NEET PG 2021

Questions with Solutions

Detailed step-by-step solutions

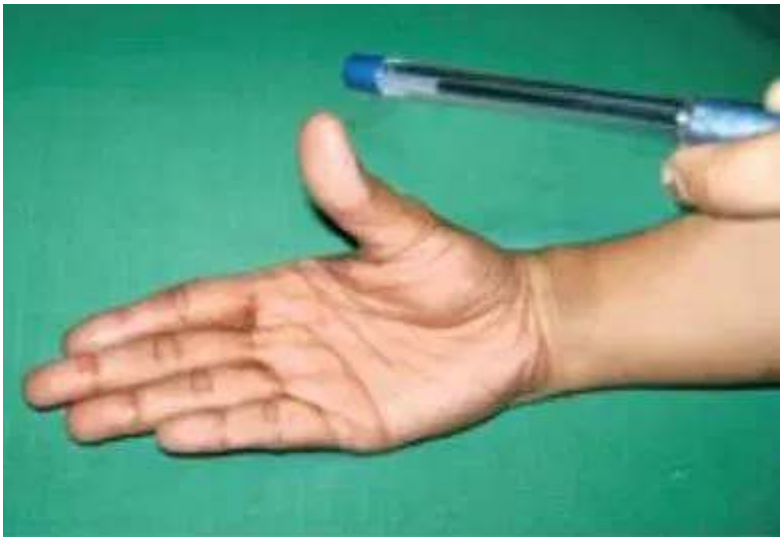
General Instructions

(i) This booklet contains 206 questions, each provided with a complete, step-by-step solution.

(ii) It comprises 206 single-correct multiple-choice questions.

(iii) Attempt each question on your own before reviewing the given solution.

1. Pen Test is for which nerve



(A) Median Nerve

(B) Ulnar nerve

(C) PIN

(D) Musculocutaneous

Correct Answer: (A) Median Nerve

SOLUTION:

The **Pen Test** is a clinical examination used to evaluate the **Median Nerve**.

Key reasoning:

The median nerve innervates muscles of the hand that are tested in the Pen Test -- specifically the thenar muscles (abductor pollicis brevis, opponens pollicis, flexor pollicis brevis) and the lateral two lumbricals.

How the test works: A small needle electrode is inserted into hand and arm muscles receiving impulses from the median nerve. Electric impulses are sent into the muscle, and the patient flexes the hand repeatedly. If the nerve is damaged or compressed, abnormal electrical activity is recorded.

Eliminating other options:
- Ulnar nerve: tested by Froment's sign, card test
- PIN (branch of radial nerve): tested by wrist/finger extension
- Musculocutaneous nerve: tested by elbow flexion and lateral forearm sensation

Quick Tip: Think about which nerve supplies the thenar muscles tested during the Pen Test.

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2. A small boy with multiple fracture of Humerus following which there is loss of sensation over lateral side of forearm, difficulty in flexion of elbow & supination of forearm.

(A) Musculocutaneous nerve

(B) Median nerve

(C) Axillary

(D) Radial nerve

Correct Answer: (A) Musculocutaneous nerve

SOLUTION:

The clinical triad in this case -- loss of lateral forearm sensation, weak elbow flexion, and weak supination -- points to injury of the **Musculocutaneous nerve** (roots C_5--C_7).

Anatomy of the Musculocutaneous nerve:
- Arises from the lateral cord of the brachial plexus
- Motor: coracobrachialis, biceps brachii, brachialis
- Sensory: continues as the lateral cutaneous nerve of forearm, supplying the lateral aspect of the forearm

Functional correlation:
- Biceps brachii = primary supinator + elbow flexor
- Brachialis = elbow flexor
- Lateral cutaneous nerve of forearm = lateral forearm sensation

Why not others?
- Median nerve injury: loss of thumb opposition, pronation, wrist flexion; no lateral forearm numbness
- Axillary nerve: deltoid weakness, lateral arm numbness
- Radial nerve: wrist drop, finger drop

Musculocutaneous nerve

Quick Tip: Consider which nerve supplies both the elbow flexors and the lateral cutaneous nerve of the forearm.

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3. Which blood vessel carries deoxygenated blood back to placenta

(A) Umbilical Artery

(B) Umbilical vein

(C) Uterine artery

(D) Descending aorta

Correct Answer: (A) Umbilical Artery

SOLUTION:

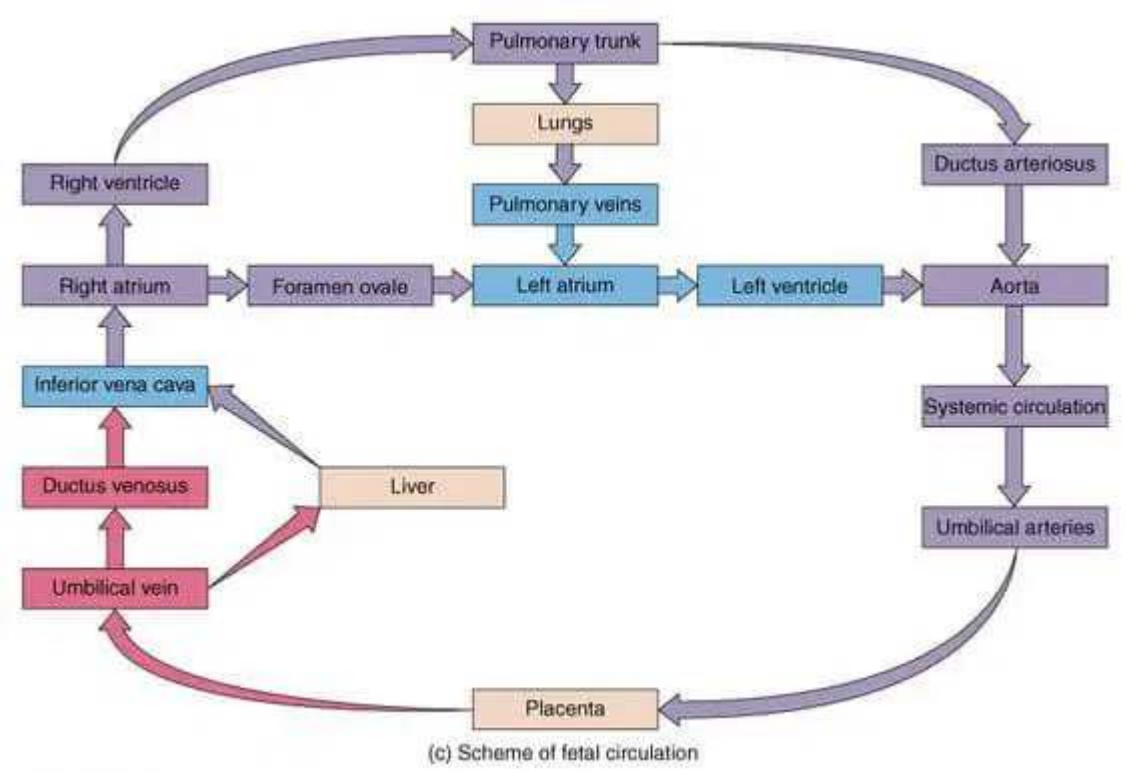
In fetal circulation, the direction of blood flow in the umbilical vessels is:

Umbilical Artery -- carries **deoxygenated** fetal blood from fetus → placenta
Umbilical Vein -- carries **oxygenated** blood from placenta → fetus

Memory trick: DAVE -- Deoxygenated blood is carried Away (in arteries) from the fetus to the placenta; oxygenated blood returns Via the umbilical vEin.

Key fact: The umbilical cord has 2 arteries and 1 vein. The two umbilical arteries are branches of the internal iliac arteries and carry waste-laden, deoxygenated blood toward the placenta for replenishment.

Why not other options?
- Umbilical vein: brings oxygenated blood back to fetus (opposite direction)
- Uterine artery: maternal vessel, not in umbilical cord
- Descending aorta: fetal systemic circulation, not a direct placental vessel



(c) Scheme of fetal circulation

Quick Tip: In fetal circulation, the naming of arteries and veins is opposite to postnatal convention regarding oxygenation.

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4. Structure preventing vertical descent of spleen

(A) Phrenocolic ligament

(B) Hepatogastric ligament

(C) Ligamentum teres

(D) Ligamentum flavum

Correct Answer: (A) Phrenocolic ligament

SOLUTION:

The structure that prevents the vertical descent of the spleen is the **Phrenocolic ligament** (also called sustentaculum lienis).

Anatomy of the Phrenocolic Ligament:

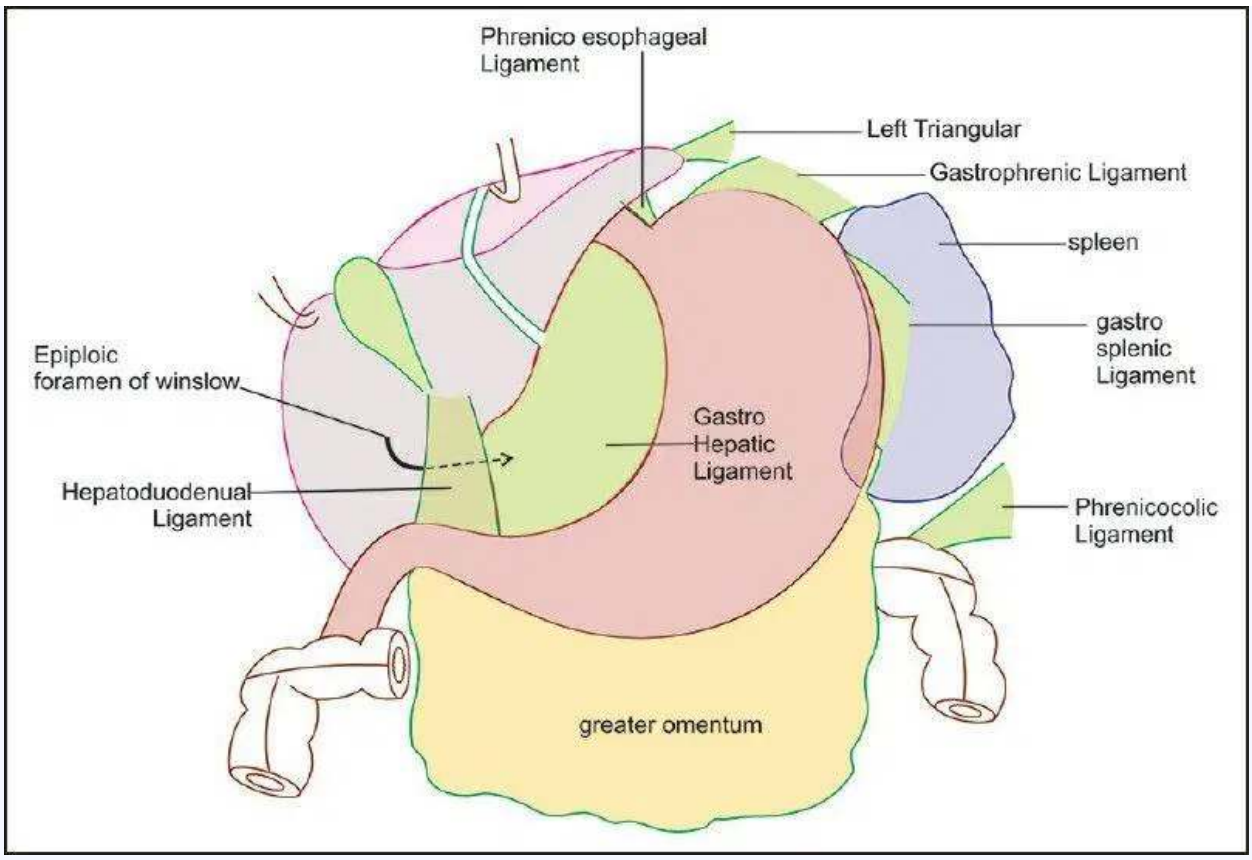
- Extends from the left colic (splenic) flexure to the thoracic diaphragm at the

level of the 10th and 11th ribs
- Lies inferior to the spleen, forming a shelf or hammock that supports it
- Acts as a mechanical barrier preventing the spleen from descending in the abdomen

Additional splenic ligaments (for reference):
Ligament	Connects	Role
Gastrosplenic	Stomach to spleen	Carries short gastric and left gastroepiploic vessels
Splenorenal	Spleen to left kidney	Carries splenic vessels and tail of pancreas
Phrenocolic	Splenic flexure to diaphragm	Prevents vertical descent of spleen

Distractors:
- Hepatogastric ligament: part of lesser omentum, unrelated to spleen
- Ligamentum teres: remnant of umbilical vein in liver
- Ligamentum flavum: spinal ligament between vertebral laminae

Phrenocolic ligament



Quick Tip: Think about which peritoneal fold forms a hammock-like support below the spleen at the splenic flexure.

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5. Which nerve is required for GAG reflex

(A) 9th cranial nerve

(B) 10th cranial nerve

(C) 11th cranial nerve

(D) 12th cranial nerve

Correct Answer: (A) 9th cranial nerve

SOLUTION:

The **Gag Reflex** (pharyngeal reflex) requires the 9^{th} cranial nerve (Glossopharyngeal nerve) as its afferent limb.

Reflex arc of the Gag Reflex:
- Stimulus: touching the posterior pharynx, soft palate, or tonsillar pillars
- Afferent: ***CN IX*** (Glossopharyngeal) -- sensory from posterior pharynx to nucleus tractus solitarius and nucleus ambiguus
- Efferent: ***CN X*** (Vagus) -- motor to pharyngeal constrictors, causing contraction

Clinical significance:
- An absent gag reflex may indicate a lesion of CN IX or CN X
- The gag reflex is used to assess brainstem integrity (especially in comatose patients)

Other cranial nerves -- roles:
- ***CN X*** (Vagus): efferent limb of gag reflex
- ***CN XI*** (Accessory): trapezius, sternocleidomastoid
- ***CN XII*** (Hypoglossal): tongue movements

9th cranial nerve (Glossopharyngeal)

Quick Tip: Identify the afferent nerve of the pharyngeal (gag) reflex arc.

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6. The Great saphenous vein graft was used for a patient in CABG. Post surgery the patient is having a neuralgia on the medial aspect of leg and foot. Which nerve has been injured?

(A) Saphenous Nerve

(B) Femoral vein

(C) Profunda femoris vein

(D) Popliteal vein

Correct Answer: (A) Saphenous Nerve

SOLUTION:

In CABG surgery, the Great Saphenous Vein (GSV) is harvested from the medial aspect of the leg. The nerve injured in this procedure causing medial leg and foot neuralgia is the **Saphenous Nerve**.

Anatomy of the Saphenous Nerve:
- Largest cutaneous branch of the femoral nerve
- Accompanies the great saphenous vein throughout its course along the medial leg
- Provides sensory supply to the medial aspect of the leg, ankle, and foot

Clinical correlation:
Saphenous neuralgia after GSV harvest for CABG is a well-known complication. Symptoms include:
- Anaesthesia (numbness) in the medial leg/foot territory
- Hyperaesthesia and pain (neuralgia) in early post-operative period
- Pain typically disappears within 5 days to 8 weeks
- Anaesthesia may persist up to 2 months post-operatively

Why not the other options?
Options B (Femoral vein), C (Profunda femoris vein), and D (Popliteal vein) are all veins -- injury to veins does not produce neuralgia (nerve pain). The question specifically asks about a nerve injury causing neuralgia.

Saphenous Nerve

Quick Tip: Think about which sensory nerve runs alongside the great saphenous vein along the medial leg.

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7. Beta 2 receptors act via following secondary messenger

(A) Adenylate Cyclase

(B) Tyrosine kinase receptors

(C) TGF-beta receptors

(D) Cytokine receptors

Correct Answer: (A) Adenylate Cyclase

SOLUTION:

Beta-2 adrenergic receptors are G_s-coupled GPCRs. Their secondary messenger works through **Adenylate Cyclase**.

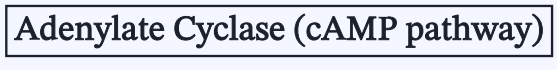
Signal transduction pathway:

Beta-2 agonist → Beta-2 receptor → G_s-protein activation → Adenylate Cyclase activation → ATP → cAMP → PKA activation → Cellular response

Physiological effects mediated via cAMP (Beta-2):
- Bronchodilation (relaxation of bronchial smooth muscle)
- Uterine relaxation (tocolysis)
- Vasodilation in skeletal muscle
- Glycogenolysis in liver and muscle

Why not other options?
- Tyrosine kinase receptors: insulin, EGF, PDGF -- not adrenergic
- TGF-beta receptors: serine/threonine kinase, SMAD pathway
- Cytokine receptors: JAK-STAT signaling

Adrenergic receptor-G protein coupling summary:
- α_1: G_q (IP3/DAG pathway)
- α_2: G_i (inhibits adenylate cyclase)
- $\beta_1, \beta_2, \beta_3$: G_s (stimulates adenylate cyclase -- cAMP)



Quick Tip: Beta-2 receptors are Gs-coupled GPCRs -- consider which enzyme is activated by the Gs protein.

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8. A child presented with dehydration and was supplemented with ORS solution for management. Which of the following receptors help in the absorption of glucose from GIT?

(A) SGLT 1

(B) SGLT 2

(C) GLUT 1

(D) GLUT 2

Correct Answer: (A) SGLT 1

SOLUTION:

Key Concept: Glucose absorption from the intestinal lumen depends on SGLT (Sodium-Glucose Linked Transporter) proteins, not GLUT proteins.

SGLT 1 vs SGLT 2:
- **SGLT 1**: Located on the apical surface of small intestinal enterocytes; co-transports 2 Na^+ per 1 glucose molecule; the primary intestinal glucose and galactose transporter.
- **SGLT 2**: Located in proximal renal tubule; reabsorbs ~90% of filtered glucose from urine; target of gliflozin drugs.

ORS Mechanism:
ORS contains sodium and glucose in a specific ratio. Sodium enters the enterocyte via SGLT 1 along its electrochemical gradient, dragging glucose in simultaneously. Water follows osmotically, restoring hydration. GLUT 1 and GLUT 2 operate on the basolateral side or in other tissues -- they do not drive luminal uptake.

Answer:

SGLT 1

Quick Tip: Think about which sodium-glucose co-transporter sits on the luminal brush border of intestinal cells.

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9. A patient presented with cold skin, fatigue, shortness of breath with activity and enlarged liver. His JVP was measured which showed higher amplitude of "a" wave. JVP is due to

(A) Tricuspid Regurgitation

(B) Tricuspid Stenosis

(C) Mitral Regurgitation

(D) Mitral Stenosis

Correct Answer: (B) Tricuspid Stenosis

SOLUTION:

JVP Waveform Analysis:
The jugular venous pulse reflects right heart pressures. The three upward deflections are:
- a wave: right atrial contraction (presystolic)
- c wave: tricuspid valve closure
- v wave: venous filling during ventricular systole

Causes of prominent a wave:
Any condition that increases resistance to right atrial outflow (i.e., makes the right atrium work harder during systole) will increase the amplitude of the a wave. Tricuspid Stenosis narrows the valve orifice, so the right atrium contracts forcefully to push blood through, producing a large a wave.

Why not Tricuspid Regurgitation?
In tricuspid regurgitation, blood leaks back into the right atrium during

ventricular systole -- this raises the v wave (giant v wave / cv fusion), not the a wave.

Mitral valve lesions affect the left heart and do not alter JVP morphology directly.

Answer:

Tricuspid Stenosis

Quick Tip: The a wave of JVP reflects right atrial contraction -- think about which valve lesion increases resistance to atrial emptying.

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10. The body fluid compartments of a patient were measured, which showed the following values:

Na - 10
K - 140
Cl - 15

Name the fluid compartment.

(A) Interstitial fluid

(B) ECF

(C) ICF

(D) Total body fluid

Correct Answer: (C) ICF

SOLUTION:

Electrolyte Composition of Fluid Compartments:

The two principal fluid compartments have opposite electrolyte profiles:

Ion	ECF (mEq/L)	ICF (mEq/L)
Na^+	~140	~10
K^+	~4	~140
Cl^-	~103	~4

The given values -- $Na^+ = 10$, $K^+ = 140$, $Cl^- = 15$ -- match the ICF profile: low sodium, high potassium, low chloride.

Mechanism:
The Na^+/K^+ ATPase pump (3 Na^+ out, 2 K^+ in per cycle) actively maintains this electrochemical gradient across the cell membrane. This gradient is essential for resting membrane potential, nerve conduction, and muscle contraction.

Answer:

ICF (Intracellular Fluid)

Quick Tip: Recall which compartment has high potassium and low sodium as its dominant electrolytes.

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11. An elderly female presented with dribbling of urine only on coughing and straining. What type of urinary incontinence is she suffering from?

(A) Stress incontinence

(B) Urge incontinence

(C) Overflow incontinence

(D) Neurogenic bladder

Correct Answer: (A) Stress incontinence

SOLUTION:

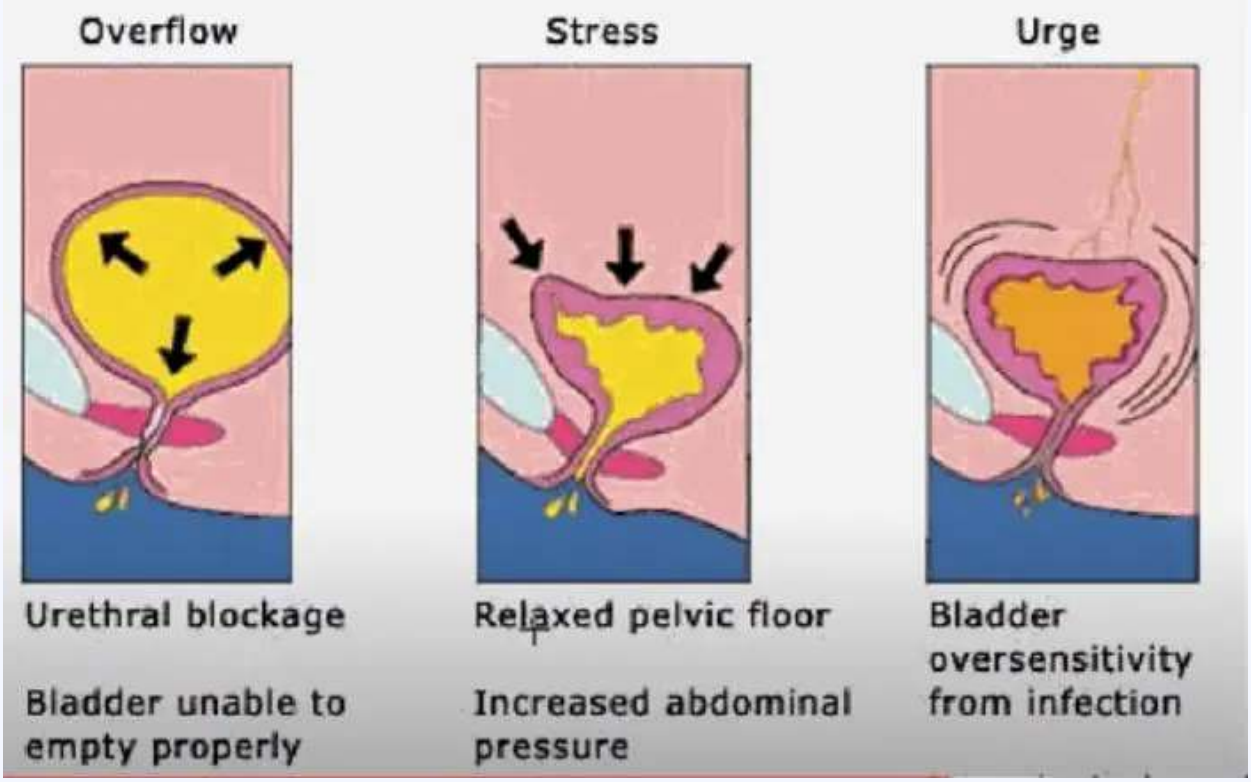
Types of Urinary Incontinence -- Quick Reference:

- **Stress Incontinence:** Urine leaks when intra-abdominal pressure suddenly increases (coughing, sneezing, straining). Pelvic floor laxity fails to resist the pressure surge. Common in elderly/multiparous women.
- **Urge Incontinence:** Strong, sudden urge followed by involuntary leakage. Due to detrusor overactivity.
- **Overflow Incontinence:** Continuous dribbling from an overfull bladder that cannot empty. Seen in BPH or atonic bladder.
- **Neurogenic Bladder:** Secondary to spinal cord or nerve damage.

This patient:
Leakage occurs only during coughing/straining -- classic triggers for ↑ intra-abdominal pressure. No urgency is described. This is the hallmark of **Stress Incontinence**, where relaxed pelvic floor muscles cannot maintain urethral closure against the pressure spike.

Answer:

Stress Incontinence



Quick Tip: Consider which type of incontinence is triggered by a sudden rise in intra-abdominal pressure rather than bladder urgency.

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12. A young patient presented with muscle spasms, numbness in hands and feet, seizures and difficulty in breathing due to laryngospasm. His blood picture showed electrolyte imbalance. What is the cause for these manifestations in the patient?

(A) Respiratory Acidosis

(B) Respiratory Alkalosis

(C) Metabolic Acidosis

(D) Metabolic Alkalosis

Correct Answer: (B) Respiratory Alkalosis

SOLUTION:

Pathophysiology of Hypocalcemic Tetany in Alkalosis:

Total serum calcium = ionized (free) Ca^{2+} + protein-bound Ca^{2+}

Albumin binds Ca^{2+} competitively with H^+ ions. In alkalosis, $[H^+]$ falls, freeing more albumin binding sites which then sequester more Ca^{2+}:

$$\text{Alkalosis} \Rightarrow \downarrow [H^+] \Rightarrow \uparrow \text{albumin-Ca}^{2+} \text{ binding} \Rightarrow \downarrow \text{free } Ca^{2+}$$

This decrease in ionized Ca^{2+} raises nerve membrane excitability, causing:
- Muscle spasms and tetany
- Perioral and peripheral paresthesias
- Laryngospasm
- Seizures

Respiratory Alkalosis (hyperventilation or acute laryngospasm) causes rapid CO_2 washout, ↑ pH, and acute hypocalcemia -- explaining all the features in this patient. Metabolic alkalosis can have a similar effect but the acute scenario and laryngospasm point to respiratory origin.

Answer:

Respiratory Alkalosis

Quick Tip: Think about how alkalosis affects the binding of calcium to albumin and thereby reduces free ionized calcium levels.

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13. A patient on a maize diet presented with diarrhea, dementia and dysentry. Which vitamin deficiency is responsible for the features?

(A) Niacin

(B) Thiamine

(C) Riboflavin

(D) Pyridoxine

Correct Answer: (A) Niacin

SOLUTION:

Pellagra -- Niacin (Vitamin B3) Deficiency:

Why maize causes it:
Maize is low in tryptophan, the essential amino acid used to synthesize niacin endogenously ($60\,mg$ tryptophan $= 1\,mg$ niacin). Additionally, niacin in maize exists as niacytin, a bound form that is not bioavailable. Populations dependent on maize develop niacin deficiency.

Classic presentation -- the 4 Ds:
1. **Dermatitis**: Photosensitive skin rash (Casal's necklace around neck)
2. **Diarrhea**: GI mucosal involvement
3. **Dementia**: Neuropsychiatric changes, confusion
4. **Death**: If untreated

Dysentery (bloody diarrhea) reflects severe GI mucosal damage in advanced pellagra.

Differential:
- Thiamine (B1): Beriberi, Wernicke-Korsakoff
- Riboflavin (B2): Cheilosis, angular stomatitis
- Pyridoxine (B6): Neuropathy, sideroblastic anemia

Answer:

Niacin (Vitamin B3)

Quick Tip: Remember the classic 4 Ds of the deficiency disease associated with a maize-heavy diet and think which B vitamin is derived from tryptophan.

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14. A patient presented with dryness in eye with a gritty sensation along with corneal softening. What is the most probable cause?

(A) Vitamin A deficiency

(B) Riboflavin Deficiency

(C) Viral Keratitis

(D) Follicular conjunctivitis

Correct Answer: (A) Vitamin A deficiency

SOLUTION:

Vitamin A Deficiency -- Ocular Manifestations:

Vitamin A (retinol) is a fat-soluble vitamin critical for:
1. Rhodopsin synthesis (night vision)
2. Epithelial differentiation and mucus secretion

Sequence of ocular features in Vitamin A deficiency:

Night blindness → Conjunctival xerosis → Bitot's spots → Corneal xerosis → Keratomalacia → Blindness

- **Xerophthalmia** (dry eye) = loss of goblet cell mucus secretion due to squamous metaplasia of conjunctival epithelium.
- **Keratomalacia** = corneal softening and liquefaction; a blinding emergency.

This patient has **dry eye + gritty sensation + corneal softening** -- a textbook presentation of advanced Vitamin A deficiency (xerophthalmia + keratomalacia).

Riboflavin deficiency does NOT cause xerophthalmia; it causes corneal vascularization. Viral keratitis presents with a painful, dendritic corneal ulcer.

Answer:

Vitamin A Deficiency

Quick Tip: Think about which fat-soluble vitamin is essential for maintaining conjunctival goblet cells and corneal epithelial integrity.

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15. Which amino acid needs to be supplemented through diet in a patient with cystathionine beta synthase deficiency?

(A) Cysteine

(B) Methionine

(C) Serine

(D) Tryptophan

Correct Answer: (A) Cysteine

SOLUTION:

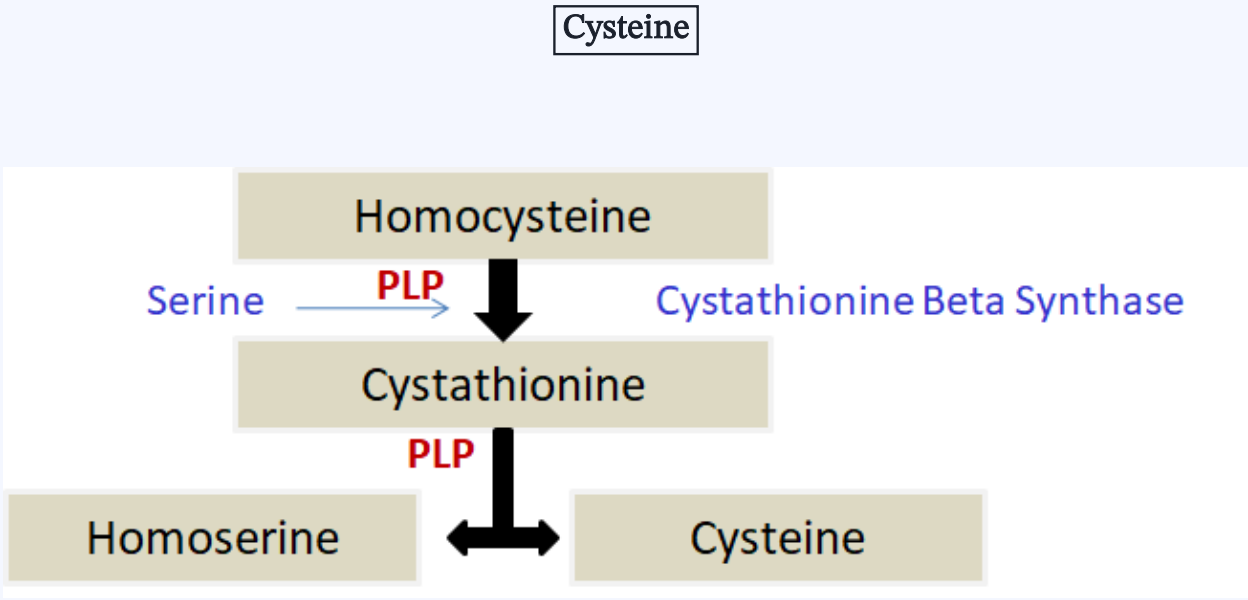
In the transsulfuration pathway: Homocysteine + Serine $\xrightarrow{\text{CBS, PLP}}$ Cystathionine $\xrightarrow{\text{Cystathionase, PLP}}$ Cysteine + Homoserine.

CBS deficiency blocks the first step, so cystathionine is not formed and consequently cysteine cannot be synthesized endogenously.

Key memory point: Cysteine is a non-essential amino acid in normal physiology, but becomes *essential* (must come from diet) in homocystinuria due to CBS deficiency.

Other options: Methionine is the upstream precursor -- it accumulates rather than

being deficient. Serine is a substrate but is not depleted to a critical level. Tryptophan is unrelated to this pathway.



Quick Tip: Think about which product of the transsulfuration pathway cannot be formed when CBS is absent.

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16. Corneal transparency is maintained by which of the following GAGs?

(A) Keratan Sulphate

(B) Dermatan Sulphate

(C) Heparan Sulphate

(D) Chondroitin Sulphate

Correct Answer: (A) Keratan Sulphate

SOLUTION:

Glycosaminoglycans (GAGs) are classified based on their sugar composition and sulfation pattern.

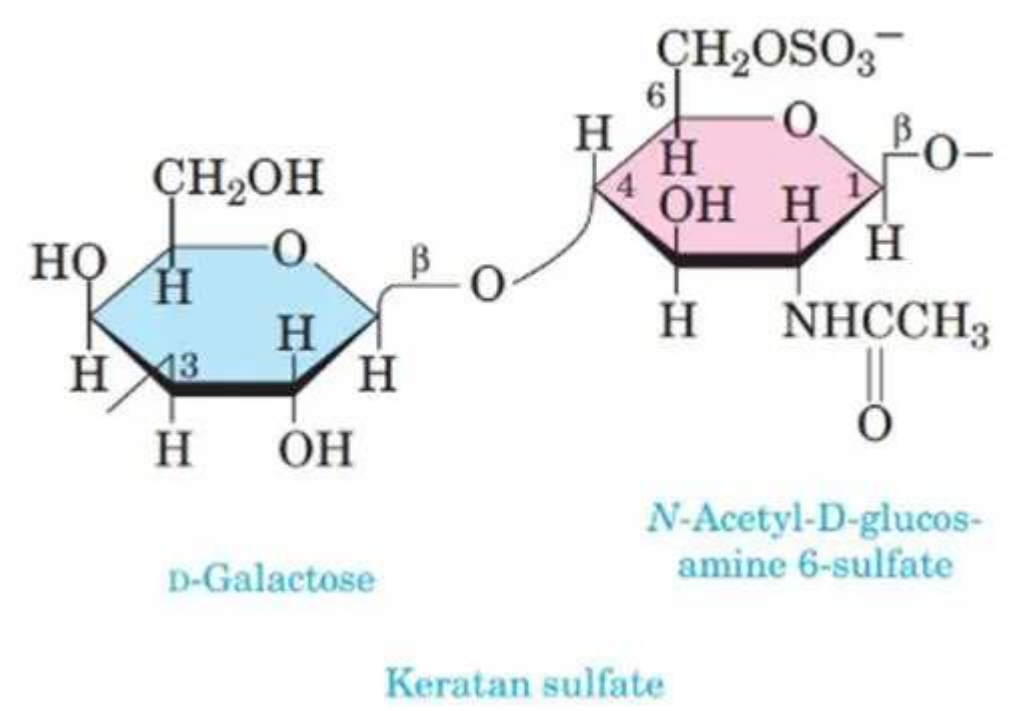
Keratan sulphate is unique among GAGs:
- Composition: N-Acetylglucosamine + Galactose (no uronic acid)

- First isolated from: Cornea
- Function in cornea: Maintains transparency by ensuring regular spacing of collagen fibrils in the stroma via proteoglycans (lumican, keratocan)

Comparison with other GAGs:
- Chondroitin sulphate: Glucuronic acid + N-Acetylgalactosamine -- found in cartilage
- Dermatan sulphate: Iduronic acid + N-Acetylgalactosamine -- found in skin
- Heparan sulphate: Glucuronic/Iduronic acid + Glucosamine -- found in basement membranes

Mnemonic: "Keratan Kornea Keeps Clarity"

Keratan Sulphate



Quick Tip: The GAG first discovered in the cornea and the only one lacking uronic acid is the key to corneal transparency.

17. Which of the following is associated with a defect in mismatch repair?

(A) Hereditary NPCC

(B) SCID

(C) Bloom Disorder

(D) MUTYH Associated Polyposis

Correct Answer: (A) Hereditary NPCC

SOLUTION:

DNA repair mechanisms and their associated genetic diseases:

Repair Type	DNA Damage	Disease
NHEJ	Double-strand breaks	SCID, RS-SCID
Homologous Recombination	Double-strand breaks	Werner Syndrome
Nucleotide Excision Repair	Pyrimidine dimers, bulky adducts	Xeroderma Pigmentosa, Cockayne Syndrome
Base Excision Repair	Abasic sites	MUTYH-associated Polyposis
Mismatch Repair (MMR)	Base mismatches	HNPCC / Lynch Syndrome

Mismatch repair involves MLH1, MSH2, MSH6, and PMS2 genes. Mutations in these lead to microsatellite instability (MSI), a hallmark of Lynch syndrome / HNPCC.

Key distinction: MUTYH-associated Polyposis involves Base Excision Repair -- not mismatch repair. SCID involves NHEJ. These are common distractors.

Hereditary NPCC (Lynch Syndrome)

Defects In DNA	Repair Mechanism	Disorders Associated
•Double strand breaks •Single strand breaks •Intrastrand Cross links	Non-homologous End Joining (NHEJ)	•Severe combined Immunodeficiency disease (SCID) •Radio-sensitive Severe combined Immunodeficiency disease (RS-SCID)
	Homologous Recombination (HR)	✓Werner's Syndrome
•Bulky Adducts •Pyrimidine Dimers	Nucleotide Excision Repair (NER)	✓Xeroderma Pigmentosa ✓Cockayne Syndrome ✓Trichothiodystrophy
Abasic Sites	Base Excision Repair (BER)	MUTYH-associated Polyposis
Bases Mismatch	Mismatch Repair(MMR)	✓Hereditary Non-Polyposis Colorectal Cancer (HNPCC) ✓Lynch Syndrome

Quick Tip: Think about which DNA repair pathway corrects base mismatches introduced during DNA replication.

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18. A patient had dinner at 8 PM in the night and does his blood sugar test at 7 AM in the morning. What is the major source of glucose?

(A) Muscle Glycogen

(B) Liver Glycogen

(C) Gluconeogenesis

(D) Dietary Carbohydrate

Correct Answer: (B) Liver Glycogen

SOLUTION:

The patient fasted for 11 hours (8 PM dinner to 7 AM test). This falls in Fasting Stage I (4-16 hours).

Sources of blood glucose by fasting duration:
- **0-4** hrs (Fed state): Dietary carbohydrates
- **4-16** hrs (Fasting Stage I): Liver glycogen (glycogenolysis)
- **16-48** hrs (Fasting Stage II/III/IV): Gluconeogenesis (liver glycogen exhausted by ~16 hrs)

Why not muscle glycogen? Muscle lacks glucose-6-phosphatase, so glycogen breakdown in muscle produces glucose-6-phosphate which enters glycolysis locally -- it cannot be exported as free glucose to raise blood sugar.

Why not dietary carbohydrate? The patient has been fasting for 11 hours -- all absorbed dietary glucose from dinner has already been utilized.

Why not gluconeogenesis? That takes over after 16+ hours of fasting.

Liver Glycogen

Quick Tip: Determine how many hours post-prandial the patient is and match it to the correct fasting stage.

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19. A patient with tendon xanthomas, increased LDL and cholesterol. What is the most probable diagnosis?

(A) Type I Hyperlipoproteinemia

(B) Type II Hyperlipoproteinemia

(C) Type III Hyperlipoproteinemia

(D) Abetalipoproteinemia

Correct Answer: (B) Type II Hyperlipoproteinemia

SOLUTION:

Classifying hyperlipoproteinemias by lipoprotein elevated, lipid elevated, and xanthoma type:

- Type I: Chylomicron + VLDL elevated; Triglycerides elevated; Eruptive xanthomas
- Type II: LDL elevated; Cholesterol elevated; **Tendon xanthomas** (Achilles, extensor)
- Type III: Chylomicron + VLDL + LDL elevated; TG + Cholesterol; Palmar + Tuberoeruptive xanthomas
- Type IV: Chylomicron + VLDL elevated; Triglycerides elevated; Eruptive xanthomas
- Type V: Chylomicron + VLDL elevated; Triglycerides elevated; Eruptive xanthomas

The patient in this question has: Tendon xanthomas + elevated LDL + elevated cholesterol.

This is the classic presentation of Type II Hyperlipoproteinemia (Familial Hypercholesterolemia), caused by deficiency or dysfunction of LDL receptors. LDL accumulates in the blood, deposits in tendons (tendon xanthomas) and skin around the eyes (xanthelasma).

Type II Hyperlipoproteinemia

	Lipoprotein Increased	Lipid Increased	Xanthomas
Type I	Chylomicron > VLDL	Triglycerides	Eruptive Xanthomas
Type II	LDL	Cholesterol	Tendenous Xanthomas
Type III	Chylomicron , VLDL , LDL	Triglycerides + Cholesterol	Palmar + Tuberoeruptive Xanthomas
Type IV	Chylomicron > VLDL	Triglycerides	Eruptive Xanthomas
Type V	Chylomicron > VLDL	Triglycerides	Eruptive Xanthomas

Quick Tip: Tendon xanthomas are a specific clinical marker that helps distinguish one type of hyperlipoproteinemia from others.

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20. A 5 year old child was brought to the physician with a history of black urine. There is no history of fever or any other complaints. There is no growth retardation and all the developmental milestones are normal. The child is suspected to have an enzyme defect for metabolism of an aromatic amino acid. What is the enzyme deficient?

(A) Homogentisae oxidase

(B) Homogentisate dehydrogenase

(C) Tryptophan Hydroxylase

(D) Tyrosine Transaminase

Correct Answer: (A) Homogentisae oxidase

SOLUTION:

Clinical diagnosis: Alkaptonuria

Pathway of tyrosine catabolism:

Tyrosine → p-hydroxyphenylpyruvate → Homogentisate $\xrightarrow{\text{Homogentisate oxidase (DEFICIENT)}}$ Maleylacetoacetate → Fumarate + Acetoacetate

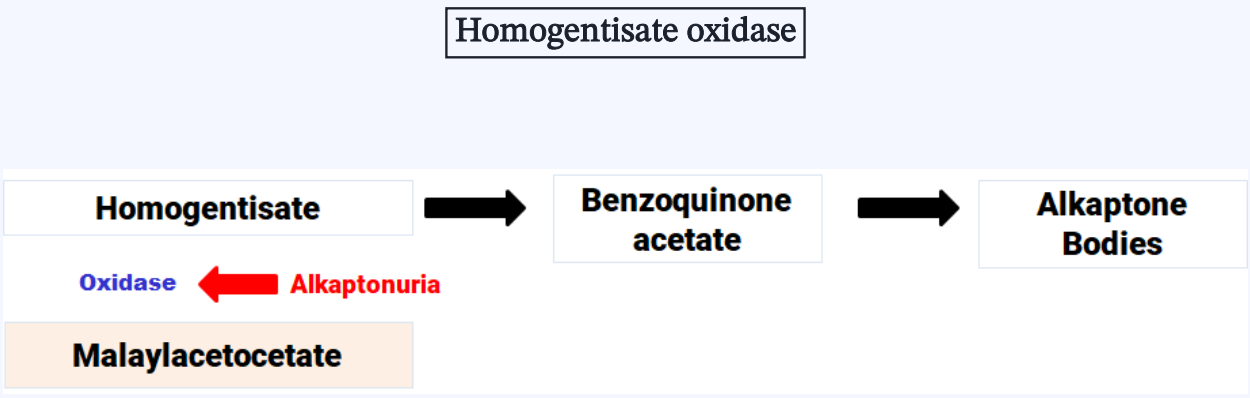
In Alkaptonuria: Homogentisate oxidase is deficient ⇒ Homogentisic acid accumulates ⇒ excreted in urine ⇒ oxidizes to dark pigment on standing (black urine).

Key features:

- Autosomal recessive disorder
- Garrod's Tetrad: Alkaptonuria, Albinism, Pentosuria, Cystinuria
- Urine darkening on standing is the only childhood symptom
- Ochronosis in adults: pigment deposition in intervertebral discs, nose and ear cartilage
- Arthritis

- Normal intelligence; normal life till 3rd-4th decade

Why not Tyrosine Transaminase? -- that deficiency causes Tyrosinemia Type II (Richner-Hanhart syndrome) with corneal and skin lesions.



Quick Tip: Dark/black urine on standing in a child with no intellectual disability points to a block in the tyrosine degradation pathway.

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21. A patient presents to you with generalized weakness and easy fatigability. He gives you a history of working in a factory with an exposure to Benzene. Which of the following cases would you suspect in this patient?

(A) Blood Cancer

(B) Urinary Bladder Cancer

(C) Carcinoma Gall Bladder

(D) Hepatocellular Carcinoma

Correct Answer: (A) Blood Cancer

SOLUTION:

Benzene is a chemical carcinogen with primary toxicity to the bone marrow.

Mechanism: Benzene is metabolized in the liver to reactive intermediates (benzene oxide, catechol, hydroquinone) that accumulate in bone marrow, causing DNA damage and inhibiting topoisomerase II, leading to chromosomal

breaks.

Consequences of chronic benzene exposure:
1. Aplastic anemia (early/chronic low-level exposure)
2. Myelodysplastic syndrome
3. Acute Myeloid Leukemia (AML) -- most important cancer association

Symptoms explained: Generalized weakness + easy fatigability = anemia due to bone marrow suppression.

Important carcinogen-cancer associations:
- Benzene → Blood cancer (AML, Leukemia)
- Beta-naphthylamine / Aniline dyes → Urinary bladder cancer
- Aflatoxin B1 / Vinyl chloride → Hepatocellular carcinoma
- Asbestos → Mesothelioma
- Chromium / Nickel → Lung cancer

Blood Cancer (Leukemia/AML)

Quick Tip: Benzene has a specific and well-known target organ -- recall its hematological toxicity and carcinogenic potential.

• • •

22. Chronic alcoholic patient with history of increasing abdominal girth. On liver biopsy there are reddish inclusions. What are these made up of?

(A) Actin

(B) Microtubules

(C) Intermediate filaments

(D) Myofibril

Correct Answer: (C) Intermediate filaments

SOLUTION:

The reddish eosinophilic inclusions on liver biopsy in a chronic alcoholic are **Mallory-Denk bodies**. These form due to defective protein processing in hepatocytes exposed to chronic ethanol.

Composition: They consist of aggregated ***cytokeratin*** **8** and ***cytokeratin*** **18**, which belong to the **intermediate filament** class of cytoskeletal proteins. Intermediate filaments (8-10 nm in diameter) are distinct from thin filaments (actin, 7 nm) and thick filaments (myosin), as well as microtubules (25 nm).

Key associations of Mallory bodies:
- Alcoholic hepatitis (most classic)
- Non-alcoholic steatohepatitis (NASH)
- Primary biliary cholangitis
- Wilson disease

Excess accumulation of cytoskeletal elements reflects cell dystrophy in the hepatocyte.

Intermediate filaments (cytokeratin 8 and 18)

Quick Tip: Identify the cytoskeletal protein that aggregates to form Mallory bodies in alcoholic hepatitis.

• • •

23. All are increased in Iron Deficiency Anemia (IDA) except?

(A) TIBC

(B) Soluble transferrin receptor

(C) Transferrin saturation

(D) Erythropoietin

Correct Answer: (C) Transferrin saturation

SOLUTION:

In Iron Deficiency Anemia (IDA), iron stores are depleted, causing characteristic changes in iron-related laboratory parameters.

Parameters and their changes in IDA:
- ***TIBC***: **Increased** - liver upregulates transferrin production to maximise iron capture
- ***Soluble transferrin receptor (sTfR)***: **Increased** - elevated specifically in tissue iron deficiency, useful to distinguish IDA from anaemia of chronic disease
- ***Transferrin saturation***: **Decreased** - calculated as $\frac{Serum\ Iron}{TIBC} \times 100$; both numerator falls and denominator rises, so saturation drops significantly
- ***Erythropoietin***: **Increased** - renal sensor detects hypoxia and releases more EPO

Memory aid: In IDA, think "High TIBC, High sTfR, High EPO, Low everything else (iron, ferritin, transferrin saturation, MCV, MCH)."

Transferrin saturation (Decreased, not increased)

Quick Tip: Consider which iron study parameter falls when serum iron is low and TIBC is high.

• • •

24. Woman on pap smear having disorganised growth of cells with hyperchromatic nuclei. Which phenomenon is occurring here?

(A) Dysplasia

(B) Metaplasia

(C) Hypertrophy

(D) Carcinoma

Correct Answer: (D) Carcinoma

SOLUTION:

Pap smear findings: disorganised cell growth + hyperchromatic nuclei. This combination points toward a malignant process.

Distinguishing cellular adaptations and abnormalities:
- **Metaplasia:** One mature cell type replaces another; architecture is preserved, cells appear organised
- **Hypertrophy:** Cells increase in size; no structural disorder
- **Dysplasia:** Atypical cells with loss of uniformity; can be mild/moderate/severe; precancerous
- **Carcinoma (Anaplasia):** Full malignant transformation with ***pleomorphism***, ***hyperchromasia***, loss of polarity, abnormal mitoses

Anaplastic features that define carcinoma:
1. Pleomorphic nuclei (variable size and shape)
2. Hyperchromatic nuclei (dark-staining due to excess DNA)
3. Loss of polarity - cells grow in disorganised pattern
4. Increased and abnormal mitoses
5. Tumour giant cells

On pap smear, disorganised growth + hyperchromatic nuclei = anaplasia = carcinoma.

Carcinoma

Quick Tip: Think about which cellular change is characterized by disorganised growth combined with hyperchromatic nuclei as seen in malignancy.

• • •

25. Poor prognostic marker in Multiple Myeloma (MM) is:

(A) S. creatinine

(B) Hypercalcemia

(C) B2 microglobulins

(D) Telomerase

Correct Answer: (C) B2 microglobulins

SOLUTION:

Multiple Myeloma (MM) prognosis is best assessed by the **ISS (International Staging System)**, which relies on two key parameters: serum Beta-2 microglobulin (B2M) and serum albumin.

Why B2M is the most important poor prognostic marker:
- B2M is the light chain of the MHC class I complex found on the surface of all nucleated cells
- In MM, rapidly proliferating plasma cells shed large amounts of B2M into serum
- Higher B2M = greater tumour burden = worse prognosis

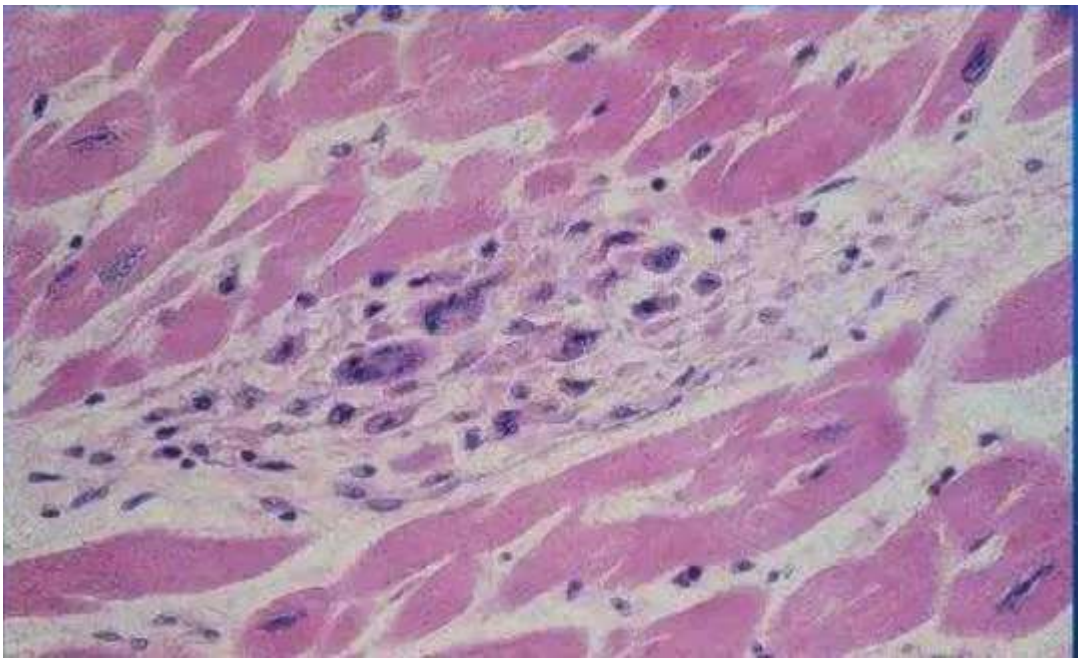
ISS staging using B2M:
- Stage I: $B2M < 3.5$ mg/L and albumin ≥ 3.5 g/dL (best prognosis)
- Stage II: Neither Stage I nor III criteria
- Stage III: $B2M \geq 5.5$ mg/L (worst prognosis)

Other CRAB features (Hypercalcemia, Renal failure, Anemia, Bone lesions) indicate disease activity but B2M is the validated staging and prognostic biomarker.

B2 microglobulins

Quick Tip: Recall which low molecular weight protein used in the International Staging System reflects tumour burden in Multiple Myeloma.

26. A 34 year old female presenting to the OPD with migratory arthritis and examination revealed a pan systolic murmur. ECHO was performed which is suggestive of mitral regurgitation. Biopsy image is provided showing characteristic nodules in heart muscle. Diagnosis will be?



(A) Infective endocarditis

(B) Rheumatic heart disease

(C) SABE

(D) Cardiac failure

Correct Answer: (B) Rheumatic heart disease

SOLUTION:

Clinical scenario: Young female, migratory arthritis, pan-systolic murmur, mitral regurgitation on ECHO, biopsy showing characteristic cardiac nodules.

Diagnosis: Rheumatic Heart Disease (RHD)

Pathognomonic finding: **Aschoff bodies (Aschoff nodules)**

Composition of Aschoff body:
- Central zone of ***fibrinoid necrosis*** (collagen degradation)
- Surrounding ***Anitchkov cells*** (Aschoff cells / caterpillar cells) - activated

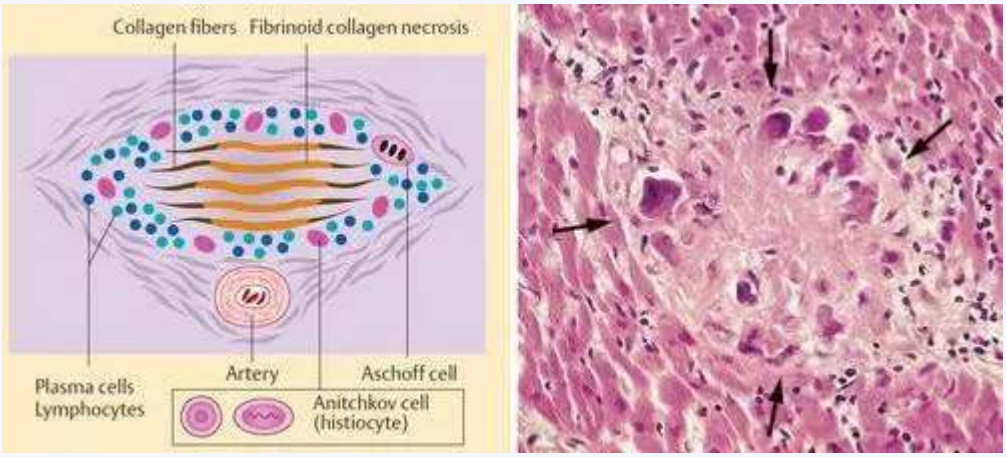
macrophages with characteristic caterpillar chromatin
- Peripheral ***lymphocytes*** and ***plasma cells***

Pathogenesis: Group A beta-haemolytic Streptococcus infection triggers molecular mimicry. Antibodies against streptococcal M protein cross-react with cardiac myosin and valve tissue, causing autoimmune inflammation.

Jones Criteria Major features: Carditis, Polyarthritis, Chorea, Erythema marginatum, Subcutaneous nodules

Most common valve affected: Mitral valve (mitral regurgitation in acute phase)

Rheumatic Heart Disease



Quick Tip: The characteristic biopsy finding in this condition shows Aschoff bodies with Anitchkov cells.

• • •

27. A 18 year old male presented to the OPD with gum bleeding, fever, low TLC and low platelet count. General examination is unremarkable. Further investigation show a low reticulocyte count, absent megakaryocytes and no immature cells. Diagnosis will be?

(A) Aplastic anemia

(B) MDS

(C) PNH

(D) None

Correct Answer: (A) Aplastic anemia

SOLUTION:

Patient profile: 18-year-old male, gum bleeding, fever, pancytopenia (low TLC + low platelets), low reticulocyte count, absent megakaryocytes, no immature cells on bone marrow examination.

Diagnosis: Aplastic Anemia

Aplastic anemia is characterised by **bone marrow failure** resulting in peripheral pancytopenia. The marrow is replaced by fat cells, resulting in a hypocellular marrow on trephine biopsy.

Key diagnostic clues in this case:
- ***Low reticulocyte count*** = marrow not producing RBCs
- ***Absent megakaryocytes*** = marrow not producing platelets
- ***No immature cells*** = not leukemia or MDS
- ***Pancytopenia*** = all three cell lines affected

Causes (Acquired aplastic anemia):
- Autoimmune (T-cell mediated destruction of haemopoietic stem cells) - most common
- Drugs (chloramphenicol, NSAIDs, chemotherapy)
- Viral (hepatitis, EBV, CMV, parvovirus B19)
- Radiation

Symptoms by cell line: Anaemia (fatigue) + Neutropenia (infections, fever) + Thrombocytopenia (gum bleeding, bruising)

Aplastic Anemia

Quick Tip: Look for the combination of pancytopenia with absent megakaryocytes and no immature cells, pointing to bone marrow failure.

• • •

28. HNPCC has defect in:

(A) Nucleotide excision

(B) Base pair excision

(C) Point mutation

(D) Mismatch repair gene

Correct Answer: (D) Mismatch repair gene

SOLUTION:

HNPCC (Hereditary Non-Polyposis Colorectal Cancer) = Lynch Syndrome. It is the most common inherited colorectal cancer, accounting for ~3-5% of all colorectal cancers.

Defect: Mismatch Repair (MMR) genes

Genes involved (germline mutations):
- ***MSH2*** (most common)
- ***MLH1***
- ***MSH6***
- ***PMS2***
- ***EPCAM***

Consequence of MMR deficiency:
- Replication errors (insertions/deletions) at microsatellite sequences go uncorrected
- Results in ***Microsatellite Instability (MSI – H)***

- Rapid accumulation of mutations leads to colorectal and other cancers

DNA repair mechanisms and associated syndromes:
- Nucleotide excision repair (NER) defect: Xeroderma Pigmentosa, Cockayne Syndrome
- Base excision repair (BER) defect: MUTYH-associated Polyposis
- Mismatch repair (MMR) defect: HNPCC / Lynch Syndrome
- Non-homologous end joining (NHEJ) defect: SCID

HNPCC cancers: Colorectal (most common), endometrial, ovarian, gastric, urinary tract

Mismatch repair gene defect (MMR)

Quick Tip: Recall which DNA repair pathway corrects replication errors and is defective in Lynch syndrome.

• • •

29. A patient had dinner at 8 pm. He then did a blood sugar test at 7 am the next morning. A major source of blood glucose at the time of this test would be:

(A) Glycogenolysis

(B) Gluconeogenesis

(C) Dietary glucose absorption

(D) Lipolysis

Correct Answer: (B) Gluconeogenesis

SOLUTION:

After an 11-hour fast (dinner at 8 pm, test at 7 am), the body has exhausted most hepatic glycogen. Hepatic glycogen supports blood glucose for roughly 8--12 hours; beyond that window, **gluconeogenesis** takes over as the dominant source.

Gluconeogenesis uses substrates such as lactate (via Cori cycle), alanine (via glucose-alanine cycle), glycerol (released from adipose lipolysis), and amino acids. The key regulatory enzymes -- **PEPCK**, fructose-1,6-bisphosphatase, and glucose-6-phosphatase -- are upregulated by glucagon and cortisol during fasting.

Glycogenolysis (option 1) was the primary pathway in the first 6--8 hours but is largely exhausted by 11 hours. Dietary glucose absorption (option 3) is zero at this stage. Lipolysis (option 4) provides glycerol as a gluconeogenic precursor and free fatty acids that spare peripheral glucose use, but it does not directly release glucose into blood.

Gluconeogenesis

Quick Tip: Consider how many hours have elapsed since the last meal and which metabolic pathway predominates after glycogen stores are depleted.

• • •

30. Corneal transparency is maintained by which of the following glycosaminoglycans (GAGs)?

(A) Hyaluronic acid

(B) Chondroitin sulphate

(C) Keratan sulphate

(D) Heparan sulphate

Correct Answer: (C) Keratan sulphate

SOLUTION:

The corneal stroma is a highly organised matrix of type I collagen fibrils embedded in proteoglycans. Corneal transparency depends on the precise uniform spacing of collagen fibrils (~60 nm apart), which causes destructive interference of scattered light.

The dominant glycosaminoglycan in the corneal stroma is **keratan sulphate**, carried by proteoglycans such as lumican and keratocan. Keratan sulphate chains regulate fibril spacing; when these chains are abnormal or absent (e.g., in macular corneal dystrophy due to CHST6 mutations), fibril spacing becomes irregular and the cornea becomes opaque.

Other GAGs compared:
- Hyaluronic acid: vitreous humor, synovial fluid -- not cornea
- Chondroitin sulphate: cartilage, minor corneal component
- Heparan sulphate: basement membranes, liver

Keratan sulphate

Quick Tip: Think about which glycosaminoglycan is unique to the corneal stroma and controls collagen fibril spacing.

• • •

31. A patient with vomiting was treated with an anti-emetic drug. The patient was relieved of vomiting but developed abnormal involuntary movements. What drug should be given to manage these abnormal movements?

(A) Methyl dopa

(B) Benzhexol

(C) Hyoscine

(D) Cyproheptadine

Correct Answer: (B) Benzhexol

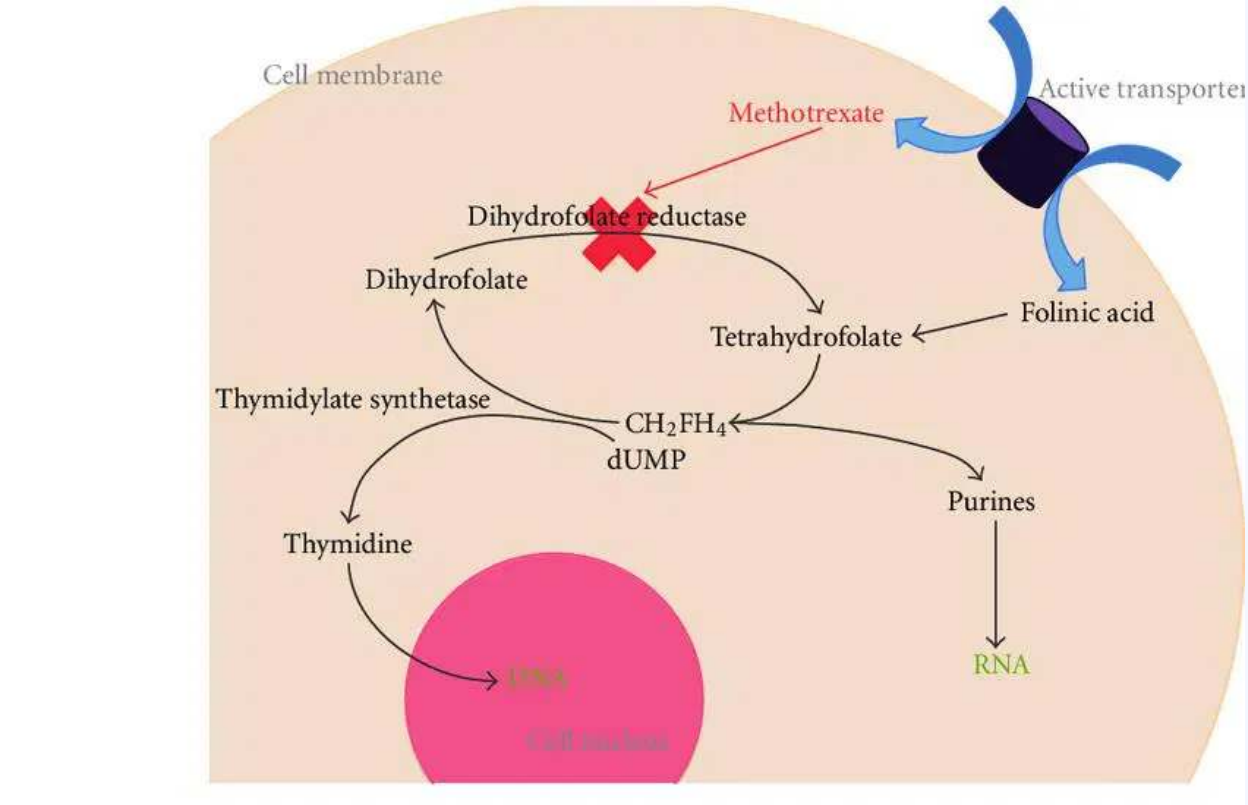
SOLUTION:

Anti-emetics such as metoclopramide and prochlorperazine are D_2 receptor antagonists. Blocking dopamine in the nigrostriatal pathway creates a relative cholinergic excess, manifesting as extrapyramidal side effects (EPS) -- acute dystonia, drug-induced parkinsonism, or akathisia.

Benzhexol (trihexyphenidyl, THP) is an antimuscarinic agent that blocks muscarinic M_1 receptors in the striatum. By reducing cholinergic activity, it restores the dopamine-acetylcholine balance and relieves EPS.

Why not the others?
- Methyl dopa: antihypertensive; can itself cause EPS
- Hyoscine: anticholinergic but not the standard choice for drug-induced EPS
- Cyproheptadine: antihistamine/antiserotonin; no role in EPS

Benzhexol (Trihexyphenidyl)



Quick Tip: The anti-emetic caused dopamine blockade -- think about which drug restores the dopamine-acetylcholine balance in the striatum.

• • •

32. In a case of measles, which antibiotic should be given?

(A) Amoxicillin

(B) Vitamin A supplementation only, no antibiotic needed

(C) Erythromycin

(D) Co-trimoxazole

Correct Answer: (C) Erythromycin

SOLUTION:

Measles is a viral illness caused by a single-stranded negative-sense enveloped RNA paramyxovirus. Antibiotics have no antiviral effect but are used to prevent or treat secondary bacterial complications -- the most common being otitis media and bacterial pneumonia (caused by **Streptococcus pneumoniae**, ***H.influenzae***).

Erythromycin is the classically recommended antibiotic in measles management. It is a macrolide that provides coverage against respiratory pathogens commonly causing secondary complications.

Additional management includes:
- Vitamin A: 200,000 IU for 2 days (reduces severity and mortality)
- Supportive care (antipyretics, fluids)
- Isolation for 4 days after rash onset

The measles vaccine (MMR) is a live attenuated vaccine and is the best prevention strategy.

Erythromycin

Quick Tip: Measles is viral, but secondary bacterial infections are treated -- recall which antibiotic covers typical respiratory bacterial complications.

• • •

33. Kaposi sarcoma is caused by which of the following?

(A) Human Herpesvirus 6 (HHV-6)

(B) Human Herpesvirus 8 (HHV-8)

(C) Epstein-Barr Virus (EBV)

(D) Human Papillomavirus (HPV)

Correct Answer: (B) Human Herpesvirus 8 (HHV-8)

SOLUTION:

Kaposi sarcoma (KS) is the most common AIDS-defining malignancy, presenting as purplish-red vascular lesions on skin, mucous membranes, and viscera.

The causative agent is **Human Herpesvirus 8 (HHV-8)**, also called Kaposi Sarcoma-associated Herpesvirus (KSHV). It belongs to the gamma-herpesvirus subfamily (same subfamily as EBV).

HHV-8 encodes viral oncoproteins that:
- Inhibit apoptosis (vFLIP, vBcl-2)
- Drive cell cycle progression (viral cyclin D)
- Stimulate angiogenesis (viral IL-6, viral VEGF homologue)

Four clinical variants of KS exist:
1. Classic KS (elderly Mediterranean men)
2. Endemic KS (sub-Saharan Africa)
3. Iatrogenic KS (organ transplant recipients on immunosuppression)
4. Epidemic/AIDS-associated KS (most aggressive)

Other herpesvirus associations to remember: EBV (HHV-4) -- Burkitt lymphoma; HHV-6 -- roseola; HPV -- cervical cancer.

HHV-8 (KSHV)

Quick Tip: Recall which herpesvirus is specifically associated with the most common

AIDS-defining malignancy presenting as purplish skin lesions.

• • •

34. A patient presents after a dog bite. How will you treat this patient?

(A) Rabies vaccine alone

(B) Rabies immunoglobulin (RIG) alone

(C) Wound washing, rabies vaccine, and rabies immunoglobulin (RIG) for category III exposure

(D) Antibiotics alone (amoxicillin-clavulanate)

Correct Answer: (C) Wound washing, rabies vaccine, and rabies immunoglobulin (RIG) for category III exposure

SOLUTION:

A dog bite with skin penetration is classified as **WHO Category III** rabies exposure.

Management protocol:

1. **Immediate wound care**: Wash the wound with soap and water for at least 15 minutes; apply povidone iodine or 70% ethanol.

2. **Rabies Immunoglobulin (RIG)**: **20 IU/kg** of human RIG (HRIG). Maximum dose infiltrated directly into and around the wound; remainder at a distant IM site. Provides immediate passive immunity. Must be given on Day 0 with the first vaccine dose.

3. **Rabies vaccine (active immunisation)**: Two accepted schedules:
- Essen: Days 0, 3, 7, 14, 28 (5 doses)
- Zagreb: Days 0 (2 doses), 7, 21 (4 doses)

Antibiotics (e.g., amoxicillin-clavulanate) are added to prevent secondary bacterial wound infections but do not protect against rabies.

If the animal is healthy and available for 10-day observation and remains healthy, PEP may be stopped after 3 doses.

Wound wash + Rabies vaccine + RIG (Category III)

Quick Tip: Classify the dog bite as a WHO Category III exposure and recall the three-pronged post-exposure prophylaxis approach.

• • •

35. The HIV virus targets which CD receptor on immune cells?

(A) CD8

(B) CD4

(C) CD3

(D) CD20

Correct Answer: (B) CD4

SOLUTION:

HIV-1 is a lentivirus with a single-stranded positive-sense RNA genome. Its surface glycoprotein **gp120** identifies and binds **CD4** -- the primary receptor expressed on CD4+ T helper lymphocytes, monocytes, macrophages, and dendritic cells.

Entry mechanism:
1. gp120 binds CD4 (high-affinity interaction)
2. Conformational change in gp120 exposes V3 loop
3. V3 loop binds co-receptor (CCR5 or CXCR4)
4. gp41 undergoes conformational change, enabling membrane fusion
5. Viral RNA and enzymes enter the cell

Clinical relevance of CD4 count:

- CD4 < 500: early immunosuppression
- CD4 < 200: AIDS-defining; risk of ***Pneumocystis jirovecii*** pneumonia
- CD4 < 100: risk of CMV retinitis, MAC infection
- CD4 < 50: risk of CNS lymphoma, CMV encephalitis

Note: Individuals homozygous for CCR5-Delta32 deletion are highly resistant to HIV infection (CCR5 is primary co-receptor for R5 strains).

CD4

Quick Tip: Recall which surface glycoprotein on CD4+ helper T cells is bound by HIV envelope protein gp120 to initiate infection.

• • •

36. Which of the following drugs is used for the long term management of obesity?

(A) Sibutramine

(B) Fenfluramine

(C) Metformin

(D) Liraglutide

Correct Answer: (D) Liraglutide

SOLUTION:

Classifying anti-obesity drugs:
Sibutramine -- SNRI; withdrawn (cardiovascular toxicity).
Fenfluramine -- Serotonin releaser; banned (valvulopathy).
Metformin -- Biguanide; not approved for obesity per se.
Liraglutide (3 mg) -- GLP-1 receptor agonist; acts on hypothalamic neurons to reduce appetite and prolongs satiety by delaying gastric emptying. It is the only option listed with regulatory approval for chronic weight management.

Key point: Bupropion + naltrexone (Contrave) is another approved combination, but liraglutide is the answer here.

Liraglutide

Quick Tip: Consider which drug class acts on GLP-1 receptors to reduce appetite and is approved for weight management.

• • •

37. A child accidentally ingested some fruit which he plucked from a tree while playing. After the ingestion of the fruit, he presented with restlessness, painful swallowing, photophobia, dry skin, urinary retention and elevated body temperature. What is the possible poisoning and the appropriate antidote for it?

(A) Datura & Physostigmine

(B) Yellow oleander & Physostigmine

(C) Datura & Pralidoxime

(D) Yellow oleander & Pralidoxime

Correct Answer: (A) Datura & Physostigmine

SOLUTION:

Pattern recognition approach:
Symptoms: restlessness, painful swallowing, photophobia, dry skin, urinary retention, hyperthermia.
Mnemonic for anticholinergic toxidrome: *Hot as a hare, dry as a bone, red as a beet, blind as a bat, mad as a hatter.*

Datura stramonium (thorn apple) contains **atropine, scopolamine, hyoscyamine** -- all muscarinic antagonists -- producing this classic picture.

Yellow oleander contains cardiac glycosides (thevetin A, B) -- causes bradycardia, heart block, not this picture.

Antidote selection:
- Physostigmine = tertiary amine; crosses BBB; reverses central + peripheral anticholinergic effects -- CORRECT.
- Neostigmine = quaternary amine; does NOT cross BBB.
- Pralidoxime = organophosphate antidote (acetylcholinesterase reactivator); not relevant here.

Datura and Physostigmine

Quick Tip: Dry skin, urinary retention, and photophobia point to an anticholinergic toxidrome -- identify the plant and the antidote that crosses the blood-brain barrier.

• • •

38. A 30 year old male presents with a history of consumption of some unknown substance. The attending doctor notices the person to be having diaphoresis, headache and acute coronary spasm like features. The person is least likely to show which clinical feature?

(A) Bradycardia

(B) Tachycardia

(C) Hyperthermia

(D) Hypertension

Correct Answer: (A) Bradycardia

SOLUTION:

Toxicological reasoning:
The clinical triad of diaphoresis + coronary spasm + headache in a young male = cocaine overdose.

Cocaine mechanism: blocks **norepinephrine/dopamine/serotonin** reuptake transporters --> sympathetic surge.

Expected features:

- Tachycardia (sympathetic stimulation)
- Hypertension (alpha-1 mediated vasoconstriction)
- Hyperthermia ('Cocaine Fever' -- increased metabolic rate)
- Coronary vasospasm -- risk of MI even in young patients
- Diaphoresis

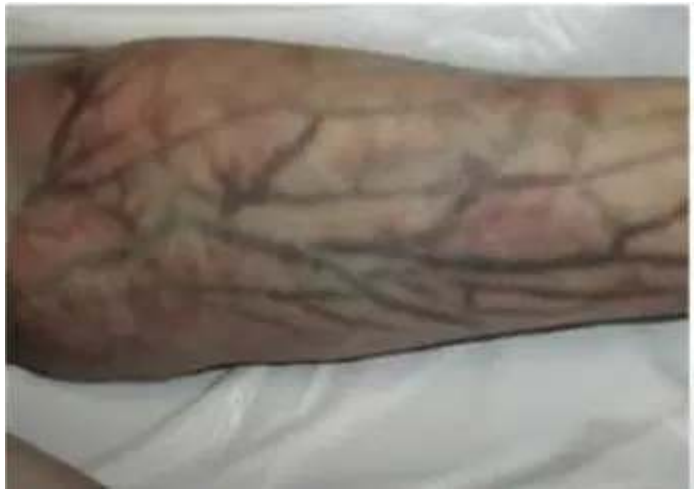
Bradycardia is a parasympathomimetic feature; cocaine is predominantly a sympathomimetic -- bradycardia is the LEAST likely finding.

Bradycardia

Quick Tip: Think about the sympathomimetic effects of cocaine -- which vital sign change would be opposite to what cocaine causes?

• • •

39. A doctor at autopsy noticed the following finding on a cadaver (image showing marbling -- greenish-black discolouration over superficial veins of the skin). Which of the following is true regarding this finding?



(A) It is due to sulphaemoglobin pigment

(B) This change is seen at 24 hours

(C) It is non bacterial

(D) It is associated with lightning case

Correct Answer: (A) It is due to sulphaemoglobin pigment

SOLUTION:

Postmortem changes -- marbling:
Definition: Greenish-black/brownish network of discolouration along superficial veins, giving a marble-like appearance.

Mechanism:
- Putrefactive bacteria (gut flora) produce **H_2S**.
- **H_2S** + haemoglobin (released by haemolysis) --> **sulphaemoglobin** (greenish-black).
- This pigment diffuses into and stains the walls of superficial blood vessels.

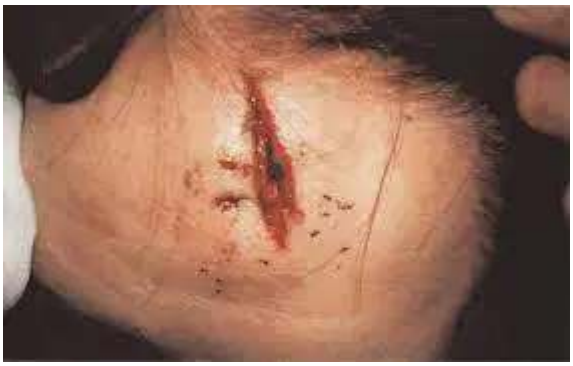
Timeline:
- Onset: ~24 hours after death (internally).
- Naked-eye visibility: 36--48 hours after death.

Option analysis:
A -- Sulphaemoglobin pigment: CORRECT.
B -- Seen at 24 hours: Incorrect (visible at 36--48 h).
C -- Non-bacterial: Incorrect (bacterial H2S is the cause).
D -- Lightning: Incorrect (lightning causes Lichtenberg figures).

It is due to sulphaemoglobin pigment

Quick Tip: Marbling follows the course of superficial veins due to a pigment formed by bacterial action on haemoglobin.

40. Identify the injury (image showing a wound on the forehead with irregular margins but sharp-looking edges due to sheering forces).



(A) Incised looking laceration

(B) Laceration

(C) Laceration looking incision

(D) Incision

Correct Answer: (A) Incised looking laceration

SOLUTION:

Wound classification in forensic medicine:

Incision: Sharp weapon; clean edges; no tissue bridges; no marginal contusion.

Laceration: Blunt weapon; irregular edges; tissue bridges present; contused margins.

Incised-looking laceration: A subtype of laceration seen over bone-covered areas (forehead, shin) where the blunt sheering force stretches and tears the skin producing edges that appear sharp and clean, mimicking an incised wound. On close examination, irregularity, tissue bridges and contused margins identify it as a laceration.

Why forehead? The thin skin over the frontal bone offers little subcutaneous padding; blunt trauma causes the skin to split sharply against the bone via a shearing mechanism.

Medico-legal importance: Misidentifying as an incision could wrongly implicate a sharp weapon; careful examination prevents this error.

Incised looking laceration

Quick Tip: A wound over a bony surface (forehead) caused by blunt sheering force can mimic a sharp-edged incision -- identify this specific forensic term.

• • •

41. While recording evidence in the court of law, lawyer asked the witness, "Were you present when A killed B?", and the witness answered "yes". This type of questioning is permitted in?

(A) Examination in chief

(B) Direct examination

(C) Redirect examination

(D) Cross examination

Correct Answer: (D) Cross examination

SOLUTION:

Medical jurisprudence -- types of examination in court:

Examination in chief (direct examination): The witness is questioned by the lawyer who summoned them. Leading questions NOT permitted (Indian Evidence Act, Section 143).

Cross examination: The opposing counsel questions the witness. Leading questions ARE permitted. The goal is to test the veracity, credibility and memory of the witness and elicit admissions favourable to the questioner's client.

Re-examination (redirect): After cross, the original lawyer may clarify; no leading questions.

The question "Were you present when A killed B?" presupposes A's guilt and

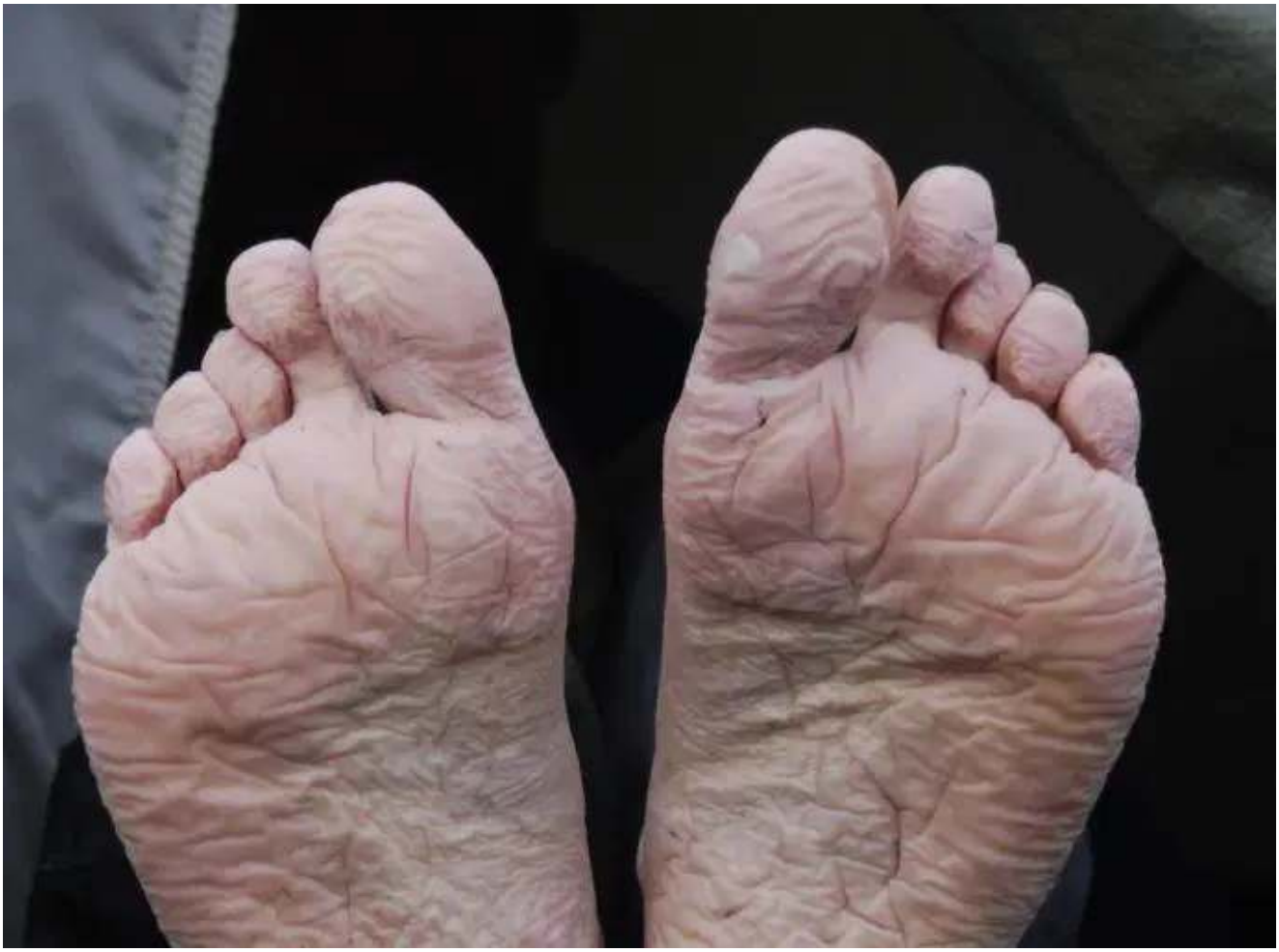
directs the witness toward a specific answer -- this is the definition of a leading question, permissible only in cross examination.

Cross examination

Quick Tip: A leading question that presupposes a fact is the hallmark of a specific type of court examination -- identify which type allows such questioning.

• • •

42. A dead body was recovered from near a pond by the police. During autopsy, the following finding was observed (image showing markedly wrinkled, pale, sodden skin of the soles of the feet). The below phenomenon is due to



(A) Case of torture in hot water

(B) Case of postmortem hanging

(C) Case of immersion in water for 36 hours

(D) Case of colliquative liquefaction

Correct Answer: (C) Case of immersion in water for 36 hours

SOLUTION:

Forensic identification of water immersion:
Finding: Markedly wrinkled, pale, sodden ('washerwoman') skin of soles -- maceration due to prolonged water immersion.

Sequence of immersion changes:
- 1--2 h: Wrinkling of fingertips.
- 6--12 h: Glove-and-stocking appearance (skin peeling).
- >36 h: Mottling, greenish-black discolouration, marked maceration, putrefactive changes begin.

Differentiating other options:
Torture in hot water -- causes scalding burns, not wrinkled pale skin.
Postmortem hanging -- shows ligature mark, congestion of face, petechiae.
Colliquative liquefaction -- adipocere formation under warm, moist, anaerobic conditions; does not present as wrinkled skin.

Conclusion: the sodden, wrinkled feet of a body from near a pond = immersion >36 hours.

Case of immersion in water for 36 hours

Quick Tip: Wrinkled, sodden skin on a body recovered from water indicates how long the body has been submerged -- match the degree of maceration to the correct time frame.

43. Which of the following drugs is most commonly associated with causing Stevens-Johnson Syndrome (SJS)?

(A) Lamotrigine

(B) Penicillin

(C) Aspirin

(D) Metformin

Correct Answer: (A) Lamotrigine

SOLUTION:

Stevens-Johnson Syndrome (SJS) is a severe, life-threatening mucocutaneous reaction. Among the options, **Lamotrigine** is the most commonly associated drug.

Key drugs implicated in SJS/TEN spectrum:
1. **Anticonvulsants:** Lamotrigine (esp. with rapid dose escalation or co-administration with valproate), carbamazepine, phenytoin, phenobarbitone
2. **Allopurinol:** Most common cause in several Asian populations
3. **Sulfonamides:** Co-trimoxazole, sulfasalazine
4. **Antiretrovirals:** Nevirapine
5. **NSAIDs:** Oxicam class (e.g., piroxicam, meloxicam)

HLA associations: HLA-B*1502 with carbamazepine-SJS (South and Southeast Asian populations); HLA-B*5801 with allopurinol-SJS.

Mechanism: Cytotoxic CD8+ T cell-mediated keratinocyte apoptosis through granulysin and Fas-FasL pathway.

Management: Immediate drug withdrawal, ICU supportive care, IVIG or cyclosporine considered.

Lamotrigine

Quick Tip: Think about anticonvulsants and their association with severe cutaneous adverse reactions.

• • •

44. Which of the following drugs causes Vitamin B12 deficiency on long-term use?

(A) Metformin

(B) Omeprazole

(C) Colchicine

(D) All of the above

Correct Answer: (D) All of the above

SOLUTION:

Vitamin B12 deficiency from drugs is a frequently tested NEET PG topic. All three listed drugs are implicated:

1. **Metformin:** Inhibits calcium-dependent IF-B12 complex absorption in the terminal ileum. Incidence ~5-10% of long-term users. Reversible with calcium supplementation. Dose-dependent.

2. **Omeprazole (PPIs):** Reduces gastric acid, impairing pepsin-dependent release of protein-bound B12 from food. Long-term PPI use causes B12 deficiency especially in elderly patients.

3. **Colchicine:** Disrupts ileal mucosal cell function, impairing IF-B12 complex absorption in the terminal ileum.

Other drugs causing B12 deficiency: H2 blockers (ranitidine), neomycin, para-aminosalicylic acid (PAS), nitrous oxide (inactivates B12 irreversibly by oxidizing cobalt).

B12 deficiency presents with megaloblastic anemia, subacute combined degeneration of the spinal cord (SACD), and peripheral neuropathy. SACD is NOT

seen in folate deficiency -- this is a key distinguishing feature.

All of the above

Quick Tip: Multiple drugs impair B12 absorption through different mechanisms involving gastric acid, ileal transport, or mucosal function.

• • •

45. Which of the following statements is CORRECT regarding the pharmacology of N-acetylcysteine (NAC)?

(A) It acts as a precursor for glutathione synthesis

(B) It is used as antidote for organophosphate poisoning

(C) It inhibits cyclooxygenase enzyme

(D) It is a specific antidote for benzodiazepine overdose

Correct Answer: (A) It acts as a precursor for glutathione synthesis

SOLUTION:

N-acetylcysteine (NAC) is a key pharmacology drug with multiple mechanisms and uses.

Mechanism of action:
NAC provides **L-cysteine**, the rate-limiting substrate for glutathione (GSH) synthesis. Glutathione is the primary intracellular antioxidant that neutralizes reactive oxygen species (ROS) and toxic electrophilic metabolites. NAC also directly acts as an antioxidant via its free thiol (-SH) group.

Paracetamol toxicity -- Classic use:
Paracetamol is converted to the toxic metabolite **NAPQI** (N-acetyl-p-benzoquinone imine) by CYP2E1 and CYP3A4. In overdose, GSH is depleted and NAPQI binds covalently to hepatic proteins, causing centrilobular necrosis.
NAC replenishes GSH, conjugates NAPQI directly (via thiol groups), and provides

cysteine for further GSH synthesis.

Route of administration:
IV (Prescott protocol: 150 mg/kg over 15 min, then 50 mg/kg over 4h, then 100 mg/kg over 16h) or oral (140 mg/kg loading, then 70 mg/kg q4h x 17 doses).

Other uses: Mucolytic (breaks disulfide bonds in mucus glycoproteins), contrast-induced nephropathy prophylaxis, ARDS adjunct.

Precursor for glutathione synthesis

Quick Tip: NAC is the antidote for paracetamol toxicity and works by replenishing an important intracellular antioxidant.

• • •

46. Which of the following is a platinum-based drug used in the treatment of carcinoma?

(A) Cisplatin

(B) Methotrexate

(C) Vincristine

(D) Doxorubicin

Correct Answer: (A) Cisplatin

SOLUTION:

Platinum-based drugs are an important class of antineoplastic agents in NEET PG pharmacology.

Members of the platinum group:
1. **Cisplatin** (1st generation) -- prototype; testicular, ovarian, head and neck, cervical, lung, bladder cancers
2. **Carboplatin** (2nd generation) -- less nephrotoxic; ovarian, lung cancers
3. **Oxaliplatin** (3rd generation) -- colorectal cancer (FOLFOX/CAPOX regimens)

Mechanism:
After entering the cell, the chloride leaving groups are displaced by water (aquation), forming a reactive Pt^{2+} species. This covalently crosslinks DNA strands, primarily forming **d(GpG) intrastrand crosslinks**, blocking DNA replication and transcription, and triggering apoptosis.

Toxicity of Cisplatin:
- Nephrotoxicity (dose-limiting; prevented by IV saline hydration + amifostine)
- Ototoxicity (irreversible high-frequency hearing loss)
- Peripheral neuropathy
- Most emetogenic agent -- requires 5-HT3 antagonist + NK1 antagonist prophylaxis
- Hypomagnesemia, hypokalemia

Carboplatin vs Cisplatin:
Carboplatin has less nephrotoxicity and ototoxicity but more myelosuppression.

Cisplatin

Quick Tip: This drug is notorious for nephrotoxicity and ototoxicity and is used in testicular and ovarian carcinomas.

47. Which of the following drugs is used in alcohol de-addiction (aversion therapy)?

(A) Disulfiram

(B) Naloxone

(C) Flumazenil

(D) Buprenorphine

Correct Answer: (A) Disulfiram

SOLUTION:

Alcohol de-addiction pharmacology is a high-yield NEET PG topic.

Disulfiram -- Mechanism of Aversion Therapy:
Normal ethanol metabolism: Ethanol → Acetaldehyde (by ADH) → Acetate (by ALDH)
Disulfiram irreversibly inhibits **ALDH (aldehyde dehydrogenase)**, causing accumulation of acetaldehyde after alcohol intake.

Disulfiram-Ethanol Reaction (DER):
Flushing, throbbing headache, nausea, vomiting, tachycardia, hypotension, dyspnea. In severe cases: arrhythmias, MI, death.

Other drugs causing disulfiram-like reaction with alcohol:
- **Metronidazole** (most commonly tested)
- Tinidazole, Ornidazole
- Cefoperazone, Cefamandole (methylthiotetrazole side chain)
- Chlorpropamide (sulfonylurea)
- Griseofulvin

Other drugs for alcohol dependence:
- **Naltrexone**: Opioid receptor antagonist; reduces craving and euphoria (anti-craving)
- **Acamprosate**: Modulates GABA and NMDA receptors; reduces withdrawal discomfort
- **Benzodiazepines**: Treat acute alcohol withdrawal (prevents seizures and

delirium tremens)

Disulfiram

Quick Tip: This drug inhibits aldehyde dehydrogenase, causing an unpleasant reaction when alcohol is consumed.

• • •

48. Which of the following statements is TRUE about Warfarin?

(A) It inhibits Vitamin K-dependent clotting factors by blocking Vitamin K epoxide reductase

(B) It acts immediately on administration and reaches full effect within 2 hours

(C) It is monitored by measuring aPTT

(D) It crosses the placenta and is safe in pregnancy

Correct Answer: (A) It inhibits Vitamin K-dependent clotting factors by blocking Vitamin K epoxide reductase

SOLUTION:

Warfarin pharmacology is one of the most frequently tested topics in NEET PG.

Mechanism:
Warfarin inhibits **Vitamin K epoxide reductase (VKORC1)**, preventing recycling of Vitamin K epoxide to active Vitamin K hydroquinone. This blocks γ-carboxylation of glutamate residues on Vitamin K-dependent factors: II, VII, IX, X, Protein C, Protein S.

Onset:
Delayed by 48-72 hours (existing factors must be cleared). First factor depleted = Factor VII (t1/2 = 4-6 h), causing early PT prolongation. Therapeutic full effect in 3-5 days.

Monitoring:
PT/INR (Prothrombin Time) -- tests the extrinsic + common pathway (Factors VII, X, V, II, fibrinogen). Target INR for most indications = 2-3. aPTT monitors unfractionated heparin.

Key pharmacokinetic facts:
- Completely absorbed orally; highly protein-bound (99%); hepatic metabolism via CYP2C9
- Genetic variants: VKORC1 and CYP2C9 affect dose requirements
- Warfarin crosses the placenta (CONTRAINDICATED in pregnancy -- teratogenic)

Antidote: Vitamin K1 (phytomenadione) -- for non-urgent reversal; Fresh Frozen Plasma (FFP) or Prothrombin Complex Concentrate (PCC) for urgent reversal.

Drug interactions: Enzyme inducers (rifampicin, carbamazepine) decrease effect; enzyme inhibitors (azole antifungals, amiodarone, metronidazole) increase effect.

Inhibits Vitamin K epoxide reductase (VKORC1)

Quick Tip: Warfarin's anticoagulant effect is delayed and it is monitored by a specific coagulation test involving the extrinsic pathway.

• • •

49. Which of the following drugs is known to cause retroperitoneal fibrosis?

(A) Methysergide

(B) Metformin

(C) Amlodipine

(D) Propranolol

Correct Answer: (A) Methysergide

SOLUTION:

Retroperitoneal fibrosis (RPF) is a high-yield NEET PG topic in pharmacology adverse effects.

Prototype drug: Methysergide
Methysergide is an ergot alkaloid derivative used in migraine prophylaxis. It is the classic drug causing drug-induced RPF. It is a partial agonist at 5-HT2A/2B receptors and an antagonist at 5-HT2C receptors.

Mechanism of fibrosis:
5-HT2B receptor agonism activates fibroblasts and promotes collagen deposition in the retroperitoneal space, leading to progressive fibrosis encasing the ureters and great vessels.

Clinical features of RPF:
- Dull back/flank pain
- Hydronephrosis and renal failure (ureteral obstruction)
- Lower limb edema (venous/lymphatic compression)

Other drugs causing RPF:
- Ergotamine (ergot class)
- Pergolide and cabergoline (dopamine agonists -- 5-HT2B agonism)
- Beta-blockers (atenolol, propranolol -- rare association)
- Hydralazine, methyldopa

Prevention:
Drug holiday of 1 month for every 6 months of methysergide therapy is recommended.

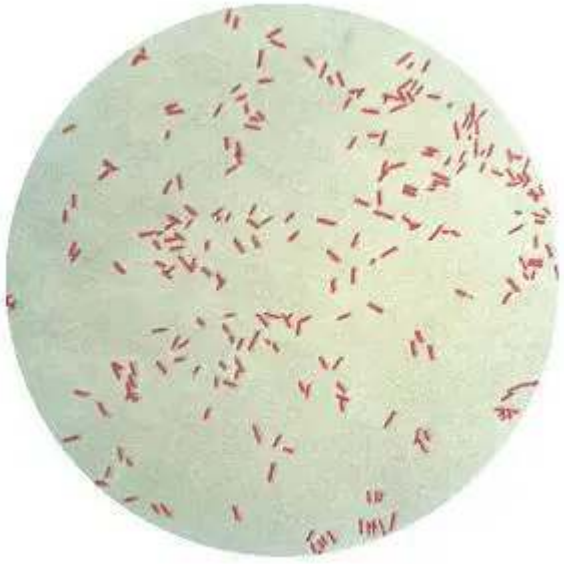
Memory tip: Methysergide → Retroperitoneal Fibrosis (also causes pleuropulmonary and endocardial fibrosis)

Methysergide

Quick Tip: This ergot derivative used for migraine prophylaxis is the classic drug associated with retroperitoneal fibrosis.

• • •

50. A patient presented with 70% burns. A test was done on a sample collected from the burnt site as shown in the picture in suspicion of the probable causative organism which is an obligate aerobe. What's the microbe?



(A) Pseudomonas aeruginosa

(B) Meningococcus

(C) Streptococcus pyogenes

(D) Pneumococcus

Correct Answer: (A) Pseudomonas aeruginosa

SOLUTION:

Approach via organism characteristics:

The key constraint is *obligate aerobe* causing infection in a burn patient.

Among the options:
- **Pseudomonas aeruginosa**: obligate aerobe, gram-negative rod, motile -- classic burn wound pathogen
- **Meningococcus**: facultative anaerobe
- **Streptococcus pyogenes**: facultative anaerobe
- **Pneumococcus**: facultative anaerobe

Pseudomonas aeruginosa produces pyocyanin (blue-green pigment), pyoverdin, and exotoxin A. It is gram-negative, motile with polar flagella, oxidase-positive, and the leading cause of burn wound sepsis. It is the only obligate aerobe among the choices.

Pseudomonas aeruginosa

Quick Tip: Think of the obligate aerobe that commonly colonizes burn wounds and produces a characteristic blue-green pigment.

• • •

51. A truck driver presented with a painless, demarcated ulcer on penis with inguinal lymphadenopathy. What is the best method of visualization of motility of the probable causative agent?

(A) Dark field microscopy

(B) Light microscopy

(C) Fluorescent microscopy

(D) Electron microscopy

Correct Answer: (A) Dark field microscopy

SOLUTION:

Systematic reasoning:

Clinical clues: painless penile ulcer + inguinal lymphadenopathy = primary

syphilis caused by **Treponema pallidum**.

Why dark field microscopy?
- ***T.pallidum*** is 6--20 microns long but only 0.1--0.18 microns wide -- below the resolution limit of standard light microscopy
- It does not stain with Gram or Giemsa reliably
- Cannot be cultured on artificial media
- In dark field microscopy, oblique light makes the thin spirochetes appear bright white against a dark background, allowing direct visualization of their characteristic *corkscrew motility*

Other direct detection methods include DFA-TP (direct fluorescent antibody) and NAATs -- but for motility specifically, dark field is required.

Dark field microscopy

Quick Tip: The causative agent of a painless penile chancre is a spirochete best visualized alive by a special microscopy technique that makes it appear bright on a dark background.

• • •

52. Swab is discarded in which color bin?

(A) Yellow bag

(B) Red bag

(C) White bag

(D) Blue bag

Correct Answer: (A) Yellow bag

SOLUTION:

Biomedical Waste Management Rules 2016 -- Color Code:

Color	Contents
Yellow	Anatomical waste, blood/body fluid-contaminated items (swabs, dressings), pharma waste
Red	Disposables (IV tubes, catheters, urine bags, syringes without needles)
White	Sharps (needles, scalpels, blades)
Blue	Contaminated glass, ampoules, vials

A swab is contaminated with body secretions/blood -- it belongs to the *Yellow bin* category along with dressings, plaster casts, and cotton swabs.

Memory aid: *Yellow = biohazardous body fluid items that need incineration.*

Yellow bag

Quick Tip: Recall which bin collects items contaminated with blood and body fluids under Indian biomedical waste management rules.

• • •

53. A female engineer works for 12-14 hours a day and gives a history of consuming only fast food. There are no vegetables or fruits in his diet. Her Hb count is 9 gm/dl MCV 120 fl. On examination, PS shows macrocytes. What will be the diagnosis?

(A) Vitamin B12 deficiency

(B) Folic acid deficiency

(C) Vitamin D deficiency

(D) None

Correct Answer: (A) Vitamin B12 deficiency

SOLUTION:

Step-by-step deduction:

Given data:
- Hb = 9 gm/dl (anaemia)
- MCV = 120 fl (normal: 80-100 fl) -- macrocytic
- Peripheral smear: macrocytes
- Diet: only fast food, no vegetables or fruits

Macrocytic anaemia causes: **Vit B12 deficiency**, **Folate deficiency**, liver disease, hypothyroidism, drugs.

Diet analysis:
- No vegetables/fruits -- depletes folate
- Fast food may contain animal products -- but lacks micronutrient variety
- According to the explanation: lack of dietary B12 intake from a non-varied diet leads to B12 deficiency megaloblastic anaemia

B12 stores in liver last 3-5 years; prolonged inadequate dietary intake eventually depletes them, causing megaloblastic changes (hypersegmented neutrophils, macro-ovalocytes).

Vitamin B12 deficiency

Quick Tip: A high MCV with macrocytes on peripheral smear in a patient with no vegetables or fruits in diet points to a megaloblastic deficiency vitamin.

• • •

54. A patient was suspected of having brucellosis. Serum sample was sent for a standard agglutination test. It came negative initially but after dilution of the serum sample, the test was positive. What could be the reason for the initial negative test?

(A) Prozone

(B) Postzone

(C) Complement inactivation

(D) Antigen antibody complexes

Correct Answer: (A) Prozone

SOLUTION:

Immunology concept: Zones of antigen-antibody reaction

In an agglutination reaction, the precipitation/agglutination pattern depends on the ratio of antigen (Ag) to antibody (Ab):

Zone	Ratio	Result
Prozone	Excess Ab	No agglutination (false negative)
Equivalence	Optimal Ag:Ab	Maximum agglutination
Postzone	Excess Ag	No agglutination (false negative)

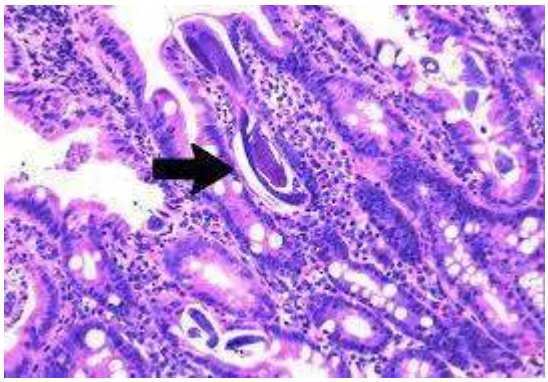
In this case: undiluted serum = high Ab concentration = *prozone* = false negative. On dilution, Ab concentration falls to the equivalence zone = agglutination seen = positive test.

Standard Agglutination Test (SAT) for brucellosis uses a titre of 1:160 or more as significant. False negative SAT occurs in:
- Prozone phenomenon
- Presence of blocking (incomplete IgG4) antibodies

Prozone

Quick Tip: When an agglutination test is negative at high antibody concentration but positive after dilution, recall which zone of the antigen-antibody reaction is responsible.

55. A patient who was on steroids presented with nocturnal cough and chronic urticaria. BAL stain was done. Identify the organism.



(A) Strongyloides stercoralis

(B) Enterobius

(C) Ancylostoma

(D) Capillaria philippinensis

Correct Answer: (A) Strongyloides stercoralis

SOLUTION:

Parasitology reasoning -- immunocompromised host:

Key clues:
- Patient on *steroids* (immunocompromised)
- Nocturnal cough (pulmonary involvement)
- Chronic urticaria (skin manifestation -- larva currens)
- BAL stain done (pulmonary larvae)

Strongyloides stercoralis life cycle and hyperinfection:
- Unique autoinfection cycle: rhabditiform larvae in gut transform to infective filariform larvae
- Filariform larvae penetrate colon wall or perianal skin, reach lungs via bloodstream
- In immunocompromised patients (steroids, HIV, HTLV-1): massive autoinfection = Disseminated Strongyloidiasis
- BAL reveals filariform (L3) larvae
- Skin manifestation: larva currens (racing larva) -- linear urticarial track moving

rapidly

Other helminthic infections do NOT cause hyperinfection in steroid-immunosuppressed patients in the same manner.

Strongyloides stercoralis

Quick Tip: In an immunocompromised patient on steroids with pulmonary symptoms, think of the nematode known for autoinfection and hyperinfection syndrome.

• • •

56. Blood spill management

(A) Ethyl Alcohol

(B) Chlorhexidine

(C) Formaldehyde

(D) Sodium Hypochlorite

Correct Answer: (D) Sodium Hypochlorite

SOLUTION:

Infection Control -- Blood Spill Protocol:

Standard blood spill management steps:
1. Don gloves before approaching the spill
2. Absorb excess blood with disposable paper/cloth
3. Clean with water and detergent
4. Apply disinfectant: **Sodium Hypochlorite** 0.5% (10,000 ppm available chlorine)
- Prepared as 1:10 dilution of 5.25% sodium hypochlorite bleach
- Must be freshly prepared daily

Why sodium hypochlorite?
- Broad-spectrum activity: bacteria, enveloped and non-enveloped viruses, fungi

- Inactivates HIV (requires 0.1% = 1000 ppm), HBV (requires 0.5% = 5000 ppm), HCV
- Cheap and readily available
- WHO and CDC recommended for blood/body fluid spills

Chlorhexidine = skin antiseptic. Alcohol = general surface disinfection. Formaldehyde = sterilant, not for spills.

Sodium Hypochlorite

Quick Tip: The WHO-recommended disinfectant for blood and body fluid spills in healthcare settings is a chlorine-based compound used at 0.5% concentration.

• • •

57. A child presented with bloody stools and abdominal pain. What enrichment medium should be used for the faeces sample?

(A) Selenite F broth

(B) Alkaline peptone water

(C) Blood agar

(D) Muller Hinton Broth

Correct Answer: (A) Selenite F broth

SOLUTION:

Approach: Pathogen-to-medium mapping

The clinical picture -- bloody stools with abdominal pain in a child -- points to *Shigella* dysentery.

Key enrichment media and their targets:

- Selenite F broth -- *Salmonella* and *Shigella* (inhibits coliforms via selenite toxicity)
- Alkaline peptone water (pH 8.6) -- *Vibrio cholerae*
- Tetrathionate broth -- *Salmonella*
- Robertson's cooked meat broth -- anaerobes

Selenite ions inhibit the Gram-negative coliforms that predominate in stool, giving *Shigella* a growth advantage during the first 12 hours. The sample is then sub-cultured onto MacConkey agar or XLD (Xylose Lysine Deoxycholate) agar for identification.

Selenite F broth

Quick Tip: Think about which enrichment broth is used specifically for Shigella culture from stool samples.

• • •

58. What is the vector for a parasite which has kinetoplast in one of its morphological forms?

(A) Sand fly

(B) TseTse fly

(C) Female Anopheles Mosquito

(D) Triatomine bug

Correct Answer: (A) Sand fly

SOLUTION:

Approach: Organelle-to-organism identification

The kinetoplast is a DNA-rich region of the single large mitochondrion, unique to protozoa of the order Kinetoplastida. The clinically important kinetoplastid

parasites are:

- ***Leishmania*** spp. -- amastigote (intracellular, in macrophages) has a prominent kinetoplast; vector = *Phlebotomus* sandfly
- ***Trypanosoma brucei*** -- vector = Tsetse fly (sleeping sickness)
- ***Trypanosoma cruzi*** -- vector = Triatomine/Reduviid bug (Chagas disease)

The question focuses on the kinetoplast being identifiable in one of its morphological forms. For *Leishmania donovani* causing Kala-azar, the vector is the female sandfly (*Phlebotomus argentipes* in India).

Sand fly (Phlebotomus species)

Quick Tip: The kinetoplast is the hallmark organelle of Leishmania; recall which arthropod transmits this parasite.

• • •

59. A known case of AIDS with productive cough and fever was found to have consolidation in the right infrascapular area. X-Ray chest showed right lower lobe consolidation with CD4 count of 55 per microlitre. What is the most common cause of this?

(A) Staphylococcus aureus

(B) Streptococcus pneumoniae

(C) Mycoplasma

(D) Pneumocystis jirovecii

Correct Answer: (B) Streptococcus pneumoniae

SOLUTION:

Approach: CD4 count and infection correlation in HIV

HIV infection causes progressive depletion of CD4+ T lymphocytes, increasing susceptibility to specific pathogens:

- CD4 >500: Bacterial infections (e.g., *S.* pneumoniae, TB)
- CD4 200-500: Candidiasis, herpes zoster
- CD4 <200: PCP, toxoplasmosis
- CD4 <100: Cryptococcus, MAC, CMV

This patient has CD4 = 55 and lobar consolidation -- a pattern of bacterial pneumonia. While PCP occurs at this CD4 level, it presents with bilateral ground-glass infiltrates, NOT lobar consolidation.

Streptococcus pneumoniae remains the single most common bacterial pulmonary pathogen in HIV at any CD4 level. HIV-1 impairs opsonization and phagocytosis of encapsulated bacteria, making pneumococcus especially dangerous.

Streptococcus pneumoniae

Quick Tip: HIV patients are highly susceptible to encapsulated bacteria; think about which organism most commonly causes lobar pneumonia.

• • •

60. Following admission of a RTA case, there is a spillage of blood on the hospital floor. Which disinfectant will you use to clean the floor?

(A) Sodium Hypochlorite

(B) Ethyl alcohol

(C) Formaldehyde

(D) Chlorhexidine

Correct Answer: (A) Sodium Hypochlorite

SOLUTION:

Approach: Biomedical waste and infection control

Blood spills in clinical areas must be managed per WHO/CDC universal precautions protocol:

Step 1: Remove gross blood with disposable towels, discard in yellow bag (infectious waste).
Step 2: Apply freshly prepared 0.5% sodium hypochlorite solution (1:10 dilution of household bleach) directly onto the spill area.
Step 3: Leave for 10 minutes of contact time, then wipe clean.

Why sodium hypochlorite?
NaOCl releases hypochlorous acid (**HOCl**) which is a potent oxidising agent that denatures proteins and disrupts lipid membranes of pathogens. At 0.5% (10,000 ppm), it is effective against:

- HIV, HBV, HCV (bloodborne viruses)
- Mycobacteria and bacterial spores at higher concentrations

Chlorhexidine and alcohols are inadequate for blood spills due to poor penetration through organic matter. Formaldehyde is toxic and not used for floor cleaning.

Sodium Hypochlorite (0.5%)

Quick Tip: Blood spills in hospitals require a high-level disinfectant effective against bloodborne viruses; recall the bleach used in standard universal precautions.

• • •

61. There is an outbreak of buboes in a community. What is the vector?

(A) Xenopsylla (Rat Flea)

(B) Tse tse fly

(C) Human flea

(D) Sand fly

Correct Answer: (A) Xenopsylla (Rat Flea)

SOLUTION:

Approach: Outbreak analysis via clinical sign identification

Buboes (enlarged tender lymph nodes) in a community outbreak = *Bubonic plague* caused by ***Yersinia pestis***.

Transmission chain:
Infected rat → Rat flea bites rat → Rat dies → Flea seeks new host → Flea bites human → Regurgitates ***Y. pestis*** during blood meal → Bubonic plague

Key vectors for important vector-borne diseases:

- ***Xenopsylla cheopis*** (Oriental rat flea) -- Bubonic plague (***Y. pestis***)
- Tsetse fly -- African sleeping sickness (***T. brucei***)
- Sandfly (***Phlebotomus***) -- Kala-azar (***Leishmania***)
- Triatomine bug -- Chagas disease (***T. cruzi***)
- Female Anopheles -- Malaria (***Plasmodium***)

While facing starvation, ***Xenopsylla*** cheopis feeds on almost any warm-blooded mammal, explaining the human spillover during rat die-offs in an epidemic.

Xenopsylla cheopis (Rat Flea)

Quick Tip: Buboes are the hallmark of plague caused by Yersinia pestis; think about which rodent flea transmits this disease.

• • •

62. A 11 year old girl is having symptoms of fever and sore throat and to diagnose throat swab was taken. Which bag is used to discard the swab after culture?

(A) Yellow bag

(B) Red bag

(C) Blue bag

(D) White bag

Correct Answer: (A) Yellow bag

SOLUTION:

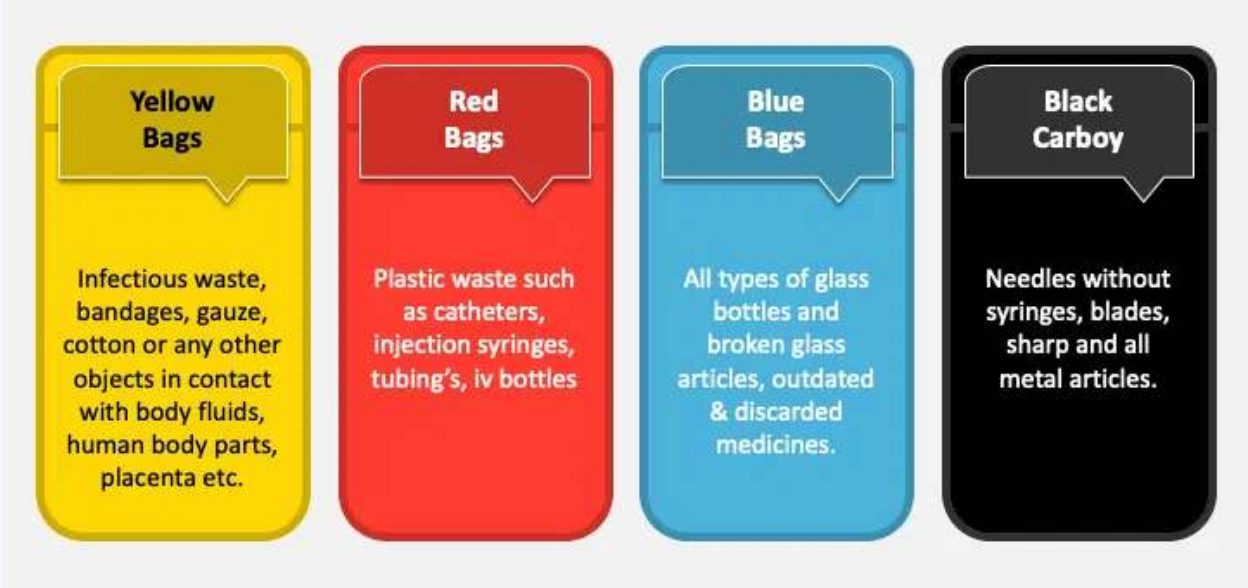
Approach: Biomedical Waste Management Rules (India)

Biomedical waste (BMW) generated in healthcare settings is segregated at the point of generation using a colour-coded container system:

Colour-coded container system:
Yellow: Infectious waste, anatomical waste, microbiology waste → Incineration
Red: Plastic recyclable waste (IV sets, syringes) → Autoclaving then recycling
Blue: Glass waste, discarded medicines → Chemical treatment
Black: General solid waste (non-infectious) → Sanitary landfill

A throat swab post-culture is contaminated microbiological waste (has direct contact with body secretions and contains live pathogens). This classifies it as infectious waste -- Category 1 under BMW Rules 2016 -- requiring disposal in a **Yellow bag** followed by incineration.

Yellow Bag



Quick Tip: Recall the biomedical waste colour-coding system; body fluid-contaminated and microbiology waste goes in one specific colour bag.

• • •

63. Global Hunger Index does not include

(A) Under 5 mortality rate

(B) IMR

(C) Child mortality rate

(D) Child undernutrition

Correct Answer: (B) IMR

SOLUTION:

Approach: Memorisation framework for GHI components

The Global Hunger Index (GHI) uses the mnemonic **UWSC**:

- **U** -- Undernourishment (% of population with insufficient caloric intake)
- **W** -- Wasting in children <5 years (weight-for-height <-2 SD)
- **S** -- Stunting in children <5 years (height-for-age <-2 SD)
- **C** -- Child mortality (under-5 mortality rate)

The under-5 mortality rate captures deaths from birth through age 4 years 364 days. The **Infant Mortality Rate (IMR)** captures only deaths in the first year of life (0-365 days) and is a SUBSET of under-5 mortality, but it is NOT separately listed as a GHI indicator.

The GHI scoring gives equal weight (1/3 each) to: undernourishment, child undernutrition (wasting + stunting averaged), and child mortality.

IMR is NOT included in GHI

Quick Tip: The GHI uses four specific indicators; check whether infant mortality rate is distinct from the under-5 mortality rate used in GHI.

• • •

64. A child presented with bluish white spots in the mouth followed by a rash. What is the genome of probable diagnosis?

(A) Enveloped virus with single stranded RNA

(B) Naked virus with single stranded RNA

(C) Double stranded Naked RNA

(D) Double stranded Enveloped RNA

Correct Answer: (A) Enveloped virus with single stranded RNA

SOLUTION:

Approach: The clinical clue here is bluish-white oral spots (Koplik's spots) followed by a maculopapular rash -- the hallmark presentation of **measles**.

Measles is caused by *Measles morbillivirus*, classified under the family *Paramyxoviridae*. Key virological properties:

- Genome: Single-stranded (ss), negative-sense RNA
- Structure: Enveloped (has a lipid bilayer envelope)

- Nucleocapsid symmetry: Helical
- Non-segmented genome

Comparing options:
- Naked virus with ssRNA -- wrong, measles is enveloped
- Double-stranded naked RNA -- describes Reoviruses
- Double-stranded enveloped RNA -- no such common pathogen; measles RNA is single-stranded

The genome of the measles virus is therefore that of an **enveloped virus with single-stranded RNA**.

Enveloped virus with single stranded RNA

Quick Tip: Think about the classic childhood illness with oral white spots and rash, and recall the family of viruses it belongs to.

• • •

65. 16 month old child, 8 kg weight. On assessing in a growth chart, child falls between standard and -2 SD. What should be done next for the management?

(A) Assure mother that no malnutrition

(B) Mild malnutrition - home treatment

(C) Moderate malnutrition - teach mother on how to feed

(D) Severe malnutrition: refer to NRC

Correct Answer: (D) Severe malnutrition: refer to NRC

SOLUTION:

Clinical analysis: A 16-month-old child weighing 8 kg is being assessed on a growth chart.

The WHO child growth standards classify nutritional status based on weight-for-

age, weight-for-height, and MUAC. For a 16-month-old, the expected weight is approximately 10-11 kg. At 8 kg, this child is significantly underweight.

Management based on severity:

- Between median and -2 SD: Normal -- reassure mother
- Between -2 SD and -3 SD: Moderate acute malnutrition -- community-based management, dietary counseling
- Below -3 SD or MUAC < 115 mm: Severe acute malnutrition (SAM) -- refer to Nutrition Rehabilitation Center (NRC)

The answer key designates this child as having SAM requiring NRC referral. NRC provides therapeutic feeding, management of medical complications, and follow-up.

Severe malnutrition: refer to NRC

Quick Tip: Recall the WHO classification cut-offs and what NRC stands for in the context of child malnutrition management.

• • •

66. An anganwadi teacher takes weight and height of a 4 year old and finds out that height-for-age is < -2 SD. The likely cause is:

(A) Chronic malnutrition

(B) Acute malnutrition

(C) Recent malnutrition

(D) No malnutrition

Correct Answer: (A) Chronic malnutrition

SOLUTION:

Key concept: Anthropometric indices in child nutrition assessment:

- **Height-for-age**: Reflects *linear growth*; reduced values indicate stunting, a marker of *chronic (long-term) malnutrition*
- **Weight-for-height**: Reflects body mass relative to height; reduced values indicate wasting, a marker of *acute malnutrition*
- **Weight-for-age**: Composite indicator reflecting both acute and chronic malnutrition

In this question, height-for-age **<** -2 SD = **stunting** = evidence of prolonged, chronic undernutrition over months to years. This is distinct from wasting (acute or recent deficiency).

The anganwadi teacher's finding of low height-for-age therefore points to **chronic malnutrition**.

Chronic malnutrition

Quick Tip: Recall which anthropometric index reflects long-term versus short-term nutritional status in children.

• • •

67. A farmer is having skin rash which increases on sun exposure. There is also redness of tongue. Maize is his staple diet. Which of the following vitamin deficiency can cause this type of feature?

(A) Niacin deficiency

(B) Folic acid deficiency

(C) Vit C deficiency

(D) Vit K deficiency

Correct Answer: (A) Niacin deficiency

SOLUTION:

Diagnosis: Pellagra

The classic presentation -- photosensitive skin rash, glossitis, and history of maize (corn) as staple diet -- points directly to **Pellagra**, caused by **Niacin (Vitamin B3) deficiency**.

Why maize? Corn is a poor source of both niacin and tryptophan (the amino acid precursor of niacin). Populations relying heavily on maize are therefore predisposed to pellagra.

The 4 Ds of Pellagra:

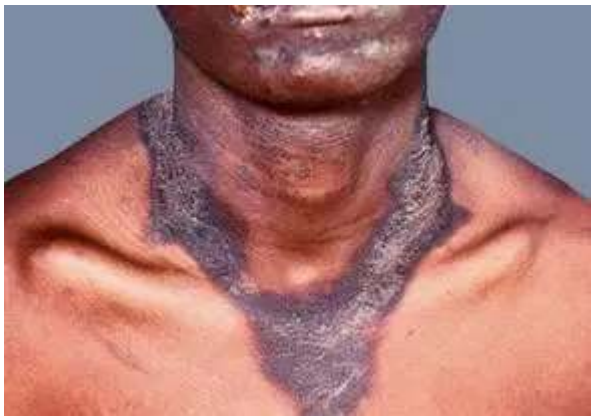
- Dermatitis: Photosensitive, symmetric rash on sun-exposed skin
- Diarrhea: Watery, sometimes bloody stools
- Dementia: Neuropsychiatric manifestations
- Death: If untreated

Comparing other options:
- Folic acid deficiency: megaloblastic anemia, neural tube defects -- no photosensitive rash
- Vitamin C deficiency: scurvy (bleeding gums, perifollicular hemorrhages)
- Vitamin K deficiency: coagulation defects

Niacin deficiency

Quick Tip: Think about the classic vitamin deficiency associated with a corn/maize-based diet and photosensitive skin rash.

68. A 45 year old man presents with the following skin changes (image showing hyperpigmented, thickened rash over the neck and chest in a photosensitive distribution). What relevant history will you take to diagnose this condition?



(A) H/o dietary pattern, dementia, diarrhea

(B) Dietary history

(C) Dementia

(D) Depression

Correct Answer: (A) H/o dietary pattern, dementia, diarrhea

SOLUTION:

Image interpretation: The skin changes shown -- hyperpigmented, rough, thickened rash over the neck and chest in a sun-exposed distribution (Casal's necklace) -- are pathognomonic of **Pellagra**.

Pellagra = Niacin (Vitamin B3) deficiency

To confirm the diagnosis of pellagra, the clinician must elicit history of all three classic features -- the **3 Ds**:

1. **Dermatitis**: Already evident on examination -- photosensitive, bilateral, symmetric
2. **Diarrhea**: Ask about loose or watery stools
3. **Dementia**: Ask about memory loss, confusion, or behavioral changes

Additionally, a dietary history focusing on maize/corn intake, alcohol use, or

malabsorptive conditions explains the nutritional cause.

Option A -- *H/o dietary pattern, dementia, diarrhea* -- captures both the etiological (dietary) and clinical (dementia + diarrhea) history needed for diagnosis.

Options B, C, D are individually insufficient as they cover only one dimension of the syndrome.

H/o dietary pattern, dementia, diarrhea

Quick Tip: Recall the three D's of Pellagra and which historical features you need to elicit to confirm the diagnosis.

• • •

69. A girl child has had recurrent yeast and respiratory virus infections since she was 3 months old. Now considering studies for immune status, which vaccine is contraindicated?

(A) TT/Td

(B) Measles/MMR

(C) DPT

(D) Killed IPV

Correct Answer: (B) Measles/MMR

SOLUTION:

Clinical reasoning: Recurrent yeast (fungal) and viral respiratory infections since 3 months of age suggest a primary immunodeficiency, most likely **SCID** (Severe Combined Immunodeficiency) or a combined T- and B-cell defect.

General rule: Live vaccines are contraindicated in immunocompromised patients because the attenuated organism can replicate unchecked and cause overt disease.

Vaccine classification:
- TT/Td: Inactivated toxoid -- safe
- MMR (Measles/Mumps/Rubella): *Live attenuated* -- **contraindicated**
- DPT: Inactivated (diphtheria/tetanus toxoids + killed pertussis) -- safe
- Killed IPV: Inactivated polio vaccine -- safe

Other live vaccines contraindicated in immunocompromised individuals include BCG, oral polio vaccine (OPV), varicella vaccine, yellow fever vaccine, and rotavirus vaccine.

Measles/MMR (live attenuated vaccine)

Quick Tip: Identify whether the child is immunocompromised, then recall which vaccine types are contraindicated in immunodeficiency states.

• • •

70. In a 10 year school child under the school health program, which vaccine has to be given?

(A) BCG

(B) MMR

(C) TT, Td

(D) DPT

Correct Answer: (C) TT, Td

SOLUTION:

School Health Program Immunization in India:

Under India's National Immunization Schedule (NIS), school-age children receive booster doses to maintain protection against vaccine-preventable diseases. The schedule for school children is as follows:

- Age 5 years: DPT booster + OPV booster
- Age 10 years: **TT (Tetanus Toxoid)**
- Age 16 years: **TT (Tetanus Toxoid)**

The Td (Tetanus-diphtheria) toxoid is also used in this age group because immunity to tetanus and diphtheria declines as children grow older and earlier vaccine protection wanes.

Why not the others?
- BCG: Birth dose only
- MMR: Infancy and toddler schedule
- DPT: Early childhood (primary and first booster); not repeated at age 10

At 10 years under the school health program, the indicated vaccine is therefore **TT/Td**.

TT, Td

Quick Tip: Recall the National Immunization Schedule for school-age children in India and which toxoid booster is given at age 10.

• • •

71. There is an outbreak of encephalitis in a community. According to the universal immunization schedule, the route of administration of vaccine for the likely infection is?

(A) Live & subcutaneous

(B) Killed & subcutaneous

(C) Live & intramuscular

(D) Killed & intramuscular

Correct Answer: (A) Live & subcutaneous

SOLUTION:

Approach: An encephalitis outbreak in a community within the UIP context points to Japanese Encephalitis (JE).

Key fact -- JE vaccine in India's NIS: India uses the *live attenuated SA 14-14-2 strain* JE vaccine (cell culture-derived, imported from China) under the National Immunization Schedule. Key properties: Type = Live; Route = Subcutaneous; Dose = 0.5 mL; Site = Left upper arm.

Why not other options? Killed JE vaccines (mouse brain-derived or cell culture-derived inactivated) are used in other countries and given IM, but are NOT the vaccine in India's national programme. So options B, C, D are incorrect.

Schedule details: Dose 1 at 9-12 months (with measles); Dose 2 at 16-24 months (with DPT booster + measles 2nd dose). Administered in 83 JE-endemic districts.

Live & Subcutaneous

Quick Tip: Under India's National Immunization Programme, the JE vaccine used is live attenuated and given via a specific non-intramuscular route.

• • •

72. Low air velocity will be measured by

(A) Kata thermometer

(B) Globe thermometer

(C) Wet thermometer

(D) Beckmans thermometer

Correct Answer: (A) Kata thermometer

SOLUTION:

Concept -- instruments in environmental health:

Low air velocity (air current) measurement requires a specialised instrument sensitive to slow-moving air. The **Kata thermometer** fulfills this role.

Mechanism: The Kata thermometer is a large-bulb alcohol thermometer. Its bulb is warmed in hot water to above 38 degrees C, then held in the air. The time (in seconds) for the alcohol to fall from 38 degrees C to 35 degrees C is recorded. Using the Kata factor engraved on the instrument and a formula, the cooling power and hence the air velocity are calculated.

Why the others are wrong:
- Globe thermometer: measures radiant temperature (used in WBGT index)
- Wet bulb thermometer: measures humidity
- Beckmans thermometer: measures small temperature differences, not air velocity

Kata thermometer

Quick Tip: Think of a heated-alcohol thermometer whose cooling rate reveals the speed of air movement.

• • •

73. School health service is at which level?

(A) District

(B) Subcentre

(C) Subdistrict

(D) PHC

Correct Answer: (D) PHC

SOLUTION:

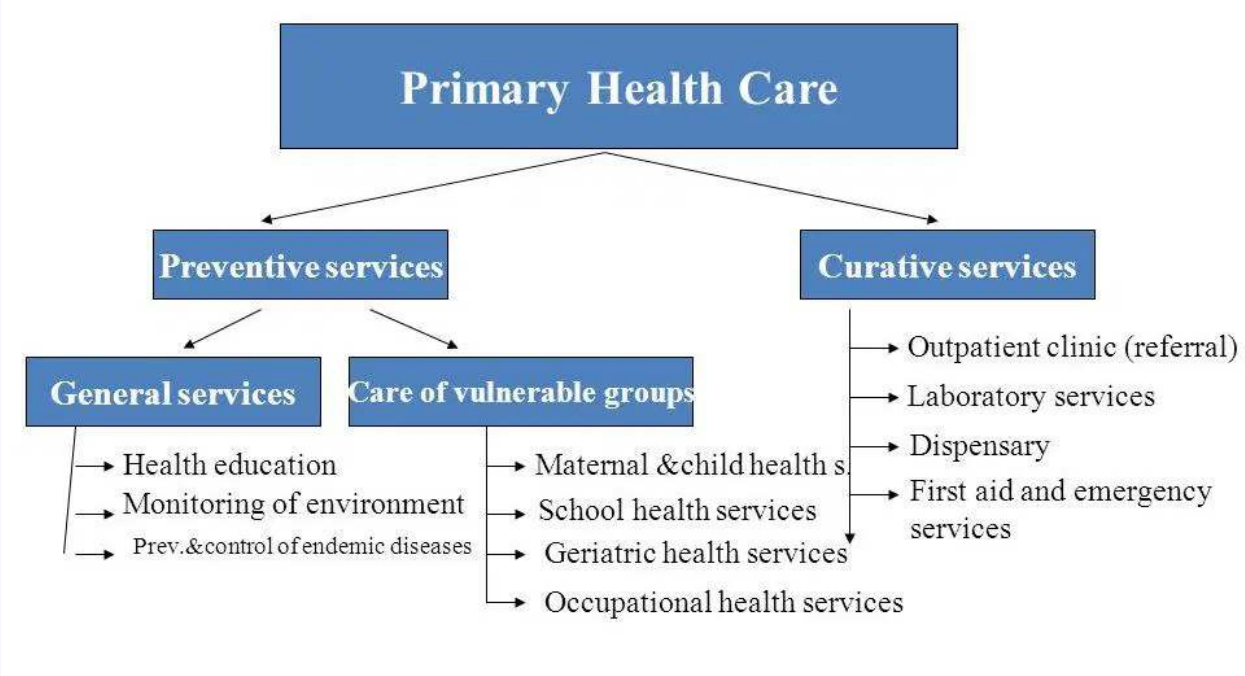
Primary Health Care structure in India:

PHC provides two broad categories of services: (1) Preventive and (2) Curative. The Preventive arm is further split into General Services and Care of Vulnerable Groups.

Care of Vulnerable Groups (at PHC level) includes:
- Maternal & Child Health services
- School Health Services
- Geriatric Health Services
- Occupational Health Services

Since school health service is listed under the PHC-level preventive services for care of vulnerable groups, the correct level is PHC -- not Sub-centre, Sub-district, or District.

PHC (Primary Health Centre)



Quick Tip: School health services fall under care of vulnerable groups in the primary health care preventive services framework.

• • •

74. Post Diwali air pollution index chart was created. Air quality index values on 4 different days were plotted. An AQI value of 470 indicates which level of air pollution?

(A) Poor

(B) Very poor

(C) Severe

(D) Moderate

Correct Answer: (C) Severe

SOLUTION:

Air Quality Index (AQI) -- Indian CPCB Scale:

India's Central Pollution Control Board (CPCB) uses the following AQI classification:

Category	AQI Range
Good	0-50
Satisfactory	51-100
Moderate	101-200
Poor	201-300
Very Poor	301-400
Severe	401 and above

An AQI value of 470 falls above 401, placing it firmly in the **Severe** category.

Health implications of Severe AQI: Affects even healthy individuals; serious respiratory effects in the general population; all outdoor activities should be

avoided.

$$\boxed{\text{Severe (AQI} = 470,\ \text{range } \geq 401)}$$

Air Quality Index Levels of Health Concern	Numerical Value	Meaning
Good	0 to 50	Air quality is considered satisfactory, and air pollution poses little or no risk
Moderate	51 to 100	Air quality is acceptable; however, for some pollutants there may be a moderate health concern for a very small number of people who are unusually sensitive to air pollution.
Unhealthy for Sensitive Groups	101 to 150	Members of sensitive groups may experience health effects. The general public is not likely to be affected.
Unhealthy	151 to 200	Everyone may begin to experience health effects; members of sensitive groups may experience more serious health effects.
Very Unhealthy	201 to 300	Health warnings of emergency conditions. The entire population is more likely to be affected.
Hazardous	301 to 500	Health alert: everyone may experience more serious health effects

Quick Tip: Use the Indian CPCB AQI scale where values above 401 correspond to the highest named category.

• • •

75. A researcher wants to know whether there is an association of CRP values with risk of MI/Cancer. They started to take CRP readings. 4 values of RR (Relative Risk) were plotted (0.5, 1.5, 1.7, 1.8) with respect to CRP.

(A) CRP increases disease/cancer risk

(B) CRP has no relationship

(C) CRP decreases & disease decreases

(D) No association in first interval

Correct Answer: (A) CRP increases disease/cancer risk

SOLUTION:

Epidemiological interpretation of Relative Risk (RR):

RR > 1: Exposure increases risk (positive association)
RR = 1: No association
RR < 1: Exposure decreases risk (protective)

Given RR values at successive CRP intervals:
- Interval 1: RR = 0.5 (below 1 -- appears protective at very low CRP)
- Interval 2: RR = 1.5 (above 1 -- increased risk)
- Interval 3: RR = 1.7 (further increased risk)
- Interval 4: RR = 1.8 (highest risk at highest CRP)

Trend analysis: As CRP rises from interval 2 onward, RR increases progressively (1.5 to 1.8), establishing a dose-response relationship. Epidemiologic data confirm that elevated CRP is associated with increased risk of MI and cancer. This is consistent with the biological plausibility that CRP is a marker of systemic inflammation, which underlies both cardiovascular disease and carcinogenesis.

CRP increases disease/cancer risk

Quick Tip: Interpret the overall trend of the RR values -- most values above 1 indicate a positive association between CRP and disease risk.

76. A child known case of HIV. His CD4 count is 50. Which vaccine is avoided in him/her?

(A) MMR

(B) TT

(C) DPT

(D) BCG

Correct Answer: (A) MMR

SOLUTION:

Principle: Live vaccines in immunocompromised patients

HIV-positive children with severely low CD4 counts (<200 cells/mm3 or equivalent severe immunosuppression) must not receive live attenuated vaccines because the attenuated organism can replicate uncontrolled and cause vaccine-strain disease.

Vaccine classification:
- MMR (Measles-Mumps-Rubella): Live attenuated -- CONTRAINDICATED in severe immunosuppression
- TT (Tetanus Toxoid): Killed toxoid -- SAFE
- DPT: Killed combination vaccine -- SAFE
- BCG: Live attenuated (also contraindicated in symptomatic HIV, but MMR is the primary exam answer for this clinical scenario)

Contraindications for MMR include:
- Severe immunosuppression (including HIV with low CD4)
- Pregnancy
- Severe anaphylactic reaction to previous dose or vaccine component (gelatin, neomycin)

A CD4 count of 50 in this child represents severe immunodeficiency, making MMR the vaccine to avoid.

MMR

Quick Tip: Live attenuated vaccines are contraindicated in severely immunocompromised patients -- identify which option is a live vaccine contraindicated in severe HIV immunosuppression.

• • •

77. For functioning of a health centre with reference to evaluation, which is the most important determinant for assessing clinical management?

(A) Input

(B) Process

(C) Structure

(D) Outcome

Correct Answer: (D) Outcome

SOLUTION:

Donabedian Model of Healthcare Quality Evaluation:

This model classifies quality indicators into three domains:

1. **Structure** (= Input): Physical and organizational resources -- staff, facilities, equipment. Tells us *what is available* to provide care.

2. **Process**: Clinical actions taken -- diagnosis, treatment decisions, prescriptions, procedures. Tells us *what was done* to the patient.

3. **Outcome**: The result of care -- recovery, restoration of function, patient survival, complication rates, patient satisfaction. Tells us *what happened* to the patient as a result of care.

Why Outcome is most important for clinical management: Outcome is the

gold standard for judging clinical quality because it captures the net effect of all structural and process factors on the patient's health. A health centre may have good structure and appropriate processes, but if patient outcomes are poor, the clinical management is considered inadequate.

Quote from Park's Textbook of PSM: "The outcome of medical care, in terms of recovery, restoration of function and of survival, has been frequently used as an indicator of the quality of medical care."

Outcome

Quick Tip: In quality assessment of healthcare, the Donabedian model's third component -- which measures recovery and survival -- is the ultimate indicator of clinical management quality.

• • •

78. A male presented with urethral discharge as shown in figure. What can be the cause?

(A) Gonorrhea

(B) Hemophilus Ducreii

(C) Syphilis

(D) HIV

Correct Answer: (A) Gonorrhea

SOLUTION:

Approach: A male with purulent urethral discharge -- identify the STI.

Key facts about each option:

- **Gonorrhea** (*Neisseria gonorrhoeae*): Gram-negative diplococci; causes profuse purulent urethral discharge; incubation 1-14 days; diagnosed by Gram stain showing intracellular diplococci or culture on Thayer-Martin medium.
- **Hemophilus Ducreii**: Causes chancroid -- soft, painful genital ulcers with suppurative inguinal lymphadenopathy (bubo), not primarily urethral discharge.
- **Syphilis** (*Treponema pallidum*): Primary syphilis = painless indurated chancre; does not cause purulent discharge.
- **HIV**: A retrovirus causing immunosuppression; does not directly cause urethral discharge.

The image shows classic purulent urethral discharge consistent with gonorrhea.

Gonorrhea

Quick Tip: Think of the most common bacterial STI causing profuse purulent urethral discharge in males.

79. A group of people had pastries late at night followed by bouts of vomiting early in the morning. What could be the cause?

(A) S. aureus

(B) B. cereus

(C) E. coli

(D) Lactobacillus

Correct Answer: (A) S. aureus

SOLUTION:

Food poisoning analysis:

The scenario describes a group outbreak after eating pastries, with vomiting as the predominant symptom and a short incubation (a few hours overnight).

Mechanism: ***S.aureus*** produces a **preformed, heat-stable enterotoxin** in food (especially cream-based, high-sugar foods). Once ingested, the toxin acts on the gut and vagal afferents to cause rapid nausea and vomiting. No live bacteria are needed -- even if food is reheated, the toxin survives.

Comparison table:

- ***S.aureus***: Cream pastries, custard; incubation 1-6 hrs; vomiting dominant -- MATCHES
- ***B.cereus*** emetic: Fried rice; incubation 1-5 hrs; vomiting -- different food vehicle
- ***E.coli***: Watery diarrhea; longer incubation -- does not match
- Lactobacillus: Not a pathogen -- does not cause foodborne illness

S.aureus

Quick Tip: Consider which organism produces a preformed heat-stable enterotoxin in cream-based foods causing rapid-onset vomiting.

• • •

80. A pregnant woman whose niece contracted varicella in the same house was negative for serum antibodies of varicella. What would this mean?

(A) She is susceptible to zoster

(B) She is susceptible to chicken pox

(C) She is immune to chicken pox

(D) She is immune to zoster

Correct Answer: (B) She is susceptible to chicken pox

SOLUTION:

Varicella serology in a pregnant contact:

The key data: pregnant woman, household exposure to varicella, serum VZV antibody = **negative**.

Interpretation of VZV antibody status:

- **Positive IgG**: Prior chickenpox or vaccination = immune; no risk of primary varicella; zoster possible if virus reactivates later.
- **Negative IgG**: No prior chickenpox, no vaccination = **susceptible to primary varicella (chickenpox)**; she cannot develop zoster because zoster is reactivation of latent VZV -- no latent virus exists if she never had chickenpox.

Clinical importance: In pregnancy, primary varicella can cause congenital varicella syndrome (limb hypoplasia, skin scarring, CNS defects) if contracted before 20 weeks, and neonatal varicella if contracted near delivery. The management is VZIG (varicella-zoster immunoglobulin) within 96 hours of

exposure.

She is susceptible to chicken pox

Quick Tip: Absent VZV antibodies indicates no prior exposure, which determines susceptibility to primary infection.

• • •

81. A child learning the steps of hand hygiene -- what domain of learning does this involve?

(A) Cognitive

(B) Psychomotor

(C) Affective

(D) Affective and cognitive

Correct Answer: (B) Psychomotor

SOLUTION:

Domain of learning -- Bloom's Taxonomy:

Bloom (1956) classified educational objectives into three domains:

1. **Cognitive**: Recall, understanding, application, analysis, synthesis, evaluation (e.g., knowing the 5 moments of hand hygiene)
2. **Affective**: Attitudes, values, motivation (e.g., appreciating the importance of hand hygiene)
3. **Psychomotor**: Motor skills, physical performance (e.g., actually performing the 7-step WHO handwashing technique)

Why Psychomotor? The question says the child is *learning the steps* -- this refers to physically executing the hand hygiene technique. This is a motor task requiring

coordination, practice, and repetition. Hand hygiene is explicitly classified as a psychomotor skill in medical education literature because correct technique must be physically demonstrated, not merely understood.

Psychomotor

Quick Tip: Consider which domain of learning involves physical skill performance and motor coordination.

• • •

82. What is the SI unit of brightness/illuminance?

(A) Candela

(B) Luminance

(C) Lumen

(D) Lux

Correct Answer: (D) Lux

SOLUTION:

Photometry units -- distinguishing the options:

In photometry (the science of measuring light as perceived by humans), four key quantities exist:

- **Luminous intensity**: How bright a source is in a given direction -- unit = **candela (cd)** (SI base unit)
- **Luminous flux**: Total light emitted in all directions per second -- unit = **lumen (lm)**
- **Illuminance**: Luminous flux received per unit surface area -- unit = **lux (lx)** = $\mathbf{lm/m^2}$
- **Luminance**: Luminous intensity per unit projected area of source -- unit = $\mathbf{cd/m^2}$

Medical relevance: In hospital/workplace settings, recommended illuminance levels are expressed in lux. For example, operating theatres require 10,000-40,000 lux, general wards require 100-300 lux.

Since the question asks for the SI unit of illuminance (brightness of a surface), the answer is lux.

$$\boxed{\text{Lux (lx)}}$$

Quick Tip: Recall which photometric unit measures lumens falling per square metre of surface area.

• • •

83. Receptor for absorption of glucose in intestine when a person is given ORS is:

(A) SGLT-1

(B) SGLT-2

(C) GLP-1

(D) GLUT-1

Correct Answer: (A) SGLT-1

SOLUTION:

ORS and intestinal glucose transport:

The scientific basis of ORS is the glucose-sodium co-transport system in the gut, discovered in the 1960s. Even during active secretory diarrhea, the absorptive mechanism of the enterocyte remains intact.

Glucose transporters comparison:

- **SGLT-1**: Apical membrane of small intestinal enterocytes; co-transports 1 glucose + 2 Na+ (secondary active); the key transporter for ORS absorption

-- CORRECT

- **SGLT-2**: Kidney proximal tubule (S1 segment); reabsorbs ~90% of filtered glucose; target of gliflozin drugs; NOT in intestine
- **GLUT-2**: Basolateral membrane of enterocytes; exports glucose from enterocyte into blood (facilitative, not sodium-linked)
- **GLP-1**: An incretin hormone from intestinal L-cells -- not a transporter at all
- **GLUT-1**: RBCs, blood-brain barrier -- not relevant to intestinal ORS absorption

The sodium gradient driving SGLT-1 is maintained by the basolateral Na^+/K^+-ATPase, making this an example of secondary active transport.

$$\boxed{\text{SGLT-1}}$$

Quick Tip: ORS efficacy depends on sodium-glucose co-transport at the apical surface of small intestinal enterocytes.

• • •

84. A 55-year-old patient from Chattisgarh presents with progressive muscle weakness, stiffness of both lower limbs, and complete paralysis. What is the most important history to ask?

(A) Dietary history

(B) Medical history

(C) Present illness

(D) Socioeconomic history

Correct Answer: (A) Dietary history

SOLUTION:

Geographic and dietary clue approach:

The clinical triad here is: **Chattisgarh + lower limb spastic paraplegia +**

progressive course. This is the classic presentation of **Neurolathyrism**.

Pathophysiology:

- Causative food: ***Lathyrussativus*** (khesari dal, grass pea) -- a cheap, drought-hardy legume consumed heavily during famines
- Toxin: ODAP (beta-N-oxalyl-amino-L-alanine) -- a structural analogue of glutamate; causes excitotoxic damage to upper motor neurons (corticospinal tract)
- Result: Spastic paraplegia with preserved sensation and sphincter control (pure upper motor neuron disease)

Why dietary history is the key question:
Unlike medical conditions that require detailed past medical or drug history, neurolathyrism is diagnosed almost entirely by establishing prolonged dietary exposure to ***Lathyrussativus***. No specific lab test confirms it; the diagnosis rests on: (1) endemic area, (2) characteristic diet, and (3) clinical features.

Prevention is by reducing lathyrus content in diet and detoxifying the seeds.

Dietary history

Quick Tip: Consider an endemic neurological disease in Chattisgarh linked to consumption of a specific drought-resistant legume.

• • •

85. A woman visited ENT OPD with nasal obstruction. On examination, greenish black crusts were present in the nasal cavity covering turbinate and septum. She also had merciful anosmia. What other sign will you find in this case on examination?

(A) Roomy nasal cavity

(B) Hypertrophied inferior turbinate

(C) Polyp

(D) Foreign antibody

Correct Answer: (A) Roomy nasal cavity

SOLUTION:

Approach: This woman has the classic triad of atrophic rhinitis: nasal obstruction, greenish-black foul crusts over turbinate and septum, and merciful anosmia (loss of smell due to atrophy of olfactory nerve endings).

Pathophysiology: In atrophic rhinitis, there is progressive atrophy of the nasal mucosa including seromucinous glands, turbinate bones, and nerve elements. Atrophy of turbinate bones causes them to shrink, paradoxically making the nasal cavity wide and roomy despite complaints of obstruction.

Key examination finding: On speculum examination, the nasal cavity appears abnormally large (roomy). The turbinates are small and shrunken. Dry, greenish-black crusts are visible. When crusts are removed, the underlying mucosa may bleed (epistaxis).

Why other options are wrong:
- Hypertrophied inferior turbinate: seen in hypertrophic rhinitis, not atrophic rhinitis
- Polyp: seen in allergic rhinitis or sinusitis
- Foreign antibody: not a clinical examination sign

The hallmark finding in atrophic rhinitis on examination is the roomy nasal cavity.

Roomy nasal cavity

Quick Tip: Think about what happens to the turbinate bones in a condition where the mucosa undergoes atrophy.

• • •

86. A 35 year old male presented with epistaxis. Conservative management was done to stop the bleeding which failed. What is the next step of management?

(A) Endoscopic Sphenopalatine artery ligation

(B) ICA ligation

(C) ECA ligation

(D) Maxillary artery ligation

Correct Answer: (A) Endoscopic Sphenopalatine artery ligation

SOLUTION:

Clinical scenario: Failed conservative management of epistaxis -- next surgical step?

Stepwise surgical escalation for epistaxis:
1. Conservative: ANP, PNP, cautery
2. Endoscopic sphenopalatine artery (SPA) ligation
3. Maxillary artery ligation
4. ECA ligation

Rationale for SPA ligation first: The sphenopalatine artery is the main arterial supply to the nasal mucosa (terminal branch of the maxillary artery). Endoscopic SPA ligation is minimally invasive with success rates >90% and avoids major surgical morbidity associated with more proximal ligation.

Why not ICA ligation? The internal carotid artery (ICA) is NEVER ligated for epistaxis because it supplies the brain and ligation causes stroke.

Why not ECA or maxillary artery first? These are reserved for cases where endoscopic SPA ligation fails, as they are more invasive procedures.

The correct next step when conservative management of epistaxis fails is endoscopic sphenopalatine artery ligation.

Endoscopic Sphenopalatine Artery Ligation

Quick Tip: After conservative measures fail, the surgical approach targets the terminal nasal blood supply first before ascending to more proximal vessels.

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87. Which of the following is the topical use of Mitomycin C (the medicine shown in the image)?

(A) Subglottic stenosis

(B) Inlay type I myringoplasty

(C) Post-adenoidectomy to control bleeding

(D) Rhino cerebral mucormycosis

Correct Answer: (A) Subglottic stenosis

SOLUTION:

Drug identification: The image shows Mitomycin C vials (10 mg and 40 mg). Mitomycin C is an alkylating antibiotic that cross-links DNA and inhibits fibroblast proliferation and collagen deposition.

Topical Mitomycin C in ENT -- key uses:
- Subglottic stenosis: applied topically after endoscopic dilation to prevent re-stenosis by inhibiting fibroblast activity
- Tracheal stenosis post-tracheostomy
- Laryngeal stenosis
- FESS: applied to sinus ostia to prevent post-operative stenosis
- Septoplasty: to prevent synechiae
- Intubation granuloma

Why not the other options?
- Type I myringoplasty uses fascia or perichondrium grafts; no role for Mitomycin C
- Post-adenoidectomy bleeding: managed by electrocautery, packing, or re-ligation
- Rhino-cerebral mucormycosis: treated with IV amphotericin B and radical surgical debridement; Mitomycin C has no role

Memory tip: Mitomycin C = anti-fibrosis drug used wherever stenosis (scarring and narrowing) is the problem in ENT airway surgeries.

Subglottic stenosis

Quick Tip: Mitomycin C inhibits fibroblast proliferation and is used topically to prevent scar-related stenosis in airway surgeries.

• • •

88. A post-tonsillectomy child was lying in the ward. He started bleeding in the ward. Which of the following should be done?

(A) Take to OT, remove the clot and re-ligation

(B) Take to OT and pressure packing

(C) Cautery

(D) Conservative management

Correct Answer: (A) Take to OT, remove the clot and re-ligation

SOLUTION:

Scenario analysis: Child in ward after tonsillectomy starts bleeding. Since the child is still in the ward (within 24 hours post-surgery), this is **reactionary (primary) haemorrhage**.

Types of post-tonsillectomy bleeding:
1. Primary (immediate intraoperative): managed with pressure packing or cautery
2. Reactionary (within 24 hours): managed by taking to OT, removing clot, and re-ligation
3. Secondary (after 24 hours, usually day 5-10): due to infection; managed conservatively if minor or surgically if severe

Why re-ligation in OT? Reactionary haemorrhage is usually due to slipping of a ligature. A clot may be sitting in the tonsillar fossa masking active bleeding. The clot must be removed under controlled OT conditions and the bleeding vessel re-ligated to achieve haemostasis.

Why not other options?
- Pressure packing/cautery: appropriate for primary intraoperative bleeding, not reactionary
- Conservative management: appropriate for minor secondary haemorrhage only

Answer: Take to OT, remove the clot, and re-ligation is the correct management of reactionary post-tonsillectomy haemorrhage.

Take to OT, remove the clot and re-ligation

Quick Tip: Post-tonsillectomy bleeding in the ward within 24 hours is reactionary haemorrhage; the definitive management requires going to OT to identify and secure the bleeding vessel.

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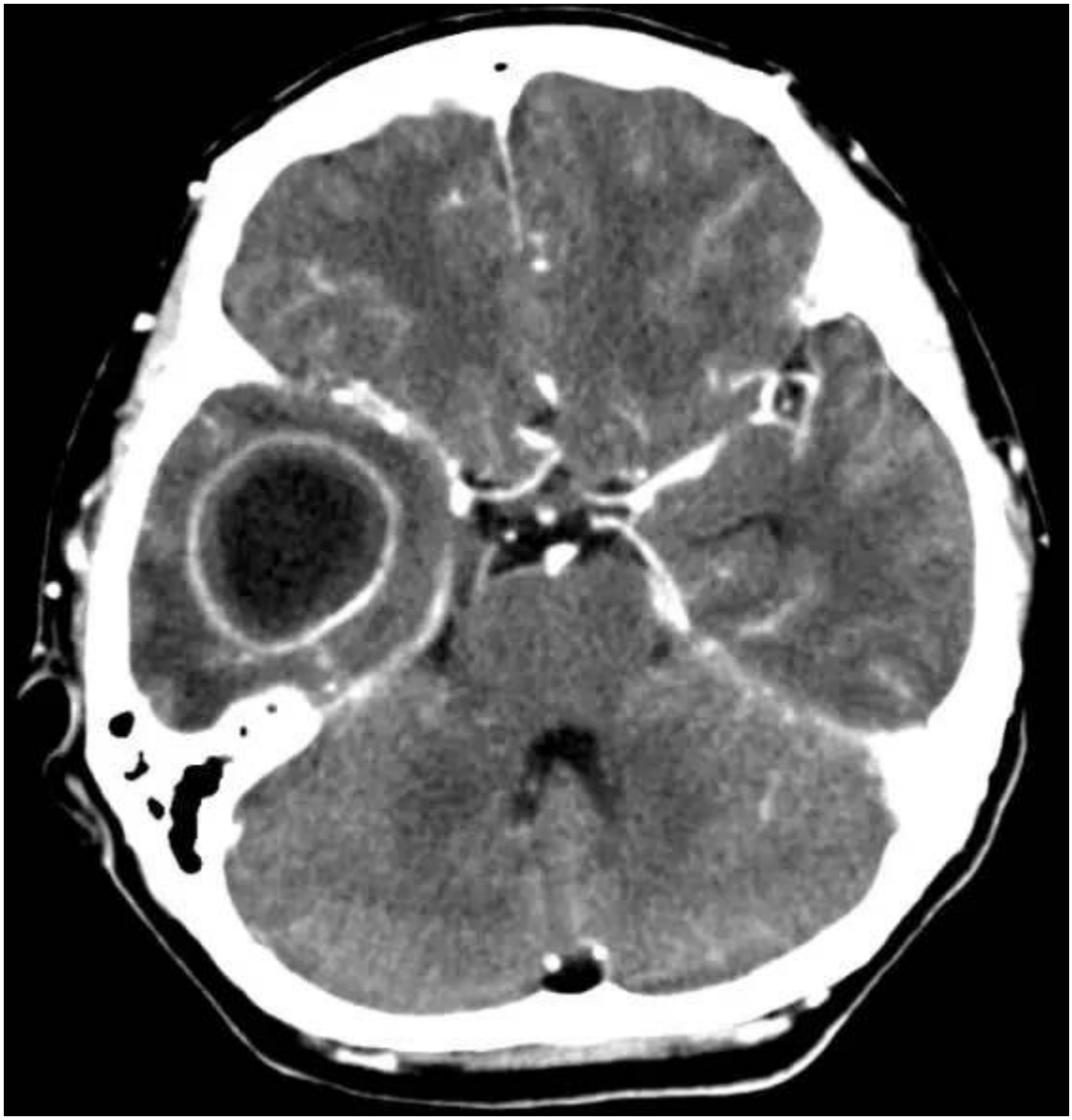
89. Patient with a history of chronic middle ear infection now presents with neurological manifestations, headache, and vomiting. CT Brain is shown (ring-enhancing lesion). What is the probable diagnosis?



(A) Extradural Abscess

(B) Cerebral Abscess

(C) Temporal lobe Abscess

(D) Meningitis

Correct Answer: (C) Temporal lobe Abscess

SOLUTION:

Clinical correlation: CSOM (chronic suppurative otitis media) is the most common cause of brain abscess. The infectious spread occurs via two main routes:
1. Through tegmen tympani (roof of middle ear) into the middle cranial fossa -- causes **temporal lobe abscess**
2. Through sinodural angle into the posterior fossa -- causes **cerebellar abscess**

CT Brain findings: A ring-enhancing lesion (hypodense centre + ring of enhancement on contrast CT) = brain abscess. The ring represents the abscess capsule. Surrounding hypodensity = cerebral oedema.

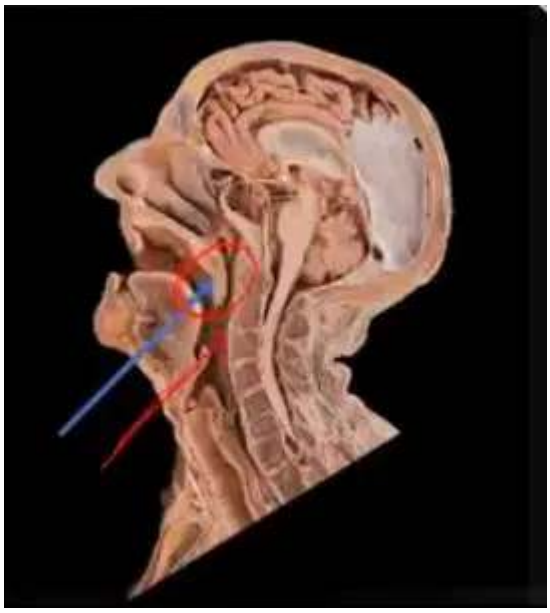
Why temporal lobe (not extradural, not meningitis)?
- Extradural abscess: lenticular-shaped collection outside the dura; no ring enhancement within brain parenchyma
- Meningitis: meningeal enhancement; no parenchymal ring lesion
- Temporal lobe abscess: parenchymal ring lesion in temporal lobe -- consistent with CSOM spread through tegmen tympani

Remember: CSOM intracranial complications in order of frequency: meningitis, extradural abscess, subdural abscess, temporal lobe abscess, cerebellar abscess, lateral sinus thrombophlebitis.

Temporal Lobe Abscess

Quick Tip: Chronic middle ear infection spreads to the brain through the tegmen tympani, most commonly producing an abscess in an adjacent lobe.

90. A patient was admitted with skull base trauma. The doctor was testing the marked structure in the image. Which of the following nerves was being tested?



(A) Vagus

(B) Facial nerve

(C) Glossopharyngeal nerve

(D) Trigeminal nerve

Correct Answer: (C) Glossopharyngeal nerve

SOLUTION:

Anatomical identification: The image shows lateral head-neck dissection in a skull base trauma patient. The marked structure is the **glossopharyngeal nerve (CN IX)**.

CN IX key facts:
- Exits skull via: jugular foramen
- Motor: stylopharyngeus (only muscle)
- Sensory: posterior 1/3 tongue (taste + general), pharynx, soft palate, middle ear
- Parasympathetic: parotid gland via lesser petrosal nerve and otic ganglion
- Autonomic: carotid sinus (baroreceptor), carotid body (chemoreceptor)

Clinical testing of CN IX:

- Gag reflex (afferent limb = CN IX; efferent limb = CN X)
- Taste on posterior 1/3 of tongue
- Sensation of posterior pharyngeal wall

Skull base trauma relevance: Jugular foramen fractures damage CN IX, X, XI (Vernet syndrome). The patient here has skull base trauma and the doctor is testing CN IX.

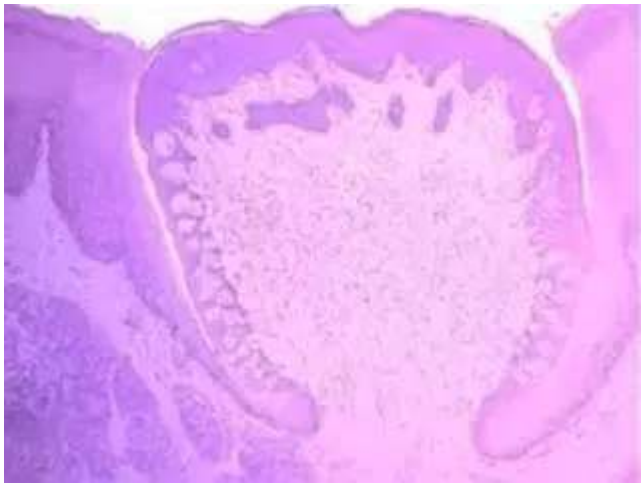
Why not others?
- Facial nerve: exits stylomastoid foramen; tested by facial movements
- Vagus: also at jugular foramen but more inferior; tested by phonation and swallowing
- Trigeminal: exits via superior orbital fissure/foramen rotundum/ovale; tested by facial sensation

Glossopharyngeal nerve (CN IX)

Quick Tip: After skull base trauma, look for which nerve exits through the jugular foramen and is tested by the gag reflex and posterior pharyngeal sensation.

• • •

91. Identify the papillae of the tongue shown in the histology image below (round-shaped papilla with surrounding moat/trench).



(A) Circumvallate

(B) Fungiform

(C) Filiform

(D) Foliate

Correct Answer: (A) Circumvallate

SOLUTION:

Image description: The histology slide shows a large round papilla surrounded by a deep groove (moat/trench). This is the hallmark of **circumvallate (vallate) papillae**.

Comparison of tongue papillae:
- Circumvallate: round, with surrounding trench; Ebner glands open into trench; taste buds in lateral walls; arranged in V at junction of anterior 2/3 and posterior 1/3; 8-12 in number; largest papillae
- Fungiform: mushroom-shaped; taste buds on top surface; no surrounding trench
- Filiform: cone/thread-shaped; most numerous; no taste buds; mechanical function only
- Foliate: club/leaf-shaped; lateral margins of tongue; parallel folds; rudimentary in adults

Memory aid:
- Circumvallate = "wall" surrounds it (vallum = wall in Latin) -- the surrounding moat
- Fungiform = fungus/mushroom shaped
- Filiform = filament/thread shaped (fil = thread)
- Foliate = leaf shaped (folia = leaf)

The round papilla with a surrounding trench and Ebner glands (serous) at the base = circumvallate papilla.

Quick Tip: Look for the characteristic surrounding trench/moat and the associated serous Ebner glands in the histology slide to identify this large papilla.

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92. A 33 year old female patient presented with inability to see the right side from both the eyes. What is the most probable cause?

(A) Injury to Left Optic Tract

(B) Right occipital lobe lesion

(C) Optic chiasma lesion

(D) Right optic nerve lesion

Correct Answer: (A) Injury to Left Optic Tract

SOLUTION:

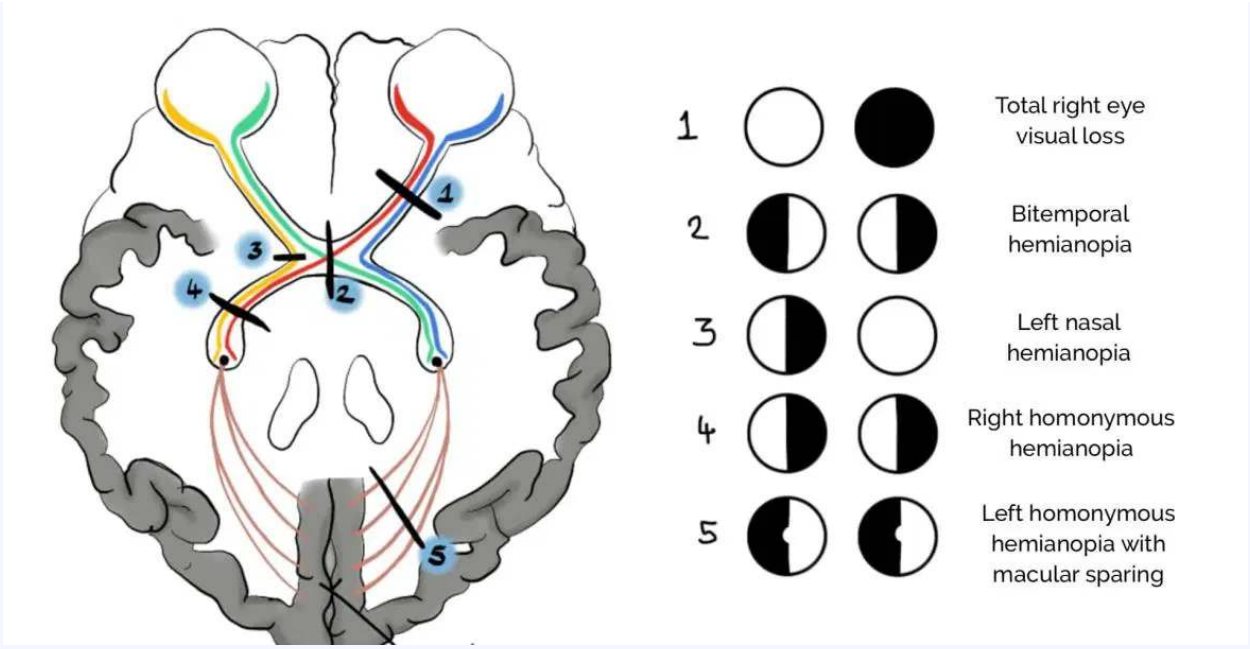
The patient has loss of the right visual field in both eyes, which is called *right homonymous hemianopia*.

Key rule: The **left optic tract** carries fibres from the nasal retina of the right eye (which crossed at the chiasma) and the temporal retina of the left eye. These fibres together encode the **right visual field**.

A lesion of the left optic tract therefore eliminates the right visual field from both eyes simultaneously -- producing right homonymous hemianopia.

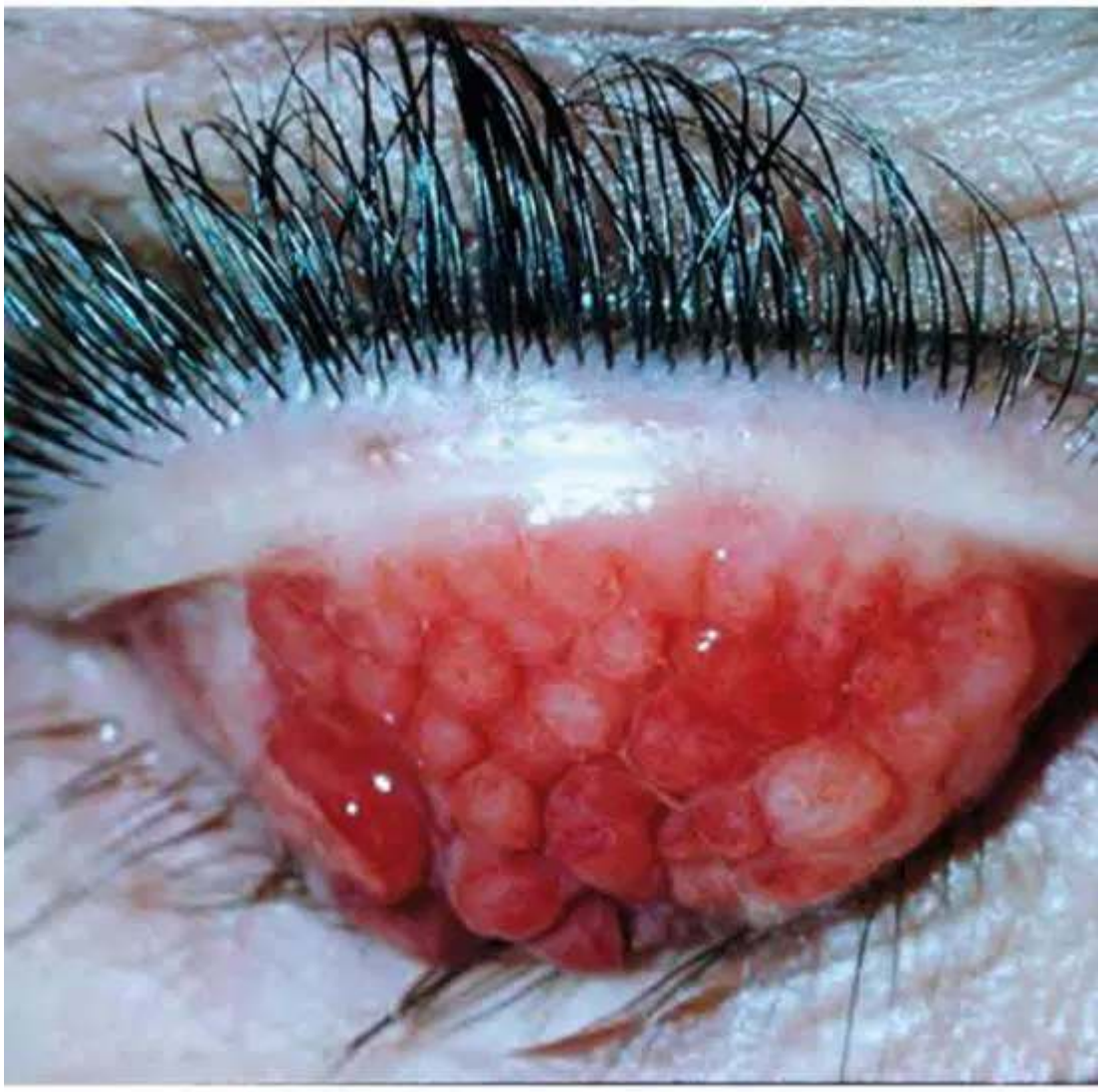
Differential reasoning:
- Optic chiasma lesion → bitemporal hemianopia (lose outer fields of both eyes)
- Right optic nerve lesion → total monocular blindness in the right eye
- Right occipital lobe lesion → left homonymous hemianopia (opposite side)

Left optic tract injury



Quick Tip: Think about which side of the brain processes the right visual field.

93. A patient with contact lens use since 2 years presented with the features shown in the image (giant papillae on the upper tarsal conjunctiva with increased mucus and itching). What is the most probable cause?



(A) Giant Papillary Conjunctivitis

(B) Trachoma

(C) Vernal Keratoconjunctivitis

(D) OSSN (Ocular Surface Squamous Neoplasia)

Correct Answer: (A) Giant Papillary Conjunctivitis

SOLUTION:

The clues are: (1) contact lens use for 2 years, (2) giant papillae in the upper tarsal conjunctiva, (3) increased mucus, itching, and decreased lens tolerance.

This clinical picture defines **Giant Papillary Conjunctivitis (GPC)**.

Mechanism: Protein deposits on the contact lens act as antigens, triggering a hypersensitivity reaction. The inflammatory infiltrate includes mast cells, eosinophils, and basophils in the epithelium, and lymphocytes and plasma cells in the stroma.

Why not the others?
- Trachoma: caused by *Chlamydia trachomatis*, not contact-lens related
- Vernal keratoconjunctivitis: atopic, young males, seasonal, not contact-lens specific
- OSSN: limbal gelatinous mass, not papillary

Giant Papillary Conjunctivitis

Quick Tip: Consider the inflammatory conjunctival complication most classically linked to prolonged contact lens wear.

• • •

94. A 15 year old girl patient does not want to use specs for myopic astigmatism. What is the best alternative for her?

(A) ICL (Implantable Collamer Lens)

(B) FEMTO Lasik

(C) LASIK

(D) Spherical Specs

Correct Answer: (A) ICL (Implantable Collamer Lens)

SOLUTION:

The patient is 15 years old with myopic astigmatism who refuses spectacles.

Key age restriction: LASIK (including FEMTO-LASIK) is approved only for patients **18 years or older** with a stable refraction. A 15-year-old has an actively

changing prescription, making laser ablation unsafe and unreliable.

ICL (Implantable Collamer Lens) is the best alternative because:
- It is a phakic IOL placed between the iris and the natural lens
- It corrects myopia, hyperopia, and astigmatism over a wide dioptre range
- The procedure is reversible -- if refraction changes, the lens can be exchanged
- It preserves natural accommodation
- No minimum age restriction applies as strictly as for laser surgery

Spherical specs would not correct the astigmatic component effectively.

ICL (Implantable Collamer Lens)

Quick Tip: LASIK requires the patient to be at least 18 years old; look for the reversible phakic lens option.

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95. A boy working on a hammer & chisel had a foreign body entering his eye. Which investigation is detrimental (contraindicated) for this boy?

(A) X-ray

(B) B scan orbit

(C) CT Scan

(D) MRI

Correct Answer: (D) MRI

SOLUTION:

Mechanism of injury: hammer striking a chisel generates high-velocity metallic fragments. The foreign body is therefore metallic and likely ferromagnetic.

MRI is contraindicated in this scenario because the strong static magnetic field of the MRI scanner will exert translational force and torque on ferromagnetic metallic objects. Inside the eye, this can cause the fragment to move and lacerate

the retina, choroid, or optic nerve, leading to permanent vision loss or globe rupture.

Safe alternatives for localising intraocular foreign bodies:
- **X-ray orbit**: quick, detects radiodense (metallic) objects
- **CT orbit**: gold standard -- detects both metallic and non-metallic foreign bodies, provides 3D localisation without magnetic risk
- **B scan ultrasound**: useful when X-ray/CT unavailable, but use with caution in open globe

MRI -- contraindicated in metallic IOFB

Quick Tip: A magnetic field is dangerous in the presence of metallic intraocular foreign bodies.

• • •

96. A child presenting with whitish pupillary reflex was treated with enucleation. Histopathology of the specimen showed Flexner-Wintersteiner rosettes. What is the diagnosis?

(A) Retinoblastoma

(B) Rhabdomyosarcoma

(C) Medulloblastoma

(D) Astrocytoma

Correct Answer: (A) Retinoblastoma

SOLUTION:

The triad to recognise: (1) child, (2) leukocoria (white pupillary reflex), (3) Flexner-Wintersteiner rosettes on histopathology.

This combination is pathognomonic of **Retinoblastoma**.

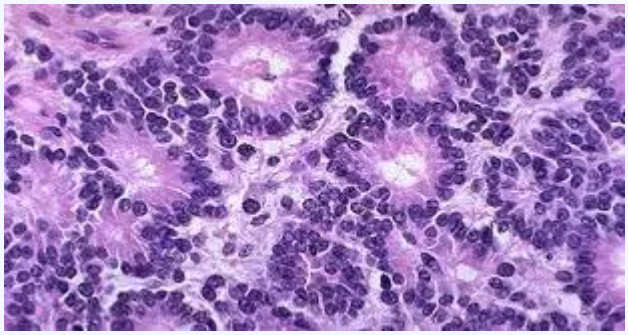
Histopathological features of retinoblastoma:

- Small hyperchromatic cells with a high nuclear-to-cytoplasmic ratio
- Large areas of necrosis with multifocal calcification
- **Flexner-Wintersteiner rosettes**: tumour cells arranged around a central lumen with a limiting membrane -- represent photoreceptor differentiation (poorly differentiated, <50%)
- Homer-Wright rosettes: cells around a central tangle of fibrils -- seen in well-differentiated (>50%) retinoblastoma

Genetics: inactivation of *RB1* tumour suppressor gene (chromosome 13q14) -- two-hit hypothesis (Knudson).

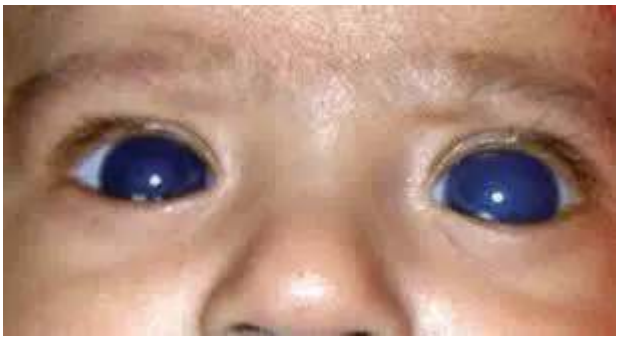
Rhabdomyosarcoma, medulloblastoma, and astrocytoma do not show Flexner-Wintersteiner rosettes.

Retinoblastoma



Quick Tip: Flexner-Wintersteiner rosettes are pathognomonic for the most common intraocular tumour of childhood.

97. A one month old baby presents with watering and increased corneal size. What is the diagnosis?



(A) Buphthalmos

(B) Hurler's Syndrome

(C) Galactosemia

(D) Cataract

Correct Answer: (A) Buphthalmos

SOLUTION:

Clinical picture: 1-month-old infant + epiphora (watering) + enlarged corneal diameter = **Buphthalmos** due to Primary Congenital Glaucoma (PCG).

Why does the eye enlarge?
In infants, the sclera is thin and elastic. Elevated IOP distends the entire globe outward. The cornea enlarges beyond normal limits (>12 mm at birth is abnormal; >13 mm is diagnostic of PCG). Horizontal breaks in Descemet's membrane (Haab's striae) appear due to stretching.

Classic triad of PCG:
- Epiphora (watering)
- Photophobia
- Blepharospasm

PCG age variants:
- Newborn onset (0-1 month)
- Infantile onset (1-24 months) -- most common presentation (3-9 months)
- Late onset (>24 months)

Cause: maldevelopment of the trabecular meshwork and anterior chamber angle impairing aqueous outflow (trabeculodysgenesis).

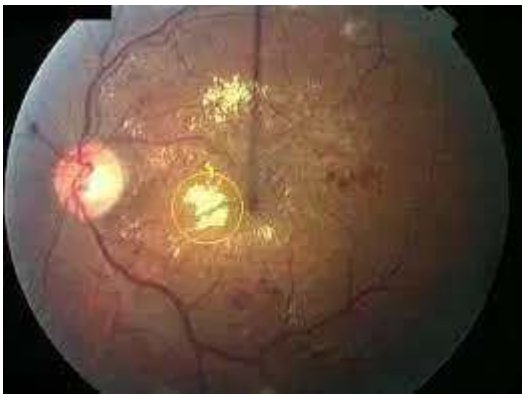
Hurler syndrome causes corneal clouding; galactosemia causes cataract; neither produces buphthalmos.

Buphthalmos (Primary Congenital Glaucoma)

Quick Tip: In infants, elevated IOP causes the entire elastic globe to enlarge, giving an ox-eye appearance.

• • •

98. An elderly woman presented with gradual painless diminution of vision. The fundus picture is shown below (yellowish-white deposits around the macula). What is the diagnosis?



(A) Hard Exudates in Diabetic Retinopathy

(B) Flame shaped haemorrhages in Hypertensive Retinopathy

(C) Soft Exudates in Hypertensive Retinopathy

(D) CRVO (Central Retinal Vein Occlusion)

Correct Answer: (A) Hard Exudates in Diabetic Retinopathy

SOLUTION:

The fundus shows yellowish-white, well-defined deposits around the macula in an elderly woman with gradual painless visual loss.

These are **hard exudates** -- the hallmark of diabetic maculopathy.

Composition: lipid and lipoprotein deposits that leak from damaged retinal capillaries and accumulate in the outer plexiform layer.

Appearance: bright yellow, waxy, well-defined edges; often arranged in a circinate (ring) pattern around foci of leaking microaneurysms.

Clinical significance: hard exudates at or near the fovea indicate **clinically significant macular oedema (CSME)** -- a sight-threatening complication of diabetic retinopathy. Large deposits can lead to subretinal fibrosis, one of the most devastating sequelae of diabetic maculopathy.

Distinguishing features:
- Soft exudates (cotton-wool spots): fluffy white, ill-defined -- nerve fibre layer infarcts in hypertension
- Flame haemorrhages: red streaks -- hypertensive retinopathy
- CRVO: "blood and thunder" fundus with haemorrhages in all 4 quadrants

Quick Tip: Yellowish waxy deposits with well-defined edges around the macula in a diabetic patient represent lipid-laden hard exudates.

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99. A patient with carcinoma of rectum has been taken up for surgery. The superior rectal artery is to be ligated. Which of the following is the correct level of ligation of the superior rectal artery?

(A) At the origin from the inferior mesenteric artery

(B) At the level of the pelvic brim

(C) At the level of S3

(D) At the level of the promontory of sacrum

Correct Answer: (B) At the level of the pelvic brim

SOLUTION:

Approach: Vascular anatomy applied to colorectal surgery.

The inferior mesenteric artery (IMA) terminates as the superior rectal artery (SRA). As the SRA descends toward the pelvis, it crosses the left common iliac vessels at the **pelvic brim**. This anatomical crossing point is the landmark surgeons use to identify and divide the SRA during resection for rectal carcinoma.

Why not at the IMA origin? Ligation at the IMA origin (high tie) is reserved for sigmoid and descending colon cancers to maximally harvest the apical lymph nodes along the IMA trunk. For rectal cancer, the SRA is specifically ligated at the pelvic brim to achieve clearance of lymph nodes along the SRA while preserving the IMA trunk if required.

Key landmark: The SRA crosses the left common iliac artery and vein as it transitions from the retroperitoneum into the pelvis -- this is the pelvic brim level.

Superior rectal artery is ligated at the level of the pelvic brim

Quick Tip: The superior rectal artery crosses a major vascular landmark as it enters the pelvis.

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100. Drug of choice for pheochromocytoma during surgery is:

(A) Phentolamine

(B) Phenoxybenzamine

(C) Propranolol

(D) Prazosin

Correct Answer: (A) Phentolamine

SOLUTION:

Pheochromocytoma -- Intraoperative Pharmacology

During surgical removal of a pheochromocytoma, handling of the tumor releases massive catecholamine surges causing acute hypertensive crises. The drug must work *rapidly* and be *titratable*.

Drug comparison table:

- **Phentolamine** -- non-selective competitive alpha blocker, IV bolus 2-5 mg, onset within 2 minutes, duration 10-15 minutes. Drug of choice intraoperatively.
- Phenoxybenzamine -- non-selective irreversible alpha blocker, used for preoperative preparation (10-14 days). Too long-acting for acute intraoperative use.
- Propranolol -- beta blocker, added only after alpha blockade to control reflex tachycardia. Never used alone (risk of unopposed alpha stimulation).
- Prazosin -- selective alpha-1 blocker, alternative for preoperative preparation only.

Phentolamine is the drug of choice during pheochromocytoma surgery

Quick Tip: Think about which alpha blocker has a short, titratable action suitable for acute intraoperative use.

101. Sengstaken Blakemore tube is used in:

(A) Bleeding esophageal varices

(B) Boerhaave syndrome

(C) Carcinoma esophagus

(D) Achalasia cardia

Correct Answer: (A) Bleeding esophageal varices

SOLUTION:

Sengstaken Blakemore Tube -- Design and Use

The SB tube has 3 lumens and 2 balloons:

- Gastric balloon (inflated with 200-250 ml air) -- anchored at cardia to tamponade fundal varices.
- Esophageal balloon (inflated to 25-45 mmHg) -- compresses esophageal varices directly.
- Gastric aspiration lumen -- for suctioning gastric contents.

Indication: Acute bleeding from esophageal or gastric varices (complication of portal hypertension), as a *bridge* to definitive therapy (TIPSS or sclerotherapy).

Modified Minnesota tube has an additional esophageal aspiration port above the esophageal balloon.

Key contraindication: Recent esophageal surgery, suspected esophageal rupture.

Sengstaken Blakemore tube is used for bleeding esophageal varices (tamponade)

Quick Tip: The SB tube works by balloon tamponade of a specific vascular complication of portal hypertension.

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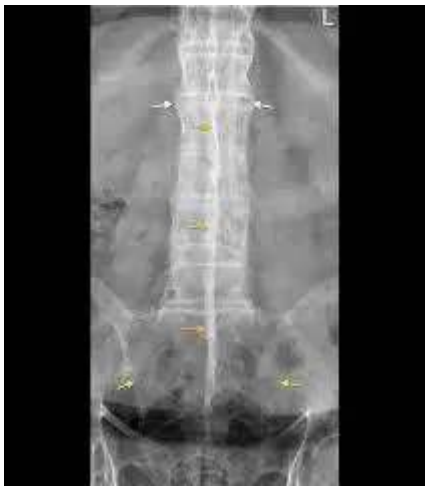
102. Meigs syndrome is associated with:



(A) Ovarian fibroma, ascites, and pleural effusion

(B) Ovarian dermoid, ascites, and pleural effusion

(C) Uterine fibroid, ascites, and pleural effusion

(D) Ovarian cystadenocarcinoma, ascites, and pleural effusion

Correct Answer: (A) Ovarian fibroma, ascites, and pleural effusion

SOLUTION:

Meigs Syndrome -- Complete Overview

Classical triad:

- Benign ovarian tumor -- most commonly *ovarian fibroma* (also fibrothecoma, thecoma)
- Ascites
- Pleural effusion (right-sided in 70%, bilateral in 10%, left-sided in 10%)

Key feature: All three resolve completely after surgical excision of the ovarian fibroma. This distinguishes it from malignant etiologies of the same triad.

Pseudo-Meigs syndrome: Same triad but with non-fibroma pelvic masses (teratoma, Brenner tumor, uterine leiomyoma, struma ovarii).

Pathophysiology: Tumor produces peritoneal fluid (ascites) which crosses the diaphragm via lymphatics into the pleural space, preferentially on the right side due to diaphragmatic lymphatic anatomy.

Serum CA-125 may be elevated in Meigs syndrome (may mimic malignancy -- important clinical trap).

Meigs syndrome: Ovarian fibroma + Ascites + Pleural effusion

Quick Tip: Meigs syndrome involves a specific benign solid ovarian tumor causing fluid accumulation in two body cavities.

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103. Instrument used for ligation of pedicles in thyroid surgery is:

(A) Kocher's forceps

(B) Lane's tissue forceps

(C) Dunhill forceps

(D) Babcock's forceps

Correct Answer: (C) Dunhill forceps

SOLUTION:

Surgical Instruments in Thyroid Surgery

Key instruments and their specific roles:

- **Dunhill forceps** -- curved haemostatic artery forceps; used for clamping thyroid vascular pedicles (superior thyroid pedicle and inferior thyroid pedicle) prior to ligation. Classic answer for thyroid pedicle ligation.
- **Kocher's forceps** -- heavy, toothed clamps; used to hold and retract thyroid lobe itself during mobilization.
- **Lahey's forceps** -- curved right-angle forceps; used to define the plane around the recurrent laryngeal nerve.
- **Babcock's forceps** -- non-crushing; used for bowel / delicate tissue grasping, not thyroid pedicles.

Mnemonic: *Dunhill Does thyroid Pedicle ligation.*

Dunhill forceps are used for ligation of pedicles in thyroid surgery

Quick Tip: This curved haemostatic forceps was specifically designed for use in thyroid surgery.

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104. Duct most commonly involved in chronic pancreatitis is:

(A) Main pancreatic duct (Wirsung)

(B) Accessory pancreatic duct (Santorini)

(C) Common bile duct

(D) Ampulla of Vater

Correct Answer: (A) Main pancreatic duct (Wirsung)

SOLUTION:

Ductal Pathology in Chronic Pancreatitis

Chronic pancreatitis leads to progressive fibrosis and ductal changes predominantly in the **main pancreatic duct (duct of Wirsung)**.

Key imaging finding: "Chain of lakes" or "beaded" appearance on MRCP/ERCP -- alternating dilations and strictures of the main pancreatic duct.

Intraductal changes:

- Protein plugs progressing to calcified stones
- Stricture formation
- Ductal hypertension causing ischemic pain

Surgical relevance: When the main pancreatic duct diameter is >7 mm (dilated), a Puestow procedure (lateral pancreaticojejunostomy) is performed to decompress the duct and relieve pain.

Accessory duct (Santorini) drains the uncinate process and opens at the minor papilla -- it is not primarily affected in chronic pancreatitis.

Main pancreatic duct (Wirsung) is most commonly involved in chronic pancreatitis

Quick Tip: The primary drainage duct of the pancreas shows characteristic chain-of-lakes dilatation in this condition.

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105. Most common cause of hemoptysis worldwide is:

(A) Pulmonary tuberculosis

(B) Bronchiectasis

(C) Lung carcinoma

(D) Mitral stenosis

Correct Answer: (A) Pulmonary tuberculosis

SOLUTION:

Hemoptysis -- Global Epidemiology and Causes

Most common worldwide: Pulmonary tuberculosis (TB)
Most common in developed countries: Bronchiectasis and carcinoma of the lung

Mechanisms of hemoptysis in TB:

1. Erosion of bronchial artery branches by cavitating TB lesions (most common mechanism)
2. Rasmussen aneurysm -- aneurysmal dilatation of a branch of the pulmonary artery within a TB cavity, can cause massive hemoptysis
3. Secondary bronchiectasis from healed TB causing vessel erosion
4. Aspergilloma colonizing old TB cavities causing mycetoma-related bleeding

Severity classification of hemoptysis:

- Mild: <200 ml/24 hr
- Moderate: 200-600 ml/24 hr
- Massive (life-threatening): >600 ml/24 hr or >150 ml/hr

Most common cause of hemoptysis worldwide = Pulmonary Tuberculosis

Quick Tip: Consider a disease with very high global prevalence, especially in developing countries, that erodes pulmonary blood vessels.

• • •

106. Known case of HIV with cough of sputum production & fever with examination finding of consolidation in right infrascapular area with x-ray showing right lower consolidation with CD4 of 55. What is the most common cause of this in these?

(A) Staph aureus

(B) Strep pneumonia

(C) Mycoplasma

(D) P. jiroveci

Correct Answer: (B) Strep pneumonia

SOLUTION:

Approach via CD4 count and pathogen prevalence:

The patient has HIV with CD4 = 55 cells/mm³ and presents with productive cough, fever, and lobar consolidation - a classic bacterial pneumonia picture.

Key principle: In HIV-infected patients, ***Streptococcus pneumoniae*** is the single most common cause of bacterial pneumonia at *any* CD4 count. As CD4 count falls, the incidence of bacterial pneumonia including accompanying bacteremia and septicemia increases.

Why not the other options?

- ***Staph aureus***: Not the most common overall cause in HIV; more likely in IV drug users or post-influenza.
- ***Mycoplasma***: Atypical pathogen; causes interstitial pattern, not lobar consolidation typically.
- ***P. jiroveci*** (PCP): Classic CD4 < 200 opportunist, but causes bilateral ground-glass opacities, not unilateral lobar consolidation; also presents with dry cough, not productive sputum.

Strep pneumonia (Option B)

Quick Tip: Consider which encapsulated bacterium most commonly causes pneumonia

across all CD4 count ranges in HIV patients.

• • •

107. A patient with mediastinal mass was diagnosed with red cell aplasia. What is the probable cause?

(A) Bronchogenic carcinoma

(B) NHL

(C) Thymic neoplasia

(D) T cell ALL

Correct Answer: (C) Thymic neoplasia

SOLUTION:

Classic associations approach:

The clinical triad to recall here is: **anterior mediastinal mass + PRCA + autoimmune condition = Thymoma**.

Acquired Pure Red Cell Aplasia (PRCA) is thought to be caused by an autoimmune mechanism - possibly via a tumor of the thymus gland. Thymoma is located in the anterior mediastinum and accounts for the majority of acquired PRCA cases in adults.

Mediastinal masses and their associations:

- ***Thymoma***: PRCA, myasthenia gravis, hypogammaglobulinemia
- ***NHL/Hodgkin lymphoma***: Anterior/middle mediastinal masses, but not PRCA
- ***Bronchogenic carcinoma***: Posterior/middle mediastinal, not associated with PRCA
- ***T cell ALL***: Thymic involvement but PRCA is not a classic association

Thymic neoplasia (Option C)

Quick Tip: Think about which anterior mediastinal tumour is classically associated with autoimmune haematological conditions including pure red cell aplasia.

• • •

108. A software engineer presented to OPD with complaints of easy fatiguability. He gives a history of sitting in front of the computer for 12-14 hrs a day and consuming junk food and less fruits and vegetables. CBC picture showed Hb concentration as 7gm%, MCV-120. What is the most likely cause of anemia?

(A) Folate deficiency

(B) Sideroblastic anemia

(C) Cyanocobalamin deficiency

(D) Acute blood loss

Correct Answer: (A) Folate deficiency

SOLUTION:

Stepwise differential diagnosis for macrocytic anaemia:

Given data: Hb = 7 gm%, MCV = 120 fL, diet poor in fruits & vegetables, sedentary lifestyle.

MCV > 100 fL = Macrocytic anaemia. The two main nutritional causes are:

- ***Folate deficiency***: Stores last ~3-4 months. Found in green leafy vegetables and fruits. A diet of junk food (lacking fresh produce) rapidly depletes folate stores.
- ***Vitamin B12 deficiency***: Stores last 3-5 years. Found in animal products. Unlikely to be deficient in someone eating junk food (which contains animal products).

The key discriminator here is the **dietary history**: junk food lacking fruits and vegetables = depleted folate, not B12.

Other options eliminated:

- Sideroblastic anaemia: microcytic or normocytic, not macrocytic
- Acute blood loss: normocytic (MCV normal), not macrocytic

Folate deficiency (Option A)

Quick Tip: A high MCV with dietary deficiency of fruits and vegetables points to megaloblastic anaemia from a vitamin found in green leafy foods.

• • •

109. Which of the following is **false** about pheochromocytoma?

(A) Propranolol is preferred drug for hypertension control

(B) Surgery is treatment of choice

(C) VMA are diagnostic test

(D) Catecholamines are diagnostic test

Correct Answer: (A) Propranolol is preferred drug for hypertension control

SOLUTION:

Pheochromocytoma - systematic review of all options:

Pheochromocytoma secretes excess catecholamines (epinephrine, norepinephrine) causing hypertensive crises.

Drug management hierarchy (pre-operative):

1. ***Alpha blockade FIRST***: Phenoxybenzamine (non-selective alpha blocker) - given 1-2 weeks pre-op to control BP and expand volume.
2. ***Beta blockade SECOND*** (only after alpha blockade): To control tachycardia.

Why propranolol alone is dangerous: Beta-2 blockade removes vasodilation, leaving alpha-1 mediated vasoconstriction unopposed ⇒ paradoxical hypertensive crisis.

Diagnostic tests - TRUE facts:

- 24-hour urinary VMA (vanillylmandelic acid): TRUE - classic screening test
- Urinary/plasma catecholamines and metanephrines: TRUE - most sensitive tests
- Surgery (adrenalectomy): TRUE - definitive treatment

The FALSE statement is that propranolol is the preferred drug for hypertension control.

Option A: Propranolol is preferred drug (FALSE)

Quick Tip: In pheochromocytoma, using a beta-blocker alone without prior alpha blockade leads to a dangerous paradoxical rise in blood pressure.

• • •

110. A 50 yr old patient with renal insufficiency was recently operated for pyelolithotomy. Which drug will you give for post-operative analgesia?

(A) Diclofenac sodium

(B) Naproxen

(C) Indomethacin

(D) Acetaminophen

Correct Answer: (D) Acetaminophen

SOLUTION:

Pharmacological safety in renal insufficiency:

Post-pyelolithotomy patient with pre-existing renal insufficiency - the key is to avoid nephrotoxic analgesics.

NSAIDs mechanism of nephrotoxicity:
NSAIDs inhibit COX ⇒ decreased prostaglandins (PGE2, PGI2) ⇒ afferent arteriolar vasoconstriction ⇒ reduced GFR ⇒ worsening renal function.

All three NSAIDs listed (diclofenac, naproxen, indomethacin) are therefore **contraindicated**:

- Diclofenac: selective COX-2 inhibitor, but still nephrotoxic
- Naproxen: non-selective COX inhibitor, nephrotoxic
- Indomethacin: most potent NSAID, most nephrotoxic

Acetaminophen (Paracetamol):
Acts via central COX-3 pathway & endocannabinoid system. Does NOT reduce renal prostaglandins. Safe for use in CKD/renal insufficiency at appropriate doses. Recommended by multiple nephrology guidelines as the preferred analgesic in renal disease.

Acetaminophen (Option D)

Quick Tip: All NSAIDs are contraindicated in renal insufficiency; choose the analgesic that does not act on COX enzymes.

• • •

111. A 68-year-old male presents with cough with sputum and bronchial sounds. RR-20/min, urea-44mg/dl, BP-110/70mmHg. What is the next step in management?

(A) Home Rx

(B) Admit in ICU without MV

(C) Admit in ICU with MV

(D) Room admission

Correct Answer: (D) Room admission

SOLUTION:

CURB-65 scoring system for Community-Acquired Pneumonia:

Clinical data provided: Age 68 yr, RR 20/min, Urea 44 mg/dL, BP 110/70 mmHg, no mention of confusion.

Scoring each parameter:

Parameter	Threshold	Patient value	Score
Confusion (C)	New onset	Not mentioned	0
Urea (U)	>19 mg/dL	44 mg/dL	1
Respiratory Rate (R)	≥30/min	20/min	0
Blood Pressure (B)	SBP <90 or DBP ≤60	110/70 mmHg	0
Age ≥65 (65)	≥65 years	68 years	1

Total CURB-65 Score = 0 + 1 + 0 + 0 + 1 = 2

Score 2 = 9.2% mortality risk = Inpatient (room) admission recommended.

- Score 0-1: Home treatment
- Score 2: Room admission (ward)
- Score ≥3: ICU consideration

Room admission (Option D)

Table 1. CURB-65 Scoring[46]

Symptom	Points
Confusion	1
Urea: BUN >19 mg/dL (>7 mmol/L)	1
Respiratory rate ≥30 breaths/min	1
Systolic BP <90 mm Hg or diastolic BP ≤60 mm Hg	1
Age ≥65 years	1
Total	_____

Score	Risk	Disposition
0 or 1	1.5% mortality	Outpatient care
2	9.2% mortality	Inpatient versus observation admission
≥3	22% mortality	Inpatient admission; consider ICU admission with score of 4 or 5

Abbreviations: BP, blood pressure; BUN, blood urea nitrogen; ICU, intensive care unit.

Quick Tip: Calculate the CURB-65 score using the given parameters to determine the appropriate level of care.

• • •

112. A patient presents with numbness in finger tips and facial skin tightening. ANA is positive with IF nucleolar pattern. What is the most probable diagnosis?

(A) Systemic sclerosis

(B) Sjogren's syndrome

(C) SLE

(D) RA

Correct Answer: (A) Systemic sclerosis

SOLUTION:

Rheumatological diagnosis using ANA IF patterns:

ANA patterns and their disease associations:

- Homogeneous/diffuse pattern: SLE (anti-dsDNA, anti-histone)
- Speckled pattern: SLE, Sjogren's, MCTD (anti-Sm, anti-Ro, anti-La, anti-U1 RNP)
- **Nucleolar pattern: Systemic Sclerosis** (anti-RNA pol I, anti-fibrillarin, anti-Th/To)
- Centromere pattern: Limited SSc/CREST syndrome
- Perinuclear pattern: PR3-ANCA diseases

Clinical correlation:
The patient has ***skin tightening of the face*** (the hallmark of scleroderma - systemic sclerosis) and ***finger tip numbness*** (Raynaud's phenomenon - most common initial feature of SSc).

This combination of:

- Facial skin fibrosis (scleroderma)
- Raynaud's phenomenon (digit numbness/color changes)
- ANA nucleolar pattern

is pathognomonic of **Systemic Sclerosis**.

Note: Nucleolar pattern is common in people with scleroderma (systemic sclerosis) and is NOT characteristic of SLE, RA, or Sjogren's syndrome.

Systemic sclerosis (Option A)

Quick Tip: Facial skin tightening with ANA nucleolar pattern is the classic combination pointing to one specific connective tissue disease.

113.

A hyperventilating patient has ABG value of pH = 7.53, pCO_2 = 20 mmHg, HCO_3 = 26 meq. What is the diagnosis?

(A) Respiratory acidosis

(B) Respiratory alkalosis

(C) Metabolic acidosis

(D) Metabolic alkalosis

Correct Answer: (B) Respiratory alkalosis

SOLUTION:

Approach using the ROME mnemonic (Respiratory Opposite, Metabolic Equal):

Given: pH = 7.53, pCO_2 = 20 mmHg, HCO_3 = 26 meq, history of hyperventilation.

Step 1: pH = 7.53 -- alkalotic (pH > 7.45).

Step 2: Apply ROME -- in Respiratory disorders, pH and pCO_2 move in OPPOSITE directions. pH is high (alkalotic) and pCO_2 is low -- they move in opposite directions, confirming a respiratory origin.

Step 3: Since pH is high and primary cause is respiratory, this is **Respiratory Alkalosis**.

Step 4: HCO_3 = 26 meq is near normal, indicating no significant metabolic compensation yet -- consistent with acute respiratory alkalosis.

Mechanism: Hyperventilation causes excess CO_2 to be blown off, reducing pCO_2 and shifting the equilibrium: $CO_2 + H_2O \rightarrow H_2CO_3 \rightarrow HCO_3^- + H^+$, resulting in decreased H^+ and raised pH.

Respiratory Alkalosis

Quick Tip: Assess the pCO_2 to determine whether the primary disturbance is respiratory or metabolic.

• • •

114.

Patient presents with breathlessness and wheezing. Absolute eosinophil count is 500. Miliary pattern on CXR. Diagnosis?

(A) Miliary TB

(B) Tropical pulmonary eosinophilia

(C) Bronchial asthma

(D) Hypersensitivity pneumonitis

Correct Answer: (B) Tropical pulmonary eosinophilia

SOLUTION:

Clinical reasoning approach:

Given: breathlessness, wheeze, AEC = 500/mm^3, miliary pattern on chest X-ray.

Key diagnostic clue -- the triad of TPE:

1. Nocturnal paroxysmal cough and wheeze (mimics asthma)
2. Peripheral blood eosinophilia (AEC typically >3000, but can be lower early)
3. Bilateral miliary or reticulonodular shadows on CXR

Ruling out other options:
- Miliary TB: miliary shadows YES, but eosinophilia NO -- TB causes lymphocytosis.
- Bronchial asthma: wheeze + mild eosinophilia YES, but miliary CXR NO.

- Hypersensitivity pneumonitis: miliary shadows possible but eosinophilia absent; lymphocytes predominate.

Pathophysiology of TPE:
Filarial larvae (Wuchereria bancrofti) are trapped in pulmonary capillaries, triggering an intense IgE-mediated eosinophilic response. This causes miliary infiltrates and obstructive airway symptoms. Treatment is diethylcarbamazine (DEC) 6 mg/kg/day for 3 weeks.

Tropical Pulmonary Eosinophilia

Quick Tip: The combination of wheezing, miliary CXR pattern, and elevated eosinophil count points to a filarial lung condition.

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115.

Breathing difficulty with generalized weakness. On auscultation a mid diastolic murmur with prominent wave is seen in:

(A) TS (Tricuspid Stenosis)

(B) MS (Mitral Stenosis)

(C) MR (Mitral Regurgitation)

(D) TR (Tricuspid Regurgitation)

Correct Answer: (A) TS (Tricuspid Stenosis)

SOLUTION:

Systematic auscultation and JVP analysis approach:

Clinical data: generalized weakness, breathing difficulty, mid-diastolic murmur, prominent wave (JVP a-wave).

Mid-diastolic murmur differential:
- Mitral stenosis (MS): left-sided, apex, opening snap, associated with AF and left atrial enlargement.
- Tricuspid stenosis (TS): right-sided, left lower sternal border, louder on inspiration.
- Austin Flint murmur (aortic regurgitation): rumbling mid-diastolic at apex, no opening snap.

The discriminating finding -- prominent a-wave:
JVP a-wave represents right atrial contraction. In TS, blood cannot cross the stenosed tricuspid valve easily, so the right atrium contracts forcefully, producing a giant a-wave in the JVP. This is the classical distinguishing feature of TS vs MS.

Other features of TS:
- Carvallo's sign: murmur increases on inspiration (right-sided murmur rule)
- Hepatomegaly and ascites (right heart failure)
- Etiology: rheumatic fever (MC), carcinoid syndrome

Therefore, the answer is **Tricuspid Stenosis (TS)**.

Tricuspid Stenosis (TS)

Quick Tip: A prominent 'a' wave in the JVP combined with a mid-diastolic murmur indicates obstruction at the right AV valve.

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116.

Patient behaving strangely, and CNS features were described. Urine osmolality = 1000 and plasma osmolality = 250. What is the most likely diagnosis?

(A) Hyponatremia

(B) Hypernatremia

(C) Hypokalemia

(D) Hyperkalemia

Correct Answer: (A) Hyponatremia

SOLUTION:

Osmolality-based diagnostic approach:

Given: CNS symptoms (strange behavior), urine osm = 1000 mOsm/kg, plasma osm = 250 mOsm/kg.

Step 1 -- Plasma osmolality interpretation:
Normal plasma osmolality = 285-295 mOsm/kg. Here it is 250 -- significantly low, indicating hypo-osmolar plasma. Plasma osm approximately = 2 x [Na] + glucose/18 + BUN/2.8. Low plasma osm strongly suggests low serum Na (hyponatremia).

Step 2 -- Urine osmolality interpretation:
Urine osm = 1000 mOsm/kg (markedly high = concentrated urine). Expected response to hypo-osmolar plasma: kidneys should suppress ADH and produce dilute urine (osm <100). Instead: high urine osm means ADH is inappropriately elevated = SIADH pattern.

Step 3 -- CNS manifestations of hyponatremia:
Serum Na <125 mEq/L leads to cerebral edema: cells swell due to osmotic water shift, causing altered behavior, confusion, and potentially seizures or coma.

Conclusion: The pattern (low plasma osm + inappropriately high urine osm + CNS features) = Hyponatremia (SIADH).

Hyponatremia

Quick Tip: Compare plasma and urine osmolality: low plasma osmolality with inappropriately concentrated urine suggests hyponatremia with SIADH.

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117.

30 y/F, 70 kg man with serum sodium = 120 mEq/L. Calculate total sodium deficit.

(A) 420

(B) 840

(C) 1400

(D) 280

Correct Answer: (B) 840

SOLUTION:

Formula-based calculation:

Given: Weight = 70 kg, Serum Na = 120 mEq/L, Target Na = 140 mEq/L.

Sodium deficit formula:
Na deficit = TBW × (Desired Na − Actual Na)

Where TBW = **0.6 × body weight (kg)**

Calculation:
TBW = 0.6 × 70 = 42 L

Na deficit = 42 × (140 − 120) = 42 × 20 = 840 mEq

Clinical note: Sodium correction rate should not exceed 8-10 mEq/L per 24 hours to prevent osmotic demyelination syndrome. For chronic hyponatremia, maximum correction is 8 mEq/L/day. Rapid correction can cause central pontine myelinolysis (CPM), characterized by dysarthria, dysphagia, and quadriplegia.

$\boxed{840 \text{ mEq}}$

Quick Tip: Use the formula: Na deficit = 0.6 x weight (kg) x (desired Na - actual Na) with desired Na = 140 mEq/L.

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118.

Hypertension with peripheral edema and CKD. Which drug is preferred?

(A) Aliskiren

(B) Chlorthalidone

(C) Prazosin

(D) Beta blocker

Correct Answer: (B) Chlorthalidone

SOLUTION:

Pharmacological reasoning approach:

Clinical scenario: hypertension + peripheral edema + CKD.

Analysis of options:

Option A -- Aliskiren (direct renin inhibitor):
- Contraindicated in CKD, especially with ACE inhibitors or ARBs
- Risk: hyperkalemia, acute kidney injury -- NOT preferred

Option B -- Chlorthalidone (thiazide-like diuretic):
- Dual action: antihypertensive + diuretic (addresses both HTN and edema)
- Unlike HCTZ, chlorthalidone is effective even when GFR is 30-45 ml/min
- Longer half-life (45-60 hrs) than HCTZ -- better 24-hr BP control
- First-line antihypertensive per JNC guidelines
- PREFERRED in HTN + CKD + edema

Option C -- Prazosin (alpha-1 blocker):
- Causes first-dose hypotension
- No diuretic benefit; does not address edema
- Not first-line in CKD

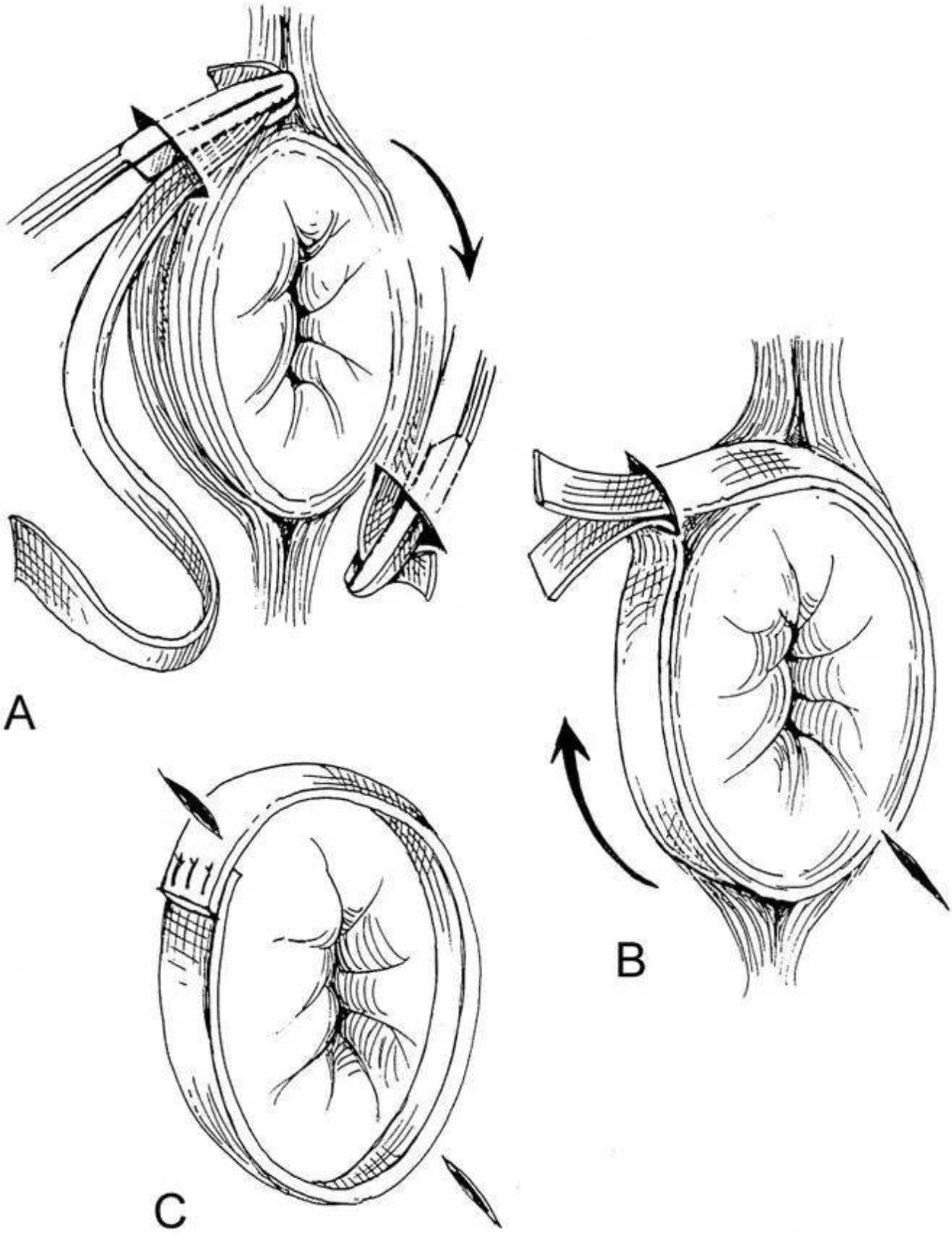
Option D -- Beta blockers:
- Useful for HTN but no significant diuretic effect
- Not preferred when edema is the co-existing problem

Chlorthalidone

Quick Tip: In hypertension with fluid retention and CKD, a diuretic that also lowers blood pressure is the drug of choice.

119.

What surgery is shown here in the image?



(A) Thiersch wiring

(B) Wells procedure

(C) Aktemeier operation

(D) Hemorrhoidectomy

Correct Answer: (A) Thiersch wiring

SOLUTION:

Surgical procedures for rectal prolapse -- identification approach:

The image demonstrates a sequential three-step technique (A, B, C) where a ring-like structure is placed circumferentially around the anal orifice to narrow it.

Rectal Prolapse Surgery Classification:

Perineal approaches (for high-risk or elderly patients):
- **Thiersch wiring / Anal encirclement:** A silver wire, nylon suture, or silastic sling placed subcutaneously around the anus to mechanically prevent prolapse by narrowing the anal canal. This is exactly what is depicted in the image.
- Delorme procedure: mucosal sleeve resection + plication of rectal musculature
- Altemeier procedure: perineal rectosigmoidectomy

Abdominal approaches (for fit patients):
- Wells procedure: posterior rectopexy with Ivalon sponge
- Frykman-Goldberg: sigmoid resection + rectopexy
- Ripstein procedure: anterior rectopexy with mesh

The image of encirclement precisely matches **Thiersch wiring**. It is a palliative procedure -- recurrence is common but it provides symptomatic relief in frail patients.

Thiersch Wiring

Quick Tip: The image shows a circumferential structure being placed around the anus -- think of the operation used for rectal prolapse in elderly high-risk patients.

• • •

120. Post Modified Radical Mastectomy (MRM) patient presented with upper limb swelling. What is the most probable cause?

(A) Upper limb Lymphedema

(B) Angiosarcoma

(C) Recurrence

(D) Metastasis

Correct Answer: (A) Upper limb Lymphedema

SOLUTION:

The surgical procedure involved is Modified Radical Mastectomy (MRM), which includes axillary lymph node dissection. Removal of axillary lymph nodes disrupts the lymphatic channels draining the upper extremity, leading to accumulation of protein-rich lymph fluid in the interstitial tissues -- clinically manifest as arm swelling (lymphedema). Post-mastectomy lymphedema is the *most common* cause of upper limb swelling in this setting, with an incidence of $\mathbf{2-10\%}$. Key contributing factors include: extent of lymph node dissection, adjuvant radiation to the axilla, and post-operative infections. Angiosarcoma (Stewart-Treves syndrome) is a rare malignant transformation arising in chronic lymphedema, not the primary cause of swelling. Recurrence or metastasis may obstruct lymphatics but is not the most probable explanation in the immediate post-operative context.

$$\boxed{\text{Upper limb Lymphedema}}$$

Quick Tip: Think about the most common complication of axillary lymph node dissection during mastectomy.

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121. Repair done for direct inguinal hernia

(A) Lichtenstein repair

(B) Bassini's repair

(C) Herniotomy

(D) All

Correct Answer: (A) Lichtenstein repair

SOLUTION:

Direct inguinal hernia results from weakness of the posterior wall of the inguinal canal (Hesselbach's triangle), not from a patent processus vaginalis. Hence, simple herniotomy (sac ligation alone) is insufficient -- the posterior wall must be reinforced. Among the available options: Bassini's repair strengthens the posterior wall using a tension-based suture technique but carries a higher recurrence rate ($\sim 10-15\%$). Lichtenstein tension-free mesh hernioplasty places a polypropylene mesh over the posterior wall without suturing muscles under tension, achieving a recurrence rate of $< 1\%$ and is therefore the current surgery of choice for direct inguinal hernia in adults. TEP (totally extraperitoneal) and TAPP (transabdominal preperitoneal) laparoscopic approaches are equally effective alternatives.

Lichtenstein repair

Quick Tip: The surgery of choice for direct inguinal hernia uses a synthetic mesh to avoid tension on the repair.

• • •

122. A patient presented with RTA (Road Traffic Accident) leading to breathlessness and decreased air entry into the right lung and the patient is hypotensive. What is the next step?

(A) Needle inserted at 2nd ICS in MCL

(B) Needle inserted at 5th ICS in mid axillary

(C) Fluid resuscitation using wide bore cannula

(D) Wide bore needle decompression

Correct Answer: (B) Needle inserted at 5th ICS in mid axillary

SOLUTION:

The clinical scenario -- RTA + breathlessness + decreased air entry on right + hypotension -- is the classic presentation of tension pneumothorax. Air accumulates in the pleural space and cannot escape, causing progressive mediastinal shift, compression of the contralateral lung, and obstructive shock (hypotension). On bedside assessment, ultrasound (FAST) shows the Seashore sign in B-mode and Stratosphere sign in M-mode confirming pneumothorax. Management is emergency needle thoracocentesis (needle decompression). Insertion site as per updated ATLS guidelines: **4th/5th ICS at the mid-axillary line (MAL)** in adults (previously 2nd ICS MCL -- still used in children). The MAL site is preferred in adults because chest wall thickness at 2nd ICS MCL may prevent a standard 14G cannula from reaching the pleural space, whereas the axillary wall is reliably thinner (**< 4** cm in most adults). Following needle decompression, a chest drain (tube thoracostomy) is inserted definitively at the same site. Fluid resuscitation cannot correct obstructive shock until the mechanical cause is relieved.

Needle at 5th ICS in mid-axillary line

Quick Tip: Breathlessness with absent breath sounds and hypotension after trauma points to tension pneumothorax requiring emergency needle decompression.

• • •

123. After total thyroidectomy, the surgeon is unable to extubate and the patient shows cyanosis and respiratory distress. What is the cause of inability to extubate?

(A) Bilateral recurrent laryngeal nerve palsy

(B) Unilateral recurrent laryngeal nerve palsy

(C) Hemorrhage

(D) Supra laryngeal nerve palsy

Correct Answer: (A) Bilateral recurrent laryngeal nerve palsy

SOLUTION:

After total thyroidectomy, postoperative respiratory distress can arise from: laryngeal edema (most common), bilateral RLN injury, tension hematoma, laryngomalacia, or tracheomalacia. In this question, the key feature is *inability to extubate* combined with *cyanosis and respiratory distress* immediately post-operatively -- indicating acute glottic or subglottic obstruction. The recurrent laryngeal nerve (RLN) innervates the posterior cricoarytenoid (only abductor) and the adductor muscles. When both RLNs are injured during total thyroidectomy, both vocal cords assume the paramedian or median (adducted) position. This bilateral adduction leaves only a narrow glottic chink, causing inspiratory stridor, respiratory failure, and inability to maintain a patent airway without the endotracheal tube. Unilateral RLN injury would only produce hoarseness because the opposite cord compensates. Superior laryngeal nerve injury causes impaired pitch change and supraglottic sensory loss -- not acute airway obstruction. Management of bilateral RLN palsy requires re-intubation or emergency tracheostomy until definitive treatment (arytenoidectomy or lateralization of one cord) is performed.

Bilateral recurrent laryngeal nerve palsy

Quick Tip: Bilateral vocal cord paralysis after thyroid surgery causes both cords to adduct to midline, obstructing the airway.

• • •

124. Asymptomatic varicose veins under CEAP scoring will be classified as

(A) C2a

(B) C2b

(C) C3a

(D) C3b

Correct Answer: (A) C2a

SOLUTION:

The CEAP classification is the internationally accepted standard for classifying chronic venous disease. The Clinical (C) component is graded C_0 through C_6: C_0 = no signs; C_1 = telangiectasias/reticular veins (< 3 mm); C_2 = varicose veins (> 3 mm); C_3 = edema; C_4 = skin changes (pigmentation, eczema, lipodermatosclerosis); C_5 = healed venous ulcer; C_6 = active venous ulcer. Each class carries a symptom qualifier: 'a' (asymptomatic) or 'b' (symptomatic -- pain, heaviness, aching, itching). Varicose veins correspond to C_2. Since the question specifies asymptomatic, the suffix is 'a', giving the classification C_{2a}. If the same varicose veins were causing symptoms such as leg aching or heaviness, they would be classified as C_{2b}.

$$\boxed{C_{2a}}$$

Table 1: CEAP Grading System

C_0	No visible or palpable signs of venous disease
C_1	Telangiectasia or reticular veins (thread veins)
C_2	Varicose veins (diameter >3mm)
C_3	Oedema
C_4	Changes in the skin and subcutaneous tissue: pigmentation, eczema, lipodermatosclerosis or atrophic blanche
C_5	Healed venous ulcer
C_6	Active venous ulcer

Quick Tip: In CEAP classification, C2 denotes varicose veins; the suffix 'a' indicates asymptomatic.

125. A 60-year-old male patient has antral carcinoma which is spreading to the head of the pancreas and multiple small metastases to the right lobe of the liver. What will be the best treatment?

(A) Whipple's surgery

(B) Gastrectomy + Right lobectomy

(C) Gastrojejunostomy

(D) Palliative care

Correct Answer: (C) Gastrojejunostomy

SOLUTION:

Antral (gastric antrum) carcinoma spreading to the head of pancreas with multiple hepatic metastases represents Stage IV (metastatic) gastric cancer. Curative surgery (radical gastrectomy with R0 margins) is contraindicated because: (a) local extension to the pancreatic head makes en-bloc resection morbid, and (b) multiple liver metastases indicate systemic disease beyond surgical cure. Whipple's procedure targets resectable pancreatic/periampullary primaries -- not applicable here. Combined gastrectomy + hepatic lobectomy is unjustified in multifocal metastatic disease. The key problem in antral carcinoma is progressive gastroduodenal obstruction, which occurs in **~ 15%** of advanced cases. Gastrojejunostomy is a palliative bypass -- the stomach is anastomosed to a jejunal loop, bypassing the obstructed gastroduodenal segment -- allowing the patient to eat, maintaining nutrition and quality of life. This is the best surgical palliation when endoscopic stenting fails or is unavailable. Systemic chemotherapy (e.g., FOLFOX, XELOX) is administered concurrently for disease control.

Gastrojejunostomy

Quick Tip: With distant metastases, curative resection is impossible; focus on palliative bypass of the obstructed gastric outlet.

126. MC (Most Common) nerve injured during Submandibular gland surgery?

(A) Lingual nerve

(B) Inferior alveolar nerve

(C) Hypoglossal nerve

(D) Nerve to mylohyoid

Correct Answer: (A) Lingual nerve

SOLUTION:

During excision of the submandibular gland, several nerves traverse the operative field. The lingual nerve (branch of the mandibular division of the trigeminal nerve, V_3) provides general sensation to the anterior two-thirds of the tongue and carries taste fibres (via chorda tympani) and parasympathetic secretomotor fibres to the submandibular and sublingual glands. Anatomically, the lingual nerve descends between the medial pterygoid and the mandible, then loops under Wharton's duct (submandibular duct) in a characteristic double-loop relationship: the nerve crosses from above the duct laterally, winds beneath it, and crosses back superiorly. This intimate looping around Wharton's duct places the lingual nerve at greatest risk during ligation and division of the duct in submandibular gland surgery. Lingual nerve injury results in ipsilateral tongue numbness, loss of taste (anterior **2/3**), and dry mouth. The hypoglossal nerve (CN XII) supplying intrinsic tongue muscles is the second most vulnerable nerve. Injury to the marginal mandibular branch of the facial nerve (CN VII) causes lower lip weakness. The inferior alveolar nerve lies within the mandibular canal and is rarely at risk.

Lingual nerve

Quick Tip: The nerve that wraps around Wharton's duct is most at risk during submandibular gland excision.

127. Which statement is true among all regarding the condition shown?

A. Associated with mixed aerobic and anaerobic infection
B. Orchidectomy should be done
C. Anti-gas gangrene serum should always be used
D. Urinary diversion done

(A) Associated with mixed aerobic and anaerobic infection

(B) Orchidectomy should be done

(C) Anti-gas gangrene serum should always be used

(D) Urinary diversion done

Correct Answer: (A) Associated with mixed aerobic and anaerobic infection

SOLUTION:

Approach: Fournier's gangrene (perineal necrotizing fasciitis) is a rapidly progressive, life-threatening synergistic infection of the perineum and external genitalia.

Microbiology: The hallmark of Fournier's gangrene is a *polymicrobial synergistic*

infection -- a combination of aerobic bacteria (e.g., ***E. coli***, ***Klebsiella***, ***Proteus***) and anaerobic bacteria (e.g., ***Bacteroides***, ***Clostridium***, ***Peptostreptococcus***). The aerobes consume oxygen, creating a low-oxygen microenvironment that favours anaerobic proliferation, while anaerobes produce toxins (e.g., collagenase, hyaluronidase) that facilitate further spread.

Why the testes are spared: The testes receive blood via the testicular arteries (branches of the abdominal aorta) in addition to cremasteric vessels. These vessels are outside the fascial planes involved in Fournier's gangrene, so the testes retain viability -- hence orchidectomy is NOT done.

Management: Emergency wide surgical debridement + broad-spectrum antibiotics (covering aerobes and anaerobes) + ICU support. Anti-gas gangrene serum is NOT routinely indicated. Urinary diversion is only needed if the urethra/bladder is involved -- not universally required.

Answer: A -- Mixed aerobic and anaerobic (synergistic) infection

Quick Tip: Think about the microbiology of synergistic necrotizing fasciitis of the perineum.

• • •

128. An 85-year-old patient has carcinoma of the prostate with Gleason score 6 and PSA <8 ng/ml. What is the best management?

(A) TURP

(B) Radiation

(C) Radical prostatectomy

(D) Keep on active surveillance

Correct Answer: (D) Keep on active surveillance

SOLUTION:

Clinical scenario analysis: An 85-year-old male with prostate cancer (Gleason 6, PSA < 8 ng/ml) requires management that accounts for both disease characteristics and patient factors.

Risk stratification:
- Gleason score 6 = low-grade (well to moderately differentiated)
- PSA < 8 ng/ml = low-risk biochemical marker
- Combined: low-risk localised prostate cancer

Age and life expectancy: At 85 years, expected life expectancy is approximately 5-7 years. Low-risk prostate cancer has a very slow natural history -- the patient is far more likely to die *with* prostate cancer than *from* it.

Why active surveillance is correct:
- Radical prostatectomy: major surgical morbidity (incontinence, erectile dysfunction) unacceptable at 85 years
- Radiation: significant side effects (radiation proctitis, cystitis) without survival benefit in this low-risk, elderly group
- TURP: only palliative for obstruction symptoms, not a cancer treatment
- Active surveillance: monitors PSA and clinical status, intervenes only if progression -- optimal risk-benefit ratio

Answer: D -- Keep on active surveillance

Quick Tip: Consider the patient's age and comorbidities in relation to the indolent nature of Gleason 6 prostate cancer.

• • •

129. A patient underwent cholecystectomy. A stone in the common bile duct (CBD) is detected 2 years after the surgery. What type of stone is it?

(A) Primary

(B) Secondary

(C) Tertiary

(D) Retained stone

Correct Answer: (A) Primary

SOLUTION:

Classification of post-cholecystectomy CBD stones:

Choledocholithiasis after cholecystectomy is classified by the time of detection:

Type	Timing	Origin
Retained	Within weeks post-op	Missed at surgery
Secondary (Residual)	Within 2 years post-op	Migrated from gallbladder / missed at surgery
Primary	After 2 years post-op	Formed de novo in CBD

Mechanism of primary stone formation: Primary CBD stones are typically brown pigment stones. They form due to:
1. Biliary stasis (stricture, stenosis of the sphincter of Oddi)
2. Bacterial infection (*E. coli* produces β-glucuronidase, which deconjugates bilirubin glucuronide into free bilirubin that precipitates with calcium)
3. Altered bile composition in the duct itself

In this question: Stone detected at 2 years post-cholecystectomy = primary CBD stone (de novo formation in the bile duct).

Answer: A -- Primary

Quick Tip: Recall the 2-year cut-off that distinguishes primary from secondary CBD

stones after cholecystectomy.

• • •

130. Gas under the diaphragm is most commonly seen in which of the following conditions?

(A) Viscus perforation

(B) Liver abscess

(C) Spontaneous rupture of oesophagus

(D) Empyema Thorax

Correct Answer: (A) Viscus perforation

SOLUTION:

Pneumoperitoneum -- gas under the diaphragm:

Free intraperitoneal gas rises to the highest point in the abdominal cavity and collects beneath the diaphragm. On an erect chest X-ray or erect abdominal X-ray, this appears as a crescent of radiolucency between the liver (right side) and the diaphragm, and/or between the stomach and the left diaphragm.

Causes of pneumoperitoneum (in order of frequency):
1. **Hollow viscus perforation** (MC) -- perforated peptic ulcer, perforated appendix, perforated carcinoma, perforated diverticulitis
2. Post-laparoscopy / post-laparotomy (iatrogenic)
3. Gas-forming intra-abdominal infections (rare, ~10% of cases)
4. Pneumatosis intestinalis (very rare)

Why not the other options:
- Liver abscess: Gas may be seen within the abscess cavity, NOT as free subdiaphragmatic gas
- Boerhaave syndrome: Produces pneumomediastinum, NOT pneumoperitoneum
- Empyema thorax: Confined to the pleural space -- no intraperitoneal gas

Answer: A -- Viscus perforation

Quick Tip: Gas under the diaphragm on an erect X-ray signifies free air in the peritoneal cavity -- think of the most common cause of pneumoperitoneum.

• • •

131. A patient presents with a left hypochondrium contusion with systolic blood pressure of 70 mmHg and pulse rate of 110 per minute. What should be done next?

(A) FAST (Focused Assessment with Sonography in Trauma)

(B) CECT abdomen

(C) DPL (Diagnostic Peritoneal Lavage)

(D) Abdominal X-ray

Correct Answer: (A) FAST (Focused Assessment with Sonography in Trauma)

SOLUTION:

Trauma management -- haemodynamically unstable patient:

Clinical picture: Left hypochondrium trauma + SBP 70 mmHg + PR 110 bpm = haemodynamic instability. Suspect splenic laceration or left-sided hollow viscus injury with haemoperitoneum.

FAST scan overview:
- Focused Assessment with Sonography for Trauma
- Rapid, non-invasive, bedside, no radiation, no contrast
- Completed in **< 5** minutes
- Detects free fluid (haemoperitoneum) in Morrison's pouch, splenorenal recess, pelvis (pouch of Douglas), and pericardium
- In unstable patient with positive FAST: proceed directly to emergency laparotomy

Comparison of investigation options:

- FAST: Preferred first-line -- fast, bedside, safe in instability
- CECT: Gold standard for stable patients, contraindicated in instability (delays definitive care)
- DPL: Invasive, superseded by FAST; used when FAST unavailable/indeterminate
- Abdominal X-ray: Cannot detect haemoperitoneum; not appropriate

Answer: A -- FAST

Quick Tip: In a haemodynamically unstable trauma patient, the bedside investigation of choice is rapid sonographic assessment of the abdomen.

• • •

132. Mr Ramu faced an accident and sustained a straddle injury. He presents with blood at the urethral meatus. What will be the next step in management?

(A) Foley's catheter insertion

(B) Suprapubic catheter (SPC) and drain the urine

(C) Do retrograde urethrogram

(D) CECT pelvis

Correct Answer: (B) Suprapubic catheter (SPC) and drain the urine

SOLUTION:

Straddle injury and urethral trauma:

Mechanism: Straddle injury compresses the bulbar (spongy) urethra between a hard surface and the inferior pubic rami. This is the most common site of urethral injury in blunt perineal trauma.

Clinical signs of urethral injury:
- Blood at the urethral meatus (most reliable sign)
- Perineal bruising / butterfly haematoma
- Inability to void (urinary retention)

- High-riding prostate on digital rectal examination (in posterior urethral injuries)

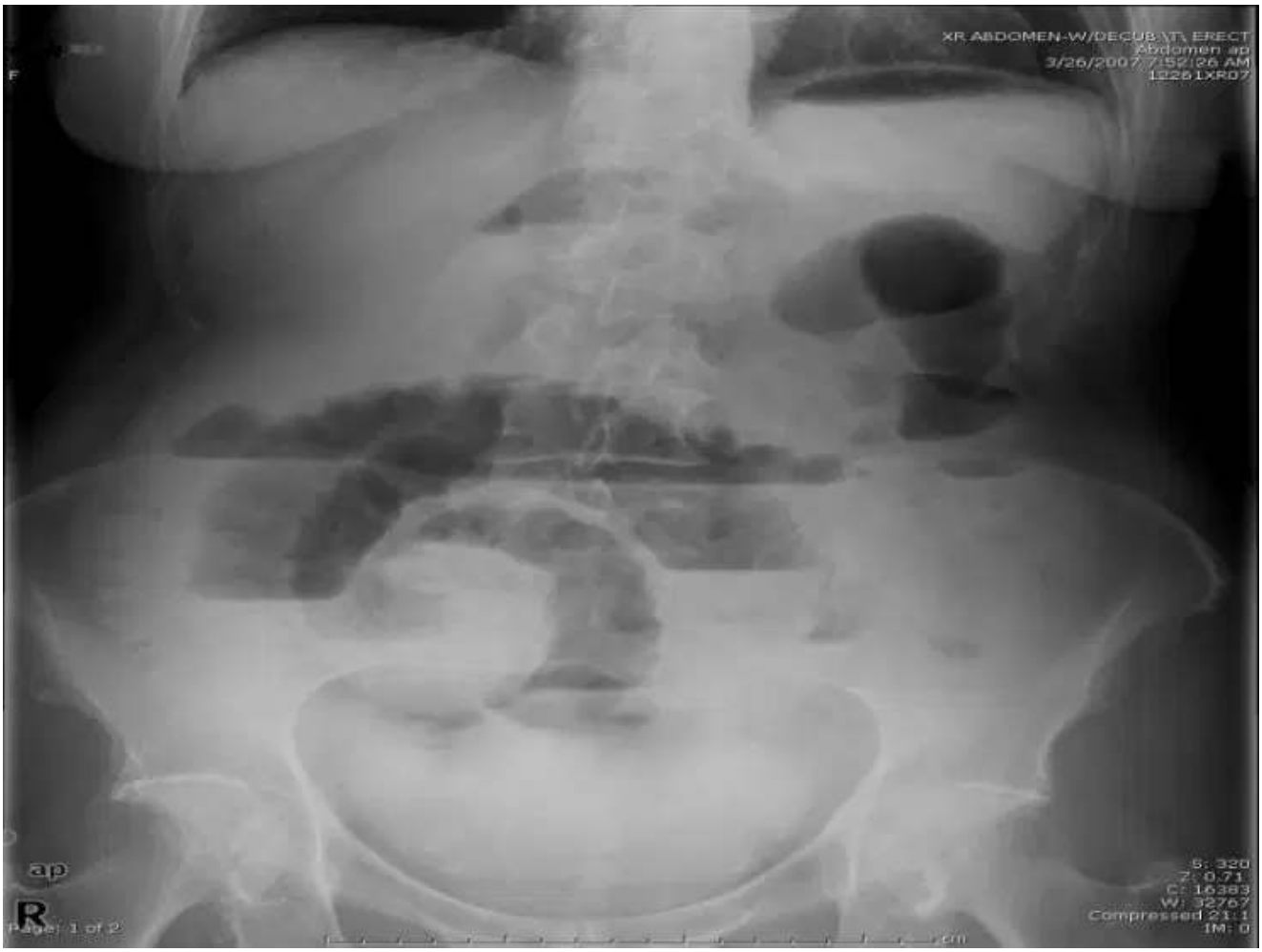
Key management principle:
- Blood at meatus = suspected urethral injury = DO NOT insert Foley catheter (risk of completing a partial tear or creating false passage)
- Safest immediate step: **Suprapubic catheter (SPC)** insertion to decompress the bladder
- Definitive diagnosis: Retrograde urethrogram using water-soluble contrast (done after securing urinary drainage)

Why SPC over retrograde urethrogram as the next step?
The question asks for the *next management step*. Bladder decompression via SPC protects the patient immediately. Urethrogram can follow after stabilisation to plan definitive repair.

Answer: B -- SPC and drain the urine

Quick Tip: Blood at the urethral meatus after perineal trauma is a contraindication to blind urethral catheterisation.

133. Identify the condition shown in the image. The X-ray reveals distended small bowel loops with air-fluid levels that appear stacked on top of each other (stepladder sign).



(A) Intestinal obstruction

(B) Valvulae conniventes

(C) Haustrations

(D) None

Correct Answer: (A) Intestinal obstruction

SOLUTION:

Stepladder sign -- intestinal obstruction:

Radiological features of small bowel obstruction (SBO) on erect abdominal X-ray:

1. **Stepladder sign:** Multiple dilated small bowel loops with air-fluid levels at

different heights in the same loop, stacked like the rungs of a ladder
2. **Central loops:** Small bowel occupies the central abdomen (vs. peripheral colon)
3. **Valvulae conniventes:** Mucosal folds crossing the *full* width of the bowel lumen (distinguish from haustrations of colon, which are incomplete)
4. **Paucity of colonic gas:** Gas absent distal to the obstruction

Small bowel vs. large bowel differentiation on X-ray:

Feature	Small Bowel	Large Bowel
Location	Central	Peripheral
Folds	Valvulae conniventes (complete)	Haustrations (incomplete)
Diameter	<3 cm normal; >3 cm dilated	<6 cm normal (cecum <9 cm)

MC cause of SBO: Adhesions (post-surgical, ~60-70% of cases), followed by hernias and malignancy.

Answer: A -- Intestinal obstruction

Quick Tip: The stepladder pattern of air-fluid levels on an erect abdominal X-ray is the hallmark of small bowel obstruction.

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134. What is the metabolic finding seen in a baby with CHPS (Congenital Hypertrophic Pyloric Stenosis)?

(A) Hyperchloremic hypernatremic metabolic alkalosis

(B) Hypochloremic hypernatremic metabolic acidosis

(C) Hypochloremic hyponatremic metabolic alkalosis

(D) Hyperchloremic hyponatremic metabolic alkalosis

Correct Answer: (C) Hypochloremic hyponatremic metabolic alkalosis

SOLUTION:

In CHPS, the infant vomits gastric contents repeatedly. Gastric juice contains HCl, so loss of HCl leads to: loss of H^+ (metabolic alkalosis) and loss of Cl^- (hypochloremia). Volume contraction triggers aldosterone release, which causes renal Na+ retention at the expense of K+ and H+, producing hyponatremia and hypokalemia. The combined result is hypochloremic, hyponatremic metabolic alkalosis. Key associations: MC surgical cause of vomiting in infants; age of presentation ~4 weeks; olive-shaped epigastric mass on palpation.

Hypochloremic hyponatremic metabolic alkalosis (Option C)

Quick Tip: Think about what is lost when a baby repeatedly vomits gastric acid.

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135. A pregnant woman came for a routine antenatal checkup. She had a history of twin pregnancy 1 year ago. What will be gravida and para?

(A) G2P2

(B) G2P3

(C) G2P1

(D) G2P0

Correct Answer: (C) G2P1

SOLUTION:

Gravida = total number of pregnancies (current included). Para = number of deliveries at or after 24 weeks (each pregnancy counts as one parous event regardless of number of fetuses). The patient: previous twin pregnancy (1 delivery = P1) + currently pregnant again = G2. A twin birth is a single parous event. Therefore obstetric history = $G2P1$.

$G2P1$ (Option C)

Quick Tip: A twin delivery counts as a single parous event, not two.

• • •

136. A hypertensive patient wants to conceive. Which of the following medicines needs to be stopped?

(A) Calcium Channel Blockers

(B) ACE inhibitors

(C) Alpha Methyl dopa

(D) Labetolol

Correct Answer: (B) ACE inhibitors

SOLUTION:

Safety of antihypertensives in pregnancy: Methyldopa is the drug of choice; labetalol and nifedipine (CCB) are safe alternatives. ACE inhibitors are absolutely contraindicated in pregnancy. They cross the placenta and cause fetal renal tubular dysplasia, oligohydramnios, limb contractures, pulmonary hypoplasia, and neonatal renal failure (ACE inhibitor fetopathy). Angiotensin II receptor blockers (ARBs) carry the same risk. When a hypertensive woman plans pregnancy, ACE inhibitors must be switched to a safer agent before conception.

ACE inhibitors (Option B)

Quick Tip: One class of antihypertensives causes fetal renal damage and is contraindicated in all trimesters of pregnancy.

• • •

137. A 27 year old woman who had delivered a female child 9 months back, came to the gynaecologist with complaints of absent periods since child birth. She has been using contraceptive methods as a family control measure. She was advised to get her serum beta hCG levels tested, which came out as 4.9 mIU/ml. Her prolactin level was 88 ng/ml, and TSH was 3.8. What could be the reason for amenorrhea in this case?

(A) Normal pregnancy

(B) Lactational amenorrhea

(C) Hypothyroidism

(D) Prolactinoma

Correct Answer: (B) Lactational amenorrhea

SOLUTION:

Analysis: beta-hCG = 4.9 mIU/ml (negative, rules out pregnancy); TSH = 3.8 (normal, rules out hypothyroidism); Prolactin = 88 ng/ml (elevated but physiological in a breastfeeding mother). Mechanism of lactational amenorrhea: infant suckling stimulates the anterior pituitary to secrete prolactin and simultaneously inhibits hypothalamic GnRH pulse secretion. Reduced GnRH leads to low FSH and LH, preventing ovarian folliculogenesis and ovulation. Result: amenorrhea persisting as long as active breastfeeding continues. Prolactinoma is unlikely at this prolactin level in the setting of recent delivery.

Lactational amenorrhea (Option B)

Quick Tip: High prolactin due to breastfeeding suppresses GnRH, preventing ovulation and menstruation.

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138. Uterine didelphys will cause all of the following symptoms except?

(A) Transverse lie

(B) Endometriosis

(C) Repeated abortion

(D) Premature labor

Correct Answer: (B) Endometriosis

SOLUTION:

Uterine didelphys is a Class III Mullerian duct anomaly with complete non-fusion producing two separate uteri and cervices. Recognized associations include recurrent abortion, premature labor, malpresentation (transverse lie), infertility, and ipsilateral renal agenesis. Endometriosis arises from retrograde menstruation or coelomic metaplasia and is an independent pathological process not caused by uterine didelphys. Therefore endometriosis is the exception in the list of complications.

Endometriosis (Option B)

Quick Tip: Think about which condition results from retrograde menstruation rather than a structural uterine anomaly.

• • •

139. Management of uterine septum?

(A) Laparoscopic resection of septum

(B) Hysteroscopic resection of septum

(C) Uterine metroplasty

(D) Laparotomy and resection

Correct Answer: (B) Hysteroscopic resection of septum

SOLUTION:

Uterine septum (Class V Mullerian anomaly) is the most common uterine anomaly and the leading uterine cause of recurrent miscarriage. Management: Hysteroscopic metroplasty (transcervical hysteroscopic resection) is the procedure of choice. The septum is avascular fibromuscular tissue and is easily incised under hysteroscopic visualization using scissors or resectoscope. This approach requires no abdominal incision, has low morbidity, and significantly improves pregnancy outcomes. Open metroplasty (Strassman, Tompkins, or Jones procedure via laparotomy) is reserved for bicornuate uterus or didelphys, not for a septate uterus.

Hysteroscopic resection of septum (Option B)

Quick Tip: The uterine septum is best treated by a minimally invasive intracavitary approach through the cervix.

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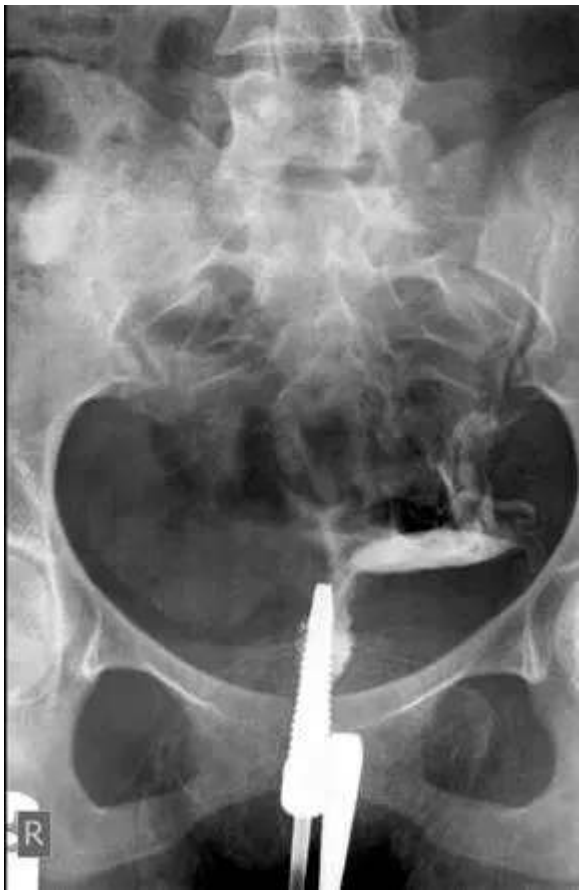
140. What is the modality of this test? [An X-ray image of the pelvis showing contrast dye outlining the uterine cavity and fallopian tubes is shown.]



(A) Hysterosalpingography

(B) Laparoscopy

(C) Hysteroscopy

(D) Saline infusion sonography

Correct Answer: (A) Hysterosalpingography

SOLUTION:

The image shows an X-ray of the pelvis with radio-opaque contrast filling the uterine cavity and both fallopian tubes - the classic appearance of Hysterosalpingography (HSG), also called uterosalpingography. HSG uses fluoroscopy/X-ray with iodinated contrast introduced via a cervical cannula. It evaluates uterine cavity morphology (septa, Asherman's, polyps, fibroids) and tubal patency (free peritoneal spillage = patent tube). Indications: infertility workup and recurrent pregnancy loss. Laparoscopy and hysteroscopy are direct surgical visualization methods (no X-ray); saline infusion sonography uses ultrasound not X-ray.

Hysterosalpingography (Option A)

Quick Tip: The image is an X-ray showing contrast outlining the uterus and fallopian tubes.

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141. A 24 year old female patient with weeks of amenorrhea, left adnexal mass on USG, B-hCG 2500, no fetal heart rate. What is the management?

(A) Expectant management

(B) Salpingectomy

(C) Single dose methotrexate

(D) Milking of tube

Correct Answer: (C) Single dose methotrexate

SOLUTION:

Approach: This question tests management of ectopic pregnancy using the methotrexate criteria.

Given data: amenorrhea + left adnexal mass on USG + β-hCG = 2500 mIU/mL + no fetal cardiac activity.

Methotrexate criteria (all must be met):

1. Hemodynamically stable patient
2. β-hCG < 5000 IU/L
3. No fetal cardiac activity on USG
4. Patient compliant with monitoring

Here: β-hCG $= 2500$ (below 5000), no cardiac activity -- criteria satisfied.

Methotrexate (MTX) is a folic acid antagonist that inhibits dihydrofolate reductase, blocking purine and thymidylate synthesis in actively dividing trophoblast cells.

Single-dose MTX regimen: 50 mg/m^2 IM, followed by serial β-hCG monitoring on days 4 and 7. A fall of >15% from day 4 to day 7 indicates success.

Salpingectomy is for hemodynamically unstable patients. Expectant management is for very low and declining β-hCG. Milking (fimbrial expression) has higher recurrence rates and is not recommended.

Single dose methotrexate

Quick Tip: Check whether the beta-hCG level and absence of cardiac activity make this patient suitable for non-surgical management of ectopic pregnancy.

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142. H/o primary infertility, 2 fibroids in the cornua, and both sides tubal blockage, ovulation of women and semen analysis is normal. Treatment?

(A) ART

(B) Lap Myomectomy

(C) Hysterectomy

(D) Uterine artery embolization

Correct Answer: (B) Lap Myomectomy

SOLUTION:

Clinical reasoning: Primary infertility + bilateral tubal blockage + 2 cornual fibroids + normal ovulation + normal semen analysis.

Key insight: Cornual fibroids physically obstruct the interstitial/cornual segment of the fallopian tube. Surgical removal can relieve this obstruction and restore tubal patency, enabling natural conception.

Evaluation of options:
- ART (IVF): Bypasses tubes entirely -- appropriate only if tubes cannot be salvaged or if myomectomy fails.
- Laparoscopic Myomectomy: Minimally invasive removal of fibroids; preferred when fertility preservation is desired.
- Hysterectomy: Removes uterus -- never appropriate in a woman seeking conception.
- Uterine artery embolization: Risk of premature ovarian failure and uterine ischemia; contraindicated in those desiring pregnancy.

In a young woman with primary infertility due to a correctable mechanical cause (cornual fibroids causing tubal obstruction), Laparoscopic Myomectomy addresses the root cause and is the first-line surgical intervention.

Laparoscopic Myomectomy

Quick Tip: Consider whether removing the fibroid causing tubal blockage could restore natural fertility before proceeding to ART.

• • •

143. Lady using OCP since 5 months. Amenorrhea since last 6 weeks. Which is best to calculate gestational age in this case?

(A) 280 days from LMP

(B) 256 days from LMP

(C) CRL by USG

(D) Abdominal girth

Correct Answer: (C) CRL by USG

SOLUTION:

Concept tested: Gestational age estimation when LMP is unreliable.

This patient has been on OCPs for 5 months. OCPs suppress the hypothalamic-pituitary-ovarian axis, preventing ovulation. Therefore, the LMP on OCPs does not represent an ovulatory cycle and cannot be used for accurate gestational age calculation using Naegele's rule (**EDD = LMP + 9 months + 7 days**).

Why CRL by USG is the answer:
CRL (Crown-Rump Length) is the gold standard for dating in the first trimester (6--13 weeks). It is a direct ultrasound measurement of embryonic length and is independent of menstrual history.

Accuracy of CRL: **±3**--5 days in early first trimester.

After 13 weeks, preferred parameters shift to:
- Biparietal diameter (BPD)
- Head circumference (HC)
- Femur length (FL)

LMP-based methods (280 days / 256 days / Naegele's rule) are all unreliable here.
Abdominal girth varies with body habitus and is not a gestational age marker.

CRL by USG

Quick Tip: When LMP is unreliable due to OCP use, which first-trimester ultrasound parameter gives the most accurate gestational age?

• • •

144. Order of ligation of devascularization in PPH (Postpartum Hemorrhage)

(A) Uterine artery, pudendal artery, vaginal artery

(B) Uterine artery, internal iliac, obturator artery

(C) Uterine artery, ovarian artery, internal iliac artery

(D) Uterine artery, ovarian artery, vaginal artery

Correct Answer: (C) Uterine artery, ovarian artery, internal iliac artery

SOLUTION:

Topic: Surgical management of Postpartum Hemorrhage (PPH) -- Devascularization.

When conservative medical measures fail (oxytocin, ergometrine, misoprostol, tranexamic acid), surgical devascularization is performed in a stepwise manner to preserve the uterus:

Step 1 -- Uterine artery ligation (O'Leary stitch):
Bilateral ligation of uterine arteries just below the level of lower uterine segment. Cuts off the dominant blood supply.

Step 2 -- Ovarian artery ligation:
Ligates the utero-ovarian arcade (collateral supply from ovarian vessels via the anastomosis with uterine artery).

Step 3 -- Internal iliac (hypogastric) artery ligation:
Ligation of the anterior division reduces pelvic arterial pulse pressure by ~85%. Pioneered by Howard Kelly for cervical cancer bleeding, later applied to PPH.

The sequence follows the anatomical hierarchy of uterine blood supply:

Uterine a. → Ovarian a. → Internal iliac a.

If all fail: Hysterectomy (definitive).

Uterine artery, Ovarian artery, Internal iliac artery

Quick Tip: Recall the stepwise surgical approach to devascularization starting with the primary uterine blood supply and then addressing collateral vessels.

• • •

145. Patient with post molar evacuation, now has lesion in lungs with cannon ball appearance. Which is the best management?

(A) Hysterectomy

(B) Emaco regimen

(C) Inj. methotrexate

(D) Multiple dose of Inj. methotrexate

Correct Answer: (B) Emaco regimen

SOLUTION:

Diagnosis: High-risk Gestational Trophoblastic Neoplasia (GTN) -- Pulmonary metastasis (cannon-ball lesions on CXR) after molar evacuation = choriocarcinoma or high-risk GTN.

WHO/FIGO risk scoring: A prognostic score ≥ 7 = high-risk GTN. Presence of pulmonary metastasis increases the score significantly.

Treatment:
Low-risk GTN (score < 7, no metastasis): Single-agent chemotherapy -- methotrexate or actinomycin D.

High-risk GTN (score $\geq$ 7, metastases): Multi-agent EMACO regimen.

EMACO regimen breakdown:
Day 1 and Day 2:
- Etoposide 100 mg/m^2 IV
- Actinomycin D 0.5 mg IV bolus
- Methotrexate 100 mg/m^2 IV push + 200 mg/m^2 IV over 12 hr
Day 2: Folinic acid rescue
Day 8:
- Cyclophosphamide 600 mg/m^2 IV
- Vincristine (Oncovin) 1 mg/m^2 IV (max 2 mg)

Cure rate with EMACO in high-risk GTN: ~75--90%.

Hysterectomy is reserved for drug-resistant cases as an adjunct.

EMACO regimen

Quick Tip: Cannon-ball pulmonary metastases after molar evacuation indicate high-risk gestational trophoblastic neoplasia requiring multi-agent chemotherapy.

• • •

146. Pregnant female with herpetic lesions in the vulva. Management is?

(A) Acyclovir and elective Caesarean section

(B) Induction of labor

(C) Acyclovir and allow spontaneous progression of labor

(D) Wait and watch

Correct Answer: (A) Acyclovir and elective Caesarean section

SOLUTION:

Clinical scenario: Pregnant female + active herpetic vulval lesions = risk of neonatal HSV transmission during vaginal delivery.

Pathophysiology: Herpes Simplex Virus (HSV-2 predominantly) causes genital herpes. Neonatal infection occurs primarily during passage through the infected birth canal. Neonatal HSV has a mortality of 60% if untreated and leads to encephalitis and disseminated disease.

Management principles:
1. **Acyclovir:** Antiviral therapy suppresses active HSV replication, reduces lesion duration and viral shedding. Dose: 400 mg TDS or 200 mg 5 times/day for 5--10 days. Safe in pregnancy (FDA Category B).
2. **Elective Caesarean section:** Indicated when active genital HSV lesions or prodromal symptoms are present at the time of delivery (ACOG recommendation). Prevents direct contact of neonate with infected maternal genital tract.

Why not vaginal delivery? Even with Acyclovir, active lesions carry neonatal transmission risk of 30--50% with vaginal delivery.

Induction of labor through active lesions is contraindicated.
Wait-and-watch risks severe neonatal morbidity.

Acyclovir + Elective Caesarean section

Quick Tip: Active genital HSV lesions at delivery are an absolute indication for Caesarean section to prevent neonatal transmission.

• • •

147. Patient with infraumbilical flattening and fetal heart rate heard laterally, what is the presentation?

(A) Occipitoposterior

(B) Knee

(C) Brow

(D) Right dorsoanterior

Correct Answer: (A) Occipitoposterior

SOLUTION:

Topic: Fetal presentation and position -- clinical diagnosis.

Clinical findings:
- Infraumbilical flattening (saucer-shaped depression below umbilicus)
- Fetal heart rate (FHR) heard laterally (in the flanks)

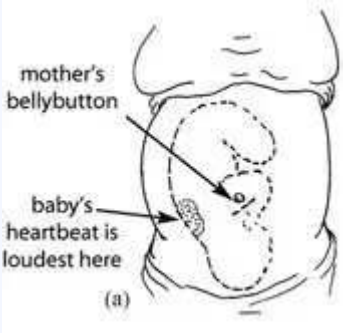
Explanation:
In **Occipitoposterior (OP) position**, the fetal occiput faces the maternal sacrum. The fetal back is directed posteriorly (toward the mother's spine), placing the fetal limbs anteriorly.

Abdominal signs of OP position:
1. Infraumbilical flattening -- limbs lie anteriorly, no rounded back present anteriorly
2. FHR heard in flanks/laterally -- fetal back is posterior, so the region closest to the fetal heart (chest/back) is far from the anterior abdominal wall
3. Head may feel deflexed on palpation
4. Maternal discomfort: severe backache (back labor) is common

In dorsoanterior positions: fetal back is anterior → FHR heard anteriorly and clearly.
In OP: fetal back posterior → FHR lateral or poorly heard anteriorly.

Incidence of OP: ~10% of all deliveries. Most rotate to OA during labor (long internal rotation). Persistent OP may require operative delivery.

Occipitoposterior



Quick Tip: In which fetal position does the fetal back face posteriorly, causing flattening below the umbilicus and laterally heard fetal heart sounds?

• • •

148. Husband asks for paternal testing of his twins. One twin is found to be his son & other is not. Diagnosis?

(A) Superfecundation

(B) Superfoetation

(C) Posthumous child

(D) None of the above

Correct Answer: (A) Superfecundation

SOLUTION:

Approach: The key clue is twins with *different* biological fathers confirmed on paternity testing.

Superfecundation = fertilization of two ova from the same menstrual cycle by spermatozoa from two separate acts of intercourse (possibly by two different men). When the fathers are different, it is called *heteropaternal superfecundation*.

Why not the others?

- Superfoetation: second fertilization during an already-established pregnancy; fetuses differ in gestational age.
- Posthumous child: born after father's death; paternity is not in question here.

Superfecundation

Quick Tip: Consider which condition allows twins in the same pregnancy to have different biological fathers.

• • •

149. Teenage patient with transverse vaginal septum with dysmennorhea & chronic pelvic pain. Diagnosis?

(A) Endometriosis

(B) Tubovarian abscess

(C) Dermoid cyst

(D) Theca lutein cyst

Correct Answer: (A) Endometriosis

SOLUTION:

Clinical reasoning: A transverse vaginal septum creates an outflow obstruction. Obstruction leads to **retrograde menstruation** -- endometrial cells travel backward via the fallopian tubes into the peritoneal cavity.

These cells implant and respond to cyclic hormonal changes, producing the classic triad of endometriosis:
- Dysmenorrhoea (painful periods)
- Chronic pelvic pain
- Infertility (in long-standing cases)

Secondary dysmenorrhoea in an adolescent with an obstructive Mullerian anomaly strongly points to endometriosis.

Distractors eliminated:
- Tubo-ovarian abscess: requires PID history
- Dermoid / Theca lutein cysts: unrelated to outflow obstruction or CPP pattern

Endometriosis

Quick Tip: Consider how an outflow obstruction leads to retrograde menstruation and ectopic endometrial implantation.

• • •

150. 28 years old married female anxious about conception. C/o profuse vaginal discharge. No h/o itching. 12 days since LMP.

(A) Candida

(B) Trichomonas

(C) Bacterial vaginosis

(D) Physiological

Correct Answer: (D) Physiological

SOLUTION:

Key facts: 12 days post-LMP corresponds to the **peri-ovulatory phase** (approximately day 12-14 of a 28-day cycle).

At this phase, rising oestrogen stimulates cervical glands to produce copious, clear, elastic mucus (spinnbarkeit). This is entirely **physiological** and causes NO itching, odour, or dyspareunia.

Pathological discharge comparison:
- Candida: curdy white discharge + intense pruritus
- Trichomonas: frothy greenish discharge + itching + offensive odour
- Bacterial vaginosis: fishy-smelling greyish discharge (Clue cells on microscopy,

positive Whiff test)

None of these features are present here. The absence of itching and the timing 12 days post-LMP confirm physiological origin.

Physiological discharge

Quick Tip: Consider the phase of the menstrual cycle and the absence of any inflammatory symptom like itching.

• • •

151. H/o recurrent abortions at 8, 11 & 22 weeks. Cardiac activity is normal in all the three. H/o preeclampsia in last pregnancy. What is the most probable cause?

(A) Syphilis

(B) APLA

(C) TORCH

(D) GDM

Correct Answer: (A) Syphilis

SOLUTION:

Pattern recognition: Recurrent pregnancy losses at 8, 11, and 22 weeks -- each successive loss occurs at a *later* gestational age. Cardiac activity was present in all fetuses (ruling out aneuploidy).

Kassowitz Law (Syphilis):
In untreated maternal syphilis, as pregnancy number increases, the gestational age at which pregnancy loss occurs also increases progressively. This law perfectly explains the ascending pattern: 8 wks → 11 wks → 22 wks.

Key rule to remember: Among all infections, **only syphilis** causes recurrent pregnancy loss. TORCH infections do NOT cause RPL and TORCH testing has no

role in RPL workup.

Why not APLA? APLA causes either 3+ losses before 10 weeks OR 1+ loss after 10 weeks -- does not follow a Kassowitz pattern.

Syphilis (Kassowitz Law)

Quick Tip: Look for the pattern of progressively later gestational age losses -- this is described by a specific law related to one infection.

• • •

152. Female missed OCP on 4 different days in 1st 2 weeks of menstrual cycle. What will you advice?

(A) Continue taking pill

(B) Take all 4 pills at once & continue taking pills

(C) Adopt another method of contraception

(D) Continue current pack, consider additional contraceptive method for remaining days

Correct Answer: (D) Continue current pack, consider additional contraceptive method for remaining days

SOLUTION:

WHO Missed Pill Protocol -- Weeks 1 and 2:

When $\geq$ **2** consecutive hormonal pills are missed (i.e., $\geq$ **48** hours since a pill should have been taken):

1. Take the most recent missed pill immediately (discard others).
2. Continue remaining pills at the usual scheduled time.
3. Use **backup contraception** (condoms) for the next 7 days.

4. Consider emergency contraception if unprotected intercourse occurred in the previous 5 days AND pills were missed in Week 1.

Option analysis:
- Option B (take all 4 at once): incorrect -- causes nausea/vomiting and is not recommended
- Option C (abandon OCPs): too aggressive; mid-cycle discontinuation is not advised
- Option D: matches WHO guidance -- continue the pack AND use additional contraception

Continue current pack + additional contraceptive method

Quick Tip: When multiple pills are missed in the first two weeks, the key is to continue the pack while adding backup contraception rather than stopping or taking all missed pills at once.

• • •

153. 36 weeks pregnant female on warfarin with mitral stenosis. What should we do?

(A) Shift to LMW Heparin

(B) Warfarin

(C) Switch to Aspirin

(D) Aspirin + Heparin

Correct Answer: (A) Shift to LMW Heparin

SOLUTION:

Core pharmacology principle: Warfarin is a small molecule that freely crosses the placental barrier. At 36 weeks (near term), it places the fetus at high risk of **intracranial haemorrhage** during labour and delivery due to compression of the fetal head in the birth canal.

LMWH (Low Molecular Weight Heparin) is a large polysaccharide that does **NOT** cross the placenta, making it safe for the fetus while providing adequate anticoagulation for the mother with mitral stenosis.

Anticoagulation in pregnancy timeline (for prosthetic valves/mitral stenosis):
- Weeks 1-12: LMWH preferred (avoids warfarin embryopathy)
- Weeks 13-35: Warfarin acceptable with dose monitoring
- ≥ 36 weeks: Switch back to LMWH until delivery

Aspirin is an antiplatelet agent, not an anticoagulant, and is insufficient for mitral stenosis thromboprophylaxis.

Shift to LMWH

Quick Tip: Consider which anticoagulant does not cross the placenta and is therefore safe for the fetus near term.

• • •

154. Indomethacin when given beyond 36 weeks what will happen?

(A) Premature closure of PDA

(B) Still birth

(C) No effect

(D) Teratogenic

Correct Answer: (A) Premature closure of PDA

SOLUTION:

Pharmacology of Indomethacin: Indomethacin is a non-selective COX inhibitor that blocks prostaglandin synthesis.

PGE_2 and PGI_2 (prostacyclin) maintain patency of the ductus arteriosus (DA) in fetal life through vasodilation. When these prostaglandins are inhibited by indomethacin after 36 weeks, the DA undergoes premature constriction -- i.e., **premature closure of PDA**.

Clinical uses of this mechanism:
- Indomethacin is used therapeutically to close a symptomatic PDA in **preterm neonates**.
- As a tocolytic (stops preterm labour) it is used before 32 weeks; after 36 weeks it risks premature DA closure.

Why not teratogenic? Teratogenicity implies structural birth defects caused during organogenesis (first trimester). Indomethacin's fetal effects are pharmacodynamic (prostaglandin inhibition), not teratogenic.

Premature closure of PDA

Quick Tip: Recall which molecules maintain patency of the ductus arteriosus and what indomethacin does to their synthesis.

• • •

155. A patient with 2nd degree cervical prolapse complains of dribbling of urine on cough. What is the diagnosis?

(A) Stress incontinence

(B) Overflow incontinence

(C) Cystitis

(D) Functional incontinence

Correct Answer: (A) Stress incontinence

SOLUTION:

Approach: The key is the trigger -- urine leaks specifically on coughing (raised intra-abdominal pressure).

Types of incontinence:

- Stress incontinence: leakage on effort/cough/sneeze due to deficient urethral closure mechanism.
- Overflow incontinence: continuous dribble from overdistended bladder.
- Urge incontinence: sudden urge followed by involuntary leakage (detrusor overactivity).
- Functional incontinence: normal bladder but inability to reach toilet.

Mechanism in prolapse: 2nd degree uterine prolapse causes descent of the bladder base (cystocele), posteriorising the urethrovesical junction and reducing the posterior urethrovesical angle. This impairs the pressure transmission ratio between urethra and bladder, so coughing produces net positive intravesical pressure exceeding urethral closure pressure -- resulting in leakage.

Stress incontinence

Quick Tip: Think about what happens to the bladder neck when pelvic floor support is lost and intra-abdominal pressure suddenly rises.

• • •

156. What does the umbilical artery do?

(A) Carrying deoxygenated blood from fetus to placenta

(B) Carrying oxygenated blood from placenta to fetus

(C) Provide nutrients

(D) None of the above

Correct Answer: (A) Carrying deoxygenated blood from fetus to placenta

SOLUTION:

Key concept -- Fetal circulation vessels:
The umbilical cord contains 2 arteries + 1 vein (AVA rule: Arteries carry blood Away from heart).

Umbilical artery: Carries deoxygenated blood + metabolic waste from fetal circulation to the placenta. Two arteries arise from the left and right internal iliac arteries of the fetus.

Umbilical vein: Carries oxygenated, nutrient-rich blood back from the placenta to the fetal liver (then via ductus venosus to IVC).

Why the confusion? Normally arteries are oxygenated (in postnatal life), but in fetal circulation the umbilical artery is deoxygenated -- the opposite of adult convention. Direction of flow relative to heart defines artery/vein here.

Umbilical artery: deoxygenated blood, fetus → placenta

Quick Tip: Remember that in fetal circulation, arteries carry blood away from the fetal heart -- regardless of oxygen content.

• • •

157. A child presents with rachitic changes in limbs which was not responding to Vitamin D. Investigations done show: Calcium 9.5 mg/dl, Phosphorous 1.6 mg/dl, ALP 814 IU, Sr. PTH 24.2, Sr. Electrolytes, Creatinine and blood gases normal. What is the diagnosis?

(A) Vitamin D dependent rickets type 1

(B) Vitamin D dependent rickets type 2

(C) Hypophosphatemic rickets

(D) Chronic renal failure

Correct Answer: (C) Hypophosphatemic rickets

SOLUTION:

Biochemical clue analysis:
Ca = 9.5 mg/dl (normal), PO4 = 1.6 mg/dl (very low), ALP = 814 IU (elevated), PTH = 24.2 (near normal), Creatinine and blood gases = normal.

Differential diagnosis of Vitamin D resistant rickets:

Type	Ca	PO4	PTH	Response to Vit D
VDDR Type 1	Low	Low	High	Yes (pharmacological dose)
VDDR Type 2	Low	Low	High	No
Hypophosphatemic rickets	Normal	Very low	Normal	No (needs phosphate + calcitriol)
Renal osteodystrophy	Low	High	High	Partial

Key mechanism: Hypophosphatemic rickets is caused by increased FGF-23 (due to PHEX gene mutation in X-linked form), which inhibits renal tubular phosphate reabsorption (Na-Pi cotransporter) and suppresses 1-alpha-hydroxylase. The primary defect is phosphopenic, not calcipenic.

Hypophosphatemic rickets

Quick Tip: Focus on which electrolyte is abnormally low, whether calcium is affected, and whether renal function is normal.

• • •

158. Which vaccine is contraindicated in a 3-month-old child with recurrent respiratory illness?

(A) Inactivated polio

(B) Measles

(C) DPT

(D) DT

Correct Answer: (B) Measles

SOLUTION:

Vaccine types and contraindications:

Live attenuated vaccines (LAV): BCG, OPV, Measles/MMR, Varicella, Yellow fever, Rotavirus. These are contraindicated in immunocompromised patients because attenuated organisms can replicate and cause serious vaccine-strain disease.

Killed/inactivated vaccines: IPV, DPT, DT, Hepatitis B, Influenza (injectable), Pneumococcal. These are safe in immunocompromised patients.

In this case: The 3-month-old has recurrent respiratory illness suggesting possible immunodeficiency. Among the options:

- IPV -- inactivated, safe
- Measles -- live attenuated, CONTRAINDICATED
- DPT -- inactivated toxoid/antigen, safe
- DT -- inactivated toxoid, safe

Additionally, the measles vaccine is not scheduled at 3 months (given at 9-12 months in India), adding to the reasons it is the wrong vaccine here.

Measles (live attenuated vaccine) is contraindicated

Quick Tip: Consider which vaccines are live attenuated and therefore contraindicated

when immune function may be compromised.

• • •

159. In a child, height for age < -2 SD. What is the likely cause?

(A) Chronic malnutrition

(B) Acute malnutrition

(C) Recent infection

(D) No malnutrition

Correct Answer: (A) Chronic malnutrition

SOLUTION:

WHO anthropometric indices and their meaning:

Index	Indicator	Cause	Timeframe
Height-for-age < -2 SD	Stunting	Chronic malnutrition	Months to years
Weight-for-height < -2 SD	Wasting	Acute malnutrition	Weeks
Weight-for-age < -2 SD	Underweight	Acute + chronic	Mixed

Key point: Height/linear growth is determined by bone growth at the epiphyseal growth plates. Chronic or recurrent undernutrition over months to years depresses IGF-1 and growth hormone signaling, slowing bone elongation and resulting in stunting.

Acute illness or recent infection may transiently reduce appetite and cause weight loss (wasting) but does not cause shortening of already achieved height.

$$\boxed{\text{Height-for-age} < -2\,\text{SD} = \text{Stunting} = \text{Chronic malnutrition}}$$

Quick Tip: Ask yourself: which nutritional parameter takes months to years to show a deficit -- height or weight?

160. A child presents with myoclonus jerks and decreased performance in school. There is a history of fever at the age of 1 year with rash. It is suggestive of which condition?

(A) Subacute sclerosing panencephalitis

(B) Mesial temporal sclerosis

(C) Polio

(D) Measles

Correct Answer: (A) Subacute sclerosing panencephalitis

SOLUTION:

SSPE -- Subacute Sclerosing Panencephalitis:

Etiology: Persistent, defective measles virus (mutant M-protein) in the CNS. The virus cannot assemble properly but replicates slowly, causing progressive inflammation and demyelination.

Epidemiology: Risk is highest with measles infection before age 2. Latent period = 6-8 years. Preventable by measles vaccination.

Clinical stages:

1. Stage I: Personality changes, declining school performance, forgetfulness
2. Stage II: Myoclonic jerks (periodic, every 5-10 sec), seizures, EEG shows periodic synchronous discharges (Radermecker complexes)
3. Stage III: Progressive dementia, autonomic dysfunction, rigidity
4. Stage IV: Vegetative state, death within 1-3 years of onset

Diagnosis: CSF shows elevated IgG antibodies to measles; CSF-to-serum measles antibody ratio is elevated. EEG: Radermecker complexes pathognomonic.

Treatment: No curative treatment. Inosiplex + intrathecal interferon may slow

progression.

Subacute Sclerosing Panencephalitis (SSPE)

Quick Tip: Think about which late neurological complication follows measles infection in early childhood after a latent period of years.

• • •

161. Webbed neck, short stature, low posterior hairline. What is the diagnosis?

(A) Turner syndrome

(B) Down syndrome

(C) Patau syndrome

(D) Edwards syndrome

Correct Answer: (A) Turner syndrome

SOLUTION:

Turner Syndrome -- Key facts:

Karyotype: 45,X (monosomy X) -- most common; also 45,X/46,XX mosaicism, isochromosome Xq, ring X, etc.

Pathophysiology: Loss of one X chromosome leads to:

- SHOX gene haploinsufficiency (on pseudoautosomal region of X) causing short stature
- Gonadal dysgenesis (streak gonads) causing primary amenorrhea and infertility
- Lymphatic dysplasia causing webbed neck and peripheral edema in neonates

Classic features mnemonic:

- Short Stature

- Shield chest, Widely Spaced nipples
- Webbed neck (pterygium colli)
- Low posterior hairline
- Cubitus Valgus
- Coarctation of aorta
- Streak gonads (primary amenorrhea)
- Horseshoe kidney

Differentiating from Noonan syndrome: Noonan syndrome has normal karyotype (PTPN11 mutation), affects both males and females, and has pulmonary stenosis (not coarctation) as the cardiac defect.

Turner Syndrome (45,X)

Quick Tip: Think about which chromosomal syndrome specifically in females presents with webbed neck and short stature due to an X chromosome abnormality.

• • •

162. A 12 year old boy presented with weak pulses in upper limbs. His BP was 90/60 mmHg. He also had retinal haemorrhages. Most likely diagnosis is

(A) PAn

(B) Microscopic polyangiitis

(C) Takayasu arteritis

(D) HSP

Correct Answer: (C) Takayasu arteritis

SOLUTION:

Approach via vessel size classification:

Vasculitides are classified by vessel size. The clinical scenario -- weak upper limb pulses + low BP + retinal haemorrhages in a 12-year-old -- localises pathology to

large vessels (aorta and branches).

Among the options:
- **PAN**: medium-vessel vasculitis, no pulse deficits
- Microscopic polyangiitis: small-vessel, causes renal and pulmonary disease
- HSP: small-vessel IgA vasculitis in children (purpura, joints, gut, kidney)
- **Takayasu arteritis**: large-vessel granulomatous vasculitis affecting the aorta and its branches

Takayasu arteritis causes progressive stenosis of the subclavian arteries leading to absent/weak upper limb pulses. The retinal haemorrhages are due to occlusive retinopathy from reduced carotid blood flow. It predominantly affects young females and children.

Takayasu arteritis

Quick Tip: Think of the large-vessel vasculitis known as pulseless disease affecting young patients.

• • •

163. A 10 year old male child presented with generalised edema. His cholesterol was 238 mg/dl and urine protein was 3+. Stool microscopy showed fat in stool.

(A) Goodpasture syndrome

(B) Urine infection

(C) Nephrotic syndrome

(D) Nephritic syndrome

Correct Answer: (C) Nephrotic syndrome

SOLUTION:

Systematic analysis of the clinical triad:

The child has three cardinal findings:
1. Generalised edema
2. Cholesterol = 238 mg/dl (hypercholesterolaemia)
3. Urine protein 3+ (heavy proteinuria)
4. Fat in stool (steatorrhoea / lipiduria)

This combination matches nephrotic syndrome precisely. The pathophysiology is:
- Heavy glomerular protein leak → hypoalbuminaemia → reduced plasma oncotic pressure → oedema
- Liver upregulates lipoprotein synthesis to compensate for albumin loss → hyperlipidaemia
- Lipids spill into urine and bowel → lipiduria and steatorrhoea

Nephritic syndrome has predominantly haematuria + oliguria + mild proteinuria -- absence of marked hyperlipidaemia distinguishes it. Goodpasture syndrome = haemoptysis + haematuria. UTI does not cause oedema or hypercholesterolaemia.

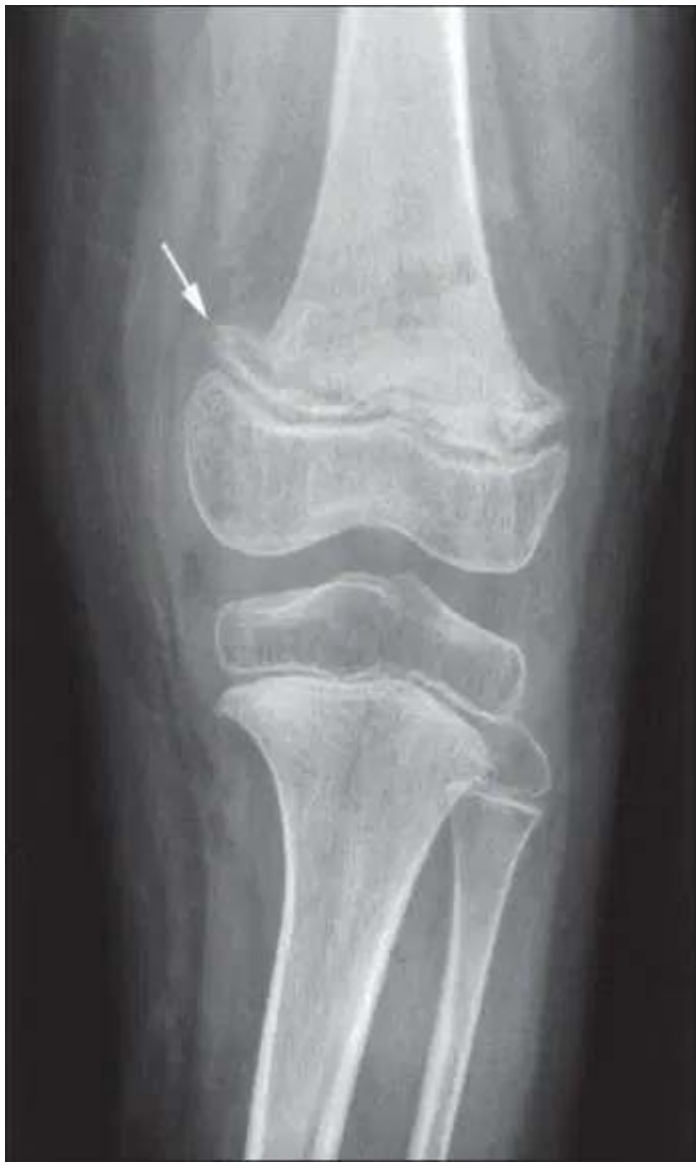
Most common cause in a 10-year-old: Minimal Change Disease (MCD).

Nephrotic syndrome

Quick Tip: Look for the combination of heavy proteinuria, oedema, and hyperlipidaemia in a child.

164. X-ray of a 5 year old child is shown in the image below. Bone mineral density is normal. Identify the condition.

[X-ray of knee joint showing subperiosteal haemorrhage, scorbutic zone (Trummerfeld zone), dense zone of provisional calcification (White line of Frankel), Ring epiphysis (Wimberger ring), and Pelken's spur]



(A) Rickets

(B) Scurvy

(C) Metaphyseal dysplasia

(D) Osteopetrosis

Correct Answer: (B) Scurvy

SOLUTION:

Radiological sign-based approach to identify the condition:

The X-ray shows a 5-year-old child's knee with the following findings:
- Subperiosteal haemorrhage
- Trummerfeld (scorbutic) zone at the metaphysis
- White line of Frankel (dense zone of provisional calcification)
- Wimberger ring epiphysis
- Pelken's spur (lateral metaphyseal spur)

These are *pathognomonic signs of scurvy* (Vitamin C deficiency).

Why not rickets? Rickets = defective mineralisation → reduced bone density, cupping and fraying of metaphysis. The question explicitly states bone mineral density is *normal*, ruling out rickets.

Why scurvy? Vitamin C is required for collagen hydroxylation. Without it, type I collagen is defective → capillary fragility → subperiosteal haemorrhages. Bone mineralisation (calcium/phosphate metabolism) remains intact, hence normal BMD.

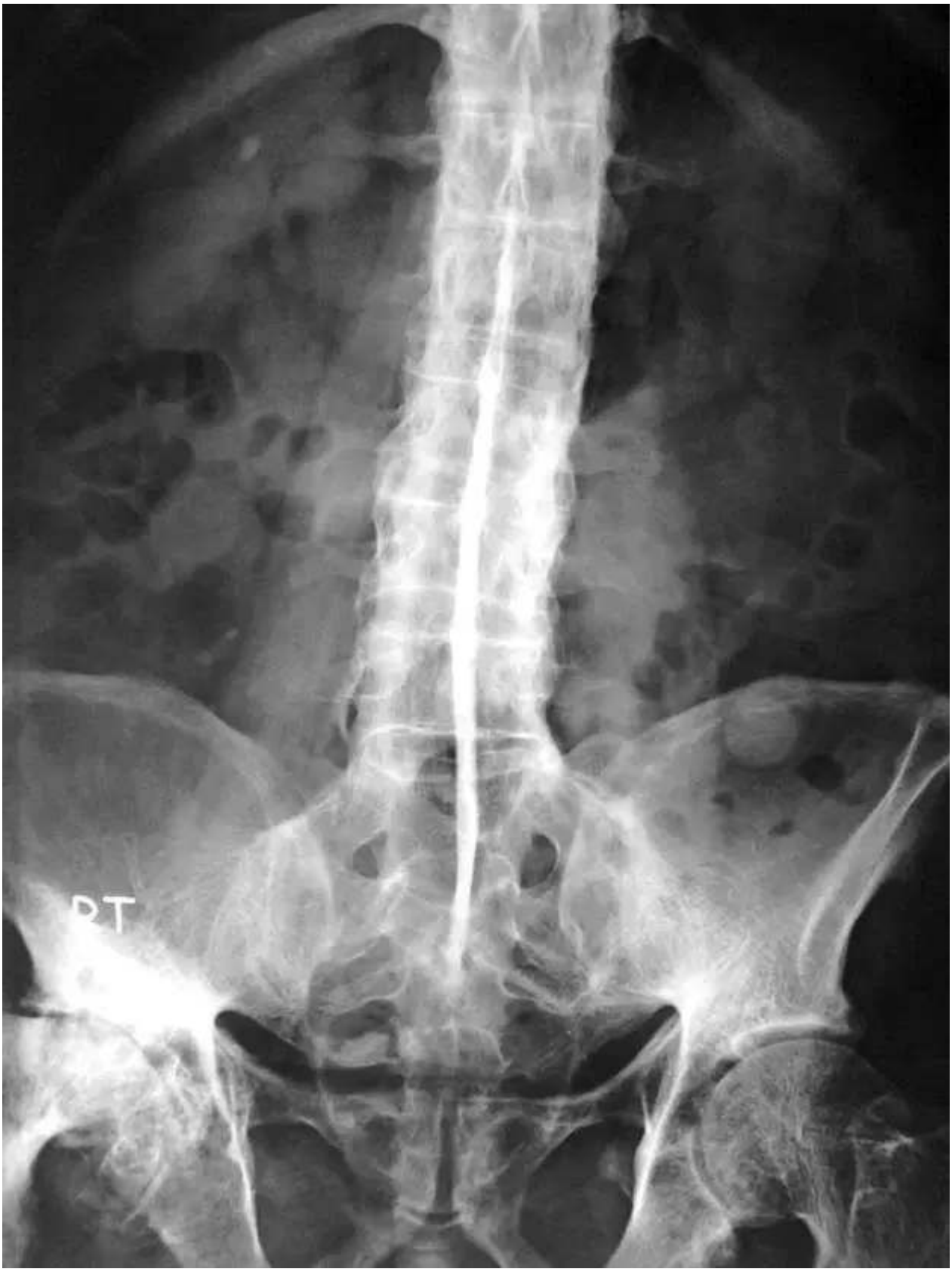
Osteopetrosis = uniformly dense marble bones. Metaphyseal dysplasia = sclerotic metaphyses, no haemorrhage signs.

Scurvy (Vitamin C deficiency)

Quick Tip: Normal bone mineral density with subperiosteal haemorrhages and Frankel's white line on X-ray points to a vitamin deficiency affecting collagen.

165. A 26 years old male with backache, morning stiffness, chest expansion and reddening of eyes with an X-ray presented in OPD. Most likely diagnosis for this patient is

[X-ray shows bamboo spine appearance with sacroiliac joint involvement]



(A) Rheumatoid arthritis

(B) Ankylosing spondylitis

(C) Paget's disease

(D) Osteopetrosis

Correct Answer: (B) Ankylosing spondylitis

SOLUTION:

Pattern recognition approach:

Key clinical clues in this case:
1. Young male (26 years)
2. Inflammatory back pain + morning stiffness (improves with activity)
3. Reduced chest expansion (costovertebral joint involvement)
4. Reddening of eyes = anterior uveitis (most common extra-articular feature of AS)
5. X-ray = bamboo spine (syndesmophytes bridging vertebral bodies)

This is the classic presentation of **Ankylosing Spondylitis**, a seronegative HLA-B27 associated spondyloarthropathy.

The 5 inflammatory back pain criteria (ASAS):
- Age of onset < 40 years
- Insidious onset
- Improvement with exercise
- No improvement with rest
- Pain at night, improving on arising

Rheumatoid arthritis → symmetric peripheral arthritis, predominantly females, RF positive. Paget's disease → elderly, bone deformity, elevated ALP. Osteopetrosis → congenital, marble bone disease.

Ankylosing spondylitis

Quick Tip: Bamboo spine on X-ray with morning stiffness and uveitis in a young male is pathognomonic of a seronegative spondyloarthropathy.

• • •

166. 60 year old elderly female with previous h/o Colles fracture is complaining of backache. Which of the given statements is wrong in relation to treatment of this patient?

(A) Teriparatide should be started before supplementing bisphosphonates

(B) Bisphosphonates not given for more than a year

(C) Calcium requirement is 1200 mg per day

(D) Oral Vit D3 given along with oral calcium

Correct Answer: (A) Teriparatide should be started before supplementing bisphosphonates

SOLUTION:

Stepwise evaluation of osteoporosis treatment statements:

Clinical background: 60-year-old female, Colles fracture (fragility fracture), backache → diagnosis is osteoporosis.

Evaluate each option for correctness:

Option A -- WRONG: Teriparatide before bisphosphonates? No. The standard treatment algorithm is:
Step 1: Calcium **1200** mg/day + Vitamin D **800–1000** IU/day
Step 2: Bisphosphonates (e.g., alendronate, risedronate) -- first-line antiresorptive agents
Step 3: Teriparatide (anabolic PTH analogue) -- reserved for severe/refractory cases AFTER bisphosphonates

Antiresorptive agents suppress osteoclast activity and are used before the bone-forming agent teriparatide.

Option B -- Bisphosphonates not > 1 year: Debatable; drug holiday after 3-5 years is recommended, but not after just 1 year.
Option C -- Calcium 1200 mg/day: Correct for postmenopausal women (NOF recommendation).
Option D -- Vit D3 + oral calcium: Correct standard practice.

The clearly wrong statement is A.

Teriparatide should be started before supplementing bisphosphonates (WRONG)

Quick Tip: Recall the correct sequence of osteoporosis pharmacotherapy -- which drug class is first-line and which is reserved for refractory cases.

• • •

167. A patient fell down from bicycle and started having pain around hip, shortening of limb and attitude was flexion, adduction, internal rotation (IR) of hip

(A) Anterior dislocation

(B) Transcervical fracture

(C) Posterior dislocation

(D) IT Fracture

Correct Answer: (C) Posterior dislocation

SOLUTION:

Limb attitude as diagnostic key:

In hip injuries, the attitude (position) of the limb is the fastest diagnostic clue:

Condition	Shortening	Rotation	Abduction/Adduction
Posterior dislocation	Yes	Internal	Adduction
Anterior dislocation	Yes	External	Abduction

| Neck of femur fracture | Yes | External | Neutral |
| IT fracture | Yes | External | Neutral |

This patient has: shortening + flexion + adduction + internal rotation.

This matches **posterior dislocation** of the hip exactly.

Mechanism: The femoral head is driven posteriorly when the hip is in a position of flexion and adduction (e.g., sitting in a vehicle seat or crouching over a bicycle). The posterior capsule, being the weakest part, tears, and the head escapes posteriorly. The muscles attached to the greater trochanter (short external rotators) pull the limb into internal rotation paradoxically because of the altered position of the greater trochanter.

Risk of avascular necrosis (AVN) of the femoral head is a serious complication if reduction is delayed beyond 6 hours.

Posterior dislocation of hip

Quick Tip: Remember the classic limb position: flexion, adduction, and internal rotation points to posterior displacement of the femoral head.

• • •

168. A 20 year old patient presenting with chronic low backache and early morning stiffness since last 2 years. Since 6 months there are bilateral heel pain also. Most likely diagnosis for this patient is

(A) TB spine

(B) Ankylosing spondylitis

(C) Mechanical pain

(D) Disc prolapsed

Correct Answer: (B) Ankylosing spondylitis

SOLUTION:

Diagnostic reasoning using the ASAS criteria and enthesitis:

Patient profile: 20-year-old male, chronic low back pain 2 years, early morning stiffness, bilateral heel pain 6 months.

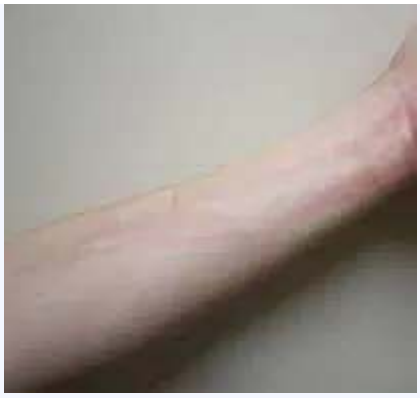
Step 1 -- Is this inflammatory or mechanical back pain?
Inflammatory: morning stiffness + improves with activity + age < 40 + insidious onset → Yes, this is inflammatory.

Step 2 -- What causes inflammatory back pain with bilateral enthesitis?
Seronegative spondyloarthropathies (SpA): AS, Reactive arthritis, Psoriatic arthritis, IBD-associated arthritis.

Bilateral heel pain = enthesitis at Achilles insertion / plantar fascia = the most common SpA enthesis site. The absence of preceding infection, skin disease, or bowel symptoms, combined with the protracted 2-year course in a young male, points specifically to AS.

Step 3 -- Eliminate alternatives:
- TB spine → constitutional symptoms + mechanical pain + single level with cold abscess
- Mechanical pain → worsens with activity, improves with rest
- Disc prolapse → radicular pain, positive SLR, no bilateral enthesitis

Ankylosing spondylitis



Quick Tip: Bilateral heel pain (enthesitis) with inflammatory back pain in a young male strongly suggests a seronegative spondyloarthropathy.

• • •

169. The image shows a skin condition with a raised, well-defined, bright red rash on the upper limb. What is the most suitable antibiotic for this condition?

(A) Amoxycillin & Clavulinic acid

(B) Amikacin

(C) Norfloxacin

(D) Metronidazole

Correct Answer: (A) Amoxycillin & Clavulinic acid

SOLUTION:

Approach: The image depicts **erysipelas** -- a superficial dermis and lymphatic infection. Key features: bright red, sharply demarcated, raised plaque on the skin.

Causative agent: *Streptococcus pyogenes* (Group A beta-hemolytic Streptococcus) is the primary pathogen in >90% of cases.

Drug of choice: Penicillin and its derivatives are first-line. Among the options, **Amoxycillin + Clavulanic acid** (a beta-lactam/beta-lactamase inhibitor combination) is the best choice -- it covers streptococci and also provides broader coverage in case of mixed infection.

Why not the others?
- Amikacin (aminoglycoside): gram-negative coverage, poor activity against streptococci
- Norfloxacin (fluoroquinolone): gastrointestinal/urinary use, poor streptococcal activity
- Metronidazole: anaerobic/protozoal coverage, inactive against streptococci

Amoxycillin and Clavulanic acid

Quick Tip: Think about the causative organism of the bright red, sharply demarcated skin infection shown.

• • •

170. A male patient came to OPD with white discharge from urethra [Image Shown]. What is the most probable organism involved?

(A) Nisseria gonorrhoeae

(B) Haemophilus ducreyi

(C) Calymmatobacterium granulomatis

(D) Treponema pallidum

Correct Answer: (A) Nisseria gonorrhoeae

SOLUTION:

Clinical picture: Male with white urethral discharge -- this is **urethritis**, most commonly a sexually transmitted infection.

Most probable organism: *Neisseria gonorrhoeae* (gonococcus) is the classic cause of urethritis with profuse purulent discharge in males. It is a gram-negative diplococcus and causes gonococcal infection (gonorrhea).

Key facts:
- Males: symptomatic (discharge + dysuria)
- Females: often asymptomatic, may present as endocervicitis
- Incubation period: 2-5 days

Why not the others?
- *H. ducreyi*: painful genital ulcer (chancroid), not discharge
- *C. granulomatis*: painless beefy-red ulcer (granuloma inguinale)
- *T. pallidum*: painless indurated chancre (primary syphilis)

Neisseria gonorrhoeae

Quick Tip: Think about the most common sexually transmitted organism causing purulent urethral discharge in males.

171. A woman, anxious to conceive, complains of profuse white discharge per vaginum, which was non foul smelling and not itchy. Her LMP was 13-15 days back. What is the most probable diagnosis?

(A) Candidiasis

(B) Bacterial Vaginosis

(C) Physiological

(D) Trichomoniasis

Correct Answer: (C) Physiological

SOLUTION:

Key clinical details:
- White, profuse vaginal discharge
- No itching, no foul smell
- LMP: 13-15 days ago (mid-cycle/ovulatory phase)
- Woman wants to conceive

Diagnosis: Physiological leucorrhoea
At ovulation (day 14), rising estrogen causes copious, clear/white, non-offensive, elastic cervical mucus (Spinnbarkeit). This is the body's natural preparation for conception -- the mucus facilitates sperm transport. The discharge is up to 30 times more than post-menstrual phase.

Differentiating features:
- Candidiasis: curdy-white + intense pruritus
- Bacterial vaginosis: fishy odour (amine odour), clue cells on microscopy
- Trichomoniasis: frothy yellow-green + offensive odour + pruritus

Physiological discharge: no odour, no itching, mid-cycle timing -- all confirmed here.

Physiological

Quick Tip: Consider the timing relative to the menstrual cycle when evaluating vaginal discharge.

• • •

172. A 30 year old woman came with flaccid bullae on her skin which were easy to rupture. Biopsy of the lesion revealed a suprabasal split. What is the most likely diagnosis?

(A) Pemphigus vegetans

(B) Pemphigus vulgaris

(C) Pemphigus foliaceous

(D) Erythema multiforme

Correct Answer: (B) Pemphigus vulgaris

SOLUTION:

Clinical scenario: 30-year-old woman, flaccid bullae, easy to rupture, biopsy shows **suprabasal split**.

Diagnosis: Pemphigus vulgaris

Pathogenesis: IgG autoantibodies against *desmoglein 3* (Dsg3) -- a desmosomal cadherin -- disrupt keratinocyte-to-keratinocyte adhesion. This results in acantholysis (loss of cohesion between keratinocytes) just above the basal layer.

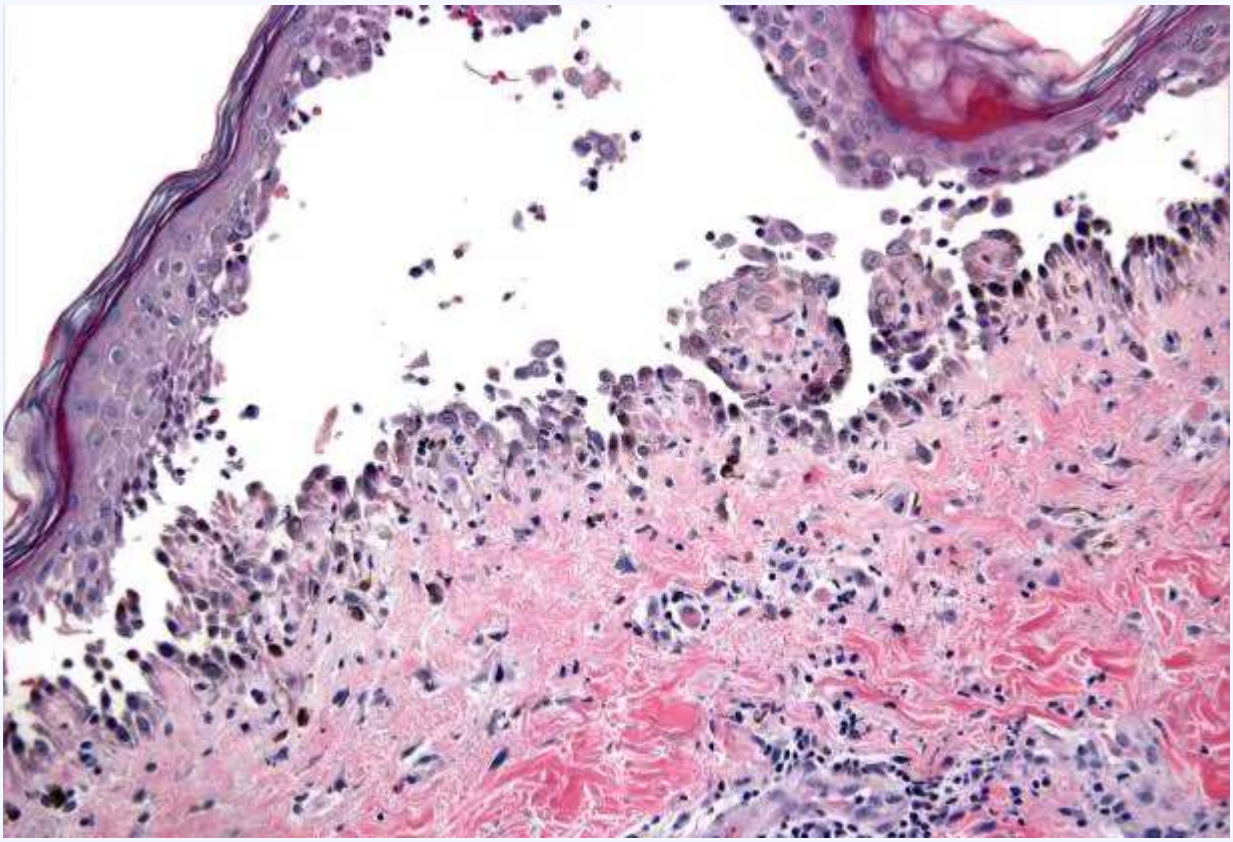
Histology hallmarks:
- Suprabasal acantholysis
- Basal cells remain on basement membrane in a "tombstone" arrangement
- Acantholytic cells (Tzanck cells) in blister cavity

Comparison:
- Pemphigus foliaceous: subcorneal split (higher up), anti-Dsg1, no mucosal involvement
- Pemphigus vegetans: suprabasal like PV but with vegetating lesions in flexures

- Erythema multiforme: subepidermal, target lesions, different immunopathology

Key clinical clue: Flaccid bullae + easy rupture + suprabasal split = Pemphigus vulgaris

Pemphigus vulgaris



Quick Tip: The level of the epidermal split on biopsy is the key to diagnosing pemphigus subtypes.

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173. A patient who has been on MBMDT presents with inflammation over pre-existing lesions and nerve involvement. What will be the best approach of treatment?

(A) Stop ALT and start steroids

(B) Stop ALT and start thalidomide

(C) Continue ALT and start steroids

(D) Continue ALT and give thalidomide

Correct Answer: (C) Continue ALT and start steroids

SOLUTION:

Scenario: Patient on MBMDT (leprosy treatment) develops inflammation over existing skin lesions + nerve involvement.

Diagnosis: Type 1 Lepra Reaction (Reversal Reaction)
- Mechanism: Abrupt increase in cell-mediated immunity (CMI) against *Mycobacterium leprae*
- Features: Erythema, edema, warmth of pre-existing plaques; nerve tenderness; new ulcerations
- Most common in borderline leprosy subtypes (BT, BB, BL)

Golden rule in lepra reactions: ALT/MDT is NEVER stopped during a reaction -- stopping increases bacterial load.

Management of Type 1 reaction:
- Continue ALT (MDT)
- Add **corticosteroids** (prednisolone 40-60 mg/day, tapered over weeks)
- Steroids prevent irreversible nerve damage

Note on thalidomide: Thalidomide is used for Type 2 (ENL) reactions, not Type 1.

Continue ALT and start steroids

Quick Tip: In lepra reactions, anti-leprosy treatment is never stopped; the reaction is

managed by adding specific anti-inflammatory agents.

• • •

174. A 13 year old male presented with erythematous edematous plaques on face over his previously existing hypoanaesthetic patches. He also complained of pain since 10 days. He has been on MBMDT since the past 2 months. What is your diagnosis?

(A) Cellulitis of face

(B) Type 1 lepra reaction

(C) Erythema Nodosum Leprosum

(D) Erysipelas

Correct Answer: (B) Type 1 lepra reaction

SOLUTION:

Key findings:
- 13-year-old male on MBMDT (leprosy patient)
- Erythematous, edematous plaques on face
- Occurring OVER pre-existing hypoanaesthetic patches
- Pain for 10 days

Diagnosis: Type 1 Lepra Reaction (Reversal Reaction)

Pathophysiology: Abrupt increase in cell-mediated immunity (CMI) against *Mycobacterium leprae* antigens leads to inflammation of previously established

skin lesions.

Distinguishing from Type 2 (ENL):
- Type 1: involves pre-existing patches/plaques, nerve involvement common, borderline leprosy
- Type 2 (ENL): NEW subcutaneous nodules + systemic features (fever, malaise), lepromatous leprosy

Distinguishing from cellulitis/erysipelas:
- These are primary bacterial infections with no prior hypoanaesthetic skin patches
- No history of leprosy treatment

Management: Continue MDT + prednisolone (steroids) to prevent nerve damage

Type 1 lepra reaction

Quick Tip: When pre-existing leprosy skin patches become inflamed in a patient on MDT, think about the type of lepra reaction that involves pre-existing lesions.

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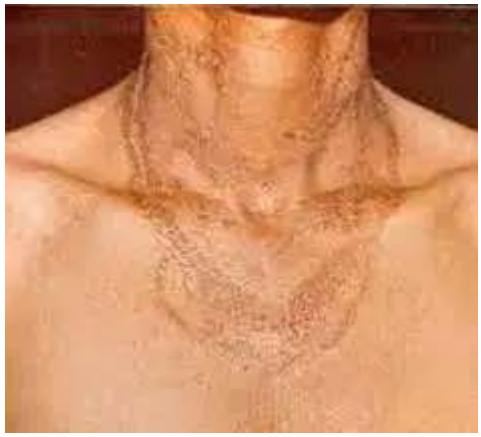
175. The image shows a skin finding on the neck (Casal's Necklace). What are the associated features of this deficiency disorder?



(A) History of diarrhoea & dementia associated with cognitive impairment

(B) Bitot's spots

(C) Angular stomatitis

(D) Loss of muscle coordination

Correct Answer: (A) History of diarrhoea & dementia associated with cognitive impairment

SOLUTION:

Image finding: Casal's Necklace -- hyperpigmented, scaly skin around the neck in a collar-like distribution on sun-exposed skin.

Diagnosis: Pellagra (Niacin/Vitamin B3 deficiency)

The 4 D's of Pellagra:
1. **Dermatitis**: Photosensitive, symmetrical, hyperpigmented rash in sun-exposed areas. Casal's necklace (neck), Gauntlet dermatitis (hands)
2. **Diarrhoea**: GI mucosal inflammation causing watery diarrhoea
3. **Dementia**: Neuropsychiatric manifestations -- confusion, cognitive impairment, disorientation
4. **Death**: Pellagra is unique -- death is included as a cardinal feature

Why not the others?
- Bitot's spots: Vitamin A deficiency
- Angular stomatitis: Riboflavin (B2) or iron deficiency
- Loss of muscle coordination: Vitamin B12 or Vitamin E deficiency

Treatment: Nicotinic acid (niacin) supplementation

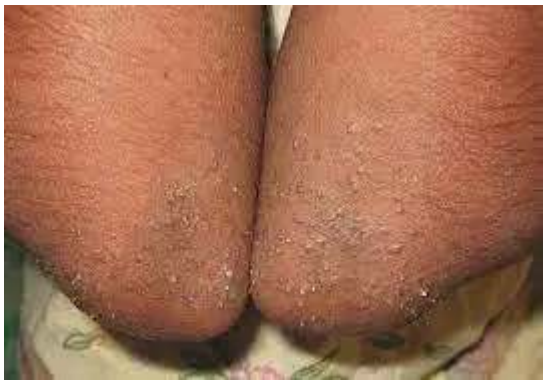
Diarrhoea and dementia with cognitive impairment (4 D's of Pellagra)

Quick Tip: The necklace-like skin rash on the neck is a classic sign of a specific vitamin

deficiency -- recall its systemic manifestations.

• • •

176. A young girl presented to the OPD with rough surfaced lesions over her elbows and knees. She also complained of diminished vision in the night. What is the most likely diagnosis?



(A) Keratosis pilaris

(B) Phrynoderma

(C) Folliculitis

(D) Pyoderma

Correct Answer: (B) Phrynoderma

SOLUTION:

Approach via nutritional deficiency pattern:

The two cardinal features in this case are: (1) follicular hyperkeratosis over pressure areas (elbows, knees) and (2) nyctalopia (night blindness).

Nyctalopia results from deficiency of **Vitamin A** (retinol), which is required for synthesis of rhodopsin (visual purple) in rod cells of the retina.

Phrynoderma is caused by deficiencies of multiple vitamins -- **Vitamin A**, **B complex**, **C**, and **E** -- but Vitamin A deficiency is predominant when night blindness coexists.

The term "phrynoderma" (Greek: phryno = toad, derma = skin) describes the toad-like rough appearance of the skin. It is a form of follicular hyperkeratosis, clinically distinct from:

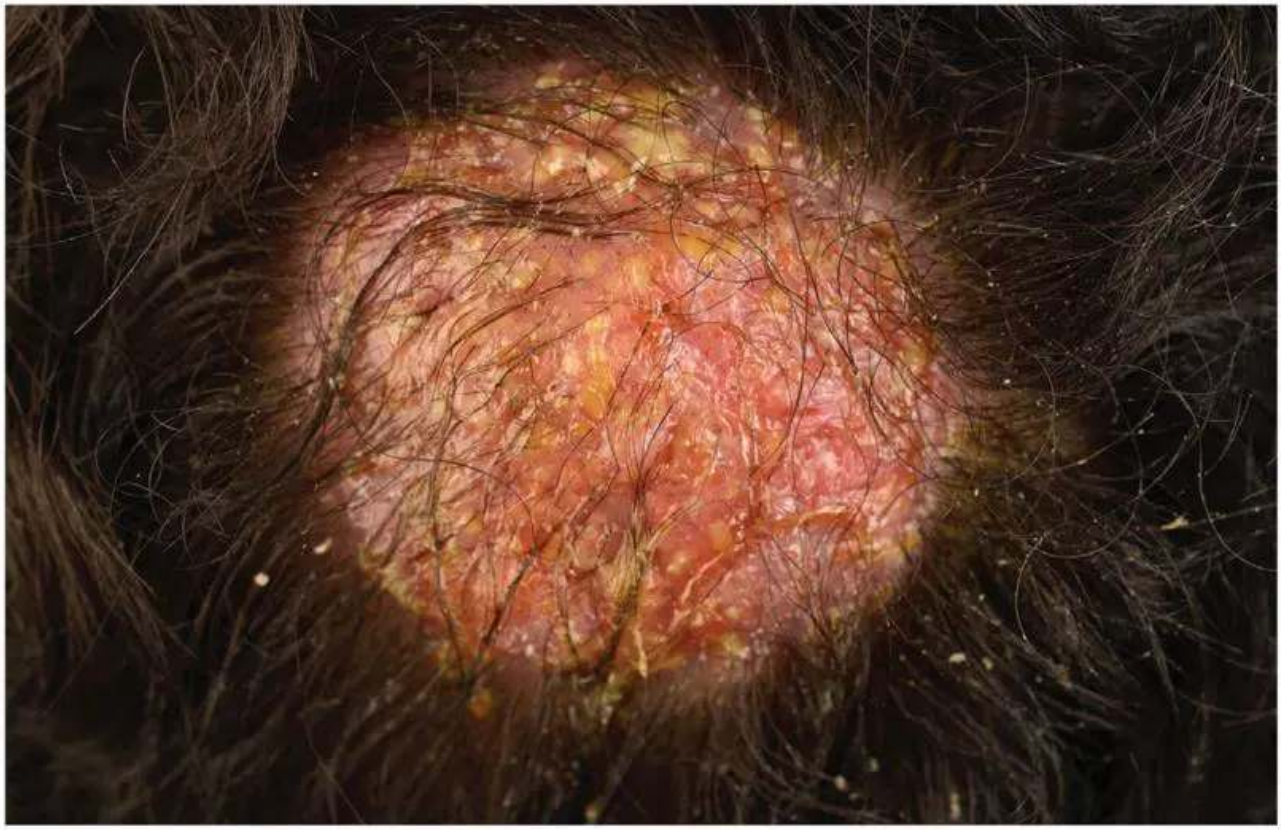
- Keratosis pilaris: genetic, no nutritional cause, no night blindness
- Folliculitis: infectious, presents with pustules
- Pyoderma: purulent infection

Treatment: Vitamin A supplementation corrects both the skin lesions and night blindness.

Phrynoderma

Quick Tip: Think of a nutritional deficiency that causes both follicular hyperkeratosis and night blindness.

177. A male child was brought with a mild painful swelling on his scalp since the last 3 months, as shown in the image. History reveals that there is a pet dog in the child's house. What is the diagnosis?



(A) Folliculitis

(B) Abscess

(C) Kerion

(D) Scabies

Correct Answer: (C) Kerion

SOLUTION:

Alternate analysis -- zoonotic dermatophytosis:

Key clues: child + 3-month painful scalp swelling + pet dog at home.

Pet dogs are reservoirs for zoophilic dermatophytes, particularly ***Microsporum canis*** and ***Trichophyton mentagrophytes***. When these infect the scalp hair follicles and provoke a strong cell-mediated immune response, the

result is a **Kerion** -- a boggy, raised, suppurative inflammatory mass with pus-discharging follicles (honeycomb pattern).

Differentiating features:

- Folliculitis: pustular, superficial, acute
- Abscess: bacterial, no honeycomb pattern, no fungal aetiology
- Scabies: burrows, interdigital spaces, intense pruritus -- not a scalp mass

Kerion is treated with systemic antifungal therapy (**griseofulvin** orally). Topical antifungals are insufficient as the infection is deep in the follicle.

Kerion

Quick Tip: Think of a fungal scalp infection transmitted from animals that causes a boggy inflammatory swelling in children.

• • •

178. A 23 year old primi gravida stays in the same house as her school going nephew, who contracted varicella infection. The woman approached the medical centre to get tested for the same and the result for varicella antibody was negative. Which of the following statements are true?

(A) She is susceptible to zoster

(B) She is susceptible to chickenpox

(C) She is immune to chickenpox

(D) She is immune to zoster

Correct Answer: (B) She is susceptible to chickenpox

SOLUTION:

Alternate approach -- VZV disease pathway:

VZV follows a strict sequential disease pattern:

Primary exposure → Chickenpox (varicella) → Virus becomes latent in dorsal root ganglia → Reactivation = Zoster

Since the patient is **antibody-negative**, she has never been exposed to VZV. This means:

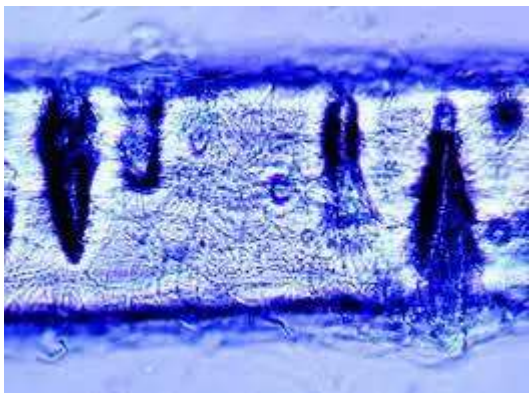
- She has **not** had chickenpox (no primary infection)
- She has **no** latent VZV in her ganglia
- She **cannot** develop Zoster (requires prior primary infection)
- She **is susceptible** to chickenpox from her infected nephew

In pregnancy, VZV seronegative status is particularly dangerous. VZIG should be given within 96 hours of exposure. Varicella vaccination is contraindicated in pregnancy (live attenuated vaccine).

She is susceptible to chickenpox

Quick Tip: Negative varicella antibody means no prior VZV exposure; zoster can only occur after primary chickenpox infection establishes latency.

179. Hair perforation test is positive for



(A) Trichophyton mentagrophytes

(B) Microsporum adouinii

(C) Epidermophyton floccosum

(D) Microsporum gypsum

Correct Answer: (A) Trichophyton mentagrophytes

SOLUTION:

Mycological differentiation approach:

The hair perforation test distinguishes dermatophytes by their capacity to actively invade (perforate) hair shafts in vitro, producing wedge-shaped perforations perpendicular to the hair shaft.

Key results to remember:

Organism	Hair Perforation Test
T. mentagrophytes	Positive
T. rubrum	Negative
M. audouinii	Negative
E. floccosum	Does not infect hair

The primary clinical use of this test is to differentiate ***T. mentagrophytes*** from ***T. rubrum***, as both are common causes of tinea pedis and tinea unguium but require different clinical approaches.

Trichophyton mentagrophytes

Quick Tip: The hair perforation test is used classically to distinguish between two common Trichophyton species based on their ability to penetrate hair in vitro.

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180. A 30 year old male was intubated for surgery. The best method to confirm the position of Endotracheal tube is

(A) X-ray chest

(B) Auscultation

(C) Capnography

(D) Chest expansion

Correct Answer: (C) Capnography

SOLUTION:

Physiological basis of capnography for ET tube confirmation:

When a patient is intubated and ventilated, exhaled gas from the lungs contains CO_2 produced by cellular metabolism. An end-tidal CO_2 (EtCO2) detector measures this CO_2 in expired air.

If the tube is in the **trachea**: sustained CO_2 waveform detected (typically 35-45 mmHg).
If the tube is in the **oesophagus**: no sustained CO_2 detected (only a brief transient rise from gastric CO2).

Comparison of methods:

- Auscultation: unreliable alone (transmitted sounds can mimic bilateral air entry)
- Chest X-ray: confirmatory but delayed; not immediate

- Chest expansion: subjective and unreliable
- Capnography: immediate, objective, continuous monitoring -- gold standard

Guidelines recommend continuous waveform capnography as the standard of care for all intubated patients in the OR and ICU.

Capnography

Quick Tip: The gold standard for confirming endotracheal tube placement detects a gas that is only present in the airway, not the oesophagus.

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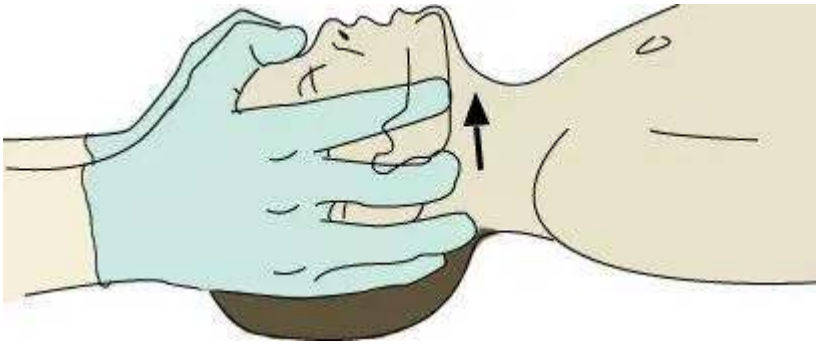
181. The below image procedure is done to maintain airway includes?



(A) Head tilt, chin lift

(B) Jaw thrust

(C) In line manual stabilization

(D) Head stabilization

Correct Answer: (A) Head tilt, chin lift

SOLUTION:

Airway manoeuvre identification approach:

The image shows the rescuer's hand on the forehead applying backward tilt while the other hand lifts the chin superiorly -- this is the **Head Tilt-Chin Lift**

manoeuvre.

Mechanism: In an unconscious patient, the tongue falls posteriorly due to loss of muscle tone, occluding the pharynx. Head tilt + chin lift displaces the tongue anteriorly, opening the airway.

Indications and distinctions:

- Head Tilt-Chin Lift: used when no cervical spine injury is suspected (standard BLS)
- Jaw Thrust: used when cervical spine injury is suspected (no neck extension needed)
- Triple airway manoeuvre = Head tilt + Jaw thrust + Mouth open (used in anaesthesia)

The triple airway manoeuvre maintains a patent upper airway by combining all three actions and is used when mask ventilation is being performed.

Head tilt, chin lift

Quick Tip: Identify the manoeuvre where one hand tilts the forehead back while the other hand lifts the chin to open the airway.

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182. A young male was given regional anaesthesia with 0.25% bupivacaine. The patient became unresponsive & pulse became unrecordable. Best Management would be

(A) CPCR with 20% Intralipid

(B) CPCR with sod. Bicarbonate

(C) CPCR with dobutamine

(D) CPCR with calcium

Correct Answer: (A) CPCR with 20% Intralipid

SOLUTION:

Lipid sink theory for Local Anaesthetic Systemic Toxicity (LAST):

Bupivacaine is highly lipophilic (protein binding ~95%). In LAST, it accumulates in myocardial tissue, blocking Na^+ channels and impairing mitochondrial fatty acid oxidation, causing refractory cardiac arrest.

Intralipid 20 (lipid emulsion therapy) reverses this by:

- Creating a lipid compartment in plasma that acts as a "lipid sink" -- bupivacaine partitions into the lipid phase, reducing free drug concentration at cardiac receptors.
- Restoring mitochondrial function by providing fatty acid substrate.

Dosing protocol:

- Bolus: **1.5 ml/kg** of Intralipid 20% IV over 1 minute
- Infusion: **0.25 ml/kg/min** for at least 10 minutes
- Repeat bolus once or twice if cardiovascular collapse persists

Other options are ineffective for this specific mechanism:

- Sodium bicarbonate: used for tricyclic antidepressant toxicity
- Dobutamine: inotropic support, not antidotal
- Calcium: used for calcium channel blocker toxicity

CPCR with 20% Intralipid

Quick Tip: Bupivacaine toxicity causing cardiac arrest has a specific antidote that works by sequestering the lipophilic drug away from cardiac tissue.

183. Child presents with myoclonus jerk, decrease performance in school. There is history of fever at the age of 1 year with rash. It is suggestive of-

(A) Subacute sclerosing panencephalitis

(B) Mesial temporal sclerosis

(C) Polio

(D) Measles

Correct Answer: (A) Subacute sclerosing panencephalitis

SOLUTION:

Key concept: SSPE (Subacute Sclerosing Panencephalitis) is caused by defective measles virus persisting in the CNS after primary infection.

Clinical clue: Measles at 1 year of age + latent period of 6-8 years + myoclonic jerks + cognitive decline = SSPE.

Why not the others?
- Mesial temporal sclerosis: causes complex partial seizures, not linked to early measles rash.
- Polio: motor neuron disease causing flaccid paralysis; no rash, no cognitive component.
- Measles: acute febrile illness; does not recur years later as a CNS degenerative disease.

EEG hallmark of SSPE: Periodic synchronous discharges (Radermecker complexes), high-amplitude biphasic slow waves every 5-8 seconds.

CSF finding: Elevated measles antibody titre (gold standard for diagnosis).

Therefore, the answer is Subacute Sclerosing Panencephalitis.

Subacute Sclerosing Panencephalitis (SSPE)

Quick Tip: Think about which progressive CNS disease is linked to measles infection in infancy after a long latent period.

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184. Webbed neck, short stature, low posterior hairline. Diagnosis-

(A) Turner syndrome

(B) Downs syndrome

(C) Patau syndrome

(D) Edwards syndrome

Correct Answer: (A) Turner syndrome

SOLUTION:

Approach: Match phenotype to chromosomal syndrome.

Given features: Webbed neck + short stature + low posterior hairline.

Turner syndrome (45,X):
- Webbed neck (pterygium colli)
- Short stature (most consistent feature)
- Low posterior hairline
- Shield chest, widely spaced nipples
- Cubitus valgus
- Primary amenorrhoea, streak gonads
- Congenital lymphoedema in neonates

Differentiating other syndromes:
- Down (Trisomy 21): flat nasal bridge, epicanthal folds, Brushfield spots
- Patau (Trisomy 13): cyclopia, holoprosencephaly, polydactyly
- Edwards (Trisomy 18): clenched fists, rocker-bottom feet

None of the above syndromes feature webbed neck as a defining characteristic.

Turner Syndrome

Quick Tip: Think about the chromosomal condition in females associated with webbed neck and short stature.

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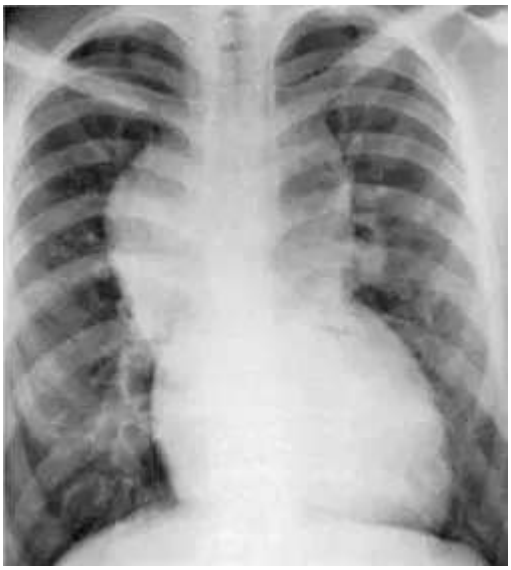
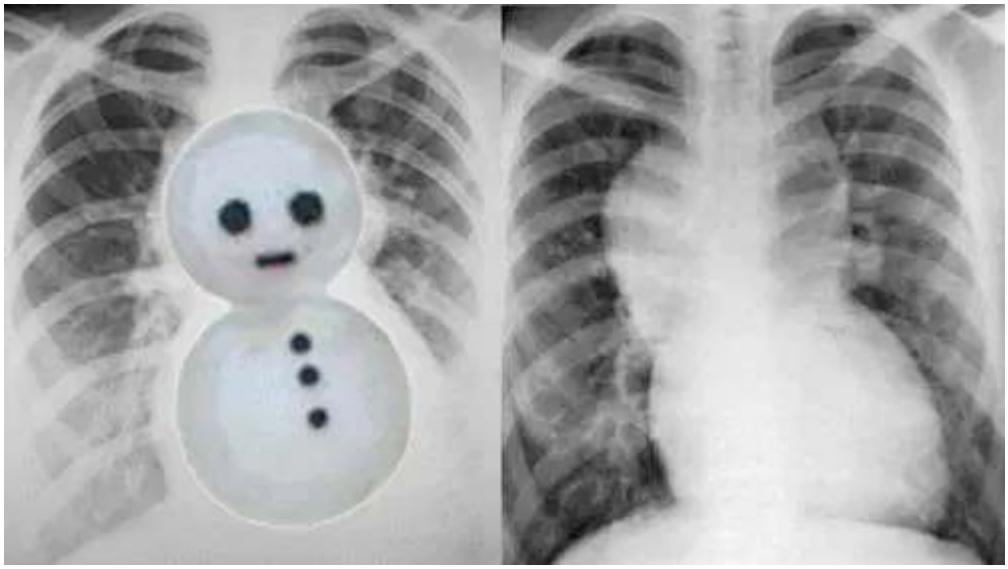
185. A 12 year old boy presented with weak pulses in upper limbs. His BP was 90/60mmHg. He also had retinal haemorrhages. Most likely diagnosis is





(A) PAN (Polyarteritis Nodosa)

(B) Microscopic polyangiitis

(C) Takayasu arteritis

(D) HSP (Henoch-Schonlein Purpura)

Correct Answer: (C) Takayasu arteritis

SOLUTION:

Diagnosis: Takayasu arteritis

Vessel size classification of vasculitides:
- Large vessel: Takayasu arteritis, Giant cell arteritis
- Medium vessel: PAN, Kawasaki disease
- Small vessel: HSP, Microscopic polyangiitis, Granulomatosis with polyangiitis

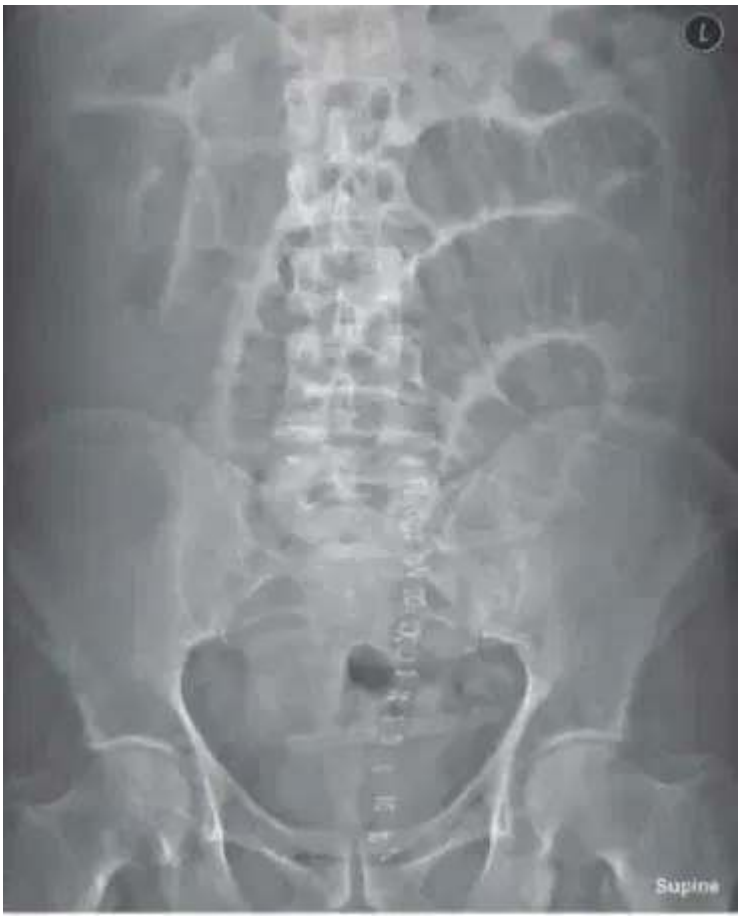
Why Takayasu arteritis fits:
1. Age: young patient (common in females aged 10-40, but males possible)
2. Weak pulses in upper limbs -- granulomatous inflammation narrows subclavian/axillary arteries
3. Low BP (90/60 mmHg) -- reduced cardiac output due to aortic arch involvement
4. Retinal haemorrhages -- ocular ischaemia from carotid artery involvement

Takayasu arteritis = Pulseless disease / Occlusive thromboaortopathy

Investigation of choice: MR angiography or CT angiography showing wall thickening and luminal narrowing of aorta and branches.

Quick Tip: Think about which large-vessel vasculitis causes absent pulses and is known as pulseless disease.

186. A 10 year old male child presented with generalised edema. His cholesterol was 238mg/dl and urine protein was 3+. Stool microscopy showed fat in stool.



(A) Goodpasture syndrome

(B) Urine infection

(C) Nephrotic syndrome

(D) Nephritic syndrome

Correct Answer: (C) Nephrotic syndrome

SOLUTION:

Nephrotic Syndrome -- Diagnostic Tetrad:

1. Proteinuria >3.5 g/day (adults) / >40 mg/m2/hr (children) -- urine protein 3+
2. Hypoalbuminaemia -- causes generalised oedema
3. Hyperlipidaemia / Hypercholesterolaemia -- cholesterol 238 mg/dl
4. Oedema (generalised, pitting)

Fat in stool explained: Massive lipid synthesis by liver overflows into GI secretions; lipid-laden shed enterocytes appear in stool as steatorrhoea.

Most common cause in children aged 1-8 years: Minimal Change Disease (MCD) -- responds well to steroids.

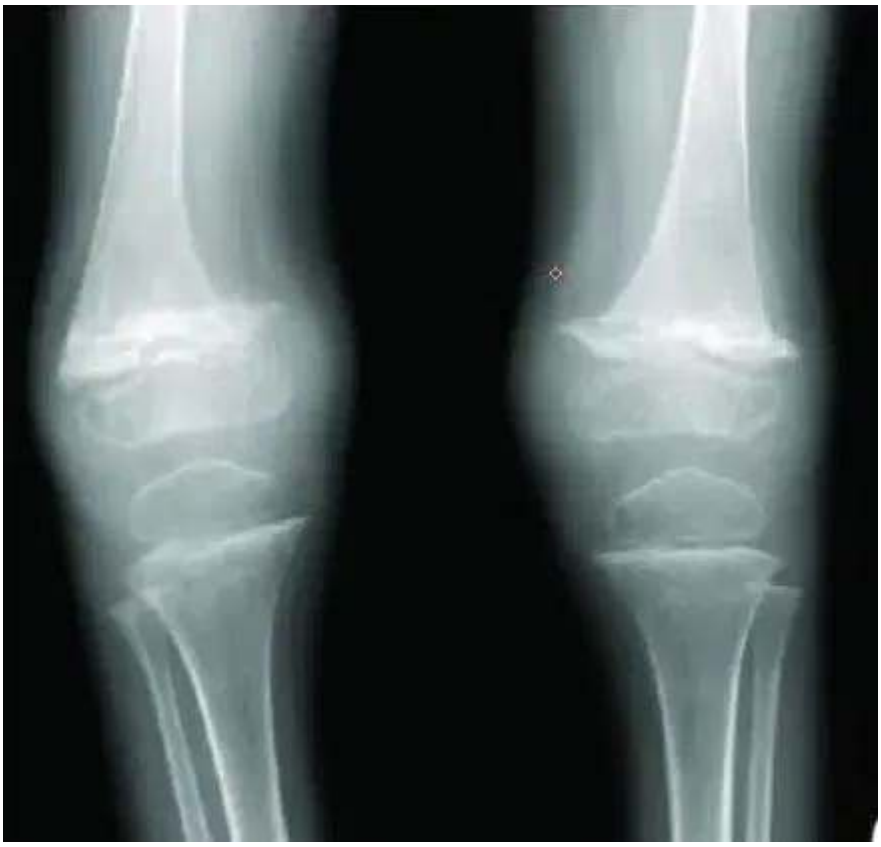
Differentiating from Nephritic Syndrome:

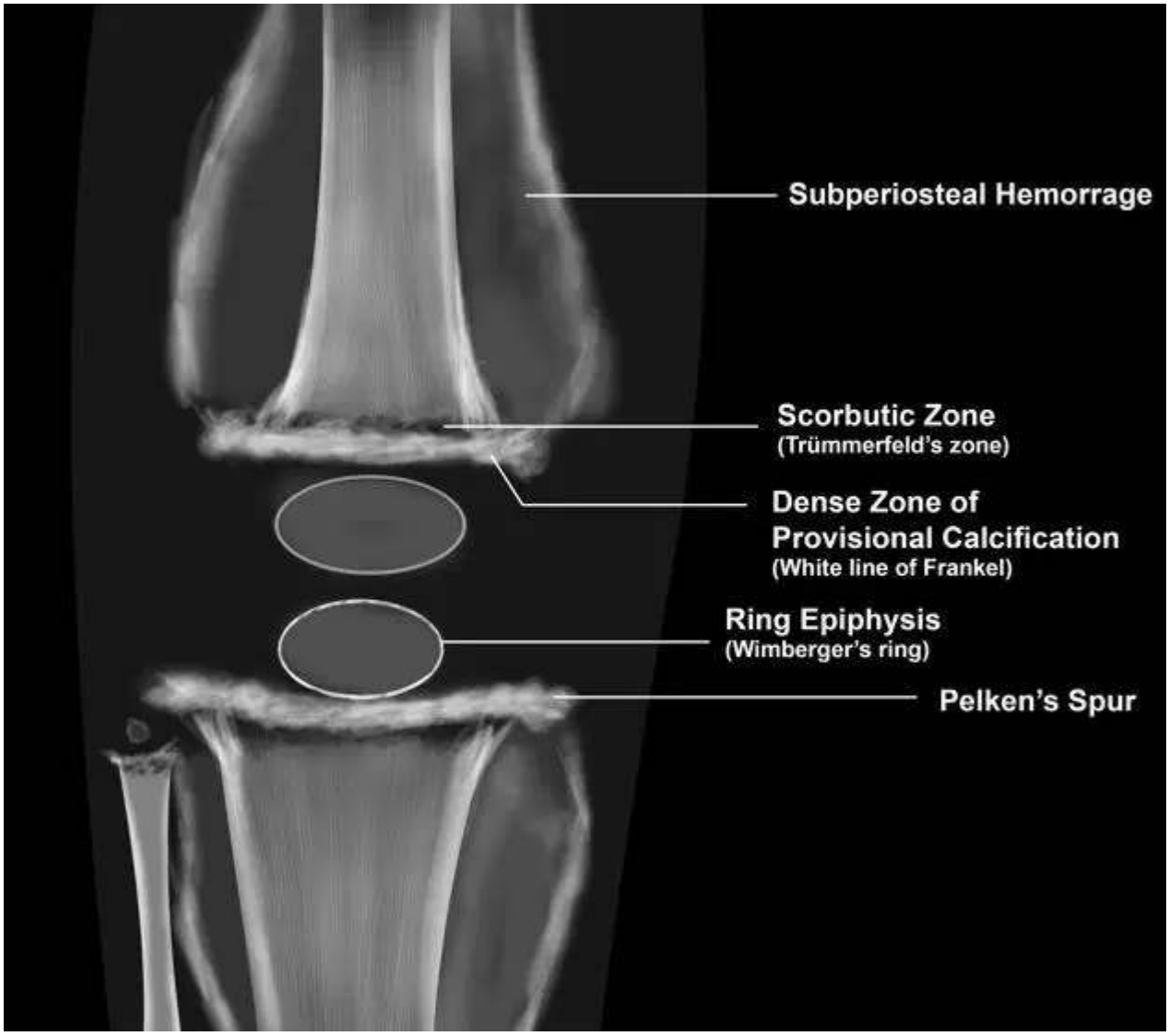
Feature	Nephrotic	Nephritic
Proteinuria	Massive (>3.5 g/day)	Mild (<3 g/day)
Haematuria	Absent	Present (hallmark)
Hypertension	Mild	Prominent
Oedema	Severe	Mild

Nephrotic Syndrome

Quick Tip: Think about the condition that combines massive proteinuria, generalised oedema, and hypercholesterolaemia in a child.

187. X-ray of a 5 year old child is shown in the image. Bone mineral density is normal. Identify the condition.





(A) Rickets

(B) Scurvy

(C) Metaphyseal dysplasia

(D) Osteopetrosis

Correct Answer: (B) Scurvy

SOLUTION:

Answer: Scurvy (Vitamin C deficiency)

Key radiological signs of scurvy (mnemonic: WPTS):
- **W**imberger ring: ring of calcification around epiphysis
- **P**elken spur: spike at lateral corner of metaphysis
- **T**rummerfeldzone: lucent band (zone of destruction) proximal to Frankel line

- **S**ubperiosteal haemorrhage: elevated periosteum due to capillary fragility
- White line of Frankel: dense band at the metaphysis (zone of provisional calcification)

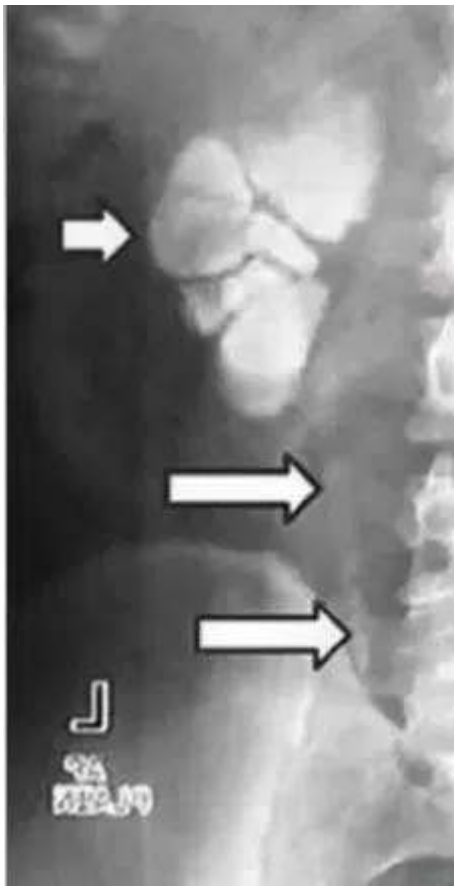
Why BMD is normal in scurvy but reduced in rickets:
- Scurvy: defective collagen (Vit C needed for hydroxylation of proline/lysine) -- mineralisation intact, BMD normal
- Rickets: defective mineralisation (Vit D deficiency) -- BMD reduced

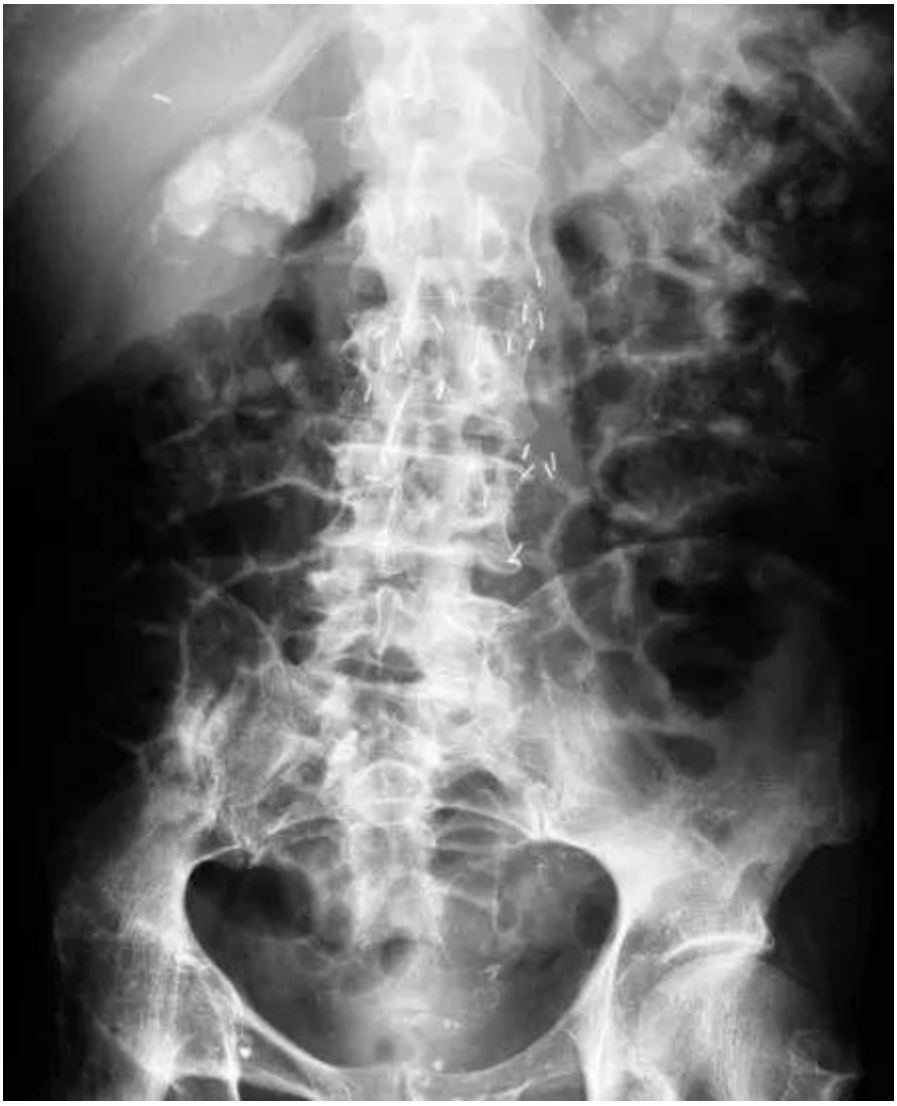
Age group: Scurvy in infants 6-24 months; manifests as irritability, pseudoparalysis, perifollicular haemorrhage, gum bleeding.

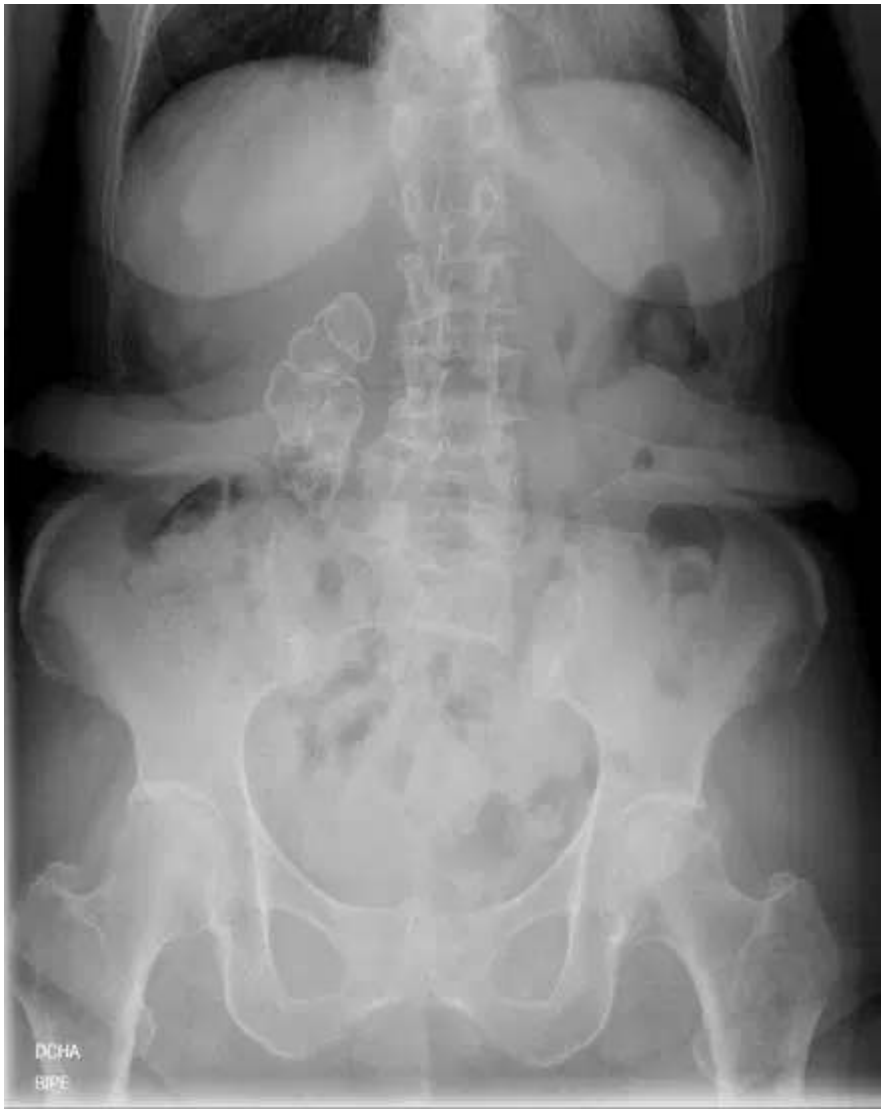
Scurvy

Quick Tip: Normal bone mineral density with subperiosteal haemorrhage and Wimberger ring on X-ray points to a vitamin deficiency disease.

188. A 26 years old male with backache, morning stiffness, chest expansion and reddening of eyes with an X-ray presented in OPD. Most likely diagnosis for this patient is







(A) Rheumatoid arthritis

(B) Ankylosing spondylitis

(C) Paget's disease

(D) Osteopetrosis

Correct Answer: (B) Ankylosing spondylitis

SOLUTION:

Diagnosis: Ankylosing Spondylitis (AS)

Key diagnostic criteria (Modified New York Criteria):
Clinical: (1) Low back pain >3 months improving with exercise, (2) Limited lumbar spine movement, (3) Limited chest expansion
Radiological: Sacroiliitis grade 2 bilateral or grade 3-4 unilateral

Extraarticular manifestations of AS:
- Eyes: Anterior uveitis (most common -- 25-30% of patients)
- Heart: Aortic regurgitation, conduction defects
- Lungs: Upper lobe fibrosis
- Kidneys: IgA nephropathy, amyloidosis

Radiological hallmarks:
- Bamboo spine: flowing syndesmophytes fusing vertebrae
- Romanus lesion: shiny corner sign -- inflammatory lesion at vertebral corner
- Trolley-track sign: on AP view of lumbar spine

HLA association: HLA-B27 (positive in ~95% of AS patients)

Treatment: NSAIDs first line; anti-TNF biologics for refractory cases

Ankylosing Spondylitis

Quick Tip: Think about the seronegative spondyloarthropathy in young males causing bamboo spine and anterior uveitis.

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189. 60 year old elderly female with previous h/o colles fracture is complaining of backache. Which of the given statement is wrong in relation to treatment of this patient?

(A) Teriparatide should be started before supplementing bisphosphonates

(B) Bisphosphonates not given for more than a year

(C) Calcium requirement is 1200mg per day

(D) Oral Vit D3 given along with oral calcium

Correct Answer: (A) Teriparatide should be started before supplementing bisphosphonates

SOLUTION:

Osteoporosis Treatment -- Identifying the Wrong Statement

Drugs for osteoporosis classified by mechanism:
- Antiresorptive (reduce bone loss): Bisphosphonates, Denosumab, SERMs (Raloxifene), Calcitonin
- Anabolic (build bone): Teriparatide (PTH 1-34), Abaloparatide, Romosozumab

Correct treatment sequence:
1. Calcium 1200 mg/day + Vitamin D3 (baseline for all patients)
2. Bisphosphonates (first-line antiresorptive): given for 3-5 years then drug holiday considered
3. Teriparatide: reserved for severe osteoporosis, multiple fractures, or bisphosphonate failure -- ALWAYS after, not before, bisphosphonates

Why Option A is WRONG:
Prior bisphosphonate use actually reduces the anabolic efficacy of teriparatide. The correct practice is: give bisphosphonates first; if still at high fracture risk, switch to teriparatide. Starting teriparatide before bisphosphonates has no evidence base and reverses the recommended sequence.

Colles fracture in a 60-year-old female = fragility fracture = osteoporosis diagnosis confirmed clinically even without DEXA.

Option A: Teriparatide before bisphosphonates (WRONG statement)

Quick Tip: Think about the correct sequence of antiresorptive versus anabolic therapy in osteoporosis management.

190. A patient presents following a Road Traffic Accident (RTA) with absent air entry on the left side and tenderness in the left lower chest wall. What is the next step in Emergency Management (EMR)?

(A) X-ray

(B) CT

(C) FAST

(D) DPL

Correct Answer: (C) FAST

SOLUTION:

Clinical Approach:
In a Road Traffic Accident (RTA) patient with absent air entry on the left and left lower chest wall tenderness, the priority is rapid identification of life-threatening injuries at the bedside.

The correct answer is **FAST (Focused Assessment with Sonography for Trauma)**.

Key reasoning:
- FAST is a bedside, non-invasive, rapid ultrasound protocol used in trauma for detecting free fluid (haemoperitoneum) in Morrison's pouch, splenorenal space, pelvis, and pericardium.
- Extended FAST (eFAST) additionally evaluates the pleural spaces for haemothorax and pneumothorax -- directly relevant in this patient with absent breath sounds.
- It does not require moving the patient to radiology, avoids radiation, and provides real-time results within minutes.

Why not others?
- ***X***-ray: useful adjunct but not as rapidly diagnostic for haemoperitoneum.
- CT: gold standard but not first-line in an unstable trauma patient.
- DPL: invasive, largely obsolete since FAST became widely available.

FAST

Quick Tip: Think of the point-of-care bedside investigation used first in trauma for detecting haemoperitoneum.

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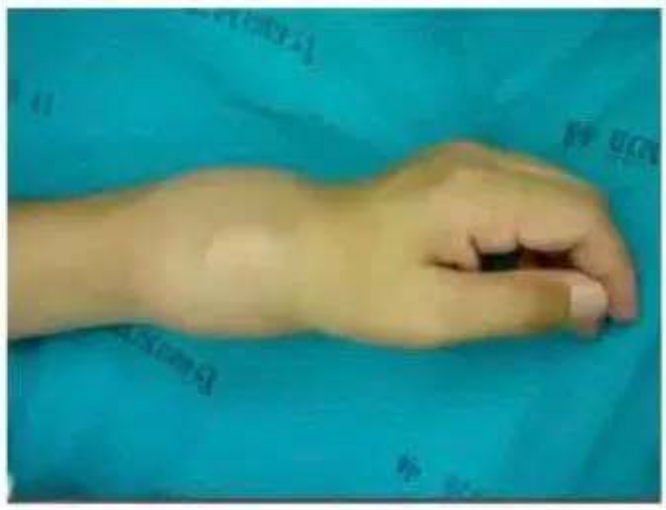
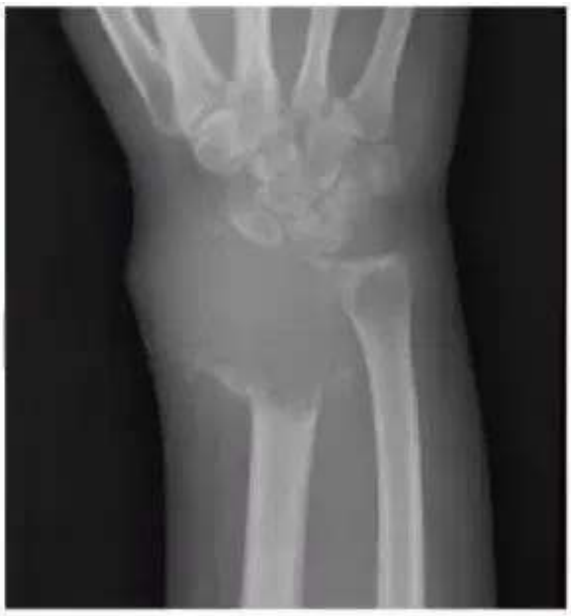
191. A patient presents with a slow-growing soft tissue swelling over the hand and wrist. The clinical image shows a subcutaneous nodule and the X-ray of the wrist is shown. What is the diagnosis?





(A) GCT (Giant Cell Tumour of tendon sheath)

(B) Osteochondroma

(C) Osteoid Osteoma

(D) Ewing Sarcoma

Correct Answer: (A) GCT (Giant Cell Tumour of tendon sheath)

SOLUTION:

Diagnosis: Giant Cell Tumour (GCT) of Tendon Sheath

The clinical scenario describes a slow-growing, painless, subcutaneous nodule over the hand and wrist -- this is the classic presentation of a **tenosynovial GCT**

(also called pigmented villonodular synovitis when diffuse).

Characteristic features of tenosynovial GCT:
- Second most common soft tissue mass of hand and wrist (after ganglion)
- Arises from the synovium of tendon sheaths
- Age: 3rd to 5th decades; slight female predominance
- Imaging: low T1 and T2 MRI signal due to haemosiderin deposits, moderate contrast enhancement
- Benign but locally recurrent after excision

Ruling out alternatives:
- Osteochondroma: bony outgrowth with cartilage cap, seen on X-ray as exostosis
- Osteoid Osteoma: nocturnal pain relieved by NSAIDs, nidus on CT
- Ewing Sarcoma: malignant, aggressive bone tumour with onion-skin periosteal reaction

GCT of tendon sheath

Quick Tip: Think of the most common benign soft tissue tumour arising from the tendon sheath in the hand.

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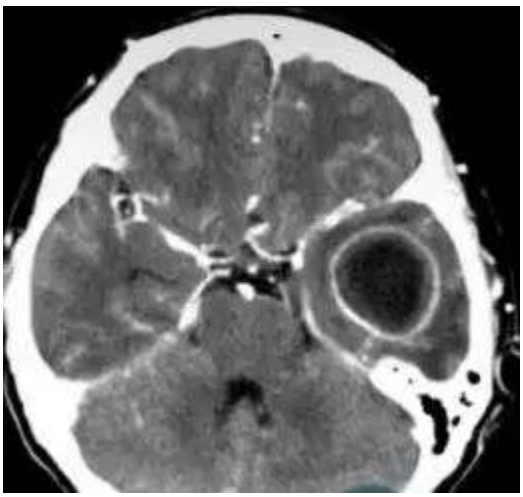
192. A patient presents with ear discharge. A CT scan of the brain is shown depicting a ring-enhancing lesion. What is the most likely diagnosis?



(A) Cerebellar abscess

(B) Temporal lobe abscess

(C) Extradural abscess

(D) Meningitis

Correct Answer: (B) Temporal lobe abscess

SOLUTION:

Answer: Temporal lobe abscess

The clinical combination of **ear discharge + CT brain showing a ring-enhancing lesion** localised to the temporal region is diagnostic of a **temporal lobe abscess** complicating chronic suppurative otitis media (CSOM).

Pathophysiology:
- The middle ear is separated from the middle cranial fossa (which houses the temporal lobe) by the tegmen tympani, a thin bony plate
- Infection from the middle ear can erode through this plate and spread directly to the temporal lobe
- The organisms involved are typically mixed anaerobic bacteria

Clinical features of temporal lobe abscess:
- Preceding ear infection/discharge
- Headache, fever, vomiting
- Dysphasia (dominant hemisphere)
- Visual field defects (superior quadrantanopia)
- Personality changes

Cerebellar abscess: also a complication of CSOM but via mastoid-posterior fossa route; presents with cerebellar signs (ataxia, nystagmus, dysdiadochokinesia)

Temporal lobe abscess

Quick Tip: Ear discharge with an intracranial ring-enhancing lesion -- consider which lobe is anatomically closest to the middle ear.

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193. An infertility patient has an ultrasound suggestive of a uterine anomaly. What is the best investigation to confirm the diagnosis?

(A) TVS (Transvaginal sonography)

(B) Hysteroscopy + Laparoscopy

(C) HSG (Hysterosalpingography)

(D) Laparoscopy

Correct Answer: (B) Hysteroscopy + Laparoscopy

SOLUTION:

Best investigation: Hysteroscopy + Laparoscopy

When USG suggests a uterine anomaly in an infertility patient, the gold standard confirmatory investigation is the **combined hysteroscopy-laparoscopy**.

Why this combination?
- **Hysteroscopy** directly visualises the internal uterine cavity and can identify septa, adhesions (Asherman's syndrome), polyps, and submucosal fibroids
- **Laparoscopy** simultaneously evaluates the external uterine contour, distinguishing septate uterus (normal fundal outline) from bicornuate uterus (indented fundal contour) -- a distinction TVS and HSG cannot reliably make
- The combination also evaluates tubal patency, ovarian morphology, and peritoneal factors causing infertility
- Most importantly, it is diagnostic AND therapeutic: uterine septum resection can be performed at the same sitting

Limitations of other options:
- TVS: good screening, poor at characterising anomaly type
- HSG: shows internal cavity and tubal patency but not external uterine contour

or peritoneal pathology
- Laparoscopy alone: cannot visualise internal cavity

Hysteroscopy + Laparoscopy

Quick Tip: Consider which investigation can both diagnose internal and external uterine anomalies and treat them at the same sitting.

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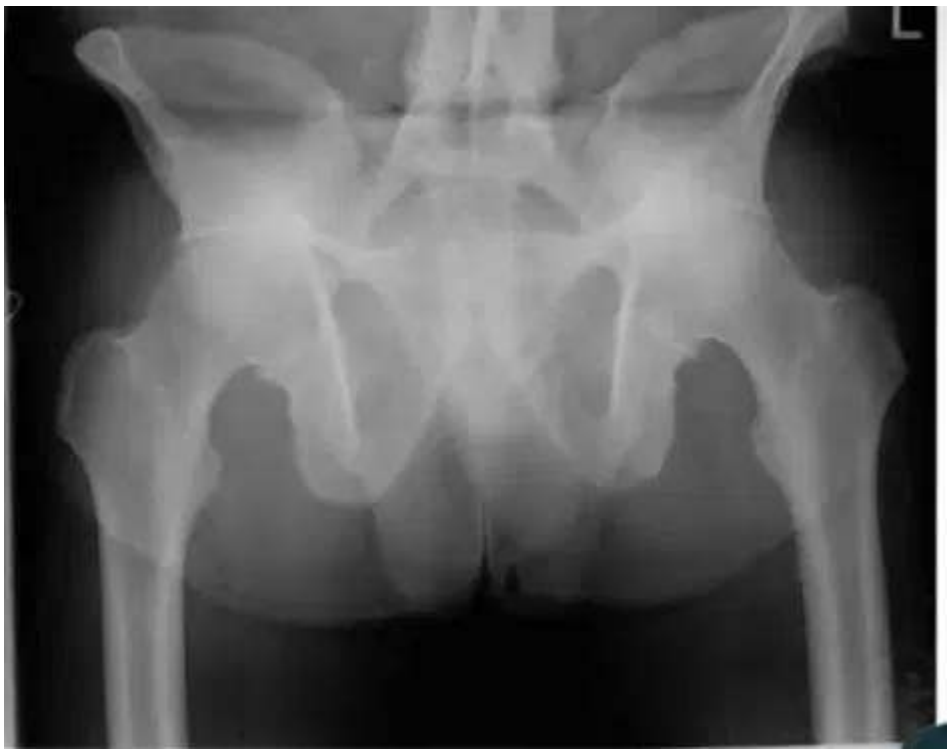
194. A 50 year old male presents with backache and morning stiffness, red eye, and ankle swelling. A pelvic X-ray is shown. What is the most likely diagnosis?



(A) Ankylosing Spondylitis

(B) Healed TB spine

(C) Paget's disease

(D) Osteopetrosis

Correct Answer: (A) Ankylosing Spondylitis

SOLUTION:

Diagnosis: Ankylosing Spondylitis (AS)

The classic triad in this question -- **inflammatory backache + morning stiffness + red eye (anterior uveitis) + ankle swelling (enthesitis)** -- is pathognomonic of **Ankylosing Spondylitis**.

Key facts about AS:
- Seronegative spondyloarthropathy strongly associated with HLA-B27
- Predominantly affects young males (onset typically under 40 years)
- Inflammatory back pain: worse at rest, improves with activity, associated with morning stiffness > 30 minutes
- Extra-articular features: anterior uveitis (25--30%), enthesitis, peripheral arthritis, aortic regurgitation, apical pulmonary fibrosis

Radiographic features on pelvic X-ray:
- Sacroiliitis: subchondral sclerosis, erosions, pseudo-widening, then ankylosis of SI joints
- Spine: vertebral squaring, Romanus lesion (shiny corner sign), syndesmophytes leading to bamboo spine
- Dagger spine: linear ossification of interspinous ligaments on AP view

Treatment: NSAIDs first-line; biologics (anti-TNF agents) for refractory disease

Ankylosing Spondylitis

Quick Tip: Inflammatory backache with red eye and ankle swelling in a young-to-middle-aged male points to a seronegative spondyloarthropathy.

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195. A mother brings her daughter who has short stature and webbing of the neck, among other features. What will an ultrasound examination show?

(A) Hepatomegaly with altered echotexture

(B) Single kidney

(C) Echo showing tricuspid stenosis

(D) Streak ovaries with small uterus

Correct Answer: (D) Streak ovaries with small uterus

SOLUTION:

Diagnosis: Turner Syndrome -- USG shows streak ovaries with small uterus

The features of **short stature + webbing of neck** in a female are hallmarks of **Turner Syndrome (45,XO)**.

Pathophysiology of gonadal failure in Turner syndrome:
- Caused by complete or partial absence of one X chromosome
- The ovaries initially form but the egg cells undergo accelerated atresia before birth
- By puberty, ovaries are replaced by fibrous streaks (streak gonads) with no functional follicles
- Absence of oestrogen leads to failure of pubertal development and primary amenorrhoea
- The uterus and fallopian tubes are present but remain small and underdeveloped

USG findings:
- Streak ovaries: thin, echogenic fibrous bands in the adnexa
- Small uterus (prepubertal size even in adolescence)

Other features of Turner syndrome:
- Cardiac: bicuspid aortic valve (most common), coarctation of aorta
- Renal: horseshoe kidney
- Lymphoedema at birth
- Shield chest, wide carrying angle

Management: Oestrogen replacement for feminisation; growth hormone for short stature

Streak ovaries with small uterus

Quick Tip: Think of the gonadal pathology that results from the chromosomal anomaly causing short stature and neck webbing in females.

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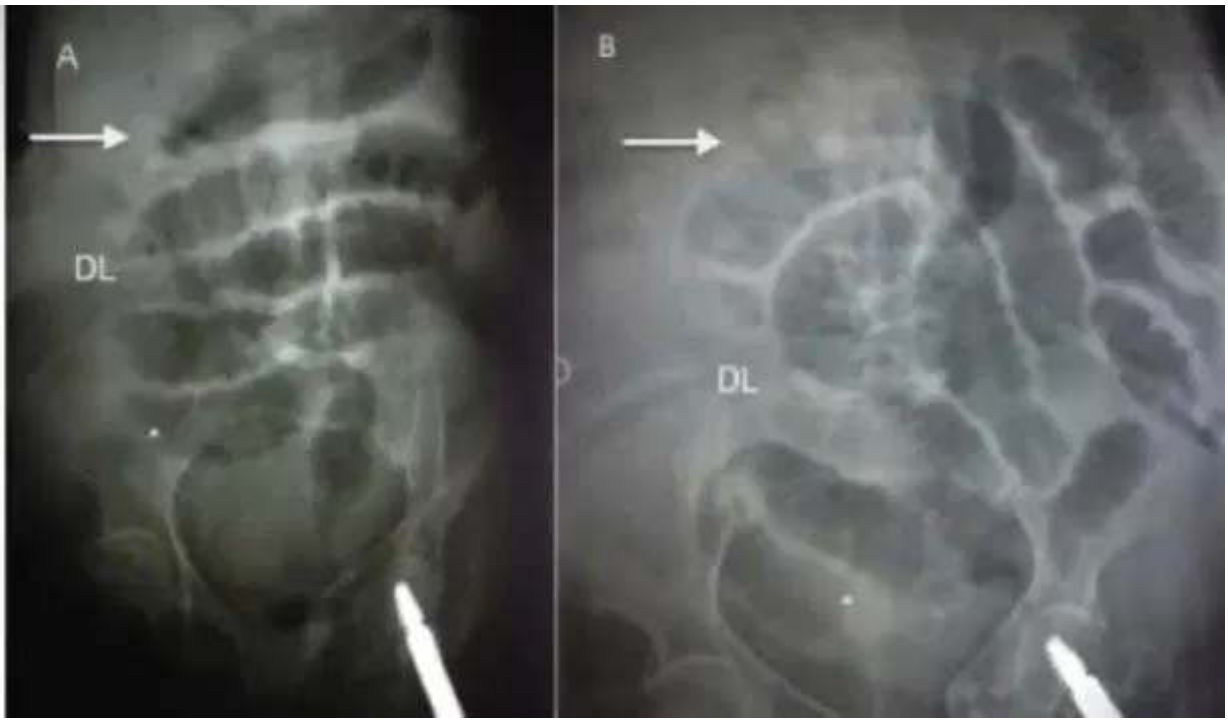
196. A 60 year old obese female presents with abdominal pain, distension, and increased bowel sounds. There are multiple air fluid levels and air in the biliary tree on imaging. She also has a history of hysterectomy 2 years back. What is the probable diagnosis?



(A) Gall stone Ileus

(B) Small bowel obstruction

(C) Large bowel obstruction

(D) Paralytic ileus

Correct Answer: (A) Gall stone Ileus

SOLUTION:

Diagnosis: Gallstone Ileus

The combination of **small bowel obstruction + air in the biliary tree (pneumobilia)** in an elderly obese woman is the hallmark of **Gallstone Ileus**.

Pathophysiology:
- Chronic cholecystitis leads to adhesion between the gallbladder and adjacent bowel (usually duodenum)
- A large gallstone (> 2.5 cm) erodes through the gallbladder wall into the bowel, creating a cholecystoenteric fistula
- The gallstone travels down the GI tract and becomes impacted, most commonly at the narrowest part -- the ileocaecal valve
- This causes mechanical small bowel obstruction
- Air enters the biliary tree through the fistula, causing pneumobilia on X-ray

Rigler's Triad (classic radiological triad):
1. Small bowel obstruction (multiple air-fluid levels)
2. Pneumobilia (air in biliary tree)
3. Ectopic radio-opaque gallstone (visible in only 15% of cases)

Differentiating from paralytic ileus:
- Paralytic ileus: absent bowel sounds, generalised gaseous distension of both small and large bowel
- Gallstone ileus: increased/high-pitched bowel sounds, localized small bowel obstruction pattern

Management: Enterolithotomy (remove the stone); cholecystectomy and fistula repair may be staged

Gallstone Ileus

Quick Tip: Look for Rigler's triad: small bowel obstruction + pneumobilia + ectopic gallstone -- a rare but classic cause of obstruction in elderly females.

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197. A 45 year old patient with hypertension presenting with acute severe chest pain & there is diaphoresis. Also there is h/o loss of consciousness, unequal pulses. In emergency condition which is the best one to make a diagnosis

(A) Cardiac enzymes

(B) MRI

(C) X-ray

(D) TEE

Correct Answer: (D) TEE

SOLUTION:

Clinical Diagnosis: The triad of hypertension + severe chest pain + unequal pulses in an emergency setting is classic for **aortic dissection**.

Investigation of choice in emergency = TEE (Transesophageal Echocardiography)

Why TEE?

- Bedside availability -- no need to transport an unstable patient
- No radiation, no contrast required
- Directly visualises the intimal flap and false lumen in real time
- Sensitivity **> 95%** and specificity **> 95%** for proximal (Type A) aortic dissection
- Can simultaneously assess aortic regurgitation and pericardial effusion (complications of dissection)

Why not the others?

- Cardiac enzymes: diagnose MI, not dissection
- MRI: best overall accuracy but takes 30-60 min -- not feasible in unstable patients
- X-ray: insensitive; widened mediastinum is only a screening clue

Answer: TEE

Quick Tip: Unequal pulses in a hypertensive patient with acute chest pain should point you away from ACS towards aortic pathology.

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198. A female presenting with abdominal pain, distension, organ failure in last 24 hours. CT scan shows pancreas which is bulky & there is fluid density lesion in the pancreas. Which of the following will be increased.

(A) AST

(B) Lipase

(C) Creatine Kinase

(D) Blood Urea Nitrogen

Correct Answer: (B) Lipase

SOLUTION:

Diagnosis: Acute Pancreatitis

CT findings of a bulky pancreas with peripancreatic fluid density lesion + acute presentation with organ failure = **acute pancreatitis**.

Key enzyme to remember:

- **Lipase** -- produced exclusively by pancreatic acinar cells; rises in 4-8 hours, peaks at 24 hours, persists for 8-14 days

- More specific than amylase (amylase is also produced by salivary glands, ovaries, fallopian tubes)
- Diagnostic threshold: **> 3** times the upper limit of normal

Other options explained:

- AST: elevated in hepatocellular damage (not pancreatitis primarily)
- CK: marker of skeletal/cardiac muscle injury
- BUN: may rise secondary to prerenal failure in severe pancreatitis, but not the primary diagnostic marker

Answer: Lipase

Quick Tip: A bulky pancreas with fluid density on CT in an acutely ill patient points to pancreatitis -- think which pancreatic enzyme is most specific.

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199. There was patient of Kidney trauma with hematuria. Which of the following investigation is advised to localised the site of hematuria

(A) CT

(B) X-ray

(C) MRI

(D) USG

Correct Answer: (A) CT

SOLUTION:

Scenario: Renal trauma with haematuria

Investigation to localise site of haematuria = **CT (Computed Tomography)**

Specifically: **CT IVP (CT Intravenous Pyelogram)** with three phases:

1. Arterial phase: detects active arterial extravasation
2. Venous/nephrographic phase: identifies parenchymal lacerations and extent of injury
3. Delayed/excretory phase: identifies collecting system disruption and ureteric injuries

AAST Renal Trauma Grading (based on CT):

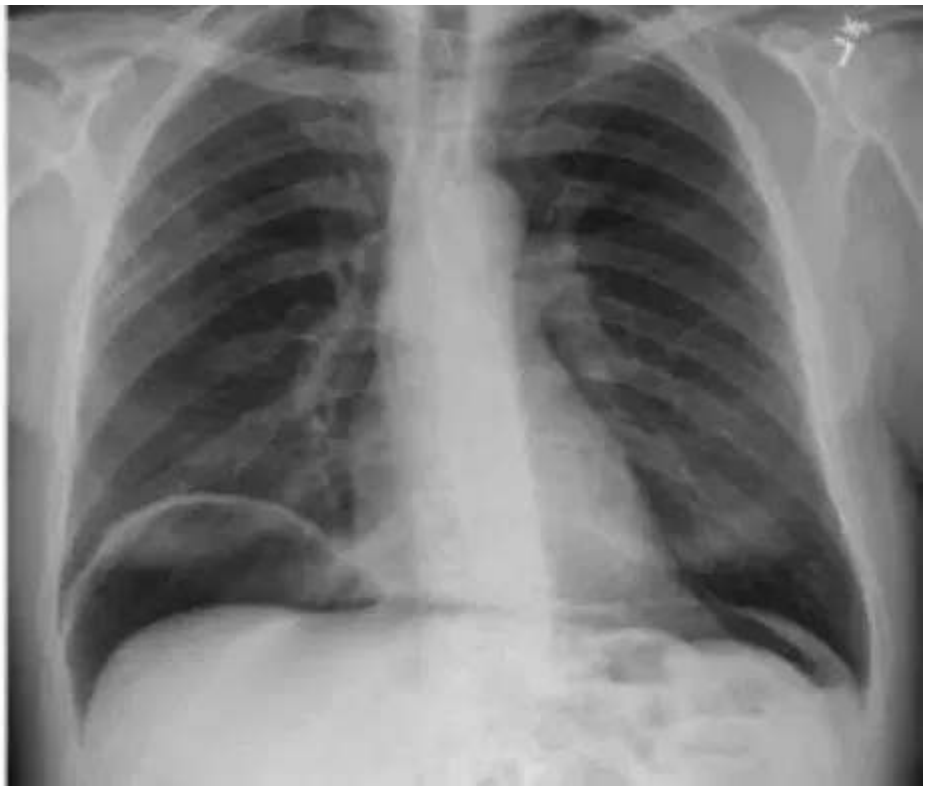
- Grade I: renal contusion or subcapsular haematoma
- Grade II: non-expanding perirenal haematoma, laceration < 1 cm depth
- Grade III: laceration > 1 cm without collecting system rupture
- Grade IV: laceration extending into collecting system, vascular injury
- Grade V: shattered kidney or avulsion of renal hilum

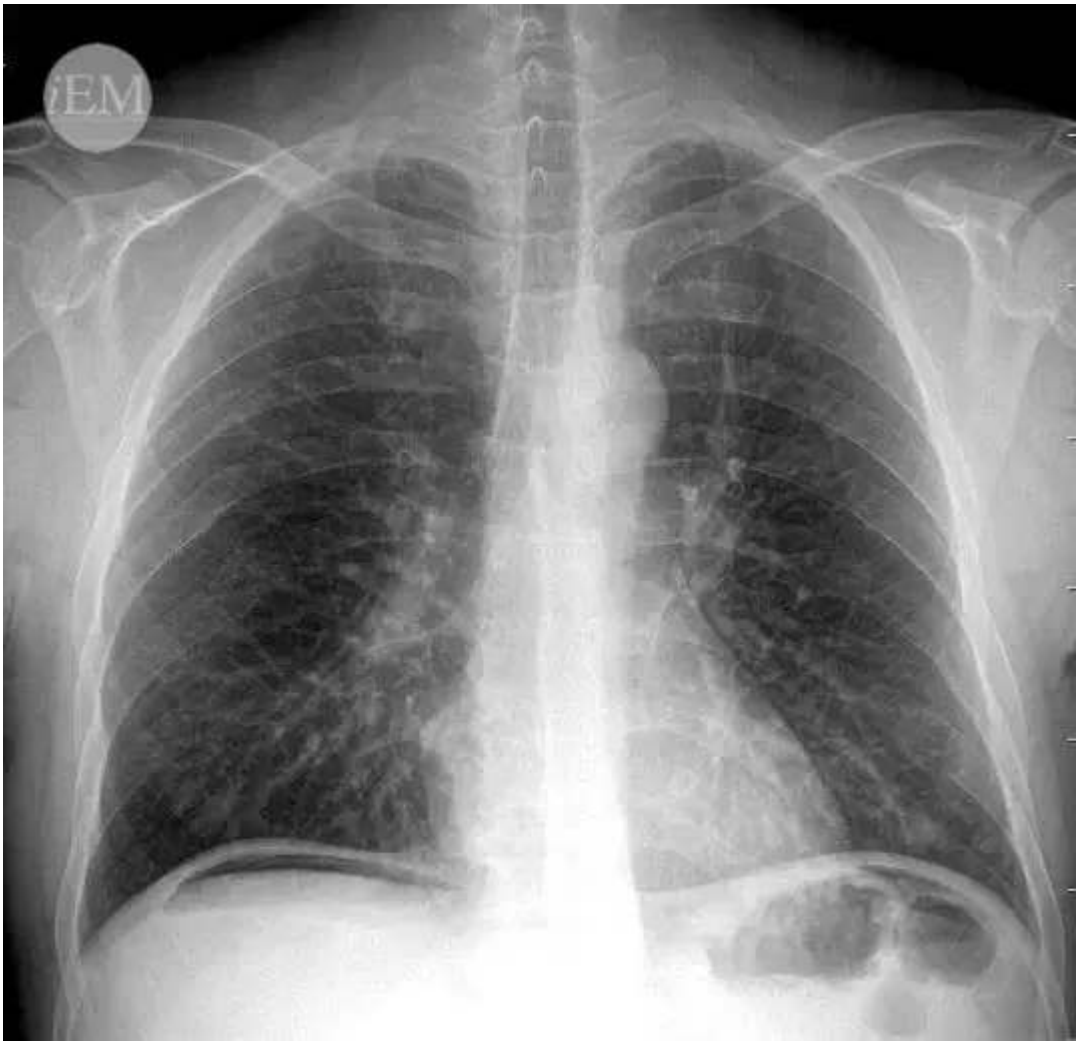
Why not others: X-ray cannot image parenchyma; USG misses collecting system injuries; MRI not practical in emergency.

Answer: CT

Quick Tip: In trauma with haematuria, think of which modality can simultaneously image the parenchyma, collecting system, and active bleeding in one scan.

200. 2 X-rays (Erect & Supine) were given to identify the condition [Image shows erect and supine chest X-rays with air under diaphragm on erect view]





(A) Empyema Thorax

(B) Liver abscess

(C) Gastric volvulus

(D) Hollow viscus perforation

Correct Answer: (D) Hollow viscus perforation

SOLUTION:

X-ray Interpretation: Erect and Supine views

Key sign: **Pneumoperitoneum** = free air under the right hemidiaphragm on erect chest X-ray

Diagnosis: **Hollow Viscus Perforation**

Radiological signs of pneumoperitoneum:

- **Erect CXR:** Crescent of air under the right (or both) hemidiaphragm(s) -- most sensitive plain film sign; as little as 1 mL of free air can be detected
- **Supine AXR:** Rigler's sign (double wall sign) -- both inner and outer bowel wall visible; football sign (large ovoid lucency over the abdomen); falciform ligament sign
- **Lateral decubitus:** Air collects between liver and lateral abdominal wall

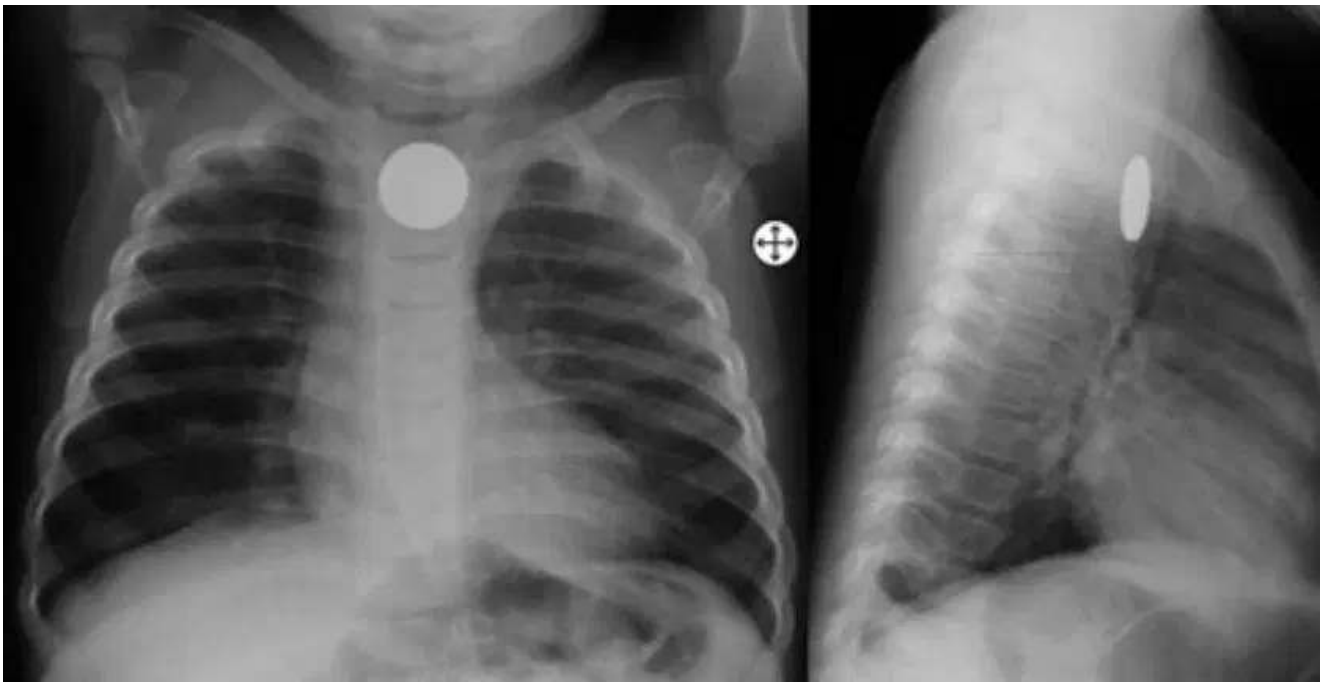
Common causes of pneumoperitoneum:

- Perforated peptic ulcer (most common)
- Perforated appendix
- Iatrogenic (post-laparoscopy -- physiological within 48 hours)
- Perforated diverticulitis

Answer: Hollow Viscus Perforation

Quick Tip: Free gas under the diaphragm on an erect X-ray is pathognomonic of one specific emergency -- identify it correctly.

201. A baby playing was left unattended by the mother develops distress. Identify where the object is [Images show PA and lateral chest X-rays with a round radio-opaque foreign body in the midline]



(A) Oesophagus

(B) Trachea

(C) Below diaphragm

(D) GI tract

Correct Answer: (A) Oesophagus

SOLUTION:

Clinical context: Child + unattended + distress + round radio-opaque object on CXR = **swallowed/aspirated foreign body**

Localisation rule for coin on X-ray:

View	Oesophagus	Trachea
AP (frontal)	En face -- full circle visible	Edge-on -- linear stripe
Lateral	Edge-on -- linear; trachea lies ANTERIOR	En face -- full circle

In this question:

- PA view: round opaque object (en face) -- suggests oesophagus
- Lateral view: trachea is anterior to the coin -- confirms coin is POSTERIOR = oesophagus
- Object is above the aortic knob = mid-thoracic oesophagus (second common impaction site after cricopharyngeus)

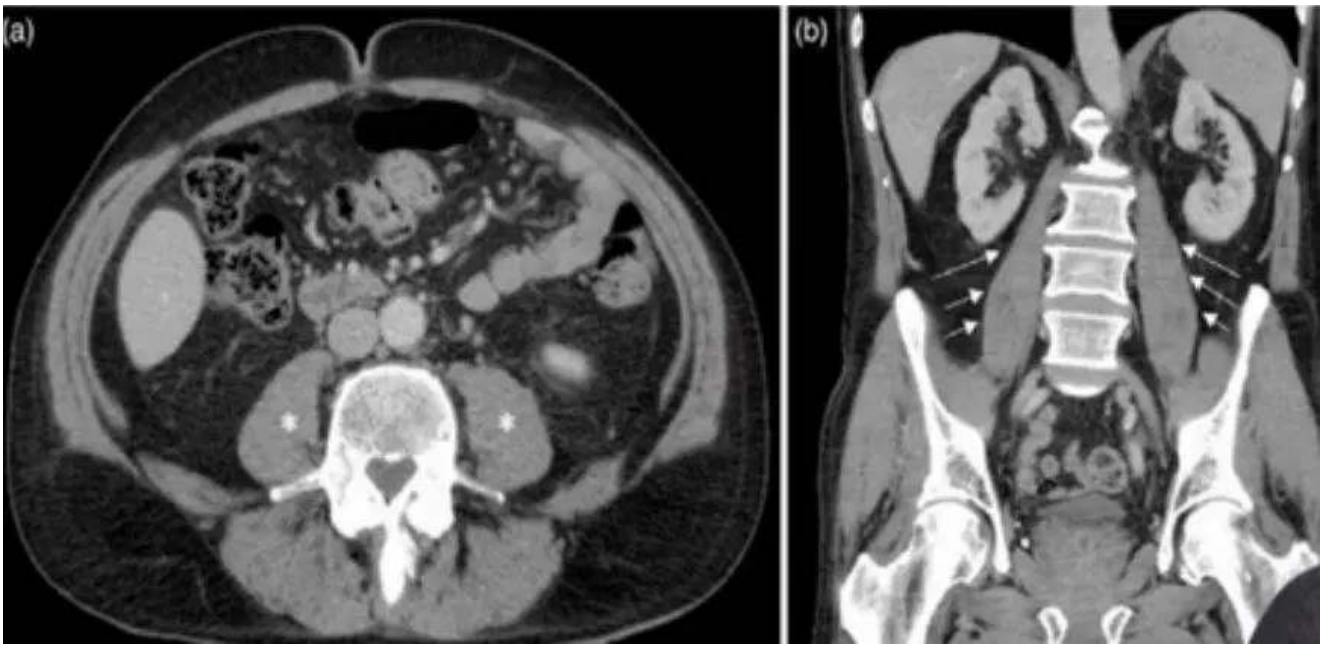
Common sites of oesophageal impaction (in order):
1. Cricopharyngeus muscle (C6 level) -- most common
2. Aortic arch level
3. Gastro-oesophageal junction

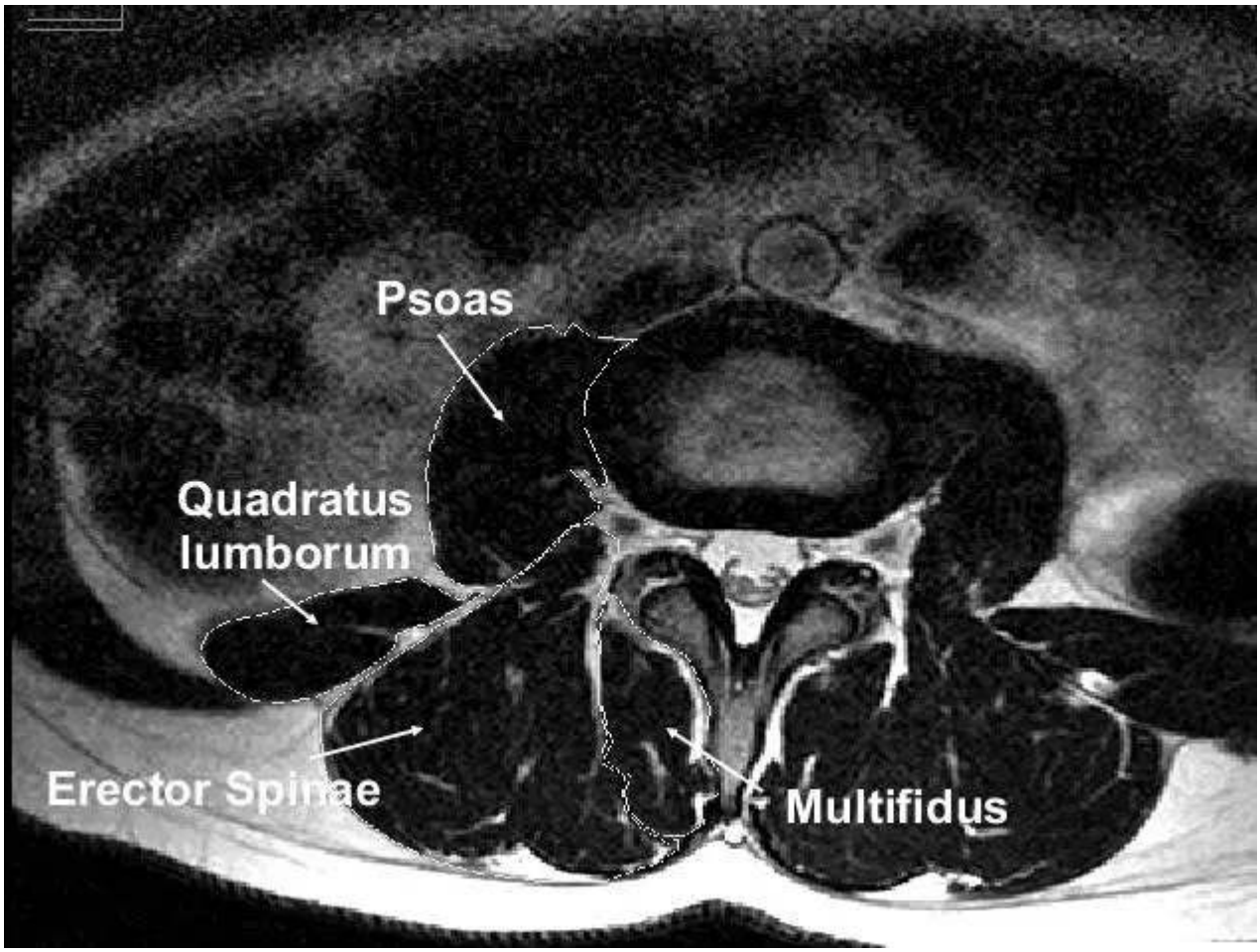
Management: Endoscopic removal under sedation

Answer: Oesophagus

Quick Tip: On a PA chest X-ray, a coin lying en face (full circle visible) with the trachea anterior to it on the lateral view localises it to the oesophagus, not the trachea.

202. Identify the muscle marked causes flexion of hip [Images show axial and coronal CT sections of the abdomen/pelvis with a muscle marked bilaterally in the retroperitoneum]





(A) Gluteus Muscle

(B) Psoas Muscle

(C) Latissimus dorsi

(D) Multifidus

Correct Answer: (B) Psoas Muscle

SOLUTION:

CT anatomy question: Identify the hip flexor muscle

Location on CT: retroperitoneal, bilateral, flanking the lumbar vertebral bodies = **Psoas Major Muscle**

Key facts:

- Origin: T12 to L5 vertebral bodies & intervertebral discs; transverse processes
- Insertion: Lesser trochanter of femur (combined with iliacus = iliopsoas)
- Innervation: Lumbar plexus (L1-L3); femoral nerve (L2-L4) for iliacus component
- Primary action: **Hip flexion** (most powerful hip flexor)
- Secondary: Lateral flexion of lumbar spine, stabilization of lumbar lordosis

Clinical relevance:

- Psoas abscess: presents with painful hip in fixed flexion (psoas sign); appears as a hypodense retroperitoneal collection tracking along the psoas on CT
- Psoas shadow: loss of psoas shadow on plain X-ray = retroperitoneal pathology (aortic aneurysm, haematoma, abscess)

On CT: the psoas appears as a well-defined ovoid-to-triangular muscle mass in the retroperitoneum, merging with iliacus in the iliac fossa.

Answer: Psoas Muscle

Quick Tip: The muscle visible bilaterally in the retroperitoneum on CT, flanking the lumbar vertebrae, and inserting into the lesser trochanter is the primary hip flexor.

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203. A 16 year old female patient presented with over familiarity, flight of ideas, elevated mood, increased sexual desire, pseudohallucinations. What will be the diagnosis?

(A) Mania

(B) Schizomania

(C) Hypomania

(D) Cyclothymia

Correct Answer: (A) Mania

SOLUTION:

Psychiatric diagnosis: 16-year-old female

Symptoms present:

- Over familiarity (disinhibited social behaviour)
- Flight of ideas (formal thought disorder -- thoughts race and jump topics rapidly)
- Elevated mood (euphoria/expansiveness)
- Increased sexual desire (hypersexuality -- increased goal-directed activity)
- Pseudohallucinations (perceptions felt to originate from within the mind -- a psychotic feature)

Diagnosis = Mania

Differentiating Mania vs Hypomania:

Feature	Mania	Hypomania
Duration	> 7 days	4-7 days
Impairment	Marked	Minimal
Psychotic features	Present (can occur)	Absent
Hospitalisation	Often required	Not required

Why not Schizomania: Not a DSM-5 diagnostic category; schizoaffective disorder requires concurrent psychotic and mood symptoms meeting specific criteria.

Why not Cyclothymia: Cyclothymia is a chronic, low-grade fluctuating condition with hypomanic and depressive symptoms for > 2 years -- does not present acutely with these severe features.

Pseudohallucinations in mania = psychotic mania, which places this beyond hypomania.

Answer: Mania

Quick Tip: Elevated mood with flight of ideas and a psychotic feature (pseudohallucinations) distinguishes a full manic episode from the milder hypomanic episode.

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204. A 50 year old male suddenly stopped alcohol consumption for 3 days in hospital with agitation, altered sensorium, paranoid delusions and hallucinations. The most likely diagnosis is

(A) Wernicke's Encephalopathy

(B) Korsakoff's psychosis

(C) Hangover

(D) Delirium Tremens

Correct Answer: (D) Delirium Tremens

SOLUTION:

Approach via withdrawal timeline:
In alcohol dependence, abrupt cessation triggers a well-defined sequence of withdrawal phenomena. The timing of symptom onset after the last drink is the key diagnostic discriminator:

- 0-6 hours: Minor withdrawal (tremor, anxiety, nausea, insomnia)
- 12-24 hours: Alcoholic hallucinosis (perceptual disturbances with clear sensorium)
- 24-48 hours: Withdrawal seizures (grand mal, self-limited)
- 48-96 hours: **Delirium Tremens** -- the most severe stage

Why Delirium Tremens fits this case:
This patient stopped alcohol 3 days ago (**72** hours) and now presents with agitation, altered sensorium (global confusion), paranoid delusions, and hallucinations. This is the classic DT presentation combining severe autonomic instability with florid psychosis.
Why the other options are wrong:
Wernicke's encephalopathy = ophthalmoplegia + ataxia + confusion (thiamine deficiency, not cessation timing-dependent). Korsakoff's psychosis = chronic anterograde amnesia + confabulation (late sequela, no acute agitation). Hangover = mild, self-limiting, resolves in <24 hours with no psychosis.
Management of DT: Benzodiazepines (diazepam/lorazepam) are the cornerstone; thiamine supplementation is always co-administered.

Delirium Tremens

Quick Tip: Think about the timing -- symptoms appearing 48-96 hours after stopping alcohol point to a specific withdrawal syndrome.

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205. Which of the following is included in form of thought disorder?

(A) Derailment

(B) Obsession

(C) Thought insertion

(D) Delusion

Correct Answer: (A) Derailment

SOLUTION:

Conceptual framework -- Form vs Content of Thought:
Psychiatry divides thought disorders along two axes: *form* (the way thoughts are linked and expressed) and *content* (what the thoughts are about).
Form of thought disorders include: derailment, thought blocking, tangentiality, circumstantiality, pressured speech, poverty of speech, verbigeration, perseveration, and flight of ideas. The unifying feature is a disruption in the logical *flow and organisation* of thought.
Content of thought disorders include: delusions (fixed false beliefs), obsessions (ego-dystonic repetitive thoughts recognised as one's own), thought insertion/withdrawal/broadcasting (passivity phenomena -- first-rank symptoms of schizophrenia), overvalued ideas, and phobias.
Applying to the options:
Option A -- Derailment: shift of thought from one track to another with no apparent connection -- this is a *form* disorder. Options B, C, D (Obsession, Thought insertion, Delusion) are all *content* disorders. Only derailment qualifies as a form of thought disorder.

Derailment

Quick Tip: Distinguish between the form (structure/flow) and content (subject matter) of thought -- only one option is a disturbance of form.

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206. During the course of psychotherapy, the therapist has mixed conscious and unconscious feeling towards a patient, this is known as

(A) Transference

(B) Countertransference

(C) Dissociation

(D) Preoccupation

Correct Answer: (B) Countertransference

SOLUTION:

Psychoanalytic framework -- Transference vs Countertransference:
These two concepts are mirror images and are frequently tested in NEET PG Psychiatry:

- **Transference:** Patient projects past feelings (often about parents or authority figures) onto the therapist. Direction: Patient → Therapist. Example: A patient begins to idealize the therapist as a father figure.
- **Countertransference:** Therapist develops mixed conscious and unconscious emotional responses toward the patient. Direction: Therapist → Patient. Example: A therapist feels excessive protectiveness or irritation toward a particular patient, rooted in the therapist's own unresolved conflicts.

Key differentiator in this question:
The subject of the feelings is the *therapist*, and the object is the *patient*. This unambiguously identifies **Countertransference**. Had the direction been reversed (patient feeling toward therapist), it would be Transference.
Clinical note: Countertransference is managed through the therapist's own supervision and personal analysis. Dissociation and Preoccupation are unrelated to the therapist-patient emotional dynamic described here.

Countertransference

Quick Tip: Remember who the feelings originate from -- is it the patient's feelings toward the therapist, or the therapist's feelings toward the patient?