection, ulceration (Cock's peculiar tumour), calcification, sebaceous horn, malignant change (rare)

Neurofibromatosis type 1 – clinical criteria (any 2)

- ≥6 café-au-lait spots (>5 mm prepubertal, >15 mm postpubertal), ≥2 neurofibromas or 1 plexiform neurofibroma, axillary / inguinal freckling, optic glioma, ≥2 Lisch nodules, distinctive bony lesion, first-degree relative with NF1

Provisional diagnosis

- Site + nature (cystic / solid / inflammatory / neoplastic) + probable pathology

Investigations

- CBC, ESR, blood sugar; ultrasound, FNAC, X-ray of part, CT / MRI, excision biopsy

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CHAPTER 10

Examination of Ulcer

Edge, floor, base, discharge, lymph nodes and classification of ulcers

Bio data

Name: .....

Age: .....

Sex: .....

Address: .....

Occupation: .....

Chief complaints

- Ulcer
- Pain

History of presenting illness

Onset

- Following trauma or spontaneously
- Example of traumatic ulcer is dental ulcer
- Example of spontaneous ulcer includes matted lymph nodes, following varicose veins or burn scars

Duration

- Acute or chronic

Pain

- *Painless ulcers:* syphilitic ulcer, trophic ulcer, malignant ulcers
- *Painful ulcers:* ulcers associated with inflammation

Discharge

- Serum, pus, blood

Associated symptoms

- Associated with disease like tabes dorsalis, syringomyelia, transverse myelitis, peripheral neuritis, generalised TB, nephritis or DM

Past history: .....

Personal history: .....

Family history: .....

General examination

- Build and nourishment
- PICCLE

Vitals

- BP –
- PR –
- Respiratory rate –

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- Temperature –

If ulcer is suspected to be:

1. Syphilitic – look for presence of syphilitic stigmata
2. Tuberculous – look for all other lymph nodes in the body
3. Buerger's disease / atherosclerotic – look for presence of atherosclerosis or its complications
4. Trophic – determine the cause of nervous disease present in this condition

Local examination

Inspection

Size and shape – carcinomatous ulcers are irregular in shape

Number – single or multiple (tuberculosis, gummatous, soft chancres)

Position

- Venous ulcers seen in gaiter area
- BCC seen on upper face – above a line joining the angle of mouth to the lobule of ear
- Hunterian chancres – external genitalia
- Trophic ulcers on heel

Margins – regular (healing ulcer); irregular (non-healing ulcer)

Edge

- Undermined edge – TB ulcer
- Punched-out edge – trophic ulcer or gummatous ulcer
- Sloping edge – healing ulcers
- Raised, rolled (beaded) edge – BCC
- Everted edge – SCC

Floor

- Red granulation tissue – healing ulcer
- If slough present – non-healing ulcer

Discharge

- Serous discharge – healing ulcer
- Purulent discharge – non-healing ulcer

Surrounding area

- Glossy, red and oedematous – acutely inflamed

Palpation

- Tenderness – acutely inflamed ulcer is tender
- Edge and margin should be palpated and correlated with inspection
- Base – base is felt and cannot be determined by inspection
- Base is felt by holding the ulcer between the index finger and thumb
- Markedly indurated base
- Bleeding on touch has to be assessed – it is seen in case of malignant ulcer

Examination of lymph nodes

- Enlarged and tender regional lymph nodes show acutely inflamed ulcer

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- Tuberculous lymph nodes – enlarged, matted and non-tender (cold)
- Hunterian chancre – discrete, firm and shotty lymph nodes
- Malignant ulcers – stony hard nodes with infiltration to nearby structures

Examination of surrounding tissue for rise in temperature and tenderness

Examination of vascular insufficiency

- If ulcer is in lower part of leg – check for varicose veins
- Check condition of arteries proximal to the ulcer – atherosclerosis, Buerger's disease, Raynaud's disease

Examination of nerves

- Trophic ulcers are mostly seen in the sole of the foot – shows presence of some sort of neurological disturbance

Characteristic ulcers at a glance

Ulcer	Site	Edge	Floor / base	Other features
Tuberculous	Neck (over lymph nodes)	Undermined, bluish	Pale granulation, caseous material	Painful, matted nodes
Syphilitic (gumma)	Leg, scalp, sternum	Punched out	Wash-leather slough	Painless, indolent
Trophic (neuropathic)	Heel, ball of foot (pressure points)	Punched out	Bone may be seen	Painless, loss of sensation
Venous	Gaiter area, above medial malleolus	Sloping	Healthy granulation, shallow	Varicose veins, pigmentation, lipodermatosclerosis
Arterial (ischaemic)	Tips of toes, pressure points	Punched out	Pale, little granulation	Very painful, absent pulses
Rodent ulcer (BCC)	Upper face	Raised, rolled, beaded	Crusted	Locally invasive, no nodes
Squamous cell carcinoma	Lips, skin, scars (Marjolin's)	Everted	Friable, bleeds	Hard, regional nodes
Diabetic foot ulcer	Pressure points of sole	Punched out / callus	Infected, deep	Neuropathy ± ischaemia

Marjolin's ulcer

- Squamous cell carcinoma arising in a chronic scar or ulcer (burn scar, chronic osteomyelitis sinus, venous ulcer)
- Slow-growing, painless (scar has no nerves), lymph node spread is late (scar tissue lacks lymphatics) – but once nodes are involved, prognosis is poor

Special investigations

- Routine examination of blood
- Examination of urine
- Bacteriological examination of discharge from the ulcer
- Skin test – Mantoux to rule out TB
- Chest X-ray
- Biopsy – in case of malignant ulcer
- X-ray of bone and joint
- Contrast radiography
- Imaging techniques

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Classification of ulcers

Clinical classification

- Spreading ulcer
- Healing ulcer
- Callous and chronic ulcer

Pathological classification

- Non-specific ulcers – traumatic, chemical, physical, arterial, neurogenic, associated with malnutrition
- Specific ulcers – associated with TB, syphilis, actinomycosis
- Malignant ulcers – epithelioma, Marjolin's ulcer, rodent ulcer, malignant melanoma

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CHAPTER 11

Examination of Lymph Nodes

History of lymphadenopathy, examination of all lymph node groups, the drainage area and the diagnosis of a neck node

Chief complaints

- Swelling(s) in neck / axilla / groin with duration

History of presenting illness

- Onset, duration, progression, number, pain
- Fever, night sweats, loss of weight (>10% in 6 months) – B symptoms
- Cough, haemoptysis, TB contact
- Symptoms in drainage area – ulcer, wound, sore throat, dental problem, ear discharge, dysphagia, hoarseness, nasal obstruction / epistaxis
- Itching, alcohol-induced pain (Hodgkin lymphoma)
- Discharge, sinus formation

Past, personal, family history

- TB, HIV risk, STI, previous malignancy, smoking and tobacco chewing, alcohol

General physical examination

- PICCLE, vitals, liver and spleen (lymphoma, leukaemia), Waldeyer's ring, signs of TB

Local examination – for each enlarged node

- Site and group
- Number
- Size (in cm)
- Shape, surface
- Consistency – soft (acute inflammation), firm / rubbery (lymphoma), hard / stony hard (metastatic carcinoma), shotty (syphilis)
- Tenderness, local temperature
- Matting – TB, metastasis
- Fixity to skin and deep structures
- Skin over the node – redness, sinus, scar (TB – cold abscess, collar-stud abscess)

Groups to examine

Cervical (levels I–VI)

- Level I – submental, submandibular
- Level II – upper jugular
- Level III – middle jugular
- Level IV – lower jugular
- Level V – posterior triangle
- Level VI – central compartment (pretracheal, paratracheal)
- Also – preauricular, postauricular, occipital, supraclavicular (Virchow's node – left)
- Examine from behind with patient seated and neck slightly flexed

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Axillary

- Anterior (pectoral), posterior (subscapular), central, lateral (humeral), apical

Epitrochlear:

Inguinal

- Horizontal group (drains perineum, anal canal, lower abdominal wall, buttock) and vertical group (drains lower limb)

Popliteal:

Deep nodes and organs

- Abdomen – liver, spleen, para-aortic nodes; chest – mediastinal signs

Examination of drainage area

- Scalp, face, oral cavity, tongue, tonsils, pharynx, larynx (indirect laryngoscopy), thyroid, breast, upper limb, perineum, anal canal, external genitalia, lower limbs

Stages of tuberculous lymphadenitis

1. Lymphadenitis – enlarged, discrete, firm nodes
2. Periadenitis – matted nodes
3. Caseation and cold abscess formation – soft, fluctuant
4. Collar-stud abscess – pus breaks through deep fascia into subcutaneous plane
5. Sinus formation – discharge of caseous material; healing with puckered scar

Ann Arbor (Lugano) staging of lymphoma

Stage	Involvement
I	Single lymph node region
II	Two or more regions on the same side of the diaphragm
III	Regions on both sides of the diaphragm
IV	Diffuse extranodal involvement (liver, bone marrow, lung)

- A – no B symptoms; B – fever >38 °C, drenching night sweats, weight loss >10% in 6 months; X – bulky disease

Differential diagnosis

Cause	Features
Tuberculous lymphadenitis	Young adult, matted, firm, cold abscess, collar-stud abscess, sinus, non-tender
Lymphoma	Rubbery, discrete, painless, B symptoms, hepatosplenomegaly
Metastatic carcinoma	Older patient, hard, fixed, primary in drainage area
Acute lymphadenitis	Tender, warm, with infection in drainage area
Reactive / viral	Small, soft, multiple, mobile

Investigations

- CBC, ESR, peripheral smear, Mantoux test, chest X-ray, HIV
- FNAC, excision biopsy (with culture, AFB, CBNAAT, histopathology)
- Panendoscopy for occult primary; ultrasound / CT neck, chest and abdomen

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CHAPTER 12

Thyroid Case Sheet

Swelling, thyroid status, pressure effects, eye signs and diagnosis

Bio data

Name: .....

Age

- Simple goitre in girls approaching puberty and pregnancy
- Multinodular, solitary colloid goitre and colloid goitre are found in women in 20's and 30's
- Papillary carcinoma in young girls
- Follicular carcinoma in middle-aged women
- Anaplastic carcinoma in elderly

Place

- In areas with iodine deficiency – areas near mountain belts like Himalayas, Vindhyas and Satpura ranges

Occupation

- More in people with stress and strain

Presenting complaint

History of presenting complaint: .....

Swelling

- Location
- Site
- Shape
- Size
- Onset
- Duration

Progression

- Sudden increase in size of swelling may indicate haemorrhage inside swelling
- Slow progression for papillary and follicular carcinoma, whereas faster progression for anaplastic carcinoma

Associated factors

- Associated with stress, anxiety, sleepless nights, palpitation, ectopic beats and even CCF

Pain

- Location
- Onset
- Duration
- Progression
- Type of pain
- Aggravating / relieving factors

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Pressure effects

- Dyspnoea
- Dysphagia
- Change in voice
- Stridor
- Venous congestion
- Horner's syndrome

Symptoms due to hyperthyroidism

- Primary thyrotoxicosis – mainly causes nervous system related symptoms
- Secondary thyrotoxicosis – mainly causes cardiovascular system related symptoms
- Alopecia, weight loss
- Eye symptoms – diplopia, protrusion of eyes
- CNS – nervousness, agitation, anxiety, insomnia, tremors
- CVS – palpitation, dyspnoea on exertion, chest pain, oedema of ankle, CCF features
- Metabolic and GIT – increased appetite, decreased weight, diarrhoea, intolerance to heat, increased sweating
- Menstrual symptoms – oligomenorrhoea, amenorrhoea
- Musculoskeletal system – proximal muscle weakness
- Skin – warm, moist
- Nail – onycholysis

Symptoms due to hypothyroidism

- Increased weight, decreased appetite
- Dry skin
- Facial puffiness
- Intolerance to cold, alopecia
- Memory loss
- Voice change
- Constipation
- Menorrhagia
- Loss of lateral part of eyebrows

Malignant change

- Sudden increase in size
- Pain
- Loss of weight
- Decreased appetite

Past history

- Co-morbidities – DM, HTN, DLP, allergies, bronchial asthma
- Cardiac, renal and lung pathology
- Chemotherapy, radiation

Personal history

- Appetite, diet, sleep, bowel and bladder habits
- Tobacco and alcohol use

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Family history

- Goitre, malignancy
- Autoimmune

Drug history

- Any thyroid-related medications
- Regular medications

Examination

General examination

Vitals

- Pulse – rate, rhythm, volume, sleeping PR (mild thyrotoxicosis <90, moderate thyrotoxicosis 90–110 and severe thyrotoxicosis >110)

BP: .....

Temperature: .....

Build and nourishment

Attitude of patient – calm / anxious / restless

Facies – restless / anxious, madarosis, puffiness, eye signs, mask-like face (hypothyroidism)

Skin

- Pretibial myxoedema
- Warm and moist / dry and inelastic
- Tremors

PICCLE

Local examination: .....

Inspection

- Location
- Size, shape
- Surface
- Edge
- Number of swellings
- Skin over swelling
- Movement with deglutition – thyroid swellings usually move upwards with deglutition (a fixed malignant or Riedel's thyroid may not)
- Movement with protrusion of tongue – thyroglossal cyst also moves with protrusion of tongue as it extends down from the foramen caecum of tongue
- Pressure effects – dysphagia, hoarseness of voice, stridor
- Engorged veins – Pemberton's sign: facial congestion and engorged neck veins on raising both arms above the head (retrosternal goitre)
- Tracheal shift
- Plane of swelling – fixity in planes indicates malignancy or chronic thyroiditis
- Scars, sinuses, fistula
- Pulsation of swelling

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Palpation

- Temperature and tenderness
- Method of palpation
- Neck is slightly flexed and entire gland is palpated from behind or from front
- Consistency
- Fluctuation, transillumination
- Pulsation, thrill
- Fixity to skin
- Mobility
- Lower border palpable (ask to swallow – try to get below swelling)
- If not palpable – percussion over sternum to see retrosternal extension

Pressure effects – stridor (Kocher's test)

Tracheal shift +/–

Carotid pulsation

Horner's syndrome

Cervical lymph nodes: more important in case of malignancy

- Site, size
- Number
- Consistency
- Tenderness
- Fixed / mobile

Percussion

- Manubrium sterni (retrosternal goitre)

Auscultation

- Bruit (upper pole) (hyperthyroidism)

Eye signs

THYROID EYE SIGNS

1. Lid retraction
2. **Dalrymple's sign** – widening of palpebral fissure due to lid retraction – 1st sign
3. **Stellwag's sign** – infrequent blinking
4. **Lid lag (von Graefe's sign)** – inability of the upper eyelid to keep pace with the eyeball when it looks downwards to follow the examiner's finger
5. **Joffroy's sign** – absence of wrinkling of the forehead when the patient looks up with the head bent down
6. **Möbius sign** – difficulty in convergence when the patient is asked to look at near objects
7. **Naffziger's sign** – with the patient in sitting position and neck fully extended, protruded eyeball can be visualised when observed from behind

Summary:

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WHO grading of goitre

Grade	Description
0	No palpable or visible goitre
1	Palpable but not visible with the neck in normal position
2	Visible with the neck in normal position; consistent with palpation

Differential diagnosis of a midline neck swelling

- Thyroid swellings (isthmus), thyroglossal cyst, sublingual dermoid, subhyoid bursitis, enlarged prelaryngeal / pretracheal node (Delphian node), lipoma, plunging ranula, laryngocele

Thyroglossal cyst vs thyroid nodule

Feature	Thyroglossal cyst	Thyroid isthmus nodule
Age	Children, young adults	Adults, more in women
Movement with deglutition	Yes	Yes
Movement with tongue protrusion	Yes	No
Transillumination	May be positive	Negative

Bethesda system for thyroid cytology (FNAC)

Category	Interpretation
I	Non-diagnostic
II	Benign
III	Atypia of undetermined significance
IV	Follicular neoplasm
V	Suspicious for malignancy
VI	Malignant

Burch–Wartofsky / clinical features of thyroid storm

- High fever, tachycardia / AF, agitation, delirium, vomiting, diarrhoea, jaundice, heart failure – often after surgery, infection or stopping antithyroid drugs

Diagnosis of thyroid swelling

- Diffuse parenchymatous (hyperplastic) goitre
- Colloid goitre
- Nodular goitre
- Multinodular goitre
- Solitary nodular goitre
- Primary toxic goitre
- Secondary goitre
- Retrosternal goitre
- Carcinoma thyroid
    - Differentiated – 1) Papillary 2) Follicular

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- Medullary carcinoma
- Undifferentiated – anaplastic carcinoma
- Lymphoma

- Thyroglossal cyst (not a thyroid neoplasm – differential diagnosis of a midline neck swelling)

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CHAPTER 13

Case Sheet for Breast

History, inspection, palpation, clinical TNM staging and diagnosis of a breast lump

Bio data

Name: .....

Age

- Younger age group – more likely to be benign; fibroadenoma
- Older age group – more likely to be malignant

Sex

- Malignancy – more common in females as compared to males
- Males with gynaecomastia – look for other signs of underlying liver disease
- Overall breast examination in females more important than in males

Address: .....

Occupation: .....

Presenting complaints

Lump in breast

- Painless – breast tumours – benign or malignant
- Painful – mastitis, breast abscess
- 10% of malignant breast lumps can be painful

History

Swelling / lump: .....

Onset

Detected either by self-examination of breast, clinical examination or mammography in age >40 years

Duration

- Progression
- Fast progression in case of malignant breast lumps
- Slower progression in case of benign breast disease

Location

- Most lumps are located in the upper outer quadrant

Relation with menstrual cycle

- Early onset (menarche) and late menopause increase the chance of breast carcinoma

Pain

Location: .....

Onset

Related to menstrual cycles, menopause or onset of puberty – unlikely to be malignant

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Related to pregnancy – likely with mastitis

Fibrocystic disease of the breast – benign and cyclical pain

Duration: .....

Progression: .....

Type of pain: .....

Aggravating / relieving factors

Diurnal variations

Associated factors

Fever – lactational mastitis

Discharge

Pain elsewhere in the body – mets

Discharge from nipple: .....

Onset

Duration

Progression

Quality – bloody – duct papilloma (commonest), duct carcinoma

Purulent – mastitis, breast abscess

Milky – galactorrhoea

Greenish – duct ectasia

Odour

Retraction of nipple: .....

Onset

Duration

Progression

Shape of retraction

- Slit-like – duct ectasia / periductal mastitis
- Circumferential (recent onset) – carcinoma
- Congenital inversion – can be everted

Other history

- H/o trauma – fat necrosis / haematoma
- Other swellings in body
- Fever
- Loss of weight / appetite
- H/o metastasis – bony pain, jaundice, breathlessness, cough with haemoptysis, headache

Past history

- Major illness – diabetes, HTN, TB, asthma, epilepsy
- Surgery – hysterectomy, D&C
- H/o similar episodes
- TB, fibroadenosis
- OCP use
- Hormonal therapy
- Infertility treatment

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Personal history

- Sleep, appetite, bowel and bladder habits
- H/o high-fat diet
- Alcohol / tobacco use

Menstrual and marital history

- Age of menarche – early age of menarche increases risk of carcinoma
- First childbirth
- Marital status / parity – carcinoma is more common in unmarried or nulliparous women
- Breastfeeding duration
- Age of menopause – late age of menopause increases risk of carcinoma

Family history

- Ask for history of carcinoma in patient's mother, sister and grandmother
- Associated carcinoma like breast Ca, ovarian tumour, uterine tumours

Examination

General examination

Build and nourishment

PICCLE

Vitals

- Pulse
- BP
- Temperature
- RR

Local examination

- Privacy ensured and well-lit room
- Patient stripped till waist, both breasts exposed

Sitting posture

- Arms by side of the body
- Arms raised above the head
- Hands on hips, alternate contracting and relaxing
- Leaning forward

Supine posture:

Inspection

Sitting posture:

Breast

- Position
- Size and shape
- Visible mass

Skin over the breast

- Colour / texture
- Peau d'orange – due to blockage of dermal lymphatics

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- Dilated veins
- Dimpling / tethering – due to involvement of ligament of Cooper
- Cancer en cuirasse – chest wall studded with multiple cancer nodules and thickened skin like an armour (cuirasse – armour)
- Ulceration, fungation

Nipple

- Present / absent
- Position
- Retraction of nipple – due to involvement of lactiferous ducts
- Number – accessory nipples
- Size and shape
- Surface – cracks / fissures / eczema
- Discharge

Areola

- Colour
- Size
- Surface, texture and tenderness
- Tubercles of Montgomery

Arms

Oedema – due to infiltration of axillary nodes

Axilla – nodes

Supraclavicular fossa – fullness

Inspection with arms raised above head to look for

- Peau d'orange
- Fixity
- Retraction of nipple

On leaning forward

- Fixity to chest wall

On contracting and relaxing pectoralis major

- Prominence of swelling
- Increased dimpling

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Palpation

- Sitting, semi-recumbent, recumbent
- From areola concentrically outwards
- Normal breast palpated first
- Palpate quadrant-wise and axillary tail
- Local temperature and tenderness
- Swelling – location, number, size, shape, margin, consistency, surface, fluctuation, transillumination, tenderness of swelling

Features for clinical staging and diagnosis

- Fixity to skin – move tumour side to side – note change in skin
- Pinch skin over tumour
- Intrinsic mobility / fixity to breast tissue – carcinoma breast
- Fixity to underlying fascia and muscles

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- Pectoralis major – place hands lightly on hips and check mobility in both directions, then press hips hard (anterior axillary fold taut); check mobility again
- Serratus anterior – swelling in lower outer quadrant only
- Fixity to chest wall – fixed irrespective of contraction of any muscle

Examination of nipple

- Tumours deep to nipple – press and look for discharge
- If retracted, press from sides deep to nipple
  - Congenital – everts
  - Carcinoma – will not evert

Examination of lymph nodes

- Palpation of axillary lymph nodes
  - Anterior / pectoral
  - Posterior / subscapular
  - Central
  - Apical

Supraclavicular and cervical nodes

- Supraclavicular nodes
- Cervical nodes

Percussion

- Over sternum – internal mammary lymph nodes

Other systems

- Pelvic examination for pelvic deposits – POD or rectovesical pouch
- RS – pleural effusion
- Abdomen – liver mets, ovarian masses, ascites
- Bones – pelvis and long bones for mets

Triple assessment of a breast lump

1. **Clinical examination** – history and examination as above
2. **Imaging** – mammography (age >35–40 years), ultrasound (young women, dense breasts, cystic lesions); BI-RADS reporting
3. **Pathology** – core needle biopsy (preferred; gives histology and receptor status) or FNAC

BI-RADS categories

Category	Meaning
0	Incomplete – needs additional imaging
1	Negative
2	Benign
3	Probably benign – short-interval follow-up
4	Suspicious – biopsy
5	Highly suggestive of malignancy
6	Biopsy-proven malignancy

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Fibroadenoma vs carcinoma breast

Feature	Fibroadenoma	Carcinoma
Age	15–30 years	Usually >35 years
Consistency	Firm, rubbery	Hard
Mobility	Highly mobile ("breast mouse")	Fixed to breast tissue / skin / muscle
Margins	Well defined, smooth	Irregular
Skin and nipple	Normal	Peau d'orange, dimpling, nipple retraction
Nodes	Not enlarged	Hard axillary nodes

Receptor status and molecular subtypes

- ER, PR, HER2 (immunohistochemistry) and Ki-67 – luminal A, luminal B, HER2-enriched, triple negative

Diagnosis

Ca breast + side affected + clinical TNM + stage grouping

TNM classification

Category	Description
Tis	Tumour in situ
T1	≤2 cm
T2	>2 cm to ≤5 cm
T3	>5 cm
T4	Any size with direct extension to chest wall and / or skin
T4a	Extension to chest wall (ribs, intercostal muscles, serratus anterior) – fixity to pectoral muscle alone is not T4
T4b	Ulceration, ipsilateral satellite skin nodules or peau d'orange (skin oedema)
T4c	Both T4a and T4b
T4d	Inflammatory carcinoma
N1	Axillary nodes involved – ipsilateral, discrete and movable
N2	
N2a	Axillary nodes involved – ipsilateral, fixed, not movable
N2b	Internal mammary nodes involved (without axillary nodes)
N3	
N3a	I/L infraclavicular nodes
N3b	I/L axillary + internal mammary nodes
N3c	I/L supraclavicular
M0	No metastasis

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Category	Description
M1	Distant metastasis

Staging – anatomic stage groups (AJCC 8th edition)

Stage	TNM
Stage 0	Tis N0 M0
Stage I	T1 N0 M0
Stage IIA	T0 N1, T1 N1, T2 N0
Stage IIB	T2 N1, T3 N0
Stage IIIA	T0 N2, T1 N2, T2 N2, T3 N1, T3 N2
Stage IIIB	T4 N0, T4 N1, T4 N2
Stage IIIC	Any T, N3
Stage IV	Any T, any N, M1

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CHAPTER 14

Hernia Examination

Groin swelling — inspection, palpation, finger tests and types of hernia

Bio data

Name: .....

Age

- Old age – direct inguinal hernia
- Young age – indirect inguinal hernia

Sex

- Inguinal hernia common in males
- Femoral hernia is commoner in females than in males (but inguinal hernia is still the commonest hernia in females)

Occupation

- Weight lifters

Presenting complaint

Swelling: .....

Pain over swelling

- Dragging and irritating pain when it first appears
- Painful and tender due to strangulation

History of presenting illness

Swelling

Site – inguinal / femoral / epigastric / umbilical / paraumbilical

Shape and size –

Onset –

Duration –

Progression – starting from inguinal region and progressed to scrotum, it is inguinal hernia

If present in scrotum since beginning, consider hydrocele

Associated factors

Pain (seen in case of strangulated hernia)

- Location
- Onset
- Duration
- Progression
- Type of pain
- Aggravating / relieving factors

History to rule out COPD, prostatomegaly, constipation

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Past history

- COPD, bronchial asthma, prostatomegaly, any other surgeries in the past

Personal history

Constipation

Family history

Physical examination:

General examination:

Build and nourishment:

PICCLE:

Vitals:

Local examination:

Inspection

Expose from umbilicus till mid-thigh

- Side
- Site
- Size
- Shape
  - Globular – direct inguinal hernia
  - Pyriform – indirect inguinal hernia
- Expansile cough impulse
- Skin over swelling – reddish (strangulated hernia)
- Visible peristalsis (bowel as content)

Palpation

Patient examined in standing and lying-down position

- Site – x cms
  - Above and medial to pubic tubercle in case of inguinal hernia
  - Below and lateral to pubic tubercle in case of femoral hernia
- Temperature (strangulated hernia)
- Tenderness (strangulated hernia)
- Get over the swelling (to differentiate inguinoscrotal swelling from hydrocele)
- Feel for the testis separately from swelling
- Size

Consistency

- Soft and elastic – intestine
- Doughy – omentum
- Reducibility

Zieman's test / three-finger test

Patient should be in standing position.

Index finger over deep inguinal ring, middle finger over superficial inguinal ring, ring finger over saphenous opening.

Patient is then asked to cough; if impulse felt over:

- Index finger – indirect hernia

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- Middle finger – direct hernia
- Ring finger – femoral hernia

Ring invagination test:

Deep ring occlusion test:

Percussion

- Resonant note – enterocele
- Dull note – omentocele

Auscultation

- Bowel sounds – enterocele
- Per rectal examination – to rule out prostatomegaly

Systemic examination

- RS – to rule out COPD

Direct vs indirect inguinal hernia

Feature	Indirect	Direct
Age	Any age, commonest in young	Elderly
Origin	Through deep ring, lateral to inferior epigastric vessels	Through posterior wall (Hesselbach's triangle), medial to inferior epigastric vessels
Shape	Pyriform	Globular
Descent into scrotum	Common	Rare
Deep ring occlusion test	Controlled	Not controlled
Reduction	Upwards, laterally and backwards	Straight backwards
Neck	Narrow – strangulation common	Wide – strangulation rare
Bilateral	Less common	Common

Inguinal vs femoral hernia

Feature	Inguinal	Femoral
Relation to pubic tubercle	Neck above and medial	Neck below and lateral
Sex	Commoner in males	Relatively commoner in females
Strangulation	Less common (indirect may strangulate)	Very common (narrow, rigid ring)

Complications of hernia

- Irreducibility, obstruction, strangulation (tense, tender, irreducible, no cough impulse, features of intestinal obstruction), inflammation, incarceration (faecal mass in colon)

Hesselbach's triangle – boundaries

- Medially – lateral border of rectus abdominis; laterally – inferior epigastric artery; inferiorly – inguinal ligament

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Diagnosis

- Inguinal hernia – indirect / direct
- Sliding hernia
- Richter's hernia
- Littre's hernia
- Maydl's hernia
- Femoral hernia
- Umbilical hernia
- Epigastric hernia / incisional hernia / lumbar hernia / obturator hernia

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CHAPTER 15

Examination of Scrotal Swellings

Hydrocele, varicocele, epididymo-orchitis, testicular tumour and the clinical approach to a scrotal swelling

Bio data

Name: .....

Age

- Infants and children – congenital hydrocele, hernia, undescended testis
- Young adults – testicular tumour, varicocele, torsion, epididymo-orchitis
- Elderly – hydrocele, epididymal cyst

Occupation: .....

Chief complaints

- Swelling in scrotum, pain, heaviness, dragging sensation, infertility

History of presenting illness

- Onset, duration, progression; side
- Did it start in the groin and descend (hernia) or start in the scrotum (hydrocele, testicular)?
- Variation with posture, coughing, straining (reducible – hernia; worse on standing, better lying – varicocele)
- Pain – sudden severe pain in young boy (torsion – emergency), fever with pain (epididymo-orchitis)
- Urinary symptoms, urethral discharge, mumps, trauma
- Loss of weight, cough, abdominal mass, back pain (tumour metastasis)
- Infertility

Past history

- TB, filariasis (endemic areas), STI, previous surgery (herniotomy, vasectomy), undescended testis

General physical examination

- PICCLE, vitals, gynaecomastia, supraclavicular nodes, abdomen (para-aortic nodes), chest

Local examination – standing and lying

Inspection

- Size and shape of scrotum, rugosity, skin (redness, oedema, sinus, ulcer, scar)
- Position of testes, penis buried in large hydrocele
- Impulse on coughing, bag-of-worms appearance (varicocele)

Palpation

- Can you get above the swelling? – yes (scrotal) / no (inguinoscrotal hernia or congenital hydrocele)
- Testis and epididymis – felt separately or not; size, consistency, tenderness, testicular sensation
- Spermatic cord – thickening, vas deferens (beaded in TB)
- Fluctuation, transillumination
- Varicocele – bag of worms, decompresses on lying down, impulse on coughing
- Opposite testis and inguinal canal

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Special signs and tests

- **Transillumination** – positive in hydrocele, epididymal cyst (spermatocele)
- **Prehn's sign** – elevation relieves pain in epididymo-orchitis, not in torsion
- **Cremasteric reflex** – absent in torsion
- **Valsalva manoeuvre** – varicocele becomes prominent
- **Testicular sensation** – lost in testicular tumour, leprosy, tabes

Clinical features of common conditions

Condition	Get above?	Testis felt separately?	Transillumination
Vaginal hydrocele	Yes	No (testis within the swelling)	Positive
Epididymal cyst	Yes	Yes (cyst above and behind testis)	Positive
Inguinoscrotal hernia	No	Yes	Negative (except in infants)
Varicocele	Yes	Yes	Negative
Testicular tumour	Yes	Testis itself enlarged, hard, heavy	Negative
Haematocele	Yes	No	Negative
Epididymo-orchitis	Yes	Tender, swollen epididymis	Negative

Per rectal examination

- Prostate and seminal vesicles (TB, chronic infection)

Types of hydrocele

- **Primary vaginal** – idiopathic, commonest in adults
- **Secondary** – underlying epididymo-orchitis, testicular tumour, trauma, filariasis
- **Congenital** – processus vaginalis patent, communicates with peritoneal cavity; fills slowly on standing, may disappear on lying
- **Infantile** – processus closed at deep ring but open up to it
- **Encysted hydrocele of cord** – moves down on pulling the testis (traction test)
- **Hydrocele en bisac** – two sacs connected, one above and one below the external ring

Complications of hydrocele

- Infection, haematocele, rupture, calcification, hernia of hydrocele sac, atrophy of testis (long-standing)

Grading of varicocele

- Grade I – palpable only on Valsalva; grade II – palpable without Valsalva; grade III – visible

Undescended testis

- Examine in warm room, lying and squatting; milk the inguinal canal towards scrotum
- Retractile (can be brought down and stays) vs ectopic (perineal, femoral, superficial inguinal pouch) vs undescended (along normal path)
- Complications – infertility, malignancy, torsion, trauma, associated hernia; orchidopexy by 6–12 months

Diagnosis

- Example: Right-sided primary vaginal hydrocele, moderate size, without complications

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Investigations

- Urine routine and culture, ultrasound scrotum with Doppler
- Tumour markers – AFP, β-hCG, LDH; chest X-ray, CT abdomen (testicular tumour)
- Semen analysis (varicocele with infertility)

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CHAPTER 16

Surgical Abdomen – Abdominal Lump, Acute Abdomen and Obstructive Jaundice

History and examination of the surgical abdomen, including abdominal masses, obstructive jaundice and gastric outlet obstruction

Bio data

Name: .....

Age: .....

Sex: .....

Occupation: .....

Chief complaints

- Pain abdomen, lump abdomen, vomiting, distension, jaundice, bleeding per rectum, altered bowel habits, inability to pass flatus / stools

History of presenting illness

Pain abdomen

- Site, onset, character (colicky – hollow viscus obstruction; constant – inflammation), radiation, shifting (appendicitis – periumbilical to right iliac fossa), aggravating and relieving factors

Lump abdomen

- Duration, progression, pain, change with meals or micturition, how it was noticed

Vomiting

- Content – undigested food (gastric outlet obstruction), bilious, faeculent (low intestinal obstruction), blood

Distension and obstipation

- Intestinal obstruction

Jaundice

- Painless progressive (periampullary carcinoma, carcinoma head of pancreas), fluctuating (CBD stone), with pruritus, clay-coloured stools, high-coloured urine; fever with chills (cholangitis – Charcot's triad)

Bowel habits

- Alternating constipation and diarrhoea, tenesmus, blood and mucus, change in calibre of stools

Loss of appetite and weight, dysphagia, early satiety: .....

Past history

- Previous abdominal surgery (adhesions), peptic ulcer, gallstones, TB, hernia, trauma

Personal and family history

- Alcohol, smoking, diet; family history of colorectal or gastric cancer, polyposis

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General physical examination

- Built, nourishment, dehydration, PICCLE, vitals
- Left supraclavicular node (Troisier's sign), scratch marks, signs of anaemia

Inspection

- Exposure nipple to mid-thigh; shape and contour, fullness in quadrants, umbilicus
- Movement with respiration, visible peristalsis (left to right – gastric outlet obstruction; step-ladder – small bowel obstruction), visible pulsation, visible lump
- Scars, sinuses, dilated veins, hernial orifices

Palpation

- Superficial – tenderness, guarding, rigidity, rebound tenderness
- Deep – lump: site (quadrant), size, shape, surface, margins, consistency, mobility, movement with respiration, fixity, pulsatility; can you get above or below it?
- Is the lump intra-abdominal or in the abdominal wall? – Carnett's sign (lump becomes more prominent on raising head – abdominal wall)
- Is it retroperitoneal? – not moving with respiration, resonant bowel in front, ballotable (kidney)
- Liver, spleen, kidneys, gall bladder (Courvoisier's law – palpable gall bladder with jaundice is unlikely to be due to stones)
- Special signs – Murphy's sign, McBurney's point tenderness, Rovsing's sign, psoas sign, obturator sign

Percussion

- Over the lump (dull / resonant), shifting dullness, liver dullness (obliterated in perforation)

Auscultation

- Bowel sounds (increased, tinkling – obstruction; absent – paralytic ileus, peritonitis), bruit, succussion splash (gastric outlet obstruction)

Hernial orifices and external genitalia

Per rectal examination

- Mass, shelf (Blumer's shelf – peritoneal deposits), tenderness, blood, stool colour, prostate

Per vaginal examination (females, with chaperone)

- To differentiate pelvic from abdominal masses

Systemic examination

- RS – pleural effusion, metastases; CVS

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Acute abdomen – quick differential by site of pain

Site	Common causes
Right upper quadrant	Acute cholecystitis, biliary colic, cholangitis, liver abscess, right basal pneumonia
Epigastrium	Peptic ulcer / perforation, acute pancreatitis, myocardial infarction (inferior wall)
Periumbilical	Early appendicitis, small bowel obstruction, mesenteric ischaemia
Right iliac fossa	Appendicitis, ureteric colic, ruptured ectopic pregnancy, ovarian torsion / cyst, Meckel's diverticulitis, ileocaecal TB
Left iliac fossa	Sigmoid diverticulitis, ureteric colic, ectopic / ovarian pathology
Loin	Pyelonephritis, renal / ureteric colic
Diffuse	Generalised peritonitis, intestinal obstruction, ruptured aortic aneurysm

Alvarado score for acute appendicitis (MANTRELS)

Feature	Score
Migration of pain to right iliac fossa	1
Anorexia	1
Nausea / vomiting	1
Tenderness in right iliac fossa	2
Rebound tenderness	1
Elevation of temperature (>37.3 °C)	1
Leucocytosis (>10,000/mm³)	2
Shift to the left (neutrophilia)	1

- 1–4 – unlikely; 5–6 – equivocal; 7–10 – probable appendicitis

Features of intestinal obstruction

- Colicky pain, vomiting, abdominal distension, absolute constipation (obstipation)
- High (small bowel) – early vomiting, less distension; low (large bowel) – late vomiting, marked distension
- Features of strangulation – continuous pain, tachycardia, fever, tenderness, guarding, leucocytosis, raised lactate

Gastric outlet obstruction

- Vomiting of large volumes of stale, undigested food without bile; visible gastric peristalsis from left to right; succussion splash 4 hours after a meal
- Metabolic – hypochloraemic, hypokalaemic metabolic alkalosis with paradoxical aciduria
- Causes – chronic duodenal ulcer with pyloric stenosis, carcinoma of antrum

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Differential diagnosis of lump by region

Region	Common causes
Right hypochondrium	Hepatomegaly, gall bladder, hepatic flexure growth, right kidney
Epigastrium	Carcinoma stomach, pancreatic pseudocyst, left lobe of liver, transverse colon growth, aortic aneurysm
Left hypochondrium	Splenomegaly, splenic flexure growth, left kidney
Right iliac fossa	Appendicular mass, ileocaecal TB, carcinoma caecum, ovarian mass
Left iliac fossa	Carcinoma sigmoid colon, faecal mass, diverticular mass, ovarian mass
Lumbar	Kidney (hydronephrosis, polycystic kidney, tumour), colon growth
Hypogastrium	Bladder, uterus (fibroid, pregnancy), ovarian cyst

Diagnosis

- Example: Obstructive jaundice, probably due to periampullary carcinoma, with palpable gall bladder, without cholangitis

Investigations

- CBC, LFT (direct bilirubin, ALP, GGT), PT / INR, renal function, electrolytes, blood sugar
- Ultrasound abdomen, contrast-enhanced CT, MRCP / ERCP, upper GI endoscopy, colonoscopy
- Tumour markers – CEA, CA 19-9; erect abdominal X-ray (obstruction, perforation)

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CHAPTER 17

Peripheral Arterial Disease and Gangrene

Claudication, rest pain, examination of peripheral pulses, Buerger's test and assessment of gangrene

Bio data

Name: .....

Age: .....

Sex: .....

Occupation: .....

Chief complaints

- Pain in limb on walking, pain at rest, ulcer, blackening of toes / foot, numbness, coldness

History of presenting illness

Intermittent claudication

- Site (calf – femoropopliteal; thigh and buttock – aorto-iliac; foot – tibial), claudication distance, relieved by rest, progression
- Leriche syndrome – buttock claudication with erectile dysfunction (aorto-iliac occlusion)

Rest pain

- Burning pain in toes and foot, worse at night, relieved by hanging the limb down

Ulcer / gangrene

- Onset, trauma, progression, line of demarcation, pain, discharge

Fontaine classification

Stage	Feature
I	Asymptomatic
II	Intermittent claudication (IIa >200 m; IIb <200 m)
III	Rest pain
IV	Ulceration / gangrene

Acute ischaemia – 6 Ps

- Pain, pallor, pulselessness, paraesthesia, paralysis, poikilothermia (perishing cold)

Associated

- Angina, stroke / TIA, abdominal angina, Raynaud's phenomenon, migratory thrombophlebitis (Buerger's disease)

Past history

- Diabetes, hypertension, dyslipidaemia, IHD, AF / RHD (embolism), previous vascular surgery or amputation

Personal history

- Smoking (bidi) – strong association with Buerger's disease (thromboangiitis obliterans) in young males; alcohol

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General physical examination

- PICCLE, all vitals, BP in both arms, cardiac rhythm (AF), xanthelasma

Local examination – inspection

- Colour (pallor, cyanosis, rubor), shiny skin, loss of hair, brittle nails, muscle wasting
- Ulcers – site (tips of toes, heel, pressure points), gangrene – dry / wet, extent, line of demarcation, skip areas
- Venous refilling – guttering of veins on elevation

Palpation

- Temperature – feel with dorsum of hand, compare both sides, level of temperature change
- Capillary refill time (normal <2 s)
- Tenderness, sensation

Peripheral pulses – grade (0 absent, 1+ diminished, 2+ normal, 3+ bounding)

Pulse	Where to feel
Femoral	Mid-inguinal point, below inguinal ligament
Popliteal	Popliteal fossa with knee flexed ~30°, both hands
Posterior tibial	Behind medial malleolus
Dorsalis pedis	Lateral to extensor hallucis longus tendon on dorsum of foot
Anterior tibial	Midway between malleoli
Radial, ulnar, brachial, subclavian, carotid	Upper limb and neck

Special tests

- **Buerger's test** – elevate the limb; angle at which the foot becomes pale (Buerger's angle <20° indicates severe ischaemia); then hang the limb down – reactive hyperaemia (rubor) and slow capillary filling
- **Capillary filling time**
- **Ankle–brachial index** – ankle systolic ÷ brachial systolic (normal 1.0–1.4; <0.9 PAD; <0.4 critical ischaemia; >1.4 calcified vessels in diabetes)
- **Allen's test** – patency of palmar arch
- **Auscultation** – bruit over femoral, iliac, aorta, carotid, subclavian

Assessment of gangrene

- Type – dry / wet; extent and level; line of demarcation (line of separation)
- Signs of infection, crepitus (gas gangrene), lymphangitis
- Sensation (diabetic neuropathy), deep tendon reflexes

Systemic examination

- CVS – AF, murmurs, aneurysm; abdomen – aortic aneurysm; CNS – stroke

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Buerger's disease vs atherosclerosis

Feature	Thromboangiitis obliterans (Buerger's)	Atherosclerosis
Age	<40–45 years	>50 years
Sex	Almost always male	Both
Smoking	Essential association	Risk factor
Vessels	Small and medium distal arteries, veins and nerves	Large and medium arteries, bifurcations
Upper limb	Often involved	Rarely involved
Migratory superficial thrombophlebitis	Present	Absent
Diabetes, hypertension, dyslipidaemia	Usually absent	Commonly present

Dry vs wet gangrene

Feature	Dry gangrene	Wet gangrene
Cause	Slow arterial occlusion	Sudden arterial occlusion / venous obstruction with infection
Appearance	Dry, shrivelled, mummified, black	Swollen, moist, foul-smelling, blebs
Line of demarcation	Clear	Poorly defined
Spread	Slow	Rapid
Systemic toxicity	Minimal	Marked (sepsis)

Rutherford classification of acute limb ischaemia

Category	Sensory loss	Muscle weakness	Prognosis
I – viable	None	None	Not immediately threatened
IIa – marginally threatened	Minimal (toes)	None	Salvageable if promptly treated
IIb – immediately threatened	More than toes, rest pain	Mild–moderate	Salvageable with immediate revascularisation
III – irreversible	Profound, anaesthetic	Profound, paralysis (rigor)	Major tissue loss or amputation

Diagnosis

- Example: Chronic lower-limb ischaemia of left side, Fontaine stage IV with dry gangrene of 2nd and 3rd toes, due to atherosclerosis in a diabetic smoker; level of occlusion – femoropopliteal

Investigations

- CBC, blood sugar, HbA1c, lipid profile, renal function, ECG, echocardiography
- ABI, arterial Doppler / duplex ultrasound, CT angiography, digital subtraction angiography
- X-ray foot (osteomyelitis), pus culture

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CHAPTER 18

Varicose Veins Examination

Venous history, tourniquet tests, DVT signs and CEAP classification

Personal details

Name: .....

Age

- Middle-aged individuals are more prone to this disease

Sex

- Female sex more prone

Address

Occupation – teacher, policeman, security guard, tram drivers

Presenting complaint

Pain in lower limbs

Type of pain – aching pain in lower part of leg towards end of the day; bursting pain while walking indicates DVT.

Dilated veins

Ulcer over gaiter area

Malignancy may arise from a long-standing ulcer (Marjolin's ulcer)

History of presenting illness

Dilated veins

- Duration
- Location – on medial side of leg corresponds to long saphenous vein and on posterolateral aspect of calf corresponds to short saphenous vein

Pain at affected site: .....

Itching: .....

Colour change

White colour (phlegmasia alba dolens) – due to excessive oedema or lymphatic obstruction.

Blue colour (phlegmasia cerulea dolens) – due to DVT.

Ulcer over gaiter area: .....

Past history

Previous serious illness or complicated operation

Family history

Can be present in mother and sister of patient

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Personal history

Obstetric history in females, previous white leg, contraceptive pill usage

Examination

- Vitals
- General examination
- Build – obese / well built
- PICCLE

Local examination

Inspection

- Site and course of dilated veins, either medial or lateral

Colour of skin

- Redness, white leg

Texture of skin

- Pigmentation

Deformity

- Equinus deformity

Toes – brittle nails

Ulceration, scar, ankle flare

Venous star – dilated radiating subcutaneous venules

Flare sign – dilatation of veins below the medial malleolus and disappearance at sole

Saphena varix (impulse on coughing at saphenous opening – Morrissey's test)

Blow-out at the level of perforators

Palpation

- Brodie–Trendelenburg test 1 (empty the veins, compress at S-F junction, ask the patient to stand up and release the pressure – incompetence of saphenofemoral valve)
- Brodie–Trendelenburg test 2 (empty the veins, compress at S-F junction, ask the patient to stand up and keep the pressure on; observe for 30–60 seconds – rapid filling from below indicates incompetence of perforators)
- Three-tourniquet test (empty veins, 3 tourniquets at S-F junction, below knee and above knee, and remove one by one from below)
- Perthes' test – tourniquet below S-F junction with patient standing; ask to walk / tiptoe for 5 min – superficial veins empty if deep veins and perforators are patent; if veins become more prominent with bursting pain, it indicates deep vein thrombosis or blockage of perforators
- Modified Perthes' test – elastocrepe bandage from toes to upper thigh; walk for 5 min – bursting / cramping pain in calf indicates DVT
- Morrissey's test – elevate the limb to 30 degrees, feel for impulse on coughing at S-F junction – incompetence of saphenofemoral junction
- Pratt's test – bandage the limb and untie from below – varicosity at the incompetent perforator – to know the position of perforator
- Fegan's test – feel the vein after emptying – depressions indicate incompetent perforators
- Homans' sign – pain in calf muscle on dorsiflexion of the foot with knee extended – DVT
- Moses' sign – pain in calf muscles on squeezing – DVT

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Percussion

- Schwartz test – tap at the most prominent part of the vein, feel for impulse at S-F junction

Auscultation

- Machinery murmur in AV fistula

Abdomen examination

- To rule out intra-abdominal malignancy (which causes secondary varicose veins)

Anatomy of the superficial venous system

- **Great (long) saphenous vein** – begins anterior to medial malleolus, ascends along medial side of leg and thigh, joins femoral vein at saphenofemoral junction (2.5–3.5 cm below and lateral to pubic tubercle) after piercing cribriform fascia
- **Small (short) saphenous vein** – begins behind lateral malleolus, ascends in midline of calf, joins popliteal vein at saphenopopliteal junction in popliteal fossa
- **Perforators** – Cockett's (medial ankle and lower leg), Boyd's (below knee), Dodd's (mid-thigh), Hunterian (adductor canal)

Complications of varicose veins

- Haemorrhage, thrombophlebitis, pigmentation, eczema, lipodermatosclerosis (inverted champagne-bottle leg), venous ulcer, periostitis, equinus deformity, Marjolin's ulcer, DVT

Management outline

- Conservative – limb elevation, graduated compression stockings, exercise, weight reduction
- Sclerotherapy (small varicosities), endovenous laser / radiofrequency ablation, foam sclerotherapy
- Surgery – Trendelenburg operation (SFJ ligation) with stripping, SPJ ligation, subfascial endoscopic perforator surgery (SEPS)

Diagnosis (C, E, A, P)

CEAP classification

- **C** – Clinical classification
- **E** – Etiological classification
- **A** – Anatomic classification
- **P** – Pathophysiological classification

C – Clinical classification – 7 classes (C0–C6)

Class	Description
Class 0	No visible or palpable sign of venous disease
Class 1	Telangiectasia or reticular veins
Class 2	Varicose veins (C2r – recurrent varicose veins)
Class 3	Oedema
Class 4	Skin changes – C4a pigmentation or eczema; C4b lipodermatosclerosis or atrophie blanche; C4c corona phlebectatica
Class 5	Skin changes defined above with healed ulceration
Class 6	Skin changes defined above with active ulceration (C6r – recurrent active ulcer)

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(CEAP revision 2020)

E – Etiological classification

- Ec – Congenital
- Ep – Primary
- Es – Secondary (Esi – intravenous, e.g. post-thrombotic; Ese – extravenous)
- En – No cause identified

A – Anatomic classification

- As – Superficial veins
- Ad – Deep veins
- Ap – Perforating veins
- An – No venous location identified

P – Pathophysiological classification

- Pr – Reflux
- Po – Obstruction
- Pr,o – Reflux and obstruction
- Pn – No pathophysiology identified

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CHAPTER 19

Salivary Gland Swellings

History and bimanual examination of parotid and submandibular swellings, facial nerve and duct examination

Bio data

Name: .....

Age: .....

Sex: .....

Occupation: .....

Chief complaints

- Swelling in front of ear / below jaw, pain, dry mouth

History of presenting illness

- Onset, duration, progression (slow – pleomorphic adenoma; rapid with pain and facial palsy – malignancy)
- Relation to meals – painful swelling while eating (calculus / sialadenitis – "meal-time syndrome")
- Bilateral swelling – mumps, Sjögren's syndrome, sarcoidosis, sialosis (alcohol, malnutrition, diabetes)
- Fever, foul taste, pus in mouth
- Facial weakness, ear pain, trismus, difficulty swallowing
- Dry eyes and mouth, joint pains (Sjögren's)

Past and personal history

- Mumps, radiation, alcohol, smoking, tobacco chewing, drugs causing dry mouth

General physical examination

- PICCLE, vitals, other salivary glands, lacrimal glands, lymph nodes

Local examination – parotid

Inspection

- Site – in front of tragus, below the lobule of ear, lifting the ear lobule; retromandibular groove obliterated
- Size, shape, surface, skin over swelling

Palpation

- Temperature, tenderness, size, surface, consistency, margins, mobility, fixity to skin / masseter (clench the teeth)
- Bidigital palpation of deep lobe (tonsillar fossa, intraoral)

Parotid duct (Stensen's duct)

- Opens opposite upper second molar; look for redness, pus, calculus

Facial nerve

- Test all branches – involvement indicates malignancy

Other

- Trismus (pterygoid involvement), skin infiltration, cervical lymph nodes

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Local examination – submandibular gland

- Inspection – swelling below the body of mandible
- Bimanual palpation – one finger in floor of mouth, other hand under the jaw (gland is bimanually palpable; lymph node is not)
- Submandibular duct (Wharton's duct) – opening at sublingual papilla; palpate for calculus
- Lingual nerve and hypoglossal nerve

Surgical anatomy relevant to the parotid

- Facial nerve divides the gland into superficial and deep lobes; five terminal branches – temporal, zygomatic, buccal, marginal mandibular, cervical
- Parotid duct is 5 cm long, crosses the masseter, pierces buccinator and opens opposite the upper second molar

Complications of parotid surgery

- Facial nerve palsy, Frey's syndrome (gustatory sweating – auriculotemporal nerve), salivary fistula, greater auricular nerve numbness, recurrence (pleomorphic adenoma – tumour spillage)

Sjögren's syndrome – clues

- Dry eyes (Schirmer's test <5 mm in 5 min), dry mouth, bilateral parotid swelling, arthritis, anti-Ro / anti-La antibodies; risk of lymphoma

Differential diagnosis

Condition	Features
Pleomorphic adenoma	Slow-growing, painless, firm, lobulated, facial nerve normal
Warthin's tumour	Elderly male smoker, soft / cystic, may be bilateral
Malignant parotid tumour	Rapid growth, pain, hard, fixed, facial nerve palsy, nodes
Submandibular calculus / sialadenitis	Meal-time swelling and pain, calculus palpable in duct
Mumps	Bilateral painful parotid swelling with fever in children

Investigations

- Ultrasound, FNAC, CT / MRI, sialography, X-ray floor of mouth (occlusal view) for calculus
- Superficial parotidectomy / excision for histopathology

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CHAPTER 20

Oral Cavity Lesions – Carcinoma of Oral Cavity

History of oral ulcer and growth, risk factors, intra-oral examination, neck node assessment and staging

Bio data

Name: .....

Age: .....

Sex: .....

Occupation: .....

Socio-economic status: .....

Chief complaints

- Ulcer / growth / white or red patch in mouth, pain, bleeding, difficulty in opening mouth (trismus), swallowing, speech, swelling in neck

History of presenting illness

- Onset, duration, progression of ulcer or growth
- Pain – referred otalgia (lingual nerve via auriculotemporal nerve)
- Excessive salivation, foul smell, bleeding
- Difficulty in chewing, swallowing, speaking; loosening of teeth; ill-fitting dentures
- Neck swelling; weight loss

Risk factors

- Tobacco chewing (betel quid with lime and areca nut), smoking (bidi, reverse smoking), alcohol, sharp tooth, ill-fitting dentures, poor oral hygiene, submucous fibrosis, leukoplakia, erythroplakia, HPV

Past history

- Premalignant lesions, previous treatment, radiotherapy, diabetes

General physical examination

- Nutrition, PICCLE, vitals

Local examination

- With good light, tongue depressor, gloved finger; remove dentures

Inspection of oral cavity

- Lips, buccal mucosa, gingivobuccal sulcus, alveolus, retromolar trigone, hard palate, floor of mouth, tongue (dorsum, lateral border, ventral surface)
- Mouth opening – inter-incisor distance (normal 3–4 fingers)
- Ulcer / growth – site, size, shape, edge (everted in carcinoma), floor, base, surrounding area; leukoplakia, erythroplakia, submucous fibrosis (blanching, fibrous bands)
- Tongue movements, fixity (ankyloglossia)

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- Teeth – sharp, carious, loose

Palpation

- Bimanual palpation – induration, extent, tenderness, bleeding on touch, fixity to mandible, involvement of floor of mouth, skin
- Mandible – thickening, irregularity (bone invasion)

Neck nodes

- Levels I–VI on both sides – size, number, consistency, fixity

Nerve examination

- Lingual (sensation), hypoglossal (tongue movements), inferior alveolar / mental nerve (lower lip numbness – mandibular invasion)

Staging – AJCC 8th edition (oral cavity), summary

T stage	Description
T1	≤2 cm and depth of invasion (DOI) ≤5 mm
T2	≤2 cm with DOI >5 mm, or >2 cm to ≤4 cm with DOI ≤10 mm
T3	>4 cm or any tumour with DOI >10 mm
T4a	Invades adjacent structures – cortical bone, maxillary sinus, skin of face
T4b	Invades masticator space, pterygoid plates, skull base, encases internal carotid artery

Premalignant lesions and conditions of the oral cavity

Lesion	Features	Malignant potential
Leukoplakia	White patch that cannot be scraped off and not attributable to other disease	3–6% (higher in speckled / verrucous)
Erythroplakia	Red velvety patch	Highest (up to 50%)
Oral submucous fibrosis	Blanching, fibrous bands, trismus, burning with spicy food – areca nut chewing	7–13%
Lichen planus (erosive)	White lacy striae (Wickham's), erosions	Low

Common sites of oral cancer in India

- Gingivobuccal complex (buccal mucosa and lower alveolus – where the quid is kept), lateral border of tongue, floor of mouth

Lymph node levels of the neck – drainage of oral cavity

- Lip and anterior floor – level I (submental); tongue and buccal mucosa – levels I–III; tip of tongue – submental, bilateral

Diagnosis

- Example: Carcinoma of left lateral border of tongue, T2 N1 M0, in a tobacco chewer

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Investigations

- Punch biopsy from edge of lesion, FNAC of node
- Orthopantomogram, CT / MRI of face and neck, chest X-ray / CT, PET-CT where indicated
- CBC, renal and liver function, dental evaluation before radiotherapy

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CHAPTER 21

Urological Case – Benign Prostatic Hyperplasia and Renal Swelling

Lower urinary tract symptoms, renal and loin pain, examination of kidney, bladder, prostate and external genitalia

Bio data

Name: .....

Age: .....

Sex: .....

Occupation: .....

Chief complaints

- Difficulty in passing urine, frequency, urgency, nocturia, retention, burning micturition, blood in urine, loin pain, swelling in flank

History of presenting illness

Lower urinary tract symptoms (LUTS)

- **Voiding (obstructive)** – hesitancy, poor stream, intermittency, straining, terminal dribbling, incomplete emptying
- **Storage (irritative)** – frequency, urgency, nocturia, urge incontinence
- International Prostate Symptom Score (IPSS): 0–7 mild, 8–19 moderate, 20–35 severe

Acute / chronic retention, overflow incontinence: .....

Haematuria

- Painless (malignancy – kidney, bladder), painful (stone, infection); initial / terminal / total; clots

Loin pain

- Renal colic radiating from loin to groin and genitalia, with vomiting – ureteric stone
- Dull ache – hydronephrosis, tumour, polycystic kidney

Others

- Fever with chills (pyelonephritis), stone passage, pneumaturia, weight loss, bone pain (prostate cancer)
- Symptoms of uraemia – nausea, itching, breathlessness, reduced urine output

Past history

- Previous catheterisation, urethral stricture, STI, stones, TB, diabetes, hypertension, neurological disease (neurogenic bladder), surgery

Drug history

- Alpha-blockers, 5-alpha-reductase inhibitors, anticholinergics, diuretics

General physical examination

- PICCLE, vitals (BP – hypertension in renal disease), signs of uraemia, dehydration

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Abdomen

Inspection

- Fullness in flank, suprapubic fullness (distended bladder)

Palpation

- **Kidney** – bimanual palpation, ballotable, moves with respiration, can get above it, band of colonic resonance in front
- Renal angle tenderness (Murphy's punch)
- **Bladder** – suprapubic, smooth, oval, dull, cannot get below it, desire to micturate on pressure

Percussion

- Dull over bladder; resonant band over renal mass

Auscultation

- Renal artery bruit

External genitalia

- Meatus (stenosis, discharge), phimosis, urethra (palpable stricture), testes, epididymis

Per rectal examination – prostate

Feature	BPH	Carcinoma prostate
Size	Enlarged	Variable
Surface	Smooth	Nodular, irregular
Consistency	Firm, rubbery	Stony hard
Median sulcus	May be obliterated	Obliterated
Rectal mucosa	Mobile over prostate	May be fixed

- Grade the enlargement (I–IV); anal tone and perianal sensation (neurogenic bladder)

Neurological examination

- Lower limb power, reflexes, saddle sensation (cauda equina, diabetes)

Haematuria – causes by site

Site	Common causes
Kidney	Glomerulonephritis, stone, renal cell carcinoma, polycystic kidney, TB, trauma
Ureter	Stone, transitional cell carcinoma
Bladder	Cystitis, stone, carcinoma bladder, schistosomiasis
Prostate and urethra	BPH, carcinoma prostate, urethritis, trauma
Systemic	Anticoagulants, bleeding disorders, sickle cell disease

Renal angle

- Between the 12th rib and the lateral border of erector spinae; tenderness in pyelonephritis and obstruction

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Polycystic kidney disease – clues

- Bilateral ballotable irregular renal masses, hypertension, haematuria, family history, hepatic cysts, berry aneurysms (subarachnoid haemorrhage)

Acute retention of urine – causes

- BPH, urethral stricture, clot retention, drugs (anticholinergics, opioids), post-operative, neurological (spinal cord lesion, diabetes), constipation, phimosis

Diagnosis

- Example: Benign prostatic hyperplasia with moderate LUTS (IPSS 16), without retention or upper-tract changes

Investigations

- Urine routine and culture, renal function, electrolytes, blood sugar, PSA
- Ultrasound KUB with post-void residual urine and prostate volume, uroflowmetry (Qmax)
- X-ray KUB, CT urography (stone, haematuria), cystoscopy, IVU

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PART IV

Orthopaedics

Trauma, joints, spine and peripheral nerves

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26 Examination of the Spine

27 Examination of Hip Joint

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29 Examination of Ankle and Foot

30 Peripheral Nerve Injuries

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CHAPTER 22

General Orthopaedic Case Sheet – Trauma and Fractures

History of injury, primary survey, look–feel–move–measure, neurovascular assessment and description of a fracture

Bio data

Name: .....

Age: .....

Sex: .....

Occupation: .....

Handedness: .....

Chief complaints

- Pain, swelling, deformity, inability to use the limb / bear weight, wound, with duration

History of presenting illness

Mechanism of injury

- Date, time, place, mode (road traffic accident, fall from height, fall on outstretched hand, twisting, direct blow, assault)
- Position of limb at impact, energy of trauma

After injury

- Immediate pain, swelling, deformity, wound, bleeding, inability to move / bear weight
- Loss of consciousness, vomiting, ENT bleeding, chest pain, abdominal pain, blood in urine (associated injuries)
- Numbness, tingling, coldness, weakness distal to injury (neurovascular injury)
- First aid, splintage, treatment by bone-setter (common in India), time of arrival

Pathological fracture

- Trivial trauma, prior pain, known malignancy, osteoporosis, bone disease

Chronic orthopaedic complaints

- Pain, stiffness, swelling, deformity, instability, limp, locking, weakness, sensory loss, functional loss

Past history

- Previous fractures or surgery, TB, diabetes, steroid use, bleeding disorders

Personal history

- Smoking (delayed union), alcohol, diet

General examination

- ABCDE primary survey in acute trauma; GCS
- PICCLE, vitals, signs of shock

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Local examination – look, feel, move, measure

Look

- Attitude of limb, swelling, deformity (angulation, rotation, shortening), bruising, wound (size, communication with fracture – open fracture), blisters, muscle wasting, scars, sinuses

Feel

- Local temperature, tenderness (bony / joint line), bony irregularity, crepitus (do not elicit deliberately), abnormal mobility, relation of bony landmarks

Move

- Active and passive movements of joints above and below; painful / restricted range

Measure

- Limb length – true (bony landmark to landmark) and apparent; segmental length
- Girth – muscle wasting at fixed point

Neurovascular examination distal to injury

- Pulses, capillary refill, temperature, colour
- Motor and sensory function of nerves at risk (e.g. radial nerve in fracture shaft of humerus, axillary nerve in shoulder dislocation, common peroneal nerve in fibular neck fracture)
- Compartment syndrome – pain out of proportion, pain on passive stretch, tense compartment

Examination of spine, pelvis, chest, abdomen and head

Describing a fracture on X-ray

- Name of bone, side, site (proximal / middle / distal third; intra- or extra-articular)
- Pattern – transverse, oblique, spiral, comminuted, segmental, greenstick, buckle, avulsion, impacted
- Displacement – translation, angulation, rotation, shortening (describe the distal fragment)
- Open / closed – Gustilo–Anderson classification for open fractures
- Associated dislocation, joint involvement, growth plate (Salter–Harris)

Gustilo–Anderson classification

Type	Description
I	Wound <1 cm, clean
II	Wound 1–10 cm, moderate soft-tissue damage
IIIA	Extensive soft-tissue damage, adequate bone cover
IIIB	Extensive soft-tissue loss with periosteal stripping, needs flap cover
IIIC	Arterial injury requiring repair

Complications to look for

- **Early** – shock, fat embolism, compartment syndrome, neurovascular injury, infection, DVT
- **Late** – delayed union, non-union, malunion, joint stiffness, avascular necrosis, Volkmann's ischaemic contracture, myositis ossificans, complex regional pain syndrome, osteoarthritis

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Salter–Harris classification of physeal injuries

Type	Pattern
I	Separation through the physis
II	Through physis and metaphysis (commonest)
III	Through physis and epiphysis (intra-articular)
IV	Through metaphysis, physis and epiphysis
V	Crush injury of physis (growth arrest)

Common eponymous fractures

Fracture	Description
Colles'	Distal radius, dorsal displacement and angulation (dinner-fork deformity)
Smith's	Distal radius with volar displacement (reverse Colles')
Barton's	Intra-articular fracture-subluxation of distal radius
Monteggia	Fracture of proximal ulna with dislocation of radial head
Galeazzi	Fracture of distal radius with dislocation of distal radio-ulnar joint
Bennett's	Intra-articular fracture-dislocation of base of first metacarpal
Boxer's	Fracture of neck of fifth metacarpal
Pott's	Bimalleolar fracture of ankle
Jones	Fracture at base of fifth metatarsal (metaphyseal–diaphyseal junction)

Signs of fracture healing

- Clinical union – no tenderness, no abnormal mobility, can bear weight
- Radiological union – bridging callus across the fracture on two views

Ottawa ankle rules (X-ray required if)

- Pain in malleolar zone and bone tenderness at posterior edge or tip of either malleolus, or inability to bear weight for 4 steps both immediately and in casualty

Diagnosis

- Example: Closed, displaced, transverse fracture of middle third of shaft of right femur, without distal neurovascular deficit

Investigations

- X-ray – two views (AP and lateral), including joints above and below
- CT for intra-articular fractures; MRI; Doppler / angiography for vascular injury
- CBC, blood grouping and cross-matching, blood sugar, coagulation profile before surgery

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CHAPTER 23

Examination of Shoulder Joint

Attitude, contour, bony points, measurements and special tests of the shoulder

Bio data

Name: .....

Age: .....

Sex: .....

Occupation: .....

History

- Pain localised to shoulder joint or radiating from acromion process down the outside of arm up to its middle
- Stiffness
- Instability

Past history: .....

Personal history: .....

Family history: .....

Examination

General examination

Vitals

Examination of shoulder joint

- Patient should be sitting on a stool and stripped up to the waist prior to the examination

Inspection

Attitude

- Patient supports the flexed elbow of injured side with the other hand – fracture clavicle, anterior dislocation of shoulder

Deformity / swelling

- Swelling at the junction of lateral one-third and medial two-thirds of the clavicle – fracture of clavicle
- Prominence at acromial end – dislocation of acromioclavicular joint
- Prominence at sternal end of clavicle – dislocation of sternoclavicular joint
- Drooping of shoulder with lengthening of arm – fracture neck of scapula
- Swelling in deltopectoral groove, flattening of shoulder, undue prominence of acromion process – subcoracoid dislocation of shoulder

Contour of shoulder

- Prominent with rounded fullness – subdeltoid bursitis / effusion (in subdeltoid bursitis, fullness is seen just beneath deltoid muscle and does not go beyond the margins of the muscle)
- Flattening – wasting of deltoid muscle due to rheumatoid arthritis, tuberculosis, arthritis, osteoarthritis, rotator cuff lesions
- Dislocation of shoulder – undue flattening and loss of roundness
- Subcoracoid dislocation (common) – head of humerus lies just below the coracoid process
- Fracture neck of humerus – swelling of shoulder just below acromion process

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- Look for any abnormal swelling

BONY ARCH OF SHOULDER

Anteriorly – formed by clavicle
Posteriorly – spine of scapula
Laterally – acromion process

Palpation

1. Clavicle

- Palpated from behind, patient in sitting position
- Palpate sternoclavicular joint, then laterally palpate the entire length of the 2 clavicles simultaneously
- Look for abnormal prominence / break in the line
- Sternoclavicular dislocation – sternal end of clavicle is displaced anteriorly
- Acromioclavicular joint dislocation – acromial end of clavicle is subluxated upwards

2. Upper end of humerus

- Palpate acromion process of both sides, then address the greater tuberosity of humerus
- Dislocation of shoulder – absence and loss of resistance
- Palpate along the line of humerus
- Local bony tenderness / bony irregularity
- Painful arc syndrome – pressure just below the acromion process elicits tenderness when the arm is by the side, but not when the arm is abducted, as the tender spot disappears under the acromion process (Dawbarn's sign)
- Osteoarthritis – crepitus +
- Supraspinatus tendinitis – pressure below acromion process, tenderness +
- Dislocation of shoulder – rotate flexed elbow; there will be no transmitted rotation of head of humerus
- Fracture of greater tuberosity / supraspinatus tendon rupture – tenderness just below acromion process
- Codman's method – another method of palpating shoulder joint

3. Scapula

- Palpate spine of scapula, acromion process, vertebral border, inferior angle
- Fracture neck of scapula – diffuse swelling in the shoulder region
- Fracture neck of scapula – drooping of shoulder with tenderness and crepitus by axial pressure upward through the flexed elbow; tenderness medial to the glenoid process
- Relative position of 3 bony points: tip of acromion process, tip of coracoid process and greater tuberosity
- Acromioclavicular dislocation – acromial end of clavicle becomes more prominent; distance between coracoid process and acromial end of clavicle increases
- Subdeltoid bursitis – swelling and tenderness just beneath the acromion process

Measurements

a) Length of arm – measure from angle of acromion to lateral epicondyle of humerus
   - Normally the angle lies posterior to the longitudinal axis of the arm
   - Subcoracoid dislocation of the shoulder / fracture shaft and neck of humerus – arm length is shortened
   - Subglenoid dislocation / fracture neck of scapula – length of arm is longer

b) Vertical circumference of axilla – increased in dislocation, fracture neck / upper end of humerus

Hamilton's ruler test

- Normally, ruler cannot be made to touch acromion process and lateral epicondyle of humerus, because of greater tuberosity
- Dislocation of shoulder – greater tuberosity is displaced medially, so it becomes possible

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Dugas' test

- Dislocation of shoulder – patient is unable to touch the opposite shoulder with the hand of affected side

Movements

- Abduction – 180 degrees
- Painful arc syndrome – pain felt at mid range of abduction (60–120 degrees)
- Flexion – 180 degrees
- Extension – 45–60 degrees
- Rotation, both medial and lateral – one quarter of a circle along vertical axis
- Circumduction

Rotator cuff and special tests of the shoulder

Test	Structure / condition
Empty can (Jobe's) test	Supraspinatus
Drop arm test	Full-thickness rotator cuff tear
External rotation lag sign	Infraspinatus, teres minor
Lift-off / belly-press test	Subscapularis
Neer's and Hawkins–Kennedy tests	Subacromial impingement
Apprehension and relocation tests	Anterior instability
Speed's and Yergason's tests	Biceps tendon
Cross-body adduction test	Acromioclavicular joint

Anterior vs posterior dislocation of shoulder

Feature	Anterior (95%)	Posterior
Mechanism	Fall on outstretched hand, abduction and external rotation	Seizure, electric shock
Attitude	Arm abducted and externally rotated, supported by other hand	Arm adducted and internally rotated
Contour	Loss of shoulder roundness, prominent acromion	Prominent coracoid, flattened anterior shoulder
Nerve at risk	Axillary nerve (regimental badge area numbness)	–

Frozen shoulder (adhesive capsulitis) – stages

- Freezing (painful), frozen (stiff), thawing (recovery); global loss of active and passive movements, especially external rotation; associated with diabetes

Differential diagnosis

- Arthritis of the shoulder joint
- Acute supraspinatus tendinitis
- Chronic supraspinatus tendinitis
- Frozen shoulder
- Rupture of supraspinatus tendon

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- Subdeltoid bursitis
- Brachial neuralgia
- Rupture of biceps tendon

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CHAPTER 24

Examination of Elbow Joint

Attitude, swelling, deformity, bony relations, measurements and special tests

Bio data

Name: .....

Age: .....

Sex: .....

Address: .....

Occupation: .....

History

- Pain
- Swelling
- Stiffness
- Deformity
- H/o trauma, surgeries

Examination

Vitals

General examination

Build and nourishment

PICCLE

Examination

Exposure: The whole upper limbs on both sides should be exposed.

Inspection

1. Attitude

In case of injuries, like supracondylar fracture – swollen elbow in flexed position supported by other arm.

Look anteriorly for

- Position of joint: extended
- Flexed (most common)
- Pronated
- Supinated – carrying angle
  - Normally 10–15 degrees
  - Look for cubitus varus and cubitus valgus

Look posteriorly for

Position of olecranon process

- Prominence of olecranon process posteriorly (posterior dislocation of elbow; in children due to supracondylar fracture of humerus)
- Laterally
- Look for anteroposterior broadening of elbow – seen in posterior dislocation and supracondylar fracture of elbow

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2. Swelling

- Fracture
- Effusion
- Olecranon bursitis / student's elbow – swelling over the olecranon process
- Bicipitoradial bursitis – inflammation of bursa beneath the tendon of biceps

3. Deformity

- Fracture
- Monteggia fracture – swelling in the upper part of ulna
- Posterior dislocation of elbow – undue prominence of olecranon process
- Supracondylar fracture – undue posterior prominence of the olecranon process (three-point relationship maintained)

4. Muscle wasting:

Palpation

In case of injuries

- Local tenderness – fractures
- Tennis elbow – tenderness at the origin of common extensor muscle at lateral epicondyle
- Golfer's elbow – tenderness at the common flexor origin at medial epicondyle
- Local rise in temperature – acute arthritis, olecranon bursitis, bicipitoradial bursitis
- Bony irregularity
- Displacement
- Abnormal mobility
- Crepitus

Palpate lower third of humerus – palpate both epicondyles with thumb and 4 fingers – abnormal position indicates separation of condylar epiphysis or fractured capitulum.

Abnormal broadening of lower end of humerus indicates T- or Y-shaped fracture.

Abnormal movement or crepitus while moving the upper end of humerus and lower segment – supracondylar fracture.

Upper end of radius

- Swelling at the upper end of radius – fracture head of radius (adults), fracture neck of radius (children)
- Effusion
- Fracture of radial head – tenderness and irregularity on rotation of radius
- Squeezing the radius and ulna together at the lower part of forearm will produce pain
- Monteggia fracture – palpate head of radius

Upper end of ulna

- Bony irregularity
- Bony tenderness
- Abnormal prominence

Olecranon process

Bony irregularity, tenderness

Abnormal prominence – posterior dislocation (adult), supracondylar fracture (children)

Relative positions of the 3 bony prominences

The 2 epicondyles are palpated with thumb and middle finger, olecranon process palpated with the index finger in flexed position.

With the elbow flexed to 90°, they normally form an isosceles triangle; in full extension the three points lie in a straight line.

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This relationship is disturbed in dislocation of the elbow but maintained in supracondylar fracture.

Both epicondyles widened – T- or Y-shaped fracture

Olecranon process posteriorly prominent – posterior dislocation

Palpate for supratrochlear (epitrochlear) lymph node in 90-degree flexed elbow – syphilis

Measurements

Forearm is held at a right angle for epicondyles to become prominent

1. Measure from angle of acromion to lateral epicondyle of humerus – shortened in supracondylar fracture
2. Measure from lateral epicondyle to radial styloid process – shortened in posterior dislocation
3. Bony points

Movements

- Humeroulnar joint – flexion, extension
- Radioulnar joint – pronation, supination
- Injury to upper end of radius causes pain during pronation and supination, which is examined with the joint kept 90 degrees flexed

Special tests

1. Wringing test – patient wrings a towel (grip with forearm twisting); pain over lateral epicondyle – tennis elbow
2. Cozen's test – to evaluate for lateral epicondylitis – pain produced at lateral epicondyle during resisted wrist extension (forearm pronated, fist clenched)

Complications

1. Volkmann's ischaemic contracture – due to inadequate blood supply to forearm muscles – patient complains of pain after fracture has been reduced and plastered
2. Myositis ossificans traumatica – sequel of forcible massage and passive stretching of elbow

Supracondylar fracture vs posterior dislocation of elbow

Feature	Supracondylar fracture	Posterior dislocation
Age	Children	Adults
Three-point bony relationship	Maintained	Disturbed
Swelling	Above the elbow	At the elbow
Arm length	Shortened	Normal
Forearm length	Normal	Shortened
Complications	Brachial artery injury, median / anterior interosseous nerve injury, Volkmann's ischaemia, cubitus varus (gunstock deformity)	Ulnar nerve injury, stiffness, myositis ossificans

Carrying angle

- Angle between long axis of arm and forearm with elbow extended and forearm supinated; normal 10–15° (more in females)
- Cubitus varus – malunited supracondylar fracture; cubitus valgus – non-union of lateral condyle fracture (may cause tardy ulnar nerve palsy)

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Diagnosis

- Acute arthritis
- Chronic arthritis
- Osteochondritis dissecans
- Charcot's joint
- Tennis elbow (lateral epicondylitis)
- Golfer's elbow (medial epicondylitis)
- Student's elbow
- Cubital tunnel syndrome – affects the ulnar nerve

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CHAPTER 25

Examination of Wrist and Hand

Deformities, swellings, tendon and nerve examination and special tests of the wrist and hand

Bio data

Name: .....

Age: .....

Sex: .....

Occupation: .....

Handedness: .....

History

- Pain, swelling, deformity, stiffness, weakness, numbness and tingling (night pain – carpal tunnel), triggering, loss of grip, trauma (fall on outstretched hand)

Inspection

- Attitude of hand, resting cascade of fingers
- **Deformities** – dinner-fork (Colles' fracture), garden-spade (Smith's fracture), wrist drop (radial nerve), claw hand (ulnar / median and ulnar), ape-thumb deformity (median), mallet finger, swan-neck, boutonnière, Dupuytren's contracture
- Swelling – ganglion (dorsum of wrist), tenosynovitis, compound palmar ganglion
- Muscle wasting – thenar (median), hypothenar and first dorsal interosseous (ulnar)
- Skin – scars, sweating, trophic changes, nail changes

Palpation

- Temperature, tenderness – anatomical snuffbox (scaphoid fracture), radial styloid (de Quervain's), distal radius, ulnar styloid
- Swellings – consistency, fluctuation, cross-fluctuation (compound palmar ganglion)
- Radial and ulnar pulses, Allen's test

Movements

Joint	Movement	Normal range
Wrist	Dorsiflexion / palmar flexion	70° / 80°
Wrist	Radial / ulnar deviation	20° / 30°
Forearm	Pronation / supination	80–90° each
MCP	Flexion	90°
PIP / DIP	Flexion	100° / 80°
Thumb	Flexion, extension, abduction, adduction, opposition	–

Tendon tests

- Flexor digitorum profundus – flex the DIP with PIP held
- Flexor digitorum superficialis – flex PIP with other fingers held in extension

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- Extensor tendons, extensor pollicis longus

Nerve tests

- **Median nerve** – abductor pollicis brevis (pen test), opponens, sensation over index finger pulp; Tinel's and Phalen's tests (carpal tunnel)
- **Ulnar nerve** – card test (palmar interossei), Egawa's test, Froment's sign, sensation over little finger
- **Radial nerve** – wrist and finger extension, sensation over first dorsal web space

Special tests

- Finkelstein's test – de Quervain's tenosynovitis
- Scaphoid compression test, snuffbox tenderness
- Watson's (scaphoid shift) test – scapholunate instability
- Grind test – first CMC arthritis

Common swellings and conditions of wrist and hand

Condition	Features
Ganglion	Cystic swelling on dorsum of wrist, transilluminates, related to joint capsule / tendon sheath
De Quervain's tenosynovitis	Pain over radial styloid, Finkelstein's test positive
Trigger finger	Locking of finger in flexion with painful click, nodule at A1 pulley
Dupuytren's contracture	Thickening of palmar fascia, flexion contracture of ring and little fingers
Carpal tunnel syndrome	Nocturnal paraesthesia in lateral 3½ fingers, thenar wasting, Tinel's / Phalen's positive
Compound palmar ganglion	TB tenosynovitis of flexor sheath, hourglass swelling across wrist, cross-fluctuation, melon-seed bodies
Scaphoid fracture	Snuffbox tenderness after fall on outstretched hand; risk of AVN of proximal pole

Infections of the hand

- Paronychia, felon (pulp space infection), tenosynovitis (Kanavel's signs – flexed posture, fusiform swelling, tenderness along sheath, pain on passive extension), web-space infection, deep palmar space infection

Diagnosis

- Example: Malunited Colles' fracture of right wrist with dinner-fork deformity and restricted supination

Investigations

- X-ray wrist AP and lateral, scaphoid views; nerve conduction study; ultrasound / MRI

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CHAPTER 26

Examination of the Spine

Back and neck pain, deformity, tenderness, movements, neurological assessment and special tests including SLR

Bio data

Name: .....

Age: .....

Sex: .....

Occupation: .....

Chief complaints

- Back pain / neck pain, radiation to limbs, stiffness, deformity (hunch back, scoliosis), weakness, numbness, bladder and bowel disturbance

History of presenting illness

- Onset (acute after lifting – disc prolapse; insidious – degenerative, TB, tumour), duration, progression
- Mechanical vs inflammatory pain (morning stiffness, night pain)
- Radiation – sciatica (below knee), brachialgia
- Neurogenic claudication – leg pain on walking, relieved by bending forward / sitting (lumbar canal stenosis)
- Red flags – age <20 or >55, trauma, fever, weight loss, night pain, history of cancer, TB, IV drug use, saddle anaesthesia, urinary retention (cauda equina), progressive neurological deficit
- Constitutional symptoms – evening fever, weight loss (Pott's spine)

Past history

- TB, trauma, cancer, osteoporosis, steroids

General examination

- PICCLE, vitals, lymph nodes, breast / prostate / thyroid (secondary deposits), chest (TB)

Inspection – standing, from behind and side

- Posture, gait, level of shoulders and pelvis
- Spinal curves – cervical and lumbar lordosis, thoracic kyphosis; loss of lordosis (muscle spasm)
- Deformities – scoliosis (structural vs postural; Adam's forward bend test – rib hump), kyphosis, gibbus (Pott's spine), list (sciatic scoliosis)
- Swellings – cold abscess (paravertebral, psoas abscess in groin), skin – café-au-lait spots, hairy patch, sinuses
- Muscle wasting

Palpation

- Spinous processes – tenderness, step (spondylolisthesis), gibbus
- Paravertebral muscle spasm, sacroiliac joints, coccyx

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Percussion

- Gentle percussion for bony tenderness

Movements

Region	Movement	Normal
Cervical	Flexion (chin to chest), extension, lateral flexion, rotation	Rotation 80° each side
Thoracolumbar	Flexion, extension, lateral flexion, rotation	–

- Modified Schober's test – lumbar flexion (increase <5 cm abnormal)
- Chest expansion (ankylosing spondylitis)

Special tests

- **Straight leg raising (SLR)** – pain radiating below knee at 30–70° (L5 / S1 root tension)
- **Lasègue's sign** – SLR to pain, lower slightly, dorsiflex foot – pain recurs
- **Crossed SLR** – pain in affected leg on raising the normal leg (large central disc prolapse)
- **Femoral nerve stretch test** – prone, knee flexion – anterior thigh pain (L2–L4)
- **Spurling's test** – cervical radiculopathy
- **FABER / Patrick's test** – sacroiliac joint and hip
- Non-organic signs (Waddell's signs)

Neurological examination of limbs

- Tone, power by myotome, reflexes, sensation by dermatome, plantar response

Root	Motor	Sensory	Reflex
L4	Ankle dorsiflexion (tibialis anterior)	Medial leg	Knee
L5	Great toe extension (EHL)	Dorsum of foot	–
S1	Ankle plantar flexion	Lateral foot, sole	Ankle
C5	Shoulder abduction	Lateral arm	Biceps
C6	Wrist extension	Lateral forearm, thumb	Supinator
C7	Elbow extension	Middle finger	Triceps
C8	Finger flexion	Medial forearm, little finger	Finger flexion

- Perianal sensation and anal tone (cauda equina syndrome)
- Peripheral pulses (vascular claudication)

Examination of abdomen and per rectal

- Aortic aneurysm, pelvic mass, prostate

Pott's spine – clinical features

- Back pain, stiffness (coin test – picks up coin by bending knees), cold abscess (paravertebral, psoas – groin swelling, retropharyngeal in cervical TB), gibbus, constitutional symptoms
- Pott's paraplegia – early onset (active disease, abscess / granulation compression) vs late onset (healed disease, bony ridge, fibrosis)

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Frankel grading of spinal cord injury

Grade	Description
A	Complete – no motor or sensory function below level
B	Sensory only, no motor
C	Motor useless (non-functional)
D	Motor useful – can walk with or without aids
E	Normal motor and sensory function

Cauda equina syndrome – red flags (surgical emergency)

- Bilateral sciatica, saddle anaesthesia, urinary retention or incontinence, faecal incontinence, lax anal tone, progressive leg weakness

Diagnosis

- Example: Tuberculosis of dorsal spine (D10–D11) with gibbus and paraplegia, Frankel grade C
- Example: Prolapsed intervertebral disc L4–L5 with left L5 radiculopathy

Investigations

- X-ray spine AP and lateral, flexion–extension views; MRI (disc, TB, tumour, cord compression)
- CBC, ESR, CRP, Mantoux test, CT-guided biopsy, CBNAAT

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CHAPTER 27

Examination of Hip Joint

Gait, attitude, deformities, measurements and the lines of the hip

Bio data

Name: .....

Age

- Birth – 5 yrs – congenital dislocation
- 5–10 yrs – Perthes' disease
- 10–15 yrs – adolescent coxa vara
- Above 40 yrs – osteoarthritis

Sex: .....

Address: .....

Occupation: .....

Presenting complaints

1. **Pain**
2. **Swelling**
3. **Deformity**
4. **Restriction of movements**

} **Can be due to injury, pathology**

History of presenting illness

Past history: .....

Personal history: .....

Family history: .....

General examination

1. Fever
2. Lymph nodes

Examination of hip

1. Inspection
2. Palpation
3. Movement
4. Measurement

Patient must be examined in standing, sitting and lying-down positions.

Patient must be inspected from front, sides and back.

Inspection

Gait

1. Antalgic gait
2. Trendelenburg gait

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3. Short-limb gait
4. Circumduction gait

Attitude of limb

Neck of femur fracture – limb is shortened and externally rotated (flexion, abduction and external rotation is the attitude of anterior dislocation of hip)

Posterior dislocation of hip – leg is flexed at hip joint, internally rotated and adducted

Tuberculosis of hip

- Stage 1 – synovitis
  - Attitude – flexion, abduction, external rotation
- Stage 2 – arthritis
  - Attitude – flexion, adduction, internal rotation
- Stage 3 – bone erosion
  - Attitude – same as stage 2

Trendelenburg gait: positive in case of

- Problems with abductors (poliomyelitis, motor neuron disease)
- Problems with fulcrum (dislocation, fracture of neck, Perthes' disease)
- Problems with lever (coxa vara, non-union of fracture neck of femur)

Trendelenburg test: patient stands on the affected limb and lifts the opposite foot. Normally the pelvis on the unsupported side rises. Positive – the pelvis on the unsupported (sound) side drops.

Hip deformities

1. Fixed abduction
2. Fixed adduction
3. Fixed flexion (Thomas' test)
4. Fixed medial rotation
5. Fixed lateral rotation

Palpation

Local rise of temperature

Fractures and dislocations

- Palpate for head of femur position (posterior, groin, perineum)
- Femoral artery – pulsation feeble, with loss of bony resistance (femoral head) behind the artery in posterior dislocation
- Tenderness over the fracture site

Pathology

- Tenderness over greater trochanter (bursitis, tendinitis)
- Palpation of joint (arthritis)
- FABER test
  - Anterior pain – femoroacetabular joint
  - Posterior pain – sacroiliac joint
- FADIR test (femoroacetabular impingement)
- Femoral artery (congenital dislocation of hip)
- Lymph nodes

Rectal examination

Done in cases of central dislocation

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Congenital dislocation of hip

- Barlow test
- Ortolani test
- Telescopic test

Movements

Movement	Normal range
Flexion	120°
Extension	15°
Abduction	40°
Adduction	30°
Internal rotation	30°
External rotation	45°

Measurements

1. Length of the limb:
   - *True length:* length from ASIS to medial malleolus
   - *Apparent length:* length from xiphisternum to medial malleolus
2. Bryant's triangle (ASIS, greater trochanter, junction of the two perpendiculars)
3. Nélaton's line: with the patient lying on the sound side and the hip flexed to about 45°, a line joining ASIS and ischial tuberosity passes through the tip of the greater trochanter on that side.
4. Shoemaker's line: with the patient lying supine, the line joining ASIS and tip of the greater trochanter is extended on the side of the abdomen on both sides. Normally the lines of both sides meet in the midline above the umbilicus; they meet below the umbilicus or away from the midline when the greater trochanter is displaced upwards.
5. Chiene's lines: line joining the greater trochanters of femur and line joining the ASIS are parallel.
6. Morris bitrochanteric test: distance between greater trochanter and pubic symphysis is measured and compared with the other side.
7. Measurement of muscle girth

Fracture neck of femur vs intertrochanteric fracture

Feature	Fracture neck of femur	Intertrochanteric fracture
Age	Elderly, osteoporotic women	Elderly
External rotation	Up to 45° (intracapsular – capsule limits rotation)	Up to 90° (extracapsular)
Shortening	Mild	Marked
Swelling, bruising	Little	Marked
Complications	Avascular necrosis, non-union	Malunion (coxa vara)

Garden classification of fracture neck of femur

- I – incomplete, impacted in valgus; II – complete, undisplaced; III – complete, partially displaced; IV – complete, fully displaced

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Signs of avascular necrosis of femoral head

- Groin pain, limp, restricted internal rotation and abduction; MRI is the earliest investigation

Differential diagnosis

- Congenital dislocation of the hip or developmental dysplasia of the hip joint
- Perthes' disease
- Slipped epiphysis
- Tuberculosis of the hip joint
- Acute suppurative arthritis
- Irritable hip
- Osteoarthritis

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CHAPTER 28

Examination of Knee Joint

Swellings, effusion, bony components, movements and cysts around the knee

Bio data

Name: .....

Age: .....

Sex: .....

Address: .....

Occupation: .....

History

- Pain
- Swelling
- Stiffness
- Mechanical disorders – locking, giving way, click
- Limp

Inspection

- First – standing position from both anteriorly and posteriorly
- Second – sitting
- Third – supine, then prone

1. Gait

- Antalgic gait – patient spends less time (short stance phase) on the painful limb

2. Attitude

- Genu valgum
- Genu varum
- Genu recurvatum
- Anterior surface and position of patella
- TB arthritis / OA – moderate flexion
- In advanced cases, joint surfaces as well as ligaments are affected → triple displacement (flexion, posterior subluxation, lateral rotation of tibia)

3. Swelling

- Effusion – horseshoe swelling above the patella and on both sides of patella
- Bilateral effusion – syphilis (Clutton's joints) / haemophilia
- Semimembranosus bursitis – becomes prominent on extension of the knee, seen behind the knee on medial aspect just above the joint line
- Prepatellar bursitis / housemaid's knee – in lower part of patella and ligamentum patellae inflamed
- Suprapatellar bursitis – knee joint effusion

4. Muscle wasting: .....

5. Skin over the knee: .....

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Palpation

Local temperature: .....

Tenderness: .....

Swelling

- Fluctuation – press suprapatellar pouch with one hand and feel impulse with thumb and fingers of other hand placed on either side of patella
- Thickened synovial membrane – boggy / spongy feel, no true fluctuation, absence of patellar tap, edges can be rolled under finger
- Patellar tap – sign of effusion, blood or pus

For small amount of fluid in knee joint:

1. Bulge (wipe) test – patient lies supine with knee extended and relaxed; pressure is applied over one of the obliterated hollows on either side of ligamentum patellae to displace the fluid and then pressure is released. Slowly the hollow refills.
2. By eliciting patellar tap with the suprapatellar pouch compressed (moderate effusion)
    - Cyst of lateral semilunar cartilage – swelling on the joint line on lateral side of ligamentum patellae
    - Popliteal aneurysm – swelling in popliteal fossa + expansile pulsation

Transillumination

- Positive in Morrant Baker's cyst
- Negative – aneurysm, pus
- Compressible – Morrant Baker's cyst / aneurysm

Popliteal fossa – examined in prone position, with knee flexed; palpate the joint, artery, vein, nerves, areolar tissue, tendons

Bony components

- Femoral and tibial condyles palpated for tenderness, irregularity, swelling
- Patella – crepitus during movement (osteoarthritis)
- Click – it is significant if associated with pain
- Painful click with locking – commonest cause is meniscal tear; osteoarthritis produces crepitus

Palpation of knee joint – palpate patellofemoral and tibiofemoral components; crepitus on pushing patella medially and laterally – chondromalacia patellae

Movements

- For active and passive movements
- Normal – flexion (0–135°), extension and slight rotation in the flexed knee
- Abnormal abduction / adduction (valgus / varus laxity) – collateral ligament injury
- Abnormal passive movement – Charcot's joint

Special tests

- Anterior drawer test and Lachman test – anterior cruciate ligament
- Posterior drawer test and posterior sag sign – posterior cruciate ligament
- Valgus / varus stress test at 30° flexion – medial / lateral collateral ligament
- McMurray test, Apley grinding test – meniscal tear
- Patellar apprehension test – recurrent dislocation of patella

Measurements

- Wasting of quadriceps in affection of the knee joint
- Genu valgum – intermalleolar distance; genu varum – intercondylar distance is used to measure degree of deformity

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Lymph nodes

- Popliteal / inguinal group enlarged – arthritis of knee joint

Knee special tests – interpretation

Test	Method	Positive in
Lachman	Knee 20–30° flexion, anterior pull on tibia	ACL tear (most sensitive)
Anterior drawer	Knee 90° flexion, foot stabilised, pull tibia forward	ACL tear
Posterior drawer / sag	Knee 90° flexion, push tibia back; tibia sags	PCL tear
Valgus stress at 30°	Abduction force	MCL injury
Varus stress at 30°	Adduction force	LCL injury
McMurray	Flexion–rotation–extension with click and pain	Meniscal tear
Apley's grind	Prone, knee 90°, compress and rotate	Meniscal tear
Patellar apprehension	Lateral push on patella causes apprehension	Recurrent patellar dislocation

Unhappy triad (O'Donoghue)

- ACL + MCL + medial meniscus injury – valgus and rotational injury to a flexed knee

Tuberculosis of knee – stages

- Synovitis (boggy swelling, mild flexion), early arthritis (more swelling, wasting), advanced arthritis (triple subluxation – flexion, posterior subluxation, lateral rotation of tibia)

Differential diagnosis

- Acute pyogenic arthritis
- Tuberculosis of the knee
- Osteoarthritis of the knee
- Recurrent dislocations of the patella
- Chondromalacia patellae
- Osteochondritis dissecans
- Pellegrini–Stieda disease – pain in the medial aspect of the knee joint due to calcification near the medial collateral ligament due to its incomplete rupture

Cysts around the knee joint

1. **Anteriorly** – prepatellar bursitis (housemaid's knee)
   - Infrapatellar bursitis (clergyman's knee)
2. **Medially** – pes anserinus bursitis
   - Cyst of the medial meniscus
3. **Laterally** – cyst of the lateral meniscus
4. **Posteriorly** – semimembranosus bursitis
   - Morrant Baker's cyst – pressure (pulsion) diverticulum of the synovial membrane of the knee joint, often bilateral

Swellings in the popliteal fossa

1. Popliteal aneurysm – expansile, pulsatile swelling
2. Swelling arising from the skin, subcutaneous tissue, popliteal lymph nodes and nerves
3. Popliteal abscess – redness and brawny induration on the posterior aspect of the fossa

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CHAPTER 29

Examination of Ankle and Foot

Gait, deformities of the foot, ankle movements, ligament tests and the diabetic foot

Bio data

Name: .....

Age: .....

Sex: .....

Occupation: .....

History

- Pain (heel pain on first steps – plantar fasciitis), swelling, deformity, twisting injury, instability, numbness, ulcers, footwear problems, limp

Inspection – standing, walking and lying

- Gait – antalgic, high-stepping (foot drop)
- Alignment from behind – heel valgus / varus
- Arches – medial longitudinal arch (flat foot / pes planus, high arch / pes cavus)
- **Deformities** – CTEV (equinus, varus, adduction, cavus), hallux valgus, hammer toe, claw toes, mallet toe
- Swelling, bruising, callosities, corns, ulcers, nails, footwear wear pattern

Palpation

- Temperature, tenderness – malleoli (Ottawa ankle rules), base of 5th metatarsal, navicular, Achilles tendon, plantar fascia origin, sinus tarsi, metatarsal heads
- Pulses – dorsalis pedis, posterior tibial
- Achilles tendon – gap (rupture)

Movements

Joint	Movement	Normal range
Ankle	Dorsiflexion / plantar flexion	20° / 50°
Subtalar	Inversion / eversion	20° / 10°
Midtarsal	Forefoot adduction / abduction	–
First MTP	Dorsiflexion	70°

Special tests

- Anterior drawer test – anterior talofibular ligament
- Talar tilt test – calcaneofibular ligament
- Squeeze test – syndesmosis injury
- Thompson's (Simmonds') test – Achilles tendon rupture
- Jack's toe-raise test – flexible flat foot (arch reforms)
- Coleman block test – cavovarus foot
- Silfverskiöld test – gastrocnemius vs Achilles tightness

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Diabetic foot examination

- Skin, nails, deformity, callus, ulcer (site, size, depth, probe to bone)
- Neuropathy – 10 g monofilament, vibration (128 Hz), ankle reflex
- Vascular – pulses, ABI
- Classification – Wagner grade 0–5

Wagner grade	Description
0	At-risk foot, no ulcer
1	Superficial ulcer
2	Deep ulcer to tendon / capsule
3	Deep ulcer with abscess / osteomyelitis
4	Localised gangrene (forefoot)
5	Gangrene of whole foot

CTEV – components and Pirani score

- Components (CAVE) – Cavus, forefoot Adduction, hindfoot Varus, Equinus
- Pirani score (0–6): hindfoot (posterior crease, emptiness of heel, rigid equinus) + midfoot (curvature of lateral border, medial crease, lateral head of talus coverage), each 0, 0.5 or 1
- Treatment – Ponseti method (serial casting, percutaneous tenotomy, foot abduction brace)

Flat foot – flexible vs rigid

Feature	Flexible	Rigid
Arch on tiptoe / Jack's test	Reforms	Does not reform
Subtalar movement	Normal	Restricted
Causes	Physiological, ligamentous laxity	Tarsal coalition, inflammatory, neuromuscular

Heel pain – causes

- Plantar fasciitis (pain on first steps in morning, tender medial calcaneal tubercle), calcaneal spur, Achilles tendinitis / enthesitis (spondyloarthritis), retrocalcaneal bursitis, calcaneal stress fracture, Sever's disease in children

Diagnosis

- Example: Idiopathic congenital talipes equinovarus, left side, Pirani score 4

Investigations

- X-ray foot / ankle (standing views), ultrasound, MRI, nerve conduction study, arterial Doppler

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CHAPTER 30

Peripheral Nerve Injuries

Examination of radial, median, ulnar, common peroneal and brachial plexus lesions with motor, sensory and special tests

History

- Mode of injury (fracture, laceration, injection, compression), time since injury
- Weakness, deformity, numbness, burning pain, trophic ulcers, sweating
- Leprosy, diabetes, alcohol, toxins

General principles of examination

- Inspection – attitude / deformity, wasting, trophic changes (dry skin, shiny skin, ulcers, nail changes)
- Motor power (MRC 0–5) of muscles supplied below the level of injury – note the highest muscle affected to localise the level
- Sensory – autonomous zone of the nerve
- Sweating (ninhydrin test), Tinel's sign (advancing – regeneration)
- Nerve thickening (leprosy) – ulnar at elbow, common peroneal at fibular neck, greater auricular

Radial nerve

- Deformity – wrist drop, finger drop, thumb drop
- High lesion (axilla) – triceps also weak; mid-arm (spiral groove – fracture shaft humerus) – triceps spared, brachioradialis weak; posterior interosseous nerve – no sensory loss, no wrist drop (ECRL spared) but finger drop
- Tests – wrist and finger extension, brachioradialis, extensor pollicis longus
- Sensory loss – first dorsal web space

Median nerve

- Deformity – ape-thumb (thenar wasting), pointing index (high lesion – benediction attitude on attempting a fist)
- Tests – pen test (abductor pollicis brevis), opposition, Ochsner's clasping test (FDS / FDP index – high lesion), anterior interosseous nerve – "OK" sign
- Sensory loss – lateral 3½ digits on palmar side
- Carpal tunnel syndrome – Tinel's, Phalen's tests

Ulnar nerve

- Deformity – ulnar claw hand (ring and little fingers); ulnar paradox – claw less marked in high lesions
- Tests – card test (palmar interossei), Egawa's test (dorsal interossei), Froment's sign (adductor pollicis), book test
- Sensory loss – medial 1½ fingers
- Wasting – hypothenar, first dorsal interosseous, guttering between metacarpals

Combined median and ulnar nerve palsy

- Complete claw hand, simian hand

Brachial plexus

- Erb's palsy (C5, C6) – waiter's tip position (arm adducted, internally rotated, elbow extended, forearm pronated)
- Klumpke's palsy (C8, T1) – claw hand, Horner's syndrome

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Common peroneal nerve

- Deformity – foot drop, high-stepping gait
- Tests – ankle dorsiflexion, toe extension, eversion
- Sensory loss – dorsum of foot and lateral leg
- Causes – fracture neck of fibula, tight plaster, leprosy, prolonged squatting

Sciatic and tibial nerves

- Sciatic – weakness of hamstrings and all muscles below knee; injection injury
- Tibial – loss of plantar flexion, sensory loss of sole

Seddon's classification

Type	Pathology	Prognosis
Neuropraxia	Conduction block, axon intact	Full recovery in weeks
Axonotmesis	Axon divided, sheath intact	Recovery by regeneration (~1 mm per day)
Neurotmesis	Whole nerve divided	No recovery without repair

Motor and sensory summary of upper-limb nerves

Nerve (root)	Key muscles to test	Autonomous sensory zone	Deformity
Axillary (C5, C6)	Deltoid	Regimental badge area	Flattened shoulder
Musculocutaneous (C5–C7)	Biceps, brachialis	Lateral forearm	–
Radial (C5–T1)	Triceps, brachioradialis, wrist and finger extensors	First dorsal web space	Wrist drop
Median (C6–T1)	Abductor pollicis brevis, FDS, FPL	Palmar tip of index finger	Ape-thumb, pointing index
Ulnar (C8, T1)	Interossei, adductor pollicis, hypothenar	Tip of little finger	Ulnar claw hand

Long thoracic nerve

- Serratus anterior paralysis – winging of scapula on pushing against a wall (after mastectomy, axillary dissection)

Sunderland classification (degree of nerve injury)

- I – neuropraxia; II – axonotmesis; III – endoneurium disrupted; IV – perineurium disrupted (only epineurium intact); V – complete transection (neurotmesis)

Diagnosis

- Example: Right radial nerve palsy at the level of spiral groove following fracture shaft of humerus – probably neuropraxia

Investigations

- X-ray of fracture, nerve conduction study and EMG (after 3 weeks), ultrasound / MRI neurography

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PART V

Obstetrics and Gynaecology

Antenatal and gynaecological case sheets

31 Obstetric Case Sheet – Antenatal Case

32 Gynaecology Case Sheet

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CHAPTER 31

Obstetric Case Sheet – Antenatal Case

Obstetric history, dating of pregnancy, general and obstetric examination, Leopold's manoeuvres and the obstetric diagnosis

Bio data

Name: .....

Age

- <18 years (teenage pregnancy) and >35 years (elderly gravida) are high risk

Husband's name, age and occupation: .....

Address: .....

Religion: .....

Socio-economic status: .....

Booked / unbooked: .....

Date of admission: .....

Obstetric score

- G (gravida) P (para) L (living) A (abortion); e.g. G3 P1 L1 A1

Dates

Last menstrual period (LMP): .....

Expected date of delivery (EDD)

- Naegele's rule – LMP + 9 months + 7 days (for regular 28-day cycles)

Period of gestation

- By dates and by dating scan (first-trimester crown–rump length)

Chief complaints

- Amenorrhoea of … months, with or without complaints (pain abdomen, bleeding PV, leaking PV, reduced fetal movements, headache, blurring of vision, swelling of feet, breathlessness, fever)

History of present pregnancy

First trimester

- How pregnancy was confirmed (UPT, scan), conception spontaneous / assisted
- Nausea, vomiting (hyperemesis), bleeding PV, pain abdomen, fever, rash, drug intake, radiation exposure
- Folic acid started; booking investigations; dating scan; NT / double marker

Second trimester

- Quickening (18–20 weeks in primigravida, 16–18 weeks in multigravida)
- Iron and calcium supplements, Td immunisation (2 doses / booster)
- Anomaly scan (18–20 weeks), OGTT (24–28 weeks)
- BP, weight gain, swelling of feet, bleeding PV

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Third trimester

- Fetal movements, BP, headache, epigastric pain, blurring of vision (pre-eclampsia), oedema
- Bleeding PV (APH – painless: placenta praevia; painful: abruption), leaking PV
- Breathlessness, palpitation, polyuria, itching (cholestasis), fever, burning micturition
- Growth scan, Doppler, Hb, repeat investigations

Menstrual history

- Age at menarche, cycles (regular / irregular), duration, flow, dysmenorrhoea

Marital history

- Duration of marriage, consanguinity, contraception used

Past obstetric history

- For each pregnancy: year, outcome (abortion / ectopic / MTP / preterm / term), mode of delivery (vaginal / instrumental / caesarean – indication), place, sex and birth weight of baby, alive / dead, complications (APH, PPH, pre-eclampsia, GDM, retained placenta, puerperal sepsis), breastfeeding
- Inter-pregnancy interval

Past history

- Hypertension, diabetes, heart disease, thyroid disease, TB, epilepsy, asthma, anaemia, jaundice, blood transfusion, surgery (myomectomy, previous caesarean)

Personal and family history

- Diet, sleep, bowel and bladder habits, smoking, alcohol
- Family history of hypertension, diabetes, twins, congenital anomalies

General physical examination

- Height (<145 cm – risk of contracted pelvis), weight, BMI, gait
- PICCLE, thyroid, breasts and nipples (flat / retracted)
- Vitals – pulse, BP (≥140/90 mmHg – hypertension), respiratory rate, temperature
- Oedema – pedal, sacral, facial; pallor (anaemia)

Systemic examination

- CVS (flow murmurs, valvular disease), RS

Obstetric examination – per abdomen

- Empty bladder, supine with knees flexed, left lateral tilt to avoid supine hypotension

Inspection

- Shape of uterus – longitudinal / transverse / globular; abdominal enlargement
- Striae gravidarum, linea nigra, scars (previous caesarean – Pfannenstiel / vertical), umbilicus, fetal movements

Palpation

- Fundal height – by palpation (in weeks, with reference to umbilicus and xiphisternum) and symphysio-fundal height in cm (≈ weeks of gestation ±2 cm after 24 weeks)
- Abdominal girth at the level of umbilicus
- **Leopold's manoeuvres**
  - Fundal grip – what lies at the fundus (breech – broad, soft, irregular; head – hard, round, ballotable)

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- Lateral (umbilical) grip – position of fetal back and limbs
- First pelvic (Pawlik's) grip – presenting part and its mobility
- Second pelvic grip – engagement, attitude, fifths of head palpable above brim

- Lie, presentation, position, engagement
- Liquor – adequate / increased / reduced; uterine tenderness, contractions, irritability
- Estimated fetal weight

Auscultation

- Fetal heart rate – site, rate (110–160 bpm), rhythm; Pinard stethoscope / Doppler

Per vaginal examination (when indicated, with consent and asepsis; avoid in placenta praevia)

- Cervix – position, consistency, length / effacement, dilatation, station of presenting part, membranes, liquor colour
- Bishop score
- Pelvic assessment – sacral promontory, sacral curve, ischial spines, subpubic angle, intertuberous diameter (clinical pelvimetry)

Bishop score

Feature	0	1	2	3
Dilatation (cm)	0	1–2	3–4	≥5
Effacement (%)	0–30	40–50	60–70	≥80
Station	–3	–2	–1, 0	+1, +2
Consistency	Firm	Medium	Soft	–
Position	Posterior	Mid	Anterior	–

Fundal height and gestational age (by palpation)

Weeks	Fundal level
12	Just palpable above symphysis pubis
16	Midway between symphysis and umbilicus
20–22	At umbilicus
28	One-third between umbilicus and xiphisternum
32	Two-thirds between umbilicus and xiphisternum
36	At xiphisternum
40	Drops to 32-week level (lightening, engagement)

High-risk factors in pregnancy

- Age <18 or >35 years, height <145 cm, grand multiparity (≥5), short inter-pregnancy interval
- Previous caesarean, stillbirth, recurrent abortions, preterm birth, PPH, congenital anomaly
- Anaemia (Hb <11 g/dL), hypertension, diabetes, heart disease, thyroid disease, epilepsy, Rh-negative mother
- Malpresentation, multiple pregnancy, APH, polyhydramnios / oligohydramnios, fetal growth restriction

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Hypertensive disorders of pregnancy

Disorder	Definition
Chronic hypertension	BP ≥140/90 mmHg before pregnancy or before 20 weeks
Gestational hypertension	New BP ≥140/90 mmHg after 20 weeks without proteinuria
Pre-eclampsia	Gestational hypertension with proteinuria (≥300 mg/24 h) or end-organ dysfunction
Severe features	BP ≥160/110, platelets <100,000, raised transaminases, creatinine >1.1 mg/dL, pulmonary oedema, headache, visual disturbance
Eclampsia	Pre-eclampsia with convulsions
HELLP syndrome	Haemolysis, elevated liver enzymes, low platelets

Anaemia in pregnancy (WHO / ICMR)

- Mild 10–10.9 g/dL; moderate 7–9.9 g/dL; severe <7 g/dL; very severe <4 g/dL

Placenta praevia vs abruptio placentae

Feature	Placenta praevia	Abruptio placentae
Bleeding	Painless, recurrent, causeless	Painful, may be concealed
Uterus	Soft, relaxed, non-tender	Tense, tender, woody hard
Fetal parts	Easily felt, malpresentation common	Difficult to feel
Fetal heart	Usually present	Often absent / distress
Shock	Proportionate to visible blood loss	Out of proportion to visible blood loss
Pre-eclampsia	No association	Associated

Obstetric diagnosis – write in this order

- Name, age, obstetric score, gestational age (weeks + days), single / twin, live intrauterine pregnancy, presentation, with / without complications (e.g. anaemia, hypertensive disorder, GDM, previous caesarean), in labour / not in labour
- Example: 26-year-old G2 P1 L1 at 36 weeks 2 days, single live intrauterine fetus in cephalic presentation, with previous LSCS, with gestational hypertension, not in labour

Investigations

- Hb, blood group and Rh (ICT if Rh negative), CBC, urine routine and culture, blood sugar / OGTT (75 g), TSH
- HIV, HBsAg, VDRL / syphilis, HCV where indicated
- Ultrasound – dating, NT, anomaly scan, growth scan, liquor, placental localisation, Doppler
- Pre-eclampsia work-up – urine protein, LFT, renal function, platelets, LDH

Danger signs in pregnancy

- Bleeding PV, convulsions, severe headache with blurred vision, high fever, severe abdominal pain, fast or difficult breathing, reduced or absent fetal movements, leaking PV

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CHAPTER 32

Gynaecology Case Sheet

Gynaecological complaints, menstrual and obstetric history, abdominal, speculum, bimanual and rectal examination

Bio data

Name: .....

Age: .....

Marital status: .....

Occupation: .....

Address: .....

Socio-economic status: .....

Chief complaints

- With duration – e.g. heavy menstrual bleeding, irregular bleeding, postmenopausal bleeding, white discharge, mass per abdomen, something coming out per vagina, pain abdomen, infertility, urinary incontinence

History of presenting illness

Abnormal uterine bleeding

- Pattern (PALM-COEIN), duration, amount (pads per day, clots, flooding), intermenstrual / post-coital bleeding
- Symptoms of anaemia

Postmenopausal bleeding

- Always to be investigated for endometrial malignancy

Vaginal discharge

- Colour, odour, quantity, itching, relation to menstruation; blood-stained (malignancy)

Mass per abdomen

- Duration, growth, pain, pressure symptoms (frequency, retention, constipation)

Something coming out per vagina (prolapse)

- Duration, reducible / irreducible, aggravated by straining, urinary symptoms (incomplete emptying, stress incontinence), bowel symptoms, ulceration

Pain abdomen / dysmenorrhoea / dyspareunia

- Primary or secondary dysmenorrhoea; chronic pelvic pain (endometriosis, PID)

Infertility

- Duration of marriage, frequency of coitus, previous investigations, husband's semen analysis

Urinary and bowel symptoms: .....

Constitutional symptoms

- Weight loss, loss of appetite

Menstrual history

- Age at menarche, cycle length, duration of flow, amount, regularity, LMP, dysmenorrhoea

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- Menopause – age, postmenopausal bleeding
- Write as: Menarche – 13 years; cycles 4–5/28–30 days, regular, moderate flow, painless; LMP …

Marital and sexual history

- Duration of marriage, coital problems, dyspareunia, post-coital bleeding

Obstetric history

- Obstetric score; details of each pregnancy and delivery (difficult labour, instrumental delivery – prolapse risk); last childbirth

Contraceptive history

- Method, duration, problems (IUCD, OCP, sterilisation)

Past history

- TB, diabetes, hypertension, thyroid disease, STI / PID, previous surgery, previous Pap smear / HPV test, hormone therapy

Personal and family history

- Smoking, alcohol
- Family history of breast, ovarian, endometrial or colon cancer

General physical examination

- Height, weight, BMI, PICCLE, thyroid, breasts, lymph nodes (inguinal, supraclavicular), vitals
- Hirsutism, acanthosis nigricans, acne (PCOS), secondary sexual characters

Systemic examination

- CVS, RS (pleural effusion – Meigs' syndrome)

Abdominal examination

- Inspection – distension, mass, scars, striae, hernia
- Palpation – mass: site, size (in weeks of gravid uterus), shape, surface, margins, consistency, mobility, tenderness; can you get below it? (pelvic origin if not); liver, ascites
- Percussion – dull mass, shifting dullness (ascites in ovarian malignancy)

Pelvic examination – with consent, privacy and a female chaperone, bladder empty, dorsal / lithotomy position

Inspection of external genitalia

- Vulva, hair distribution, Bartholin's glands, discharge, ulcers, warts, urethral meatus
- Ask patient to strain – prolapse (cystocele, rectocele, uterine descent), stress incontinence (cough)

Per speculum examination (Cusco's / Sims' speculum)

- Cervix – size, erosion / ectropion, growth, ulcer, bleeding on touch, polyp, discharge
- Vaginal walls; take Pap smear / VIA / VILI before bimanual examination

Bimanual (per vaginal) examination

- Cervix – position, consistency, mobility, movement tenderness (PID, ectopic)
- Uterus – size, position (anteverted / retroverted), shape, consistency, mobility, tenderness
- Fornices – adnexal mass, tenderness, nodularity (endometriosis)

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- Mass – is it uterine or adnexal? (movement of cervix transmitted to mass – uterine)

Per rectal / recto-vaginal examination

- Virgin patients; pouch of Douglas nodules; parametrial involvement (staging carcinoma cervix)

Prolapse grading – POP-Q or Shaw's degrees

- First degree – cervix descends but remains within vagina; second degree – cervix at / outside introitus; third degree (procidentia) – whole uterus outside

PALM-COEIN classification of abnormal uterine bleeding (FIGO)

Structural (PALM)	Non-structural (COEIN)
Polyp	Coagulopathy
Adenomyosis	Ovulatory dysfunction
Leiomyoma (fibroid)	Endometrial
Malignancy and hyperplasia	Iatrogenic
–	Not yet classified

FIGO 2018 staging of carcinoma cervix (summary)

Stage	Extent
I	Confined to cervix (IA microscopic; IB clinically visible / >5 mm depth)
II	Beyond uterus but not to pelvic wall or lower third of vagina (IIA vagina, IIB parametrium)
III	Lower third of vagina, pelvic wall, hydronephrosis, or pelvic / para-aortic nodes
IV	Bladder or rectal mucosa (IVA) or distant metastasis (IVB)

Fibroid vs ovarian mass (clinical)

Feature	Uterine fibroid	Ovarian mass
Movement of cervix	Transmitted to mass	Not transmitted
Groove between mass and uterus	Absent	Present (felt in fornix)
Menstrual symptoms	Heavy menstrual bleeding common	Usually normal
Consistency	Firm, irregular	Cystic or solid

Rotterdam criteria for PCOS (any 2 of 3)

- Oligo- or anovulation, clinical or biochemical hyperandrogenism, polycystic ovaries on ultrasound (after excluding other causes)

Diagnosis

- Example: 45-year-old P3 L3 with abnormal uterine bleeding due to fibroid uterus of 16 weeks size, with moderate anaemia

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Investigations

- CBC, blood group, blood sugar, renal and liver function, urine routine, TSH
- Ultrasound pelvis (transabdominal / transvaginal), Pap smear / HPV test, colposcopy, endometrial biopsy, D&C, hysteroscopy
- Tumour markers – CA-125 (ovarian mass), β-hCG, AFP, LDH (germ-cell tumours); CT / MRI for staging

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PART VI

ENT

Ear, nose, throat and neck

33 ENT Examination

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CHAPTER 33

ENT Examination

Ear, nose, throat and neck — symptoms, otoscopy, tuning-fork tests and rhinoscopy

Bio data

Name: .....

Age

Otitis media is common in children

Otitis externa and other external ear problems are common in adults

Sex: .....

Presenting complaints

1. Ear: .....

Pain

- Otitis externa
- Cellulitis or furuncle of the ear canal
- Acute otitis media
- Acute mastoiditis
- Cholesteatoma
- Traumatic tympanic membrane rupture

Reduced hearing

- Weber's lateralised to the deaf ear in conductive deafness and the good ear in sensorineural hearing loss
- Rinne's is negative (BC > AC) in conductive deafness, while it is positive (AC > BC) in normal ears and in sensorineural hearing loss

Discharge: .....

Tinnitus and vertigo

- Benign positional vertigo
- Ménière's disease
- Acute labyrinthitis
- Acoustic neuroma
- Cholesteatoma
- Stroke or TIA
- Trauma
- Wax or foreign body in the ear

Itching: .....

Swelling around the ear: .....

Deformity of the pinna: .....

2. Nose

- Facial pain – sinusitis
- Nasal obstruction
- Anosmia
- Bad odour experienced by others (atrophic rhinitis)
- Discharge

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- Bleeding
- Itching
- Foreign body
- Swellings – polyps
- Snoring

3. Throat

- Pain (odynophagia)
- Dysphagia
- Trismus
- Voice change – hoarseness
- Cough
- Stridor
- Foreign body

History of presenting illness

Past illness: .....

Personal history: .....

Family history: .....

Socio-economic status: .....

General examination

ENT examination: .....

Examination of ear: .....

Pinna

- Preaural – tragal tenderness (external otitis)
- Postaural – mastoid tenderness (mastoiditis)
- External auditory canal – discharge / nature
  - Profuse and mucoid – tubotympanic type
  - Scanty and purulent – atticoantral type
  - Serous – serous otitis media
  - Whitish discharge – Candida
  - Blackish discharge – aspergillosis
  - Clear fluid – CSF otorrhoea
  - Blood-stained – trauma
- Tympanic membrane – draw diagram, mark landmarks and mark any pathologies if present
- If perforation of tympanic membrane
  - Site
  - Pars tensa – tubotympanic
  - Pars flaccida – atticoantral
  - Size

Tympanic membrane – other findings

- Retraction of TM – glue ear (serous otitis media)
- Rest of the TM
  - Congested TM – otitis media
  - Bluish or deep red TM – blood in middle ear due to trauma
  - White plaques – tympanosclerosis
  - Yellow – serous fluid in middle ear

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Condition of middle ear mucosa

- Congested – otitis media
- Polypoidal – CSOM
- Whitish growth – cholesteatoma

Valsalva manoeuvre – done to check the patency of Eustachian tube

Siegelisation – to check for mobility of ear drum

Fistula test – done to stimulate eroded semicircular canals leading to nystagmus

Describe the other ear till fistula test

T.F. tests – Rinne, Weber, absolute bone conduction test

Nystagmus

Cranial nerves examination

Cerebellar signs:

Examination of nose and sinuses

- External nose
- Nasal vestibule – boils, furuncle, abscess
- Reddish-pink polyps, bleed on touch – rhinosporidiosis
- Cold spatula test – to assess the patency of nostrils
- Anterior rhinoscopy – draw diagram
  - Septum – deviated nasal septum
  - Lateral wall – look for polyps
  - Floor
  - Cavity

Postnasal examination

- Posterior rhinoscopy – adenoids, choanae, posterior ends of turbinates, Eustachian tube openings, fossa of Rosenmüller

Examination of paranasal sinuses

Paranasal sinus tenderness

Examination of throat

- Mouth
- Lips
- Cheeks
- Vestibule of mouth
- Teeth
- Gingiva
- Retromolar region
- Tongue – movements
- Floor of mouth
- Palate – hard and soft

Oropharynx – draw diagram

- Anterior pillar
- Posterior pillar
- Tonsil
- Posterior pharyngeal wall
- Palpation of tonsil
- I/L (indirect laryngoscopy) for larynx

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Examination of neck

Look for thyroid swellings and lymph nodes

Summary: .....

Diagnosis: .....

Interpretation of tuning fork tests (512 Hz)

Test	Normal	Conductive deafness	Sensorineural deafness
Rinne	Positive (AC > BC)	Negative (BC > AC)	Positive (both reduced)
Weber	Central	Lateralised to the deaf ear	Lateralised to the better ear
Absolute bone conduction	Same as examiner	Same as examiner	Reduced

CSOM – tubotympanic vs atticoantral

Feature	Tubotympanic (mucosal, safe)	Atticoantral (squamous, unsafe)
Discharge	Profuse, mucoid, odourless	Scanty, purulent, foul-smelling
Perforation	Central, pars tensa	Attic or posterosuperior marginal
Cholesteatoma	Absent	Present
Complications	Rare	Common – mastoiditis, facial palsy, labyrinthitis, meningitis, brain abscess

House–Brackmann grading of facial nerve function

- I normal; II mild; III moderate (complete eye closure with effort); IV moderately severe (incomplete eye closure); V severe; VI total paralysis

Common ENT cases in examinations

- CSOM (safe / unsafe), deviated nasal septum, nasal polyps (ethmoidal / antrochoanal), chronic tonsillitis, hoarseness of voice, carcinoma larynx, otosclerosis, epistaxis, foreign body

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PART VII

Ophthalmology

Ocular history and examination

34 Ophthalmology Case Sheet

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CHAPTER 34

Ophthalmology Case Sheet

Ocular history, visual acuity, examination of adnexa, anterior segment, pupils, ocular movements, intra-ocular pressure and fundus

Bio data

Name: .....

Age: .....

Sex: .....

Occupation

- Welders (UV keratitis), agricultural workers (fungal keratitis after vegetative trauma), near-work

Address: .....

Chief complaints

- Diminution of vision (sudden / gradual, painful / painless, distant / near), redness, pain, watering, discharge, itching, photophobia, glare, haloes, floaters, flashes, diplopia, deviation of eye, swelling of lids, protrusion of eye, foreign body sensation

History of presenting illness

- Onset, duration, progression, unilateral / bilateral
- **Gradual painless diminution** – cataract, refractive error, chronic glaucoma, diabetic / hypertensive retinopathy, macular degeneration
- **Sudden painless diminution** – retinal detachment, central retinal artery / vein occlusion, vitreous haemorrhage, ischaemic optic neuropathy
- **Painful red eye with diminution** – acute angle-closure glaucoma, keratitis, iridocyclitis, endophthalmitis
- Red eye without diminution – conjunctivitis, subconjunctival haemorrhage, episcleritis
- Haloes around lights – acute angle-closure glaucoma, corneal oedema
- Trauma – mode (blunt / penetrating / chemical), time, first aid

Past history

- Spectacles (since when, last change), previous eye surgery, laser, trauma, squint in childhood, amblyopia treatment
- Diabetes, hypertension, TB, syphilis, connective tissue disease, thyroid disease, atopy

Drug history

- Steroids (cataract, glaucoma), hydroxychloroquine, ethambutol, topical medications

Family history

- Glaucoma, squint, refractive error, retinitis pigmentosa, cataract

Personal history

- Smoking, alcohol, diet (vitamin A)

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General physical examination

- PICCLE, vitals (BP), blood sugar, facial asymmetry, head posture (squint), skin (rosacea, herpes zoster)

Visual acuity – each eye separately

- Distance – Snellen's chart at 6 metres (6/6 normal); <6/60 – counting fingers, hand movements, perception and projection of light
- With pinhole – improvement suggests refractive error
- Near – Jaeger chart (N6 at 33 cm)
- Colour vision – Ishihara plates; contrast sensitivity

Ocular examination – right eye and left eye side by side

Structure	What to look for
Head posture and face	Head tilt, facial asymmetry, ocular position
Eyebrows	Madarosis, position
Eyelids	Oedema, ptosis (MRD1), lid retraction, entropion, ectropion, trichiasis, chalazion, stye, lid lag
Eyelashes	Trichiasis, madarosis, crusting
Lacrimal apparatus	Swelling over sac, regurgitation on pressure over sac (ROPLAS), punctum position
Eyeball	Proptosis, enophthalmos, deviation, size
Conjunctiva	Congestion (conjunctival / ciliary), chemosis, discharge, follicles, papillae, pterygium, pinguecula
Sclera	Episcleritis, scleritis, thinning, pigmentation
Cornea	Size, shape, transparency, surface, opacity (nebula, macula, leucoma), ulcer (fluorescein staining), sensation, keratic precipitates
Anterior chamber	Depth (shallow – angle closure), contents (cells, flare, hypopyon, hyphaema)
Iris	Colour, pattern, synechiae, neovascularisation, iridodonesis
Pupil	Size, shape, colour, direct and consensual light reflexes, relative afferent pupillary defect (swinging flashlight test), near reflex
Lens	Transparency, position; cataract – type and grade, iris shadow (immature cataract)

Ocular movements and alignment

- Uniocular (ductions) and binocular (versions) in 9 gaze positions; diplopia charting
- Hirschberg corneal reflex test, cover–uncover test (manifest / latent squint)

Visual field

- Confrontation test; perimetry

Intra-ocular pressure

- Digital tonometry (rough), Schiøtz indentation tonometry, applanation tonometry (normal 10–21 mmHg)

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Slit-lamp examination

- Detailed anterior segment; gonioscopy (angle)

Fundus examination

- Distant direct ophthalmoscopy – red reflex (opacities in media)
- Direct / indirect ophthalmoscopy – optic disc (colour, margins, cup–disc ratio, oedema, atrophy), blood vessels (AV ratio, nicking, haemorrhages), macula (foveal reflex, exudates, oedema), periphery (detachment)

Regional examination

- Preauricular lymph nodes (viral conjunctivitis), sinus tenderness, orbital margins

Types of red eye – differentiation

Feature	Conjunctivitis	Acute iritis	Acute angle-closure glaucoma	Keratitis
Vision	Normal	Mildly reduced	Markedly reduced	Reduced
Pain	Gritty discomfort	Moderate, photophobia	Severe, with headache, vomiting	Moderate to severe
Congestion	Conjunctival (fornices)	Ciliary (circumcorneal)	Ciliary	Ciliary
Discharge	Present	Absent	Absent	Watery / purulent
Cornea	Clear	Keratic precipitates	Hazy (oedema)	Opacity, staining
Pupil	Normal	Small, irregular	Mid-dilated, vertically oval, fixed	Normal / small
IOP	Normal	Normal / low	Very high	Normal

Stages of senile cataract

- Incipient (lamellar separation, cuneiform opacities), immature (iris shadow present), mature (no iris shadow, white pupil), hypermature (morgagnian – liquefied cortex, nucleus sinks; or sclerotic – shrunken)

Hypertensive retinopathy – Keith–Wagener–Barker grading

- Grade 1 – arteriolar narrowing; grade 2 – AV nicking; grade 3 – haemorrhages and exudates; grade 4 – papilloedema

Diabetic retinopathy – summary

- Non-proliferative (microaneurysms, dot-blot haemorrhages, hard exudates, cotton-wool spots, venous beading, IRMA); proliferative (neovascularisation, vitreous haemorrhage, tractional detachment); diabetic macular oedema at any stage

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Squint – paralytic vs concomitant

Feature	Paralytic	Concomitant
Onset	Usually sudden, adults	Childhood
Diplopia	Present	Absent (suppression)
Ocular movements	Restricted in direction of action of paralysed muscle	Full
Secondary deviation	Greater than primary	Equal to primary
Head posture	Compensatory head tilt / turn	Normal

Diagnosis – for each eye

- Example: Right eye – immature senile cortical cataract; left eye – early nuclear sclerosis; both eyes – no fundus changes

Investigations

- Blood sugar, BP, urine routine; conjunctival / corneal scraping (Gram, KOH, culture)
- Keratometry and A-scan biometry (IOL power before cataract surgery), sac syringing
- B-scan ultrasound (opaque media), OCT, fundus fluorescein angiography, perimetry, CT / MRI orbit

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APPENDIX

Appendix

Reference values

A Adult Laboratory Values

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APPENDIX

Adult Laboratory Values

Reference ranges for blood, CSF, synovial fluid, urine and arterial blood gases

Reference ranges vary between laboratories and assay methods – always interpret results against your own laboratory's reference range.

Blood plasma, serum reference range

Test	Reference range
Alanine aminotransferase (ALT, GPT, SGPT)	7–56 U/L
Alkaline phosphatase	40–130 U/L
Amylase	25–125 U/L
Aspartate aminotransferase (AST, GOT, SGOT)	10–40 U/L
Bilirubin	Total: 0.1–1.0 mg/dL Direct: 0.0–0.3 mg/dL
Calcium	8.4–10.2 mg/dL
C-reactive protein	<5 mg/L
C-reactive protein, high sensitivity	Low risk: <1.0 mg/L Average risk: 1.0–3.0 mg/L High risk: >3.0 mg/L
Creatine kinase	Male: 25–90 U/L Female: 10–70 U/L
Creatinine	0.6–1.2 mg/dL
Ferritin	Male: 15–200 ng/mL Female: 12–150 ng/mL
Folic acid	3–20 ng/mL
Iron	50–170 µg/dL
Iron-binding capacity	250–370 µg/dL
Lactate dehydrogenase (LDH)	140–280 U/L
Lipase	0–160 U/L
Phosphate	3.0–4.5 mg/dL
Urea nitrogen (BUN)	7–18 mg/dL
Uric acid	3.0–8.2 mg/dL
Vitamin B12	200–900 pg/mL

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Hormones

Test	Reference range
Follicle-stimulating hormone	Male: 4–25 mIU/mL Female – premenopause: 4–30 mIU/mL Female – midcycle peak: 10–90 mIU/mL Female – postmenopause: 40–250 mIU/mL
Luteinising hormone	Female – follicular phase: 1–18 mU/mL Female – luteal phase: 0.4–20 mU/mL Female – midcycle: 24–105 mU/mL Female – postmenopausal: 15–62 mU/mL
Parathyroid hormone	11–54 pg/mL
Prolactin	<20 ng/mL
Testosterone	Male: 300–1200 ng/dL Female: 20–75 ng/dL

Thyroid function

Test	Reference range
Thyroid-stimulating hormone	0.5–5.0 µU/mL
Thyroxine (T4)	5–12 µg/dL
Triiodothyronine (T3)	115–190 ng/dL
Triiodothyronine (T3), resin uptake	25–35%

Cardiac markers

Test	Reference range
Brain natriuretic peptide (BNP)	<100 pg/mL (NT-proBNP <125 pg/mL, non-acute)
Troponin I (conventional assay)	0–0.4 µg/L
Troponin T (conventional assay)	0–0.1 µg/L
High-sensitivity troponin I / T	Abnormal if above the sex-specific 99th percentile of the assay (ng/L)

Electrolytes

Test	Reference range
Sodium	136–145 mEq/L
Chloride	95–105 mEq/L
Potassium	3.5–5.0 mEq/L
Bicarbonate	22–28 mEq/L
Magnesium	1.5–2.0 mEq/L

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Glucose

Test	Reference range
Fasting	70–99 mg/dL
2-h postprandial	<140 mg/dL
Haemoglobin A1c	<5.7% (5.7–6.4% prediabetes; ≥6.5% diabetes)

Lipids

Test	Reference range
Total cholesterol	Desirable: <200 mg/dL Borderline: 200–239 mg/dL High: ≥240 mg/dL
LDL cholesterol	Desirable: <130 mg/dL Borderline: 130–159 mg/dL High: ≥160 mg/dL
HDL cholesterol	Desirable: ≥60 mg/dL Low: <40 mg/dL (men), <50 mg/dL (women)
Triglycerides	Desirable: <150 mg/dL

Protein

Test	Reference range
Total	6.0–7.8 g/dL
Albumin	3.5–5.5 g/dL
Globulin	2.3–3.5 g/dL

Cerebrospinal fluid

Test	Reference range
Cell count	0–5 cells/mm^3
Chloride	118–132 mEq/L
Gamma globulin	3–12% total proteins
Glucose	40–70 mg/dL
Opening pressure	70–180 mmH_2O
Protein, total	<40 mg/dL

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Synovial fluid

Test	Reference range
Appearance	Clear, light yellow
Glucose	Nearly equal to serum
PMN	<25%
Red blood cells	0 /µL
White blood cells	<200 /µL
Viscosity	High

Haematologic

Test	Reference range
Red blood cell count	Male: 4.3–5.9 million/mm³ Female: 3.5–5.5 million/mm³
Erythrocyte sedimentation rate (Westergren)	Male: 0–15 mm/hr Female: 0–20 mm/hr
Haematocrit	Male: 41–53% Female: 36–46%
Haemoglobin	Male: 13.5–17.5 g/dL Female: 12.0–16.0 g/dL
Mean corpuscular haemoglobin	25.4–34.6 pg/cell
Mean corpuscular haemoglobin concentration	32–36 g/dL
Mean corpuscular volume	80–100 fL (µm³)
Platelet count	150,000–400,000/mm³
Reticulocyte count	0.5–1.5% of red cells

White blood cell count and differential

Test	Reference range
White blood cell count	4500–11,000/mm³
Segmented neutrophils	54–62% (2430–6820/mm³)
Bands	3–5% (135–550/mm³)
Eosinophils	1–3% (45–330/mm³)
Basophils	0–0.75% (0–83/mm³)
Lymphocytes	25–33% (1125–3630/mm³)
Monocytes	3–7% (135–770/mm³)

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Coagulation

Test	Reference range
Prothrombin time	11–15 sec
International normalised ratio (INR)	0.8–1.2
Partial thromboplastin time	25–40 sec
Thrombin time	14–19 sec

Urine

Test	Reference range
Creatinine clearance	Male: 97–137 mL/min Female: 88–128 mL/min
Sodium	60–260 mEq/24 hr
Specific gravity	1.002–1.028

Arterial blood gases (room air)

Test	Reference range
pH	7.35–7.45
pCO_2	35–45 mmHg
pO_2	75–105 mmHg

Unit conversions commonly needed

Test	Conventional unit	SI unit	Multiply by
Glucose	mg/dL	mmol/L	0.0555
Creatinine	mg/dL	µmol/L	88.4
Urea (BUN)	mg/dL	mmol/L	0.357
Bilirubin	mg/dL	µmol/L	17.1
Cholesterol	mg/dL	mmol/L	0.0259
Triglycerides	mg/dL	mmol/L	0.0113
Calcium	mg/dL	mmol/L	0.25

Useful derived values

- Anion gap = $Na^+ – (Cl^- + HCO_3^-)$; normal 8–12 mEq/L
- Corrected calcium = measured calcium + 0.8 × (4 – albumin in g/dL)
- Serum osmolality = 2 × Na^+ + glucose/18 + BUN/2.8; normal 285–295 mOsm/kg
- Corrected sodium in hyperglycaemia = measured Na^+ + 1.6 × (glucose – 100)/100
- eGFR – CKD-EPI equation; creatinine clearance (Cockcroft–Gault) = (140 – age) × weight (kg) ÷ (72 × creatinine) × 0.85 for women

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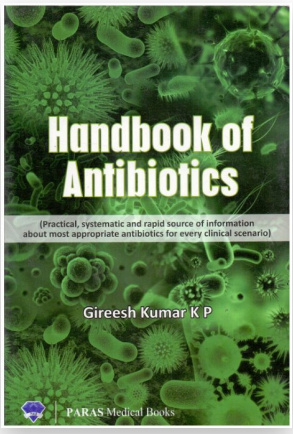
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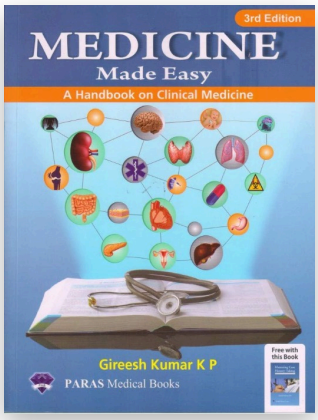
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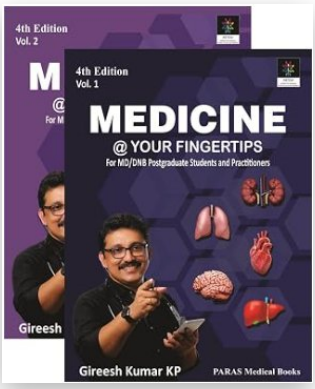
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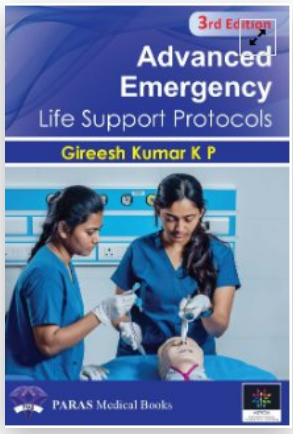
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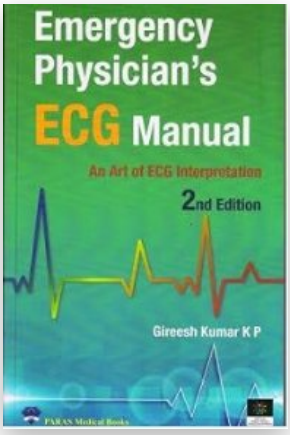
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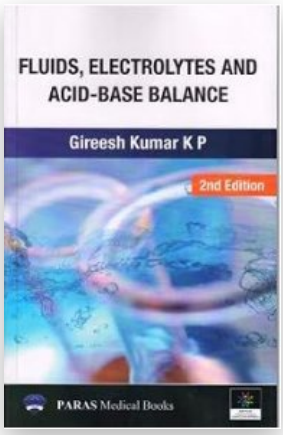
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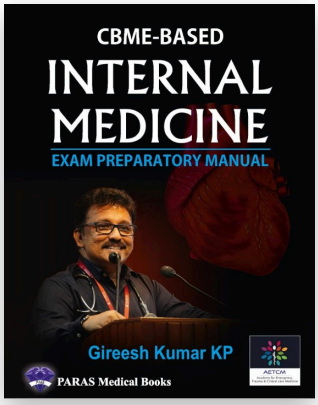
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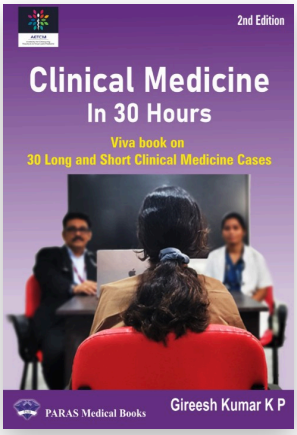
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