

General Instructions

- (i) This booklet contains 300 questions, each provided with a complete, step-by-step solution.
- (ii) It comprises 300 single-correct multiple-choice questions.
- (iii) These questions follow the NEET PG examination pattern.
- (iv) Each correct answer is awarded +4 marks, with -1 for an incorrect answer.
- (v) The actual NEET paper has 180 questions to be attempted in 3 hours 20 minutes.
- (vi) Use of calculators is not permitted.
- (vii) Attempt each question on your own before reviewing the given solution.

1.



Identify the type of muscle shown in the image below.

- (A) Cruciate
- (B) Multipennate
- (C) Parallel
- (D) Unipennate

Correct Answer: (B) Multipennate

SOLUTION:

Step 1: Recall the feather analogy used for skeletal muscle architecture. In pennate muscle the fascicles attach obliquely to the tendon. Counting the number of tendon-feeding rows tells you the subtype: one row is unipennate, two rows is bipennate, and many rows is multipennate.

Step 2: The pectoralis major depicted here gathers numerous oblique fibre rows that all insert into one tendon at the bicipital groove of the humerus. Multiple oblique rows draining into a common tendon define a multipennate pattern.

Step 3: Eliminate the rest. A strap-like parallel muscle (for example sartorius) would show fibres straight along the muscle belly, not oblique. A unipennate design (extensor digitorum longus) shows fibres on a single side only. Cruciate is not a recognised fascicle class and is a trap option.

Multipennate

Quick Tip: Many oblique fibre rows feeding one tendon, as in pectoralis major.

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2. Nerves of the branchial arch are derived from:

- (A) Mesoderm
- (B) Endoderm
- (C) Neural crest
- (D) Neuroectoderm

Correct Answer: (C) Neural crest

SOLUTION:

Step 1: Think about the three germ-layer contributions to a single pharyngeal arch. The outer covering is ectoderm, the inner lining is endoderm, and the central mass is mesoderm. None of these three on its own supplies the arch nerves.

Step 2: A fourth, migratory population - the neural crest - seeds each arch. Crest cells originate at the dorsal lip of the neural folds, then stream ventrolaterally into the arches where they generate peripheral neurons, Schwann cells and connective tissue. So the answer for the nerve supply is the neural crest.

Step 3: Cross out the distractors. Mesoderm gives rise to the arch musculature and endothelium; endoderm builds pouch organs such as the thymus and parathyroids; neuroectoderm (the neural tube proper) makes the brain and spinal cord, not the peripheral arch nerves.

Neural crest

Quick Tip: Peripheral neurons and glia of the arches are migratory crest cells.

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3. The hard palate contains:

- (A) Keratinised epithelium, submucosa, minor salivary gland
- (B) Keratinised epithelium, absent submucosal layer, minor salivary gland
- (C) Non-keratinised epithelium, submucosal layer, minor salivary gland
- (D) Non-keratinised epithelium, absent submucosa, minor salivary gland

Correct Answer: (A) Keratinised epithelium, submucosa, minor salivary gland

SOLUTION:

Step 1: Classify the oral mucosa first. The hard palate and gingiva are masticatory mucosa; the cheek, lips and soft palate are lining mucosa; the tongue dorsum is specialised mucosa. Masticatory mucosa is always keratinised, which immediately favours a keratinised answer.

Step 2: Now build the layers. Beneath the keratinised stratified squamous epithelium lies a connective tissue layer. Laterally and posteriorly there is a genuine submucosa containing the palatine minor salivary glands, while centrally the mucosa binds tightly (mucoperiosteum). Therefore keratinised epithelium plus a submucosa plus minor salivary glands is the right description.

Step 3: Reject the alternatives. Any choice calling the epithelium non-keratinised contradicts its masticatory nature. The choice denying a submucosa is also wrong, because the gland-bearing submucosa is the very feature that produces the orange-peel surface posteriorly.

Keratinised, submucosa present, minor salivary gland

Quick Tip: Masticatory mucosa is keratinised and has gland-bearing submucosa posterolaterally.

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4. What is the tensor of the vocal cords?

- (A) Cricothyroid
- (B) Lateral cricoarytenoid
- (C) Thyroarytenoid
- (D) Posterior cricoarytenoid

Correct Answer: (A) Cricothyroid

SOLUTION:

Step 1: Sort the intrinsic laryngeal muscles by their action on the rima glottidis and on cord tension. Adductors close the gap, the lone abductor opens it, and a separate pair governs tension and relaxation.

Step 2: To increase tension, the thyroid lamina must rotate forward and downward about the cricothyroid joint, which is precisely what the cricothyroid does. Lengthening the folds raises their tension and pitch, so the cricothyroid is the tensor.

Step 3: Discard the others. The thyroarytenoid does the opposite job, slackening

the folds. The posterior cricoarytenoid abducts the cords (it is the safety muscle that keeps the airway open). The lateral cricoarytenoid adducts the cords for phonation. None of these tightens the folds.

Cricothyroid

Quick Tip: The only cord muscle supplied by the external laryngeal nerve stretches them.

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5. The ureteric bud develops from:

- (A) Mesonephros
- (B) Metanephros
- (C) Pronephros
- (D) Genital sinus

Correct Answer: (A) Mesonephros

SOLUTION:

Step 1: Map the three nephric systems in time order: pronephros (rudimentary, regresses), mesonephros (interim kidney with the Wolffian duct), and metanephros (the definitive adult kidney). The duct of the mesonephros persists and is the key to this question.

Step 2: Near where the mesonephric duct meets the cloaca, it sprouts a diverticulum. This outgrowth is the ureteric bud, so its parent is the mesonephric duct (mesonephros). The bud later branches to build the collecting system - ureter, pelvis, major and minor calyces, and collecting tubules.

Step 3: Knock out the rest. The metanephric blastema, derived from the metanephros, contributes nephrons (glomeruli, Bowman capsule, proximal and distal tubules, loop of Henle) but not the bud itself. The pronephros never persists to form anything. The genital sinus builds the bladder and urethra, unrelated to the ureteric bud.

Mesonephros (mesonephric duct)

Quick Tip: The metanephric diverticulum sprouts from the Wolffian (mesonephric) duct.

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6. Regarding Weber's syndrome, which of the following is incorrect?

- (A) Contralateral hemiplegia
- (B) Ipsilateral oculomotor nerve palsy
- (C) Contralateral parkinsonism
- (D) Anterior cerebral peduncle

Correct Answer: (D) Anterior cerebral peduncle

SOLUTION:

Step 1: Localise Weber's syndrome precisely - it is a ventral (basal) midbrain lesion in the territory of paramedian posterior cerebral artery branches. The damaged structures are the crus cerebri (cerebral peduncle) carrying corticospinal fibres and the fascicles of cranial nerve III passing through it.

Step 2: Because the third nerve is hit before it crosses, the eye signs are ipsilateral: ptosis, mydriasis and a down-and-out eye. The corticospinal fibres are damaged above the medullary decussation, so the weakness is contralateral hemiplegia. Nigral involvement may add contralateral parkinsonism. All three of these match the syndrome.

Step 3: Pick the wrong statement. The lesion is in the cerebral peduncle of the midbrain; the phrase anterior cerebral peduncle is not a valid description of the site. Therefore that option is the incorrect (and so the correct choice for a negatively framed question).

Anterior cerebral peduncle (incorrect statement)

Quick Tip: The lesion is the midbrain crus cerebri, not an 'anterior cerebral peduncle'.

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7. Regarding Sibson's fascia, which of the following is incorrect?

- (A) Attached to the inner border of the 2nd rib
- (B) Covers the apical part of the lung
- (C) Part of the scalenus anterior muscle
- (D) Vessels pass above the fascia

Correct Answer: (A) Attached to the inner border of the 2nd rib

SOLUTION:

Step 1: Recall the anatomy of the thoracic inlet roof. The dome of the pleura needs a protective tent over it, and that tent is the suprapleural membrane, named Sibson's fascia after the surgeon who described it.

Step 2: Trace its margins: medially and posteriorly it grips the transverse process of C7, and peripherally it fixes to the medial (inner) border of the first rib. It is a fascial expansion related to the scalene musculature, and the subclavian artery and vein run over its upper surface. These three points are accurate.

Step 3: Spot the error. The membrane is anchored to the first rib, so claiming attachment to the inner border of the second rib is false, and that is the answer to this negatively worded item.

Attached to the inner border of the 2nd rib (incorrect)

Quick Tip: The suprapleural membrane grips the first rib and C7, not the second rib.

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8. Thrombosis of the posterior inferior cerebellar artery causes:

- (A) Lateral medullary syndrome
- (B) Weber syndrome
- (C) Medial medullary syndrome
- (D) None

Correct Answer: (A) Lateral medullary syndrome

SOLUTION:

Step 1: Match each brainstem artery to its territory. PICA, a branch of the vertebral artery, feeds the dorsolateral medulla, so its loss strikes the lateral medullary structures.

Step 2: The dorsolateral medulla houses the spinal trigeminal nucleus, the spinothalamic tract, vestibular nuclei, nucleus ambiguus and descending sympathetic fibres. Damaging all of these at once produces Wallenberg (lateral medullary) syndrome - crossed sensory loss, vertigo, bulbar signs and Horner syndrome. So PICA thrombosis equals lateral medullary syndrome.

Step 3: Eliminate the rest. Weber syndrome is a ventral midbrain stroke from posterior cerebral artery perforators. Medial medullary syndrome follows anterior spinal artery occlusion and gives contralateral hemiplegia with tongue deviation. Neither involves PICA, so 'none' is also incorrect.

Lateral medullary (Wallenberg) syndrome

Quick Tip: PICA occlusion equals Wallenberg syndrome of the dorsolateral medulla.



9. Broca's area is situated in the:

- (A) Inferior frontal gyrus
- (B) Superior temporal gyrus
- (C) Angular gyrus
- (D) None of the above

Correct Answer: (A) Inferior frontal gyrus

SOLUTION:

Step 1: Separate the two main language hubs. The expressive (output) centre lies in the frontal lobe, while the receptive (comprehension) centre lies in the temporal lobe. Broca's area is the expressive one.

Step 2: Pinpoint it to the pars opercularis and pars triangularis of the inferior frontal gyrus in the dominant hemisphere, corresponding to Brodmann area 44/45. So the inferior frontal gyrus is the location asked for. A lesion produces halting, telegraphic speech with intact understanding.

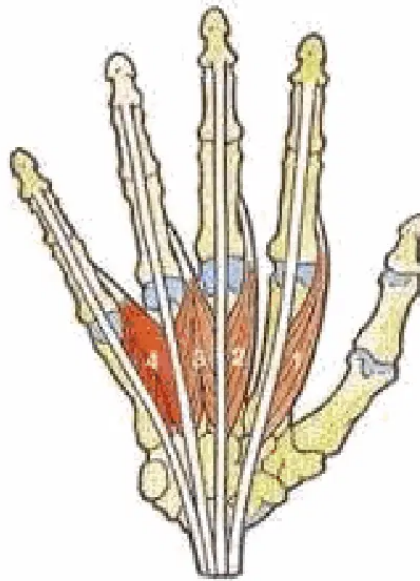
Step 3: Reject the alternatives. The superior temporal gyrus is Wernicke's territory, where lesions cause fluent but meaningless speech. The angular gyrus serves reading and writing. Since the inferior frontal gyrus is clearly correct, 'none of the above' is also wrong.

Inferior frontal gyrus

Quick Tip: Motor speech area sits in pars opercularis and triangularis of the frontal lobe.



10.



What is the function of the muscle shown in the picture?

- (A) Flexion
- (B) Extension
- (C) Adduction
- (D) Abduction

Correct Answer: (A) Flexion

SOLUTION:

Step 1: Identify the intrinsic hand muscle depicted - the lumbricals, which uniquely bridge a flexor tendon (flexor digitorum profundus) to an extensor apparatus (the dorsal extensor hood).

Step 2: This flexor-to-extensor link lets the lumbricals bend the knuckles (flex the MCP joints) and straighten the fingers (extend the IP joints) at the same time - the classic lumbrical grip used in writing. Of the four choices, flexion is the action being asked, so flexion is correct.

Step 3: Cross off the distractors. Pure extension is not the lumbrical effect at the MCP joints. Finger abduction belongs to the dorsal interossei (DAB) and finger adduction to the palmar interossei (PAD); neither is a lumbrical function.

Flexion

Quick Tip: Lumbricals flex the MCP joints (the writing position).

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11. Acute tonsillitis affects which nerve?

- (A) Glossopharyngeal nerve
- (B) Facial nerve
- (C) Trigeminal nerve
- (D) Vagus nerve

Correct Answer: (A) Glossopharyngeal nerve

SOLUTION:

Step 1: Locate the palatine tonsil in the lateral wall of the oropharynx, sitting in the tonsillar fossa. Whatever nerve lies in this fossa is the one threatened by tonsillar inflammation or surgery.

Step 2: The glossopharyngeal nerve (IX) passes immediately deep to the tonsillar fossa and gives the tonsil its main sensory supply. Inflammation in acute tonsillitis therefore involves this nerve, explaining the typical referred ear pain through its tympanic (Jacobson) branch. The answer is the glossopharyngeal nerve.

Step 3: Dismiss the rest. The facial nerve handles facial muscles and anterior tongue taste, not the tonsil. The vagus supplies the larynx and pharyngeal constrictors rather than the tonsil directly. The trigeminal only adds a minor maxillary sensory branch, which is not the principal nerve at risk.

Glossopharyngeal nerve

Quick Tip: Cranial nerve IX lies deep to the tonsillar fossa and refers pain to the ear.

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12. Which structure does NOT pass through the aortic opening of the diaphragm?

- (A) Azygos vein
- (B) Aorta
- (C) Thoracic duct
- (D) Vagus

Correct Answer: (D) Vagus

SOLUTION:

Step 1: Recall the rhyme for the three diaphragmatic apertures by vertebral level. T8 caval (with the right phrenic), T10 oesophageal (with both vagi), and T12 aortic. The question targets the T12 hiatus.

Step 2: Through the aortic hiatus run the descending aorta, the thoracic duct and the azygos vein (and frequently the greater splanchnic nerve). Hence three of the listed options - aorta, thoracic duct and azygos vein - belong to this opening.

Step 3: Identify the odd one out. The vagus nerve travels with the oesophagus through the T10 oesophageal opening as the anterior and posterior vagal trunks, not through the aortic hiatus. So the vagus is the structure that does not use the aortic opening.

Vagus nerve

Quick Tip: The vagi pierce the T10 oesophageal opening, not the T12 aortic hiatus.

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13. A newly erupted tooth is covered by:

- (A) Perikymata
- (B) Nasmyth's membrane
- (C) Fibrous tissue
- (D) All of the above

Correct Answer: (B) Nasmyth's membrane

SOLUTION:

Step 1: Think about the fate of the enamel organ after the ameloblasts finish laying down enamel. They shrink to a thin layer called the reduced enamel epithelium, which travels with the crown as it erupts.

Step 2: This reduced enamel epithelium forms the primary enamel cuticle, named Nasmyth's membrane, draped over the freshly erupted crown. It shields the enamel from resorption and secretes enzymes that clear the dental sac, allowing a bloodless eruption. Therefore Nasmyth's membrane is the covering of a newly erupted tooth.

Step 3: Rule out the distractors. Perikymata are merely the external manifestations of the incremental lines of Retzius on the enamel surface, not a membrane. Plain fibrous tissue does not specifically coat an erupted tooth. With a single correct option, 'all of the above' cannot be right.

Nasmyth's membrane

Quick Tip: Reduced enamel epithelium becomes the primary enamel cuticle over the new crown.

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14. What should the value of BMI be to be considered as 'lethal' in men?

- (A) 12
- (B) 18
- (C) 13
- (D) 14

Correct Answer: (C) 13

SOLUTION:

Step 1: Start from the definition of BMI as a weight-for-height ratio,

$$BMI = \frac{\text{weight in kg}}{(\text{height in m})^2}.$$

Standard cut-offs are: underweight below 18.5, normal 18.5 to 24.9, pre-obesity 25 to 29.9, and obesity 30 or more.

Step 2: The question asks for the extreme low value incompatible with life in men. The accepted lethal lower limit of BMI for men is 13; at this point lean and fat mass are critically depleted. Hence 13 is the answer.

Step 3: Knock out the rest. A value of 18 simply borders the underweight category and is survivable. A value of 12 lies below the male lethal figure and is in the range women may tolerate (down to around 11). A value of 14 is higher than the male lethal threshold, so it is not the lethal value asked for.

$$\boxed{\text{BMI} = 13}$$

Quick Tip: The lowest survivable BMI in men is around 13; women tolerate lower.

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15. Which receptors are blocked in myasthenia gravis?

- (A) Acetylcholine (Ach) receptors
- (B) Ca^{2+} receptors
- (C) Na^{+} receptors
- (D) Opioid receptors

Correct Answer: (A) Acetylcholine (Ach) receptors

SOLUTION:

Step 1: Frame the problem at the neuromuscular junction. Normal transmission needs acetylcholine released from the nerve to bind nicotinic receptors on the muscle end plate. An autoimmune attack on those receptors will impair this step.

Step 2: In myasthenia gravis, circulating IgG antibodies bind and deplete the postsynaptic nicotinic acetylcholine receptors and damage the junctional folds. The end plate potential then fails to reach threshold, especially on repeated activity, giving the hallmark fatigable weakness. Therefore the acetylcholine receptors are the blocked receptors.

Step 3: Exclude the others. Antibodies to presynaptic calcium channels belong to

Lambert-Eaton syndrome (often paraneoplastic). Sodium-channel and opioid-receptor pathology do not cause this disorder. The diagnostic improvement with anticholinesterase drugs (more acetylcholine competing for the few remaining receptors) confirms the receptor involved.

Acetylcholine receptors

Quick Tip: Autoantibodies destroy postsynaptic nicotinic acetylcholine receptors.

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16. What is the characteristic pattern seen in Brown-Sequard syndrome?

- (A) Contralateral loss of joint sense and position
- (B) Contralateral loss of pain
- (C) Ipsilateral loss of complete sensory functions
- (D) Contralateral motor functions

Correct Answer: (B) Contralateral loss of pain

SOLUTION:

Step 1: Approach Brown-Sequard by tracking three tracts through a one-sided cord lesion: the lateral corticospinal tract (motor), the dorsal column (fine touch, proprioception) and the spinothalamic tract (pain, temperature).

Step 2: Pain and temperature fibres synapse and decussate almost immediately after entering the cord. So a lesion on one side interrupts fibres that have crossed from the opposite side, producing contralateral loss of pain and temperature a couple of segments below the level. This crossed pain loss is the signature finding, so the contralateral pain-loss option is correct.

Step 3: Dismiss the alternatives. Proprioception and vibration travel in the ipsilateral dorsal column until the medulla, so their loss is on the same side as the lesion, not contralateral. Voluntary motor power is carried by the already-decussated corticospinal tract, so weakness is ipsilateral. There is no pure one-sided total sensory loss; the deficits dissociate across the midline.

Contralateral loss of pain (and temperature)

Quick Tip: Spinothalamic fibres cross early, so pain loss is contralateral.

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17. When is the ventilation-perfusion ratio (V_A/Q) equal to infinity?

- (A) Partial pressure of O₂ becomes zero
- (B) No exchange of O₂ and CO₂
- (C) Partial pressure of CO₂ alone becomes zero
- (D) Partial pressures of both CO₂ and O₂ remain normal

Correct Answer: (B) No exchange of O₂ and CO₂

SOLUTION:

Step 1: Treat V_A/Q as a fraction. A ratio of zero means ventilation has stopped while blood still flows (a shunt). A ratio of infinity means the perfusion term Q has dropped to zero while ventilation persists (dead space). The question concerns the infinity end.

Step 2: If no blood perfuses the alveolus, there is no medium to take up oxygen or to deliver carbon dioxide, so gas exchange ceases across that respiratory membrane. The single defining consequence of $V_A/Q = \infty$ is therefore no exchange of O₂ and CO₂.

Step 3: Reject the others. Because fresh air keeps entering an unperfused alveolus, its gas equilibrates with humidified inspired air, giving an alveolar P_{O_2} near 149 mmHg (not zero) and a P_{CO_2} near 0 mmHg. These pressure values are downstream results, while the essence of the infinite ratio is the abolished gas exchange.

No exchange of O₂ and CO₂

Quick Tip: Infinite V_a/Q means dead space - ventilation without perfusion, so no gas exchange.

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18. The 'c' wave of the jugular venous pulse is seen in:

- (A) Isovolumetric contraction
- (B) Slow filling at the end of diastole
- (C) End of systole
- (D) Start of diastole

Correct Answer: (A) Isovolumetric contraction

SOLUTION:

Step 1: List the JVP deflections with their causes: a equals atrial systole, c equals tricuspid bulge, v equals atrial filling, x descent equals atrial relaxation, y descent equals tricuspid opening and ventricular filling. The target is the c wave.

Step 2: Immediately after the tricuspid valve shuts, the right ventricle contracts isovolumetrically. Its rising pressure pushes the closed tricuspid leaflets upward into the right atrium, momentarily raising atrial pressure and generating the c wave. So the c wave maps to the phase of isovolumetric ventricular contraction.

Step 3: Eliminate the others. The end-diastolic slow-filling phase and the onset of diastole correspond to ventricular filling and the y descent, not the c wave. The end of systole is the time of the v wave. Hence isovolumetric contraction is the correct phase.

Isovolumetric contraction

Quick Tip: The c wave is the tricuspid valve bulging during isovolumic contraction.

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19. Alpha waves on the EEG are seen during which state?

- (A) Sleep
- (B) REM movements
- (C) Relaxed state
- (D) Active state

Correct Answer: (C) Relaxed state

SOLUTION:

Step 1: Rank the EEG rhythms by frequency: beta (fast, alert), alpha (intermediate, relaxed), theta and delta (slow, drowsy and deep sleep). The question asks where alpha fits.

Step 2: Alpha activity at 8 to 13 Hz appears over the occipital region when the subject is awake but calm, eyes shut, and not concentrating on anything in particular. This quiet, restful condition is the relaxed state, so that option is correct. Opening the eyes or concentrating abolishes alpha (alpha block) and brings in beta.

Step 3: Remove the distractors. The active, focused state generates beta waves, not alpha. Ordinary sleep brings slow theta and delta waves. REM sleep produces a desynchronised low-voltage fast pattern. None of these is the alpha rhythm, confirming the relaxed state as the answer.

Relaxed state

Quick Tip: 8-13 Hz alpha rhythm appears awake, relaxed, with eyes closed.



20. In hypovolemic shock, there is:

- (A) Afferent arteriolar constriction
- (B) Efferent arteriolar constriction
- (C) Increased blood flow to the kidney
- (D) Normal cardiac output

Correct Answer: (A) Afferent arteriolar constriction

SOLUTION:

Step 1: Begin with the haemodynamics of hypovolemia. Less circulating volume means less venous return, a smaller stroke volume and a fall in cardiac output. The body must defend blood pressure and perfusion of the brain and heart.

Step 2: The compensatory baroreceptor and sympathetic reflex raises heart rate and clamps down on systemic arterioles. The kidney is sacrificed: powerful sympathetic tone constricts the renal afferent arteriole, dropping renal blood flow so that blood is redirected to essential organs. Hence afferent arteriolar constriction is the right answer.

Step 3: Cross off the rest. Kidney blood flow is reduced, not increased. Cardiac output is depressed, so it is not normal. Selective efferent constriction is the angiotensin-mediated trick to preserve GFR in milder states, but the prevailing change in shock is afferent constriction with falling renal flow.

Afferent arteriolar constriction

Quick Tip: Sympathetic drive in shock constricts the renal afferent arteriole, cutting renal flow.

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21. The components responsible for the counter-current mechanism in the kidney are all of the following EXCEPT:

- (A) Sodium outflow in the thick ascending limb
- (B) Water outflow in the thin descending limb
- (C) Sodium outflow in the thin ascending limb
- (D) Flow of tubular fluid from PCT to DCT

Correct Answer: (C) Sodium outflow in the thin ascending limb

SOLUTION:

Step 1: Recall how the loop of Henle generates a hyperosmotic medulla. The key engine is the single effect: active NaCl pumping out of the water-impermeable thick ascending limb, which is then multiplied along the length of the loop by counter-current flow.

Step 2: Confirm the legitimate parts. The thick ascending limb actively extrudes sodium (with K and Cl), the thin descending limb is water permeable and loses water to the interstitium, and tubular fluid must keep flowing through the loop from PCT toward DCT for the multiplier to work. All three are true components.

Step 3: Find the exception. In the thin ascending limb, sodium chloride leaves passively and the segment lacks the active sodium pump that powers the multiplier; calling 'sodium outflow in the thin ascending limb' an active driving component is incorrect. So it is the odd one out.

Sodium outflow in the thin ascending limb

Quick Tip: The active sodium pump (single effect) is in the thick, not the thin, ascending limb.

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22. Glucose is absorbed in the intestine by which transport mechanism?

- (A) Secondary active transport
- (B) Facilitated diffusion
- (C) Simple diffusion
- (D) Primary active transport

Correct Answer: (B) Facilitated diffusion

SOLUTION:

Step 1: Recall that membrane carriers fall into a few classes. A primary active transporter splits *ATP* at the protein itself, a secondary active transporter rides on an ion gradient set up by a pump, and a facilitated diffusion carrier simply opens a path for a solute to slide down its own gradient with no energy spent.

Step 2: Place glucose in this scheme. Crossing the brush border it is dragged in against gradient by *SGLT1*, coupled to the inward Na^+ gradient maintained by the Na^+/K^+ ATPase, which is secondary active transport.

Step 3: Crossing the basolateral side, glucose is now concentrated inside and leaves through the *GLUT2* transporter purely along its gradient. A bulky, water-loving molecule moving through a protein channel without energy is textbook facilitated diffusion, which is the option the examiner wants.

Step 4: Eliminate the rest. Glucose is far too polar for simple diffusion through the bilayer, and no glucose carrier directly burns ATP, ruling out primary active transport.

Facilitated diffusion

Quick Tip: Think of the carrier that moves a large polar sugar down its gradient without spending ATP.

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23. Insulin-like growth factor (IGF) is secreted mainly by which organ?

- (A) Liver
- (B) Pituitary gland
- (C) Pancreas
- (D) Adrenal glands

Correct Answer: (A) Liver

SOLUTION:

Step 1: The puzzle here is separating where a hormone is triggered from where it is actually made. The anterior pituitary fires off growth hormone, but growth hormone is largely a messenger that tells another organ to do the real work.

Step 2: That target organ is the liver. Under growth hormone stimulation, hepatocytes synthesise somatomedins, and the chief one, somatomedin C or *IGF-1*, is the molecule that promotes skeletal and soft-tissue growth.

Step 3: *IGF-1* binds plasma carrier proteins, so it persists for around 20 hours compared with the brief 20-minute life of growth hormone, and its concentration mirrors growth hormone output.

Step 4: Cross off the distractors. The pituitary only releases growth hormone, the pancreas releases true insulin, and the adrenals release cortisol and catecholamines, none of which is the IGF source.

Liver

Quick Tip: Growth hormone acts on this organ to make somatomedins.

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24. What is prosopagnosia?

- (A) Impairment of consciousness
- (B) Being unaware of one's own problems
- (C) Difficulty in identifying known faces
- (D) Failure to identify objects

Correct Answer: (C) Difficulty in identifying known faces

SOLUTION:

Step 1: Break the word down. "Prosopon" means face and "agnosia" means lack of knowing, so prosopagnosia literally means an inability to know or recognise faces.

Step 2: Clinically the patient sees the face perfectly well but cannot match it to a

person they know, because the face-processing region in the fusiform gyrus of the temporo-occipital cortex is damaged. This points straight to difficulty identifying known faces.

Step 3: Match each wrong choice to its real name. Reduced awareness or alertness is an impairment of consciousness. Denial of one's own illness is anosognosia. Not recognising objects in general is object agnosia.

Step 4: Therefore the only definition that fits the term is the one describing failure to recognise familiar faces.

Difficulty in identifying known faces

Quick Tip: The word starts with the Greek root for "face".

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25. Transport across the nucleus is carried out by all of the following except?

- (A) Caveolins
- (B) Local signals
- (C) Importins
- (D) Rat proteins

Correct Answer: (D) Rat proteins

SOLUTION:

Step 1: This is an "odd one out" item, so the strategy is to confirm three genuine players in nuclear traffic and let the fourth stand out as the answer.

Step 2: Importins clearly qualify. They are a class of karyopherin that grab a cargo's nuclear localisation sequence and ferry it through the nuclear pore, using importin α and β subunits.

Step 3: Local signals also qualify, since the localisation and export sequences on cargo proteins are what tell the transport machinery where to send them. Caveolins are membrane scaffolding proteins that have been linked to shuttling and signalling, so they too can be tied to transport.

Step 4: That leaves rat proteins, which is simply recombinant material used in laboratory cell culture and has nothing to do with nucleocytoplasmic transport, so it is the exception.

Rat proteins

Quick Tip: Three options are real transport machinery; one is a lab reagent term.

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26. Iron is taken up from the gut lumen into enterocytes through which transporter?

- (A) DMT1
- (B) DMT2
- (C) Ferroportin 1
- (D) GLUT1

Correct Answer: (A) DMT1

SOLUTION:

Step 1: Track the path of iron through a duodenal cell. It must first be carried in across the luminal surface, then later be sent out across the blood-facing surface, and two different proteins handle these two directions.

Step 2: The entry step at the apical brush border uses the Divalent Metal Transporter 1, *DMT1*, which pulls ferrous iron into the enterocyte and can also handle zinc, copper, cobalt and manganese.

Step 3: The exit step at the basolateral membrane is the job of ferroportin 1, so

ferroportin is about export, not uptake, and is the classic trap option here.

Step 4: The remaining choices fail outright: there is no meaningful *DMT2* iron transporter, and *GLUT1* is a glucose carrier. Hence iron entry into the enterocyte is via *DMT1*.

DMT1

Quick Tip: Apical entry uses a divalent metal transporter; the basolateral exporter is the trap.

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27. Serotonin is also known as?

- (A) 5-hydroxytryptamine (5-HT)
- (B) N-methyl phenylamine
- (C) 3-Methoxytyramine
- (D) Phenethylamine

Correct Answer: (A) 5-hydroxytryptamine (5-HT)

SOLUTION:

Step 1: Start from the precursor. Serotonin is built from tryptophan, an indole-containing amino acid, by adding a hydroxyl group and removing the carboxyl group.

Step 2: The added hydroxyl sits on carbon 5 of the indole ring and the remaining backbone is an amine, so the systematic name reads **5-hydroxytryptamine**, conventionally shortened to **5-HT**.

Step 3: The decoys come from the catecholamine and phenethylamine families. **3-methoxytyramine** is a breakdown product of dopamine, and phenethylamine and N-methyl phenylamine are trace amines, so none matches serotonin's indole

structure.

5-hydroxytryptamine (5-HT)

Quick Tip: It is the indole amine made from tryptophan, hydroxylated at position 5.

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28. Tyrosinosis is caused due to deficiency of which enzyme?

- (A) Fumarylacetoacetate hydrolase
- (B) *p*-hydroxyphenylpyruvate dehydrogenase
- (C) Tyrosine transaminase
- (D) Tyrosine ligase

Correct Answer: (A) Fumarylacetoacetate hydrolase

SOLUTION:

Step 1: Lay out the tyrosine catabolic pathway in order: tyrosine is transaminated, then *p*-hydroxyphenylpyruvate is oxidised, and several steps later fumarylacetoacetate is finally split into fumarate and acetoacetate.

Step 2: Tyrosinosis, the type I and most severe tyrosinemia affecting liver and kidney, results from blocking that very last hydrolysis step, which is run by fumarylacetoacetate hydrolase.

Step 3: With this enzyme missing, the toxic intermediates fumarylacetoacetate and succinylacetone pile up and injure hepatic and renal tissue, fitting the clinical picture.

Step 4: Map the distractors to their own diseases: deficiency of tyrosine transaminase gives type II, deficiency of *p*-hydroxyphenylpyruvate dioxygenase gives type III, and tyrosine ligase is not part of the pathway.

Fumarylacetoacetate hydrolase

Quick Tip: The defect is in the final step of tyrosine breakdown.

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29. Lesch-Nyhan syndrome is caused by deficiency of which enzyme?

- (A) Orotate phosphoribosyltransferase
- (B) Uracil phosphoribosyltransferase
- (C) Quinolinate phosphoribosyltransferase
- (D) Hypoxanthine-guanine phosphoribosyltransferase (HGPRT)

Correct Answer: (D) Hypoxanthine-guanine phosphoribosyltransferase (HGPRT)

SOLUTION:

Step 1: Frame this around purine salvage. Cells reuse free purine bases instead of always making them from scratch, and the key salvage enzyme for hypoxanthine and guanine is **HGPRT**.

Step 2: When the X-linked **HPRT** gene is mutated, **HGPRT** activity is lost, and this is exactly the defect in Lesch-Nyhan syndrome, also called juvenile gout.

Step 3: The clinical fallout follows logically: unsalvaged bases are funneled into uric acid, producing hyperuricemia, while neurologic damage gives self-injury, dystonia and cognitive impairment.

Step 4: Reject the alternatives because they act on pyrimidines or NAD. Orotate and uracil phosphoribosyltransferases are pyrimidine enzymes, and quinolinate phosphoribosyltransferase feeds NAD synthesis, none tied to this syndrome.

Hypoxanthine-guanine phosphoribosyltransferase (HGPRT)

Quick Tip: Think of the purine salvage enzyme on the X chromosome linked to juvenile gout.

• • •

30. Fish odour syndrome is caused by deficiency of which enzyme?

- (A) Fumarylacetoacetate hydrolase
- (B) Methane monooxygenase
- (C) Flavin-containing monooxygenase 3 (FMO3)
- (D) D-amino acid oxidase

Correct Answer: (C) Flavin-containing monooxygenase 3 (FMO3)

SOLUTION:

Step 1: Trace the offending molecule. Gut bacteria turn dietary choline and related compounds into trimethylamine, a volatile substance with a strong fishy smell.

Step 2: The liver normally detoxifies it by N-oxidation into odourless trimethylamine oxide, a reaction performed by flavin-containing monooxygenase 3, written *FMO3*.

Step 3: If *FMO3* is deficient, as in trimethylaminuria or fish odour syndrome, unconverted trimethylamine builds up and is shed in urine, sweat and breath, explaining the characteristic odour.

Step 4: Dismiss the others: fumarylacetoacetate hydrolase belongs to tyrosine breakdown, methane monooxygenase is microbial, and D-amino acid oxidase has no role here.

Flavin-containing monooxygenase 3 (FMO3)

Quick Tip: An enzyme that N-oxidises trimethylamine is missing.

• • •

31. Classic galactosemia is due to deficiency of which enzyme?

- (A) Galactose-1-phosphate uridyltransferase
- (B) HGPRT
- (C) Galactokinase
- (D) Epimerase

Correct Answer: (A) Galactose-1-phosphate uridyltransferase

SOLUTION:

Step 1: Recall the Leloir pathway, which converts galactose into glucose-1-phosphate through three enzymes: galactokinase, galactose-1-phosphate uridyltransferase, and UDP-galactose epimerase.

Step 2: Classic galactosemia, the severe disease presenting in neonates, maps to a block at the middle step, the transferase **GALT**. This is the answer the question targets.

Step 3: Loss of **GALT** traps galactose-1-phosphate, which poisons liver, brain and kidney, while diverted galactose forms galactitol that clouds the lens and causes cataracts.

Step 4: Separate the look-alikes: galactokinase deficiency is a milder, mainly cataract phenotype, epimerase deficiency is a rarer variant, and HGPRT is a purine salvage enzyme that has nothing to do with galactose.

Galactose-1-phosphate uridyltransferase

Quick Tip: The central Leloir-pathway transferase is missing in the classic severe form.



32. Which of the following is the most abundant end product of fatty acid synthesis?

- (A) Oleic acid
- (B) Palmitic acid
- (C) Arachidonic acid
- (D) Glucose

Correct Answer: (B) Palmitic acid

SOLUTION:

Step 1: Picture the fatty acid synthase machine. It loads acetyl-CoA and malonyl-CoA and runs cycles of condensation, reduction, dehydration and reduction, growing the chain two carbons at a time.

Step 2: The complex stops and releases the chain once it reaches 16 carbons, so the direct, most abundant output is the saturated C_{16} acid, palmitate, which is palmitic acid.

Step 3: Anything longer or unsaturated, like stearic acid or oleic acid, is made afterward by separate elongase and desaturase systems, so they are not the primary product.

Step 4: Arachidonic acid is a polyunsaturated derivative of the essential fatty acid linoleic acid, and glucose is not a lipid at all, leaving palmitic acid as the answer.

Palmitic acid

Quick Tip: Fatty acid synthase releases a 16-carbon saturated acid.



33. Regarding DNA polymerase I, which one of the following is correct?

- (A) Not required in bacteria
- (B) Repairs any damage within DNA
- (C) Involved in Okazaki fragment processing
- (D) Participates in DNA replication

Correct Answer: (B) Repairs any damage within DNA

SOLUTION:

Step 1: Sort the bacterial DNA polymerases by job. Pol III is the workhorse that synthesises most of the new strand during replication, while Pol I is the clean-up and repair specialist.

Step 2: Pol I carries a polymerase activity plus a $5' \rightarrow 3'$ exonuclease, letting it excise RNA primers, fill the resulting gaps, and correct lesions. Its dominant described role is repairing damage within DNA, which is the statement marked correct.

Step 3: It is also active at the lagging strand where it processes Okazaki fragments by removing primers before ligase joins them, but the option singled out as the key fact is its repair function.

Step 4: Reject the false claims: Pol I is definitely needed in bacteria, and the principal replicative polymerase is Pol III, not Pol I.

Repairs any damage within DNA

Quick Tip: This polymerase is the repair and primer-removal enzyme, not the main replicase.

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34. What do chaperones assist in?

- (A) Protein cleavage
- (B) Protein folding
- (C) Protein degradation
- (D) Protein modification

Correct Answer: (B) Protein folding

SOLUTION:

Step 1: Consider what a fresh polypeptide faces as it leaves the ribosome. Its exposed hydrophobic stretches could clump together and misfold before it reaches its proper shape.

Step 2: Chaperones step in to guard the chain, binding and releasing it, often using *ATP*, so it can settle into the correct native fold without aggregating. Therefore their role is protein folding.

Step 3: Familiar examples are the heat shock proteins, including Hsp70 and the chaperonin Hsp60 system, which actively promote correct folding in vivo.

Step 4: The wrong answers belong to other machinery: proteases and the proteasome handle cleavage and degradation, and dedicated transferases handle covalent modification, none of which is the chaperone function.

Protein folding

Quick Tip: Heat shock proteins guide a new polypeptide into its correct shape.

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35. A fishy body odour can occur due to dietary deficiency of which vitamin?

- (A) Biotin
- (B) Thiamine
- (C) Riboflavin
- (D) Vitamin A

Correct Answer: (C) Riboflavin

SOLUTION:

Step 1: Link the smell to its chemistry. The fishy compound is trimethylamine, and the enzyme that detoxifies it is the flavin-containing monooxygenase 3, an enzyme that needs a flavin cofactor to function.

Step 2: Flavin cofactors, *FAD* and *FMN*, are made from the B-vitamin riboflavin. If riboflavin is lacking in the diet, FMO3 cannot work well, trimethylamine builds up, and the body gives off a fishy odour. Hence riboflavin is the answer.

Step 3: This is the nutritional counterpart of the inherited fish odour syndrome, just driven by missing cofactor instead of a mutated enzyme.

Step 4: Set aside the rest: biotin assists carboxylases, thiamine assists decarboxylation and transketolation, and vitamin A serves vision and epithelium, with none feeding the FMO3 reaction.

Riboflavin

Quick Tip: FMO3 needs a flavin cofactor that comes from this B vitamin.

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36. Vanillylmandelic acid (VMA) is excreted in urine in which condition?

- (A) Alkaptonuria
- (B) Phenylketonuria
- (C) Pheochromocytoma
- (D) Diabetic ketoacidosis

Correct Answer: (C) Pheochromocytoma

SOLUTION:

Step 1: Identify what VMA represents. It is the final breakdown product of the catecholamines adrenaline and noradrenaline, cleared into the urine.

Step 2: Now ask which listed disease floods the body with catecholamines. A pheochromocytoma, an adrenal medullary tumour, secretes excess catecholamines, so their catabolism yields high urinary VMA. That makes pheochromocytoma the answer.

Step 3: This is why measuring urinary VMA (and metanephrines) screens for pheochromocytoma and helps monitor neuroblastoma and ganglioneuroma.

Step 4: Match the others to their own markers: alkaptonuria with homogentisic acid, phenylketonuria with phenyl ketoacids, and diabetic ketoacidosis with ketones, leaving none that produces VMA.

Pheochromocytoma

Quick Tip: VMA is a catecholamine metabolite, so think of a catecholamine-secreting tumour.

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37. All of the following are excreted in excess in cystinuria except?

- (A) Cystine
- (B) Cysteine
- (C) Arginine
- (D) Ornithine

Correct Answer: (B) Cysteine

SOLUTION:

Step 1: Anchor on the transporter. Cystinuria knocks out the renal and intestinal carrier for the dibasic amino acids, summarised by the mnemonic COLA: cystine, ornithine, lysine, arginine.

Step 2: With reabsorption gone, all four COLA amino acids spill into the urine. Cystine is the least soluble, so it crystallises into hexagonal crystals and forms recurrent stones, the clinical hallmark.

Step 3: The trap is cystine versus cysteine. The transporter and disease are about cystine, the disulfide-linked dimer, whereas free cysteine is a different single-residue molecule and is not the characteristically excreted species, so it is the exception.

Step 4: Confirm by elimination: arginine and ornithine are genuine COLA members and are excreted, leaving cysteine as the odd one out.

Cysteine

Quick Tip: Remember COLA, and note the dimer cystine versus the single amino acid cysteine.

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38. Fibrinopeptide A and fibrinopeptide B are acidic due to the presence of which amino acids in their structure?

- (A) Serine and threonine
- (B) Glutamate and aspartate
- (C) Histidine and lysine
- (D) Glutamine and valine

Correct Answer: (B) Glutamate and aspartate

SOLUTION:

Step 1: Classify the amino acids by side chain. Acidic residues carry a free carboxyl group, and those are glutamate and aspartate; basic residues are lysine, arginine and histidine; the rest are neutral.

Step 2: The question states the fibrinopeptides are acidic, so the residues responsible must be the carboxyl-bearing pair, glutamate and aspartate. That is the answer.

Step 3: Functionally these negatively charged fibrinopeptides sit at the N-termini of the fibrinogen α and β chains and are clipped off by thrombin, allowing fibrin monomers to assemble into a clot.

Step 4: Rule out the rest on charge alone: serine and threonine are neutral hydroxyl types, histidine and lysine are basic, and glutamine and valine are neutral, so only glutamate and aspartate make a peptide acidic.

Glutamate and aspartate

Quick Tip: Acidic side chains mean the carboxyl-bearing amino acids.

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39. 5-hydroxyindoleacetic acid (HIAA) is present in urine in which condition?

- (A) Alkaptonuria
- (B) Albinism
- (C) Carcinoid syndrome
- (D) Phenylketonuria

Correct Answer: (C) Carcinoid syndrome

SOLUTION:

Step 1: Start from the parent molecule. **5-HIAA** is the principal urinary metabolite of serotonin, so a high urinary **5-HIAA** signals serotonin overproduction.

Step 2: Scan the options for a serotonin excess. Carcinoid tumours pour out serotonin along with bradykinin and histamine, causing flushing, cramps and diarrhoea, and the serotonin is converted to **5-HIAA** in urine. Hence carcinoid syndrome is correct.

Step 3: Clinically, a 24-hour urinary **5-HIAA** measurement is the key screening test for this syndrome.

Step 4: Reject the distractors by their own markers: homogentisic acid in alkaptonuria, absent melanin in albinism, and phenyl ketoacids in phenylketonuria, none yielding **5-HIAA**.

Carcinoid syndrome

Quick Tip: 5-HIAA is a serotonin metabolite, so think of a serotonin-secreting tumour.

• • •

40. Warthin-Finkeldey cells are seen in which disease?

- (A) Measles
- (B) Rubella
- (C) Rabies
- (D) Typhoid

Correct Answer: (A) Measles

SOLUTION:

Step 1: Recognise the cell as a named histologic clue. Warthin-Finkeldey cells are giant cells packed with many nuclei in a grape-like cluster, a buzzword pointing to a specific infection.

Step 2: That infection is measles. The virus enters through respiratory epithelium, seeds the reticuloendothelial system through viremia, and produces these multinucleated giant cells in hyperplastic lymph nodes during the early course. Therefore measles is the answer.

Step 3: The same cells can turn up in HIV infection and Kimura disease, but the classic textbook link tested here is measles.

Step 4: Pair the distractors with their own hallmarks: rabies with Negri bodies, typhoid with typhoid nodules, and rubella without this giant-cell finding, so none replaces measles.

Measles

Quick Tip: Grape-like multinucleated giant cells in lymph nodes point to a classic viral exanthem.

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41. CD59 is a marker of which disease?

- (A) Paroxysmal nocturnal hemoglobinuria (PNH)
- (B) PTEN syndrome
- (C) BRR syndrome
- (D) Cowden syndrome

Correct Answer: (A) Paroxysmal nocturnal hemoglobinuria (PNH)

SOLUTION:

Step 1: Trace the defect. PNH begins with an acquired *PIGA* mutation that blocks synthesis of the GPI anchor, the tether that holds certain proteins on the cell surface.

Step 2: Among the proteins lost are the complement brakes CD55 and CD59. With CD59 missing, red cells cannot resist complement and undergo intravascular hemolysis, so CD59 deficiency is the marker pointing to PNH.

Step 3: This is why the diagnostic test is flow cytometry demonstrating absent CD55 and CD59 on blood cells, reflecting their heightened susceptibility to complement.

Step 4: The remaining options cluster as PTEN hamartoma tumor syndromes, namely Cowden and Bannayan-Riley-Ruvalcaba syndromes, which are unrelated to CD59. Thus the answer is PNH.

Paroxysmal nocturnal hemoglobinuria (PNH)

Quick Tip: Loss of a GPI-anchored complement regulator points to a hemolytic disease.

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42. Which complement component acts as an opsonin?

- (A) C3a
- (B) C3b
- (C) C5a
- (D) C6

Correct Answer: (B) C3b

SOLUTION:

Step 1: Define opsonisation as flagging a microbe with a molecular coat so phagocytes can grab it more easily. We need the complement fragment that does the coating.

Step 2: Complement C3 is split into two pieces, **C3a** and **C3b**. The larger **C3b** binds covalently to the bacterial surface and is the principal complement opsonin, which makes **C3b** the answer.

Step 3: Supporting opsonins include iC3b and C4b, with antibody IgG doing the same job via Fc receptors.

Step 4: Separate the functions of the wrong options: **C3a** and **C5a** are anaphylatoxins driving inflammation and chemotaxis, while **C6** joins the membrane attack complex for lysis, so none of them serves as an opsonin.

C3b

Quick Tip: The larger cleavage fragment of C3 coats bacteria for phagocytosis.

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43. Bernard-Soulier syndrome is due to a deficiency of which platelet glycoprotein?

- (A) Gp IIb/IIIa
- (B) Gp Ib
- (C) von Willebrand factor (vWF)
- (D) TNF

Correct Answer: (B) Gp Ib

SOLUTION:

Step 1: Recall that primary haemostasis needs platelets to stick to exposed collagen, a process bridged by von Willebrand factor. **Step 2:** The platelet anchor that grips vWF is the glycoprotein Ib-IX-V receptor. **Step 3:** In Bernard-Soulier syndrome this *GpIb* receptor is missing or non-functional, so platelets cannot latch onto vWF and adhesion collapses, giving large platelets with low counts. **Step 4:** Contrast this with Glanzmann thrombasthenia, where *GpIIb/IIIa* (the fibrinogen-binding aggregation receptor) is absent; that is a different disease. A primary vWF shortage is von Willebrand disease, and TNF is an inflammatory cytokine, so neither fits. Therefore the deficient protein here is Gp Ib.

Gp Ib

Quick Tip: Think of the platelet receptor that grabs von Willebrand factor for adhesion.

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44. Cowden syndrome is associated with mutation of which gene?

- (A) P53
- (B) PTEN
- (C) Rb
- (D) Ras

Correct Answer: (B) PTEN

SOLUTION:

Step 1: The clue is a hereditary syndrome with hamartomas plus high breast and thyroid cancer risk. **Step 2:** That picture defines the PTEN hamartoma tumour syndrome, of which Cowden syndrome is the prototype. **Step 3:** *PTEN* encodes a phosphatase that switches off the PI3K-AKT growth pathway; an inactivating germline mutation lifts this brake and drives tumour formation, explaining the trichilemmomas and polyps. **Step 4:** The other choices map to different syndromes: *P53* to Li-Fraumeni, *Rb* to familial retinoblastoma, and *Ras* is an oncogene that is activated rather than lost. So the responsible gene is PTEN.

PTEN

Quick Tip: A tumour-suppressor phosphatase linked to hamartomas and breast or thyroid cancer.

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45. The chromosome involved in myotonic dystrophy is:

- (A) Chromosome 19
- (B) Chromosome 20
- (C) Chromosome 21
- (D) Chromosome 22

Correct Answer: (A) Chromosome 19

SOLUTION:

Step 1: Identify the disease class - myotonic dystrophy is a trinucleotide-repeat expansion disorder. **Step 2:** The expanded *CTG* repeat sits in the DMPK gene, which is mapped to band 19q13.3. **Step 3:** This expansion explains the clinical triad of distal weakness, type I fibre atrophy and the inability to quickly relax a gripped hand (myotonia), with anticipation across generations as the repeat lengthens. **Step 4:** None of the other listed chromosomes (20, 21, 22) carry the DMPK locus, so by elimination and direct mapping the answer is chromosome 19.

Chromosome 19

Quick Tip: CTG repeat in the DMPK gene on the long arm of this chromosome.

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46. TRALI (transfusion-related acute lung injury) occurs within how many hours of transfusion?

- (A) 48 hours
- (B) 72 hours
- (C) 6 hours
- (D) 12 hours

Correct Answer: (C) 6 hours

SOLUTION:

Step 1: TRALI is one of the leading causes of transfusion-related death and is essentially an acute lung injury triggered by donor antibodies. **Step 2:** Its consensus diagnostic criterion requires symptoms to start during the transfusion or within a 6-hour window afterwards. **Step 3:** The patient develops sudden breathlessness, low oxygen, fever and bilateral fluffy infiltrates that look like ARDS but without raised filling pressures, separating it from circulatory overload (TACO). **Step 4:** Therefore the time frames of 12, 48 and 72 hours are too long, and the defining limit is 6 hours.

6 hours

Quick Tip: Acute lung injury defined by onset within a short single-digit window after transfusion.

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47. How does the kidney respond to shock?

- (A) Decreases renal blood flow
- (B) Increases afferent arteriole resistance
- (C) GFR remains unaltered
- (D) Perfusion of the kidney increases

Correct Answer: (B) Increases afferent arteriole resistance

SOLUTION:

Step 1: Frame the question as what the kidney actively does, not merely what happens to it, when systemic pressure drops. **Step 2:** Sensing reduced volume, the kidney drives vasoconstriction of the afferent arteriole, so afferent resistance R_{aff} rises. **Step 3:** Because glomerular filtration depends on the pressure gradient across this vessel, raising R_{aff} lowers glomerular capillary pressure and hence GFR; simultaneously aldosterone and ADH conserve sodium and water. **Step 4:** Thus saying renal blood flow simply decreases or perfusion increases or GFR is unchanged all miss the active regulatory step, which is the rise in afferent arteriolar resistance.

Increases afferent arteriole resistance

Quick Tip: The kidney actively constricts a glomerular inflow vessel to defend pressure.

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48.



Choose the best method of diagnosis for the clinical sign represented in the image.

- (A) Serum copper
- (B) Serum ceruloplasmin
- (C) Karyotyping
- (D) PCR

Correct Answer: (B) Serum ceruloplasmin

SOLUTION:

Step 1: Recognise the eye finding - a brownish ring at the corneal margin from copper laid down in Descemet's membrane is the Kayser-Fleischer ring. **Step 2:** It points to Wilson's disease, where defective ATP7B copper transport leads to copper overload. **Step 3:** The single most useful listed laboratory marker is a low serum ceruloplasmin, since most circulating copper normally travels bound to this protein; its level falls in Wilson's disease and forms part of the diagnostic criteria. **Step 4:** Total serum copper can be misleading, and genetic tests such as karyotyping or PCR are not the first-line confirmation here, so ceruloplasmin is the answer.

Serum ceruloplasmin

Quick Tip: The corneal ring points to Wilson disease, so test the copper-carrying

protein.

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49. Which of the following is an epithelial tumour of the stomach?

- (A) Carcinoid
- (B) Lymphoma
- (C) GIST
- (D) Gastric adenocarcinoma

Correct Answer: (D) Gastric adenocarcinoma

SOLUTION:

Step 1: Classify each option by tissue of origin to find the true epithelial neoplasm. **Step 2:** Carcinoid is neuroendocrine, gastric lymphoma is lymphoid (MALT), and GIST is mesenchymal from the interstitial cells of Cajal - none come from surface or glandular epithelium. **Step 3:** Gastric adenocarcinoma, by contrast, springs directly from the glandular epithelium of the gastric mucosa, making it the epithelial malignancy. **Step 4:** Its *Lauren* subtypes - intestinal (gland-forming) and diffuse (signet-ring, leather-bottle stomach) - confirm its epithelial glandular nature. So the epithelial tumour of the stomach is gastric adenocarcinoma.

Gastric adenocarcinoma

Quick Tip: Pick the tumour that arises from glandular mucosal epithelium, not nerve, lymphoid or mesenchymal cells.

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50. Identify an X-linked disorder.

- (A) Colour blindness
- (B) Thalassemia
- (C) Azoospermia
- (D) Retinitis pigmentosa

Correct Answer: (A) Colour blindness

SOLUTION:

Step 1: Sort each option by its mode and chromosome of inheritance. **Step 2:** The genes for the red and green cone photopigments lie on the **X** chromosome, so red-green colour blindness is transmitted in an X-linked recessive pattern and shows male preponderance. **Step 3:** Thalassemia is autosomal recessive (alpha and beta globin genes on chromosomes 16 and 11), so it is not X-linked. **Step 4:** The remaining two, azoospermia and retinitis pigmentosa as listed here, are tied to the Y chromosome, leaving colour blindness as the sole X-linked condition.

Colour blindness

Quick Tip: Which condition is carried on the X chromosome and is far commoner in males?

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51. H and L (lymphocytic and histiocytic) cells are seen in which type of Hodgkin lymphoma?

- (A) Mixed cellularity Hodgkin
- (B) Lymphocyte depleted
- (C) Lymphocyte predominance
- (D) Nodular sclerosis

Correct Answer: (C) Lymphocyte predominance

SOLUTION:

Step 1: Split Hodgkin lymphoma into its two big families: classical HL and the nodular lymphocyte-predominant form. **Step 2:** The defining cell of classical HL is the Reed-Sternberg cell, present in the mixed cellularity, lymphocyte-depleted and nodular sclerosing subtypes. **Step 3:** The lymphocyte-predominant subtype is the odd one out - it lacks classic RS cells and instead displays **L&H** (lymphocytic and histiocytic) popcorn cells with a multilobated nucleus. **Step 4:** Matching the H and L cell description to this subtype gives lymphocyte predominance Hodgkin lymphoma.

Lymphocyte predominance

Quick Tip: Popcorn (L&H) cells instead of Reed-Sternberg cells point to which subtype?

• • •

52. Stellate granuloma is seen in:

- (A) Sarcoidosis
- (B) Cat scratch disease
- (C) Cryptococcosis
- (D) Histoplasmosis

Correct Answer: (B) Cat scratch disease

SOLUTION:

Step 1: Anchor on the descriptor stellate granuloma, which means a star-shaped focus of suppurative necrosis rimmed by palisading histiocytes. **Step 2:** This pattern is classically produced by Bartonella henselae in cat scratch disease, where infected lymph nodes develop central necrosis with neutrophils. **Step 3:** The same suppurative stellate appearance is shared by lymphogranuloma venereum, but among the choices given only cat scratch disease fits. **Step 4:** Sarcoidosis gives tight non-caseating epithelioid granulomas, and the fungal

infections cryptococcosis and histoplasmosis give organism-laden granulomas without the stellate neutrophilic core, so the answer is cat scratch disease.

Cat scratch disease

Quick Tip: A star-shaped suppurative granuloma from a Bartonella infection.

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53. Which option best explains the LDH flipped (flipping) pattern?

- (A) $LDH\ 1 > LDH\ 2$
- (B) $LDH\ 2 > LDH\ 1$
- (C) $LDH\ 2 > LDH\ 3$
- (D) $LDH\ 3 > LDH\ 2$

Correct Answer: (A) $LDH\ 1 > LDH\ 2$

SOLUTION:

Step 1: Start from the normal serum hierarchy of LDH isoenzymes, where $LDH_2 > LDH_1$. **Step 2:** The heart is rich in LDH-1 (composed of four H subunits), so a healthy serum still keeps LDH-2 on top. **Step 3:** When the myocardium is injured, as in acute myocardial infarction, it spills LDH-1 into the circulation in such quantity that the order reverses to $LDH_1 > LDH_2$ - this reversal is the flipping effect. **Step 4:** Since the question asks which inequality represents the flip, the correct description is LDH 1 greater than LDH 2.

$LDH\ 1 > LDH\ 2$

Quick Tip: After an MI the heart isoenzyme overtakes the normally dominant serum one.

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54. Nude mice are not resistant to xenografts because of the absence of which cells?

- (A) B cells
- (B) T cells
- (C) Both B and T cells
- (D) None

Correct Answer: (B) T cells

SOLUTION:

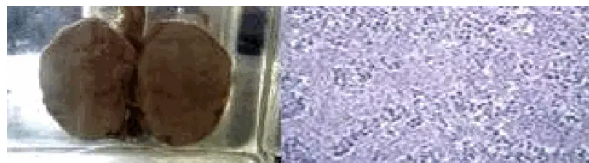
Step 1: Recall the defining feature of the nude mouse - it is athymic. **Step 2:** A missing thymus means *T* cell maturation fails, so the animal has essentially no functional T lymphocytes while its B cell compartment is preserved. **Step 3:** Transplant rejection of foreign tissue (a xenograft) depends on CD4+ and CD8+ T cells; with these absent, the mouse cannot reject the graft and the xenograft survives, which is exactly why nude mice are used to grow human tumours. **Step 4:** Therefore the cell type whose absence removes resistance to xenografts is the T cell.

T cell

Quick Tip: Athymic mice lack maturation of which lymphocyte needed for graft rejection?

...

55.



Identify the condition represented in the image.

- (A) Seminoma
- (B) Germ cell differentiated tumour
- (C) Non-seminoma
- (D) Teratoma

Correct Answer: (A) Seminoma

SOLUTION:

Step 1: Read the histology in the picture as a testicular germ cell tumour and look for the discriminating feature. **Step 2:** Seminoma arises from the germinal epithelium of the seminiferous tubules and is highly chemo- and radio-sensitive, giving cure rates over **95%** when caught early. **Step 3:** Its hallmark microscopy is monotonous large cells with clear glycogen-rich cytoplasm arranged in nests, partitioned by fibrous bands packed with lymphocytes. **Step 4:** Teratoma would show multiple tissue types and non-seminoma a mixture of elements, so the clean lymphocyte-rimmed pattern identifies the lesion as seminoma.

Seminoma

Quick Tip: A testicular germ cell tumour with clear cells in nests separated by lymphocyte-rich septa.



56. Anaplasia is:

- (A) Changing one type of epithelium to another
- (B) Nuclear chromatin
- (C) Lack of differentiation
- (D) Morphological changes

Correct Answer: (C) Lack of differentiation

SOLUTION:

Step 1: Break down the word - ana (backward) plasia (formation) implies cells losing their mature form. **Step 2:** Functionally this means the neoplastic cells fail to differentiate and no longer resemble the tissue they came from. **Step 3:** Such anaplastic cells look primitive and are the strongest morphological marker of malignancy, accompanied by pleomorphism and atypical mitoses. **Step 4:** Do not confuse it with metaplasia (one mature epithelium replaced by another), so the precise meaning of anaplasia is lack of differentiation.

Lack of differentiation

Quick Tip: Tumour cells that look primitive and no longer resemble their parent tissue.

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57. Which level of prolactin definitely suggests a prolactinoma?

- (A) 200 ng/ml
- (B) 150 ng/ml
- (C) 50 ng/ml
- (D) 100 ng/ml

Correct Answer: (A) 200 ng/ml

SOLUTION:

Step 1: Recognise that prolactin can rise modestly from medications, hypothyroidism or pituitary stalk compression, so a small bump is non-specific. **Step 2:** The question asks for the level that definitely (not just possibly) indicates a prolactin-secreting adenoma. **Step 3:** Clinically a value sustained above about 150 to 200 **ng/ml** is regarded as confirmatory for a prolactinoma; of the listed figures, 200 **ng/ml** clears this threshold. **Step 4:** The lower values of 50 and 100 ng/ml overlap with benign secondary causes and cannot definitely confirm the tumour, so the diagnostic level is 200 ng/ml.

200 ng/ml

Quick Tip: Only the highest value definitely confirms a prolactin-secreting tumour.

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58. Laxative abuse causes which of the following renal stones?

- (A) Uric acid
- (B) Ammonium urate
- (C) Struvite
- (D) Calcium oxalate

Correct Answer: (B) Ammonium urate

SOLUTION:

Step 1: Map each stone to its usual trigger - calcium oxalate is the common idiopathic stone, struvite forms with urease-producing infections, and pure uric acid stones form in acidic concentrated urine. **Step 2:** Laxative misuse drives chronic gastrointestinal loss of potassium and water. **Step 3:** The kidney answers the potassium deficit by raising renal ammonium synthesis; the combination of high urinary ammonium with urate precipitation yields ammonium acid urate crystals. **Step 4:** This makes the uncommon ammonium urate stone the characteristic finding in laxative abusers.

Ammonium urate

Quick Tip: Potassium loss from laxatives raises renal ammonium, favouring an unusual urate stone.

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59.



Identify the condition shown in the image.

- (A) Lobar pneumonia
- (B) Bronchopneumonia
- (C) Acute glomerulonephritis
- (D) Congested kidney

Correct Answer: (A) Lobar pneumonia

SOLUTION:

Step 1: Interpret the gross specimen - a firm, airless, liver-like lung surface is the classic picture of red hepatization. **Step 2:** Red hepatization is the second of the four stages of *lobar pneumonia* (congestion, red hepatization, grey hepatization, resolution). **Step 3:** In this stage the alveolar spaces fill with congested capillaries, erythrocytes, neutrophils and fibrin, giving the dense uniform consolidation of a whole lobe. **Step 4:** Bronchopneumonia gives patchy multifocal consolidation and the renal options do not fit a lung specimen, so the condition shown is lobar pneumonia.

Lobar pneumonia

Quick Tip: A firm, airless, liver-like lung (red hepatization) points to which pneumonia pattern?

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60.



Identify the condition represented in the image below.

- (A) Miliary tuberculosis
- (B) Bronchiectasis
- (C) COPD
- (D) Lung cancer

Correct Answer: (A) Miliary tuberculosis

SOLUTION:

Step 1: Read the picture as countless tiny uniform nodules spread evenly across both lungs. **Step 2:** Such a fine micronodular pattern arises when *Mycobacterium tuberculosis* disseminates through the bloodstream, seeding the whole lung. **Step 3:** Each focus measures only 1 to 5 mm and the appearance is likened to scattered millet seeds, the origin of the term miliary; spleen and liver may be seeded too. **Step 4:** This is unlike bronchiectasis (dilated bronchi), COPD (air trapping) or lung cancer (a focal mass), so the diagnosis is miliary tuberculosis.

Miliary tuberculosis

Quick Tip: Countless tiny millet-seed-like nodules across both lungs.

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61. Which of the following can result in dactylitis?

- (A) Hemophilia
- (B) Von Willebrand disease type 1
- (C) Measles
- (D) Sickle cell anemia

Correct Answer: (D) Sickle cell anemia

SOLUTION:

Step 1: Define dactylitis as a painful inflammatory swelling of the digits, also called the hand-foot syndrome. **Step 2:** In children it is most famously the presenting feature of *sickle cell anemia*. **Step 3:** The mechanism is occlusion of the marrow microvasculature of the small tubular bones by rigid sickled cells, producing bone ischaemia and painful swelling. **Step 4:** The bleeding disorders haemophilia and von Willebrand disease typically cause haemarthrosis instead, and measles produces a rash with Koplik spots, so the condition that gives dactylitis is sickle cell anemia.

Sickle cell anemia

Quick Tip: Painful hand-foot swelling that is often the first sign of which haemoglobinopathy?

• • •

62. Which chromosome is responsible for the production of MIF (Mullerian inhibiting factor)?

- (A) Chromosome 16
- (B) Chromosome 22
- (C) X chromosome
- (D) Y chromosome

Correct Answer: (D) Y chromosome

SOLUTION:

Step 1: Trace where MIF comes from - it is anti-Mullerian hormone made by testicular Sertoli cells to regress the female ductal system in a male embryo. **Step 2:** A testis only forms when the **SRY** gene, the testis-determining factor on the short arm of the **Y** chromosome, switches on. **Step 3:** AMH production sits downstream of this SRY-driven testis formation, so the controlling chromosome is the Y chromosome. **Step 4:** Even though the AMH structural gene and receptor are autosomal, the question targets the chromosome responsible for triggering MIF production, which is the Y chromosome.

Y chromosome

Quick Tip: MIF follows testis formation, which is switched on by SRY on which chromosome?

• • •

63. Burkholderia cepacia is resistant to which of the following drugs?

- (A) Ceftazidime
- (B) Trimethoprim-sulfamethoxazole
- (C) Temocillin
- (D) Cefotetan

Correct Answer: (D) Cefotetan

SOLUTION:

Step 1: Recall the intrinsic resistance profile of the Burkholderia cepacia complex, which shrugs off aminoglycosides, polymyxins, early cephalosporins and carboxypenicillins. **Step 2:** Compare each option against the list of agents known to be active - ceftazidime, temocillin and trimethoprim-sulfamethoxazole are all reliable choices, so they are eliminated. **Step 3:** Cefotetan is a second generation cephamycin, exactly the early-cephalosporin class to which the organism is naturally resistant. **Step 4:** Hence the drug Burkholderia cepacia resists among these is cefotetan.

Cefotetan

Quick Tip: It resists the early-generation cephalosporin, not ceftazidime, temocillin or co-trimoxazole.

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64. Shingles is caused by which of the following?

- (A) Varicella-zoster
- (B) Herpes simplex
- (C) CMV
- (D) None

Correct Answer: (A) Varicella-zoster

SOLUTION:

Step 1: The clue is the word shingles, which is simply the everyday name for herpes zoster.

Step 2: Chickenpox and shingles are two clinical faces of one organism. The primary attack of chickenpox is followed by lifelong latency of the virus in sensory ganglia. When immunity wanes, the agent reactivates and erupts along a single dermatome as shingles.

Step 3: That single agent is varicella-zoster virus. Herpes simplex, cytomegalovirus and the none option do not produce the classic dermatomal zoster rash.

Varicella-zoster

Quick Tip: Same virus that causes chickenpox, reactivated in a dermatome.

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65. Urea breath test is used for diagnosis of:

- (A) H. pylori
- (B) Campylobacter jejuni
- (C) E. coli
- (D) Lactobacillus

Correct Answer: (A) H. pylori

SOLUTION:

Step 1: Ask which gut organism is famous for splitting urea, because the test is named after that reaction.

Step 2: Helicobacter pylori carries an abundant urease. When isotope-tagged urea is ingested, the enzyme converts it to ammonia plus carbon dioxide. The tagged CO₂ escapes into the blood, reaches the lungs and appears in the breath, where it is measured.

Step 3: Because only H. pylori among the choices produces this brisk urease activity, it is the organism diagnosed by the breath test. The other three do not.

H. pylori

Quick Tip: Think of the urease-positive spiral bacterium of the stomach.

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66. Hyperacute graft rejection occurs after how much time?

- (A) 24 hours
- (B) 2 weeks
- (C) In minutes
- (D) Years

Correct Answer: (C) In minutes

SOLUTION:

Step 1: Match each type of rejection to its tempo. Hyperacute is the immediate one.

Step 2: The speed comes from antibodies that already exist in the recipient before transplant, most often from ABO incompatibility. The moment the graft is perfused, these antibodies coat the vessel lining, trigger complement and clotting, and the organ becomes thrombosed and cyanotic almost at once.

Step 3: Acute rejection appears over days to a few weeks and chronic over months to years, so neither fits. The hyperacute reaction unfolds in minutes.

In minutes

Quick Tip: Pre-formed antibodies act the instant the graft is perfused.

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67. Australian antigen for hepatitis B is?

- (A) HBsAg
- (B) HBeAg
- (C) HBdAg
- (D) HBV DNA

Correct Answer: (A) HBsAg

SOLUTION:

Step 1: Recall the eponym. The Australia antigen is the original label for the outer coat protein of HBV.

Step 2: That coat protein is the surface antigen, written HBsAg. Detecting it tells you the person is currently infected with hepatitis B, and it is the first marker to appear in serum.

Step 3: The e antigen reflects active replication and infectivity, while viral DNA measures the load. These are useful markers but are not the Australia antigen, which is HBsAg.

HBsAg

Quick Tip: It is the surface coat protein detected first in HBV infection.

...

68. Which fungus is most commonly associated with orbital cellulitis in patients with diabetic ketoacidosis?

- (A) Candida
- (B) Mucor
- (C) Aspergillus
- (D) Rhizopus

Correct Answer: (B) Mucor

SOLUTION:

Step 1: The trigger words are diabetic ketoacidosis plus an invasive orbital fungus, a combination that points to one classic mould.

Step 2: Mucor thrives in the low-pH, high-glucose, iron-available milieu of ketoacidosis. It invades blood vessels, producing thrombosis, black necrotic eschars and rapidly spreading rhino-orbital-cerebral infection with proptosis and ophthalmoplegia.

Step 3: Although Aspergillus is the other angioinvasive mould seen in immunocompromised hosts, the textbook pairing with diabetic ketoacidosis is mucormycosis. Therefore the single best answer is Mucor.

Mucor

Quick Tip: Angioinvasive mould of rhino-orbital-cerebral disease in ketoacidosis.

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69. Sabin-Feldman dye test is used for diagnosis of which of the following conditions:

- (A) Botulism
- (B) Toxoplasmosis
- (C) Sarcoidosis
- (D) Yellow fever

Correct Answer: (B) Toxoplasmosis

SOLUTION:

Step 1: Link the eponymous test to its parasite. The Sabin-Feldman dye test belongs to Toxoplasma diagnosis.

Step 2: The reaction works because antibody-coated, complement-activated *Toxoplasma* lose their ability to bind methylene blue. Healthy unopsonised parasites stain blue, whereas antibody-damaged ones remain colourless, signalling a positive test for prior or current infection.

Step 3: The other options use entirely different methods, so the condition diagnosed by this dye test is toxoplasmosis.

Toxoplasmosis

Quick Tip: A dye-exclusion serology for an intracellular protozoan.

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70. Acute haemorrhagic conjunctivitis is caused by which enterovirus type?

- (A) 69
- (B) 68
- (C) 70
- (D) 71

Correct Answer: (C) 70

SOLUTION:

Step 1: Tie the eye condition to its enterovirus serotype. AHC is the picornavirus eye disease.

Step 2: The two recognised agents are Coxsackievirus A24 and enterovirus type 70. Since only one enterovirus number is offered that matches, the relevant serotype is EV70, which produces the explosive, self-limited red eye with sub-conjunctival bleeding.

Step 3: Serotype 71 drives hand-foot-mouth disease and brainstem encephalitis,

and 68 causes respiratory disease, so neither explains AHC. The correct enterovirus is type 70.

Enterovirus 70

Quick Tip: Same enterovirus number that pairs with Coxsackie A24 for red eye.

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71. Echinococcus granulosus is commonly seen in which of the given animals:

- (A) Dog
- (B) Cat
- (C) Fox
- (D) Pig

Correct Answer: (A) Dog

SOLUTION:

Step 1: Identify the host that carries the adult tapeworm, because that is the definitive host being asked about.

Step 2: The everyday name dog tapeworm gives the answer away. The adult Echinococcus granulosus resides in the canine intestine; the dog sheds eggs, herbivores ingest them to form hydatid cysts, and humans become accidental dead-end hosts.

Step 3: Among the choices, only the dog serves as the definitive host, so the parasite is commonly associated with dogs.

Dog

Quick Tip: Its common name is the dog tapeworm.

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72. An anaerobe causing multiple abscesses with discharging sinuses, demonstrating sulphur granules in pus, is?

- (A) Actinomycetes
- (B) Nocardia
- (C) Salmonella
- (D) Tularemia

Correct Answer: (A) Actinomycetes

SOLUTION:

Step 1: Spot the three buzzwords: anaerobe, discharging sinuses and sulphur granules. Together they name a single disease.

Step 2: That disease is actinomycosis. The causative organism is an anaerobic, gram-positive, branching filamentous bacterium. Its microcolonies clump in the exudate to form the visible yellow sulphur granules that ooze through sinus tracts.

Step 3: Nocardia is the aerobic mimic, Salmonella causes typhoid, and Francisella causes tularaemia, so none fits. The correct organism is Actinomyces.

Actinomycetes

Quick Tip: Anaerobic branching bacterium whose pus shows sulphur granules.

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73. Whole blood is used as a sample for which test?

- (A) Bacteria
- (B) IGRA
- (C) GeneXpert
- (D) Virus

Correct Answer: (B) IGRA

SOLUTION:

Step 1: Look for the test whose very principle depends on living blood cells, since that test needs whole blood.

Step 2: IGRA fits exactly. Whole blood is incubated with *M. tuberculosis* antigens, and prior sensitised T lymphocytes respond by secreting interferon-gamma. Measuring this cytokine reveals latent or active TB infection.

Step 3: GeneXpert is usually a sputum-based molecular test, while bacteria and virus are not single named assays. The whole-blood test is therefore IGRA.

IGRA

Quick Tip: Whole-blood interferon-gamma assay for tuberculosis.

• • •

74. Which organism causes acute bacterial prostatitis?

- (A) Enterococcus
- (B) Streptococcus viridans
- (C) Peptostreptococcus
- (D) E. coli

Correct Answer: (D) E. coli

SOLUTION:

Step 1: Treat prostatitis like a urinary tract infection, because the same gut flora ascend to infect the prostate.

Step 2: The dominant uropathogen is *Escherichia coli*, a motile gram-negative rod that causes roughly half to four-fifths of acute bacterial prostatitis. The remaining cases are split among *Klebsiella*, *Proteus* and a small fraction of *Enterococcus*.

Step 3: The viridans streptococci and *Peptostreptococcus* belong to other settings, so they are wrong. The leading cause is *E. coli*.

E. coli

Quick Tip: Same gram-negative rod that tops the list for UTIs.

• • •

75. Which of the following organisms releases histamine and causes scombroid fish poisoning?

- (A) *Salmonella*
- (B) *Staphylococcus*
- (C) *P. aeruginosa*
- (D) *Weissella*

Correct Answer: (C) *P. aeruginosa*

SOLUTION:

Step 1: Recognise that scombroid poisoning is really histamine toxicity, so the answer must be a histamine-generating bacterium.

Step 2: When dark-fleshed fish sit unrefrigerated, surface and gut bacteria

decarboxylate the amino acid histidine into histamine. The classic culprits are gram-negative rods such as *Morganella morganii* and *Pseudomonas aeruginosa*.

Step 3: Of the four choices, only *Pseudomonas aeruginosa* belongs to that histamine-forming group, while *Salmonella*, *Staphylococcus* and *Weissella* do not fit the scombroid story. Hence the answer is *P. aeruginosa*.

P. aeruginosa

Quick Tip: A gram-negative rod that decarboxylates histidine to histamine.

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76. Who is the father of microbiology?

- (A) A. van Leeuwenhoek
- (B) Robert Brown
- (C) J. C. Bose
- (D) Pasteur

Correct Answer: (A) A. van Leeuwenhoek

SOLUTION:

Step 1: Ask who first actually saw micro-organisms, because that person earns the founding title.

Step 2: Antoni van Leeuwenhoek ground his own lenses and, looking at pond water, scrapings and other samples, became the first human to visualise bacteria and protozoa, naming them animalcules. This pioneering observation makes him the father of microbiology.

Step 3: Brown and Bose belong to other fields, and Pasteur, though monumental, is termed the father of modern microbiology. The discoverer of microbes is

Leeuwenhoek.

A. van Leeuwenhoek

Quick Tip: First to see animalcules through a single-lens microscope.

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77. Cutaneous larva migrans is caused by which organism?

- (A) Strongyloides
- (B) Toxocara canis
- (C) Ancylostoma braziliense
- (D) Necator americanus

Correct Answer: (C) Ancylostoma braziliense

SOLUTION:

Step 1: Realise that CLM comes from an animal hookworm whose larvae are lost in human skin, so pick the dog and cat hookworm.

Step 2: Ancylostoma braziliense is that organism, the leading cause especially in the Americas. Its larvae burrow into the skin and crawl along the epidermis, leaving the typical itchy serpentine track known as creeping eruption.

Step 3: Human hookworms like Necator americanus and Ancylostoma duodenale complete their cycle in people, and Toxocara causes visceral larva migrans, so none of these fits. The cause of CLM is Ancylostoma braziliense.

Ancylostoma braziliense

Quick Tip: Dog and cat hookworm whose larvae make creeping tracks in skin.

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78. After kidney transplantation, infection with which organism is more likely to happen?

- (A) CMV
- (B) Klebsiella
- (C) Streptococcus
- (D) Staphylococcus

Correct Answer: (A) CMV

SOLUTION:

Step 1: Think about which pathogen exploits the deep immunosuppression that follows a renal transplant.

Step 2: That pathogen is cytomegalovirus. It is the leading opportunistic virus after kidney transplant and produces a recognisable syndrome of fever, low white cell count, enlarged liver and spleen, and aches in muscles and joints.

Step 3: Ordinary bacteria like Klebsiella, Streptococcus and Staphylococcus are not the signature post-transplant organism being asked about. The expected answer is CMV.

CMV

Quick Tip: Most common opportunistic virus after solid organ transplant.

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79. Microbial cause of catheter infection in a young female.

- (A) *S. aureus*
- (B) *S. viridans*
- (C) *P. mallei*
- (D) *P. cepacia*

Correct Answer: (A) *S. aureus*

SOLUTION:

Step 1: Remember that catheter infections come from skin flora migrating along the device, then match to the options.

Step 2: The overall leader is coagulase-negative staphylococci, but that organism is absent from the choices. The next staphylococcal species in rank is *Staphylococcus aureus*, which causes roughly 5 to 10 percent of catheter-related infections and is the most frequent among the listed answers.

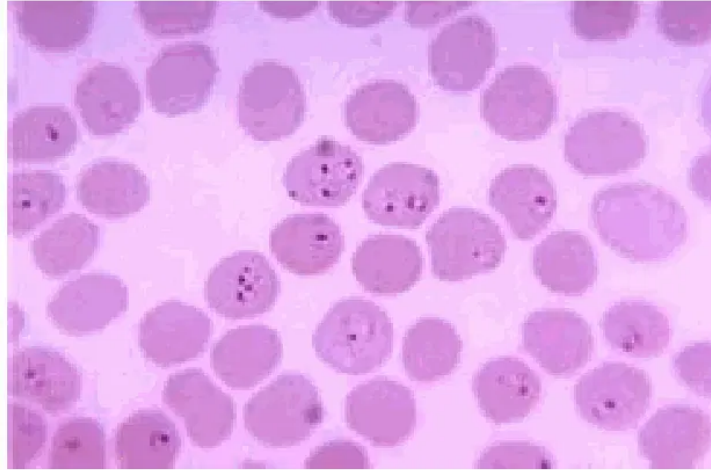
Step 3: Viridans streptococci, *P. mallei* and *P. cepacia* are uncommon in this context, so the best available answer is *S. aureus*.

S. aureus

Quick Tip: Skin staphylococcus is the top catheter coloniser among the options.

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80.



Identify the organism related to the blood smear image.

- (A) Plasmodium malariae
- (B) S. Typhi
- (C) Treponema pallidum
- (D) Toxoplasma gondii

Correct Answer: (A) Plasmodium malariae

SOLUTION:

Step 1: Read the smear: tiny ring-shaped forms sitting inside red blood cells point straight to malaria.

Step 2: In malaria diagnosis, the thick film is the sensitive screen for parasite presence and the thin film lets you name the species. Here the thin film displays early ring trophozoites within and occasionally outside the erythrocytes, the classic Plasmodium morphology.

Step 3: The other listed organisms are not found as intra-red-cell rings on a peripheral smear, so the parasite shown is Plasmodium (malaria parasite).

Plasmodium malariae

Quick Tip: Ring forms inside red cells mean the malaria parasite.

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81. Which of the following is an endogenous pyrogen?

- (A) PGE2
- (B) PGD2
- (C) PGF2 alpha
- (D) PGI2

Correct Answer: (A) PGE2

SOLUTION:

Step 1: Trace the fever pathway from cytokines to the prostaglandin that actually moves the thermostat.

Step 2: Cytokine pyrogens such as IL-1, IL-6 and TNF-alpha reach the hypothalamus and stimulate synthesis of prostaglandin E2. PGE2 is the molecule that raises the thermoregulatory set point, which is exactly why antipyretics that block prostaglandin synthesis reduce fever.

Step 3: The other prostaglandins listed do not serve as the fever mediator at the set point, so the answer among the choices is PGE2.

PGE2

Quick Tip: The prostaglandin that resets the hypothalamic set point in fever.

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82. In Bartter syndrome, the defect is seen in:

- (A) Defect in PCT
- (B) Defect in DCT
- (C) Defect in thick ascending limb of loop of Henle
- (D) None

Correct Answer: (C) Defect in thick ascending limb of loop of Henle

SOLUTION:

Step 1: Picture Bartter syndrome as a built-in loop diuretic, then locate where loop diuretics act.

Step 2: Loop diuretics block the Na-K-2Cl cotransporter in the thick ascending limb, and Bartter syndrome is caused by inherited loss of function of that same transporter or the associated potassium and chloride channels. The result is salt wasting and an inability to concentrate the urine.

Step 3: A DCT defect points instead to Gitelman syndrome, and the PCT is the wrong site, so the lesion in Bartter syndrome is in the thick ascending limb of the loop of Henle.

Defect in thick ascending limb of loop of Henle

Quick Tip: It behaves like a permanent loop diuretic; think where they act.

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83. Not seen in allergic bronchopulmonary aspergillosis is:

- (A) High IgE level
- (B) Recurrent pneumonia
- (C) Occurrence in patients with old cavitory lesions
- (D) Pleural effusion

Correct Answer: (B) Recurrent pneumonia

SOLUTION:

Step 1: This is a negative question, so confirm what truly belongs to ABPA and discard the odd one out.

Step 2: ABPA is an allergic, IgE-driven reaction to *Aspergillus* in asthmatic airways. Expected findings are very high serum IgE, fleeting pulmonary infiltrates, blood eosinophilia, central bronchiectasis, positive skin tests and precipitins, and it can arise in lungs bearing old cavities.

Step 3: Recurrent pneumonia is not part of the classic ABPA picture, which is hypersensitivity rather than repeated infection. Hence the feature not seen is recurrent pneumonia.

Recurrent pneumonia

Quick Tip: ABPA is allergy, not repeated infection; find the infection answer.

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84. Pseudo P pulmonale is seen in:

- (A) Hypokalemia
- (B) Hyponatremia
- (C) Hypocalcemia
- (D) Hypercalcemia

Correct Answer: (A) Hypokalemia

SOLUTION:

Step 1: Separate the real P-wave abnormalities from the pseudo pattern. True P pulmonale means right atrial enlargement with tall peaked P waves.

Step 2: When the ECG shows tall peaked P waves that look like P pulmonale but the right atrium is in fact normal, the finding is labelled pseudo P pulmonale, an electrolyte-driven mimic rather than a structural change.

Step 3: The electrolyte disturbance classically responsible is low serum potassium, so among the options the answer is hypokalemia.

Hypokalemia

Quick Tip: Tall peaked P waves mimicking P pulmonale from a low electrolyte.

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85. An Automatic Implantable Cardioverter Defibrillator (AICD) implantation is done for which of the following conditions?

- (A) Brugada syndrome
- (B) Ventricular fibrillation
- (C) Acute coronary syndrome with low ejection fraction
- (D) All of the above

Correct Answer: (D) All of the above

SOLUTION:

Step 1: Think of the AICD as a guard inside the chest that watches every heartbeat and fires a shock the instant a fatal rhythm appears. The clinical question is simply which patients need such a guard.

Step 2: Brugada syndrome is an inherited sodium-channel abnormality. Affected people can suddenly drop into polymorphic VT, so a device that can shock them back is life saving.

Step 3: A person who has already had ventricular fibrillation has proven they can

generate a lethal rhythm. Secondary prevention with a device is standard of care.

Step 4: After an acute coronary event with a weak pump (low EF), the scarred ventricle is electrically unstable and prone to sudden death, qualifying the patient for primary prevention. All three scenarios independently justify a device.

All of the above

Quick Tip: Both inherited channelopathies and post-MI low-EF patients qualify for a defibrillator.

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86. What is the line of treatment for intractable Sydenham chorea?

- (A) Haloperidol
- (B) Valproate
- (C) Warfarin
- (D) Risperidone

Correct Answer: (B) Valproate

SOLUTION:

Step 1: Sydenham chorea is the neurological face of acute rheumatic fever, marked by restless, dance-like involuntary movements. The pharmacological goal is to calm the overactive movement circuitry.

Step 2: Agents that strengthen the brain's main inhibitory transmitter, GABA, dampen the chorea. Valproate raises GABA-ergic activity and is the go-to drug when the chorea will not settle.

Step 3: The neuroleptics (haloperidol, risperidone) act by blocking dopamine and can be used, but their movement-disorder side effects make them second choices.

Warfarin is irrelevant as it only thins blood.

Valproate

Quick Tip: The preferred drug enhances GABA action rather than blocking dopamine.

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87. All of the following are diagnostic criteria for Neurofibromatosis type 1 EXCEPT:

- (A) Brain tumor
- (B) Acoustic neuromas
- (C) Pseudoarthrosis
- (D) Cafe-au-lait spots

Correct Answer: (B) Acoustic neuromas

SOLUTION:

Step 1: NF1 is diagnosed when a patient meets two or more of seven well-known features, the easiest to recall being multiple cafe-au-lait spots, skin-fold freckling, neurofibromas, optic glioma, Lisch nodules, a typical bony defect, and an affected first-degree relative.

Step 2: Checking the options: cafe-au-lait spots are a core criterion, pseudarthrosis falls under the long-bone abnormality criterion, and the optic glioma counts as the NF1 brain tumor.

Step 3: The odd one out is the acoustic neuroma. Bilateral vestibular schwannomas define NF2, a separate disorder, so it does not belong in the NF1 list.

Acoustic neuromas

Quick Tip: Bilateral acoustic neuromas point to NF2, not NF1.

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88. What is the most common site of a chronic gastric ulcer?

- (A) Pyloric antrum
- (B) Upper part of lesser curvature
- (C) Lower part of lesser curvature
- (D) Segment of large intestine

Correct Answer: (A) Pyloric antrum

SOLUTION:

Step 1: A chronic gastric ulcer is a defect in the stomach wall that persists because of ongoing inflammation, most often from *H. pylori* infection.

Step 2: *H. pylori* has a preference for the antral lining of the stomach, where it sets up chronic gastritis and weakens the mucosal defence. The region that bears the brunt is the pyloric antrum.

Step 3: Comparing the choices, the colon is part of the large bowel and is never a gastric ulcer site, while the antrum outranks the isolated lesser-curvature options as the classic location.

Pyloric antrum

Quick Tip: Think of where *H. pylori* colonizes the stomach.

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89. The approximate time interval between HIV infection and the manifestation of AIDS is:

- (A) 7.5 years
- (B) 10 years
- (C) 12 years
- (D) 11 years

Correct Answer: (B) 10 years

SOLUTION:

Step 1: HIV does not cause AIDS overnight. There is a silent phase where CD4 counts gradually fall over years.

Step 2: The classically taught median time from acquiring untreated HIV to crossing into AIDS is roughly a decade.

Step 3: Among the offered numbers, only 10 years matches this widely quoted incubation period.

10 years

Quick Tip: Recall the classic decade-long latency of untreated HIV.

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90. Heller's myotomy is done for:

- (A) Zenker's diverticulum
- (B) Achalasia cardia
- (C) Bunions
- (D) Knee arthroscopy

Correct Answer: (B) Achalasia cardia

SOLUTION:

Step 1: In achalasia, the valve between the esophagus and stomach stays shut because the lower esophageal sphincter will not relax, and food backs up.

Step 2: The definitive surgical fix is to divide the muscle fibres at the gastroesophageal junction, allowing the valve to stay open. That operation is Heller's myotomy.

Step 3: The remaining options involve a throat pouch, a toe deformity and a knee joint procedure, none of which need a myotomy of the cardia.

Achalasia cardia

Quick Tip: The operation divides the muscle at the gastroesophageal junction.

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91. A patient shows a pattern of myocardial stunning that does not match the territory of a single coronary artery on the ECG. What is the most likely diagnosis?

- (A) Takotsubo cardiomyopathy
- (B) Restrictive cardiomyopathy
- (C) Brugada cardiomyopathy
- (D) Pericardial disease

Correct Answer: (A) Takotsubo cardiomyopathy

SOLUTION:

Step 1: When a wall of the heart is stunned but the dysfunction spreads beyond what one coronary artery supplies, you should suspect a non-ischemic, stress-related cause.

Step 2: Takotsubo cardiomyopathy is exactly that - an acute, reversible stunning of the heart, classically with ballooning of the apex, that ignores normal coronary

boundaries.

Step 3: The distractors do not fit: restrictive cardiomyopathy is a problem of filling, Brugada is an electrical channel disorder, and pericardial disease affects the sac around the heart rather than producing regional stunning.

Takotsubo cardiomyopathy

Quick Tip: Reversible apical stunning that crosses coronary territories suggests a stress-induced cause.

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92. An alternative drug for cardiac arrest in place of epinephrine is:

- (A) Amiodarone infusion
- (B) Atropine
- (C) High dose vasopressin
- (D) Adenosine

Correct Answer: (C) High dose vasopressin

SOLUTION:

Step 1: The drug that substitutes for adrenaline in an arrest must also clamp down blood vessels to push blood to the heart and brain.

Step 2: Vasopressin fits because it constricts vessels through V1 receptors without needing the adrenergic pathway, and guidelines allow one 40 unit dose to stand in for a dose of epinephrine in pulseless arrest.

Step 3: The other choices fail the job: amiodarone steadies rhythm, atropine speeds a slow heart, and adenosine slows the AV node. Only vasopressin is a true vasopressor alternative.

High dose vasopressin

Quick Tip: Look for a non-adrenergic vasopressor that constricts vessels via V1 receptors.

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93. A patient presents with cutaneous vasculitis, glomerulonephritis and peripheral neuropathy. Which investigation should be performed next to help diagnose the condition?

- (A) ANCA
- (B) Rheumatoid factor
- (C) HBsAg
- (D) MIF

Correct Answer: (A) ANCA

SOLUTION:

Step 1: When skin, kidney and nerve are simultaneously attacked, the unifying explanation is inflammation of small blood vessels.

Step 2: The serological marker that pins down this family of disorders is ANCA, an IgG antibody aimed at neutrophil cytoplasmic proteins, giving the name ANCA-associated vasculitis.

Step 3: Rheumatoid factor lacks specificity, HBsAg checks for a viral cause that is less likely here, and MIF has no established diagnostic role, so ANCA is the test to order.

ANCA

Quick Tip: Skin, kidney and nerve involvement together point to a small-vessel vasculitis marker.

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94. Cryoglobulinemia is most commonly associated with which of the following?

- (A) Hepatitis C
- (B) Ovarian cancer
- (C) Diabetes
- (D) Leukemia

Correct Answer: (A) Hepatitis C

SOLUTION:

Step 1: In cryoglobulinemia, abnormal antibodies in the blood clump together when the temperature drops, then dissolve again on warming.

Step 2: The infection most famously behind mixed cryoglobulinemia is chronic Hepatitis C, which keeps the immune system producing these cold-precipitating proteins.

Step 3: The remaining options - an ovarian malignancy, diabetes and leukemia - are not recognised classic triggers, leaving Hepatitis C as the answer.

Hepatitis C

Quick Tip: A chronic viral hepatitis is the classic trigger.

• • •

95. Which of the following causes hypokalemic metabolic alkalosis WITH hypertension?

- (A) Liddle syndrome
- (B) Bartter syndrome
- (C) Gitelman syndrome
- (D) Renal tubular acidosis

Correct Answer: (A) Liddle syndrome

SOLUTION:

Step 1: Several tubular disorders produce low potassium and alkalosis, so the deciding feature here is whether blood pressure is high.

Step 2: In Liddle syndrome the sodium channel ENaC is stuck on. The kidney hoards sodium and water, driving up blood pressure, while dumping potassium and acid, giving the hypokalemic alkalosis.

Step 3: Bartter and Gitelman share the electrolyte picture but keep blood pressure normal or low, and renal tubular acidosis moves the blood the other way into acidosis. Only Liddle pairs alkalosis with hypertension.

Liddle syndrome

Quick Tip: An overactive ENaC channel retains sodium and raises blood pressure.

• • •

96. According to the GOLD criteria, very severe COPD is defined by:

- (A) $FEV_1/FVC < 70$ and $FEV_1 < 30$
- (B) $FEV_1/FVC < 70$ and $FEV_1 < 70$
- (C) $FEV_1/FVC < 70$ and $FEV_1 < 50$
- (D) Both A and C

Correct Answer: (A) $FEV_1/FVC < 70$ and $FEV_1 < 30$

SOLUTION:

Step 1: COPD is first confirmed by an obstructive ratio, that is post-bronchodilator $FEV_1/FVC < 0.70$.

Step 2: Once obstruction is confirmed, severity is graded by how low the FEV1 percent predicted falls. The very severe (Stage IV) band sits at $FEV_1 < 30\%$ predicted (or below 50% with respiratory failure).

Step 3: Matching this to the choices, the option giving $FEV_1/FVC < 70$ together with $FEV_1 < 30$ is the defining spirometric statement for very severe disease.

$$FEV_1/FVC < 70 \text{ and } FEV_1 < 30$$

Quick Tip: Very severe means FEV1 below 30 percent predicted with an obstructive ratio.

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97. The Ankle-Brachial Pressure Index (ABPI) is artificially increased in:

- (A) Arteriosclerosis with calcified arteries
- (B) Ischemic ulcers
- (C) Intermittent claudication
- (D) Deep vein thrombosis

Correct Answer: (A) Arteriosclerosis with calcified arteries

SOLUTION:

Step 1: The ABPI compares the blood pressure at the ankle with that in the arm; values fall when arteries are narrowed.

Step 2: If the wall of the leg artery is stiff with calcium, the cuff cannot squeeze it shut. The machine then reads a falsely high ankle pressure and the index is

spuriously elevated.

Step 3: By contrast, ischemic ulcers and claudication signal real obstruction and pull the index down, while DVT involves veins, so the calcified, incompressible artery is the cause of a falsely high ABPI.

Arteriosclerosis with calcified arteries

Quick Tip: Incompressible calcified arteries give a falsely high ankle pressure.

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98. Minimal brain dysfunction syndrome is seen in:

- (A) Dyslexia
- (B) ADHD
- (C) Mental subnormality
- (D) Down's syndrome

Correct Answer: (A) Dyslexia

SOLUTION:

Step 1: Minimal brain dysfunction describes children of near-normal intelligence who nonetheless struggle with attention, behaviour and specific scholastic skills.

Step 2: The hallmark learning problem of this syndrome is dyslexia, where the child cannot smoothly combine what is heard with what is seen to read fluently.

Step 3: ADHD is a related attention disorder but the specific learning deficit tied to the term is dyslexia, whereas mental subnormality and Down's syndrome are conditions of global intellectual impairment rather than isolated learning disability.

Dyslexia

Quick Tip: The associated specific learning disability is a reading disorder.

• • •

99. The site of action of amphotericin B is:

- (A) Ribosomes
- (B) Cell wall
- (C) Plasma membrane
- (D) Protein

Correct Answer: (C) Plasma membrane

SOLUTION:

Step 1: Amphotericin B belongs to the polyene class. The defining trick of polyenes is that they latch onto a membrane sterol rather than attacking the wall, ribosomes or proteins.

Step 2: Its target is ergosterol, the cholesterol-like sterol embedded in the fungal plasma membrane. The drug binds this sterol and wedges itself into the lipid bilayer.

Step 3: Once inserted, several molecules line up to create a pore, so potassium and other contents leak out and the fungus dies. The whole action takes place at the plasma membrane.

Plasma membrane

Quick Tip: Polyenes bind ergosterol and punch pores in the fungal membrane.

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100. Which antiretroviral drug also has anti-hepatitis activity?

- (A) Abacavir
- (B) Tenofovir
- (C) Nevirapine
- (D) Emtricitabine

Correct Answer: (D) Emtricitabine

SOLUTION:

Step 1: We are looking for an HIV drug that doubles as a hepatitis agent. Emtricitabine is an NRTI used to prevent and treat HIV in both adults and children.

Step 2: Beyond HIV, emtricitabine carries activity against the hepatitis B virus, and clinically it is paired with tenofovir for this combined coverage.

Step 3: Following the recall key, the chosen dual-purpose drug is emtricitabine.

Emtricitabine

Quick Tip: An NRTI partnered with tenofovir that also covers hepatitis B.

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101. The drug of choice for resistant rheumatic chorea is:

- (A) Valproate
- (B) Haloperidol
- (C) Diazepam
- (D) Probenecid

Correct Answer: (A) Valproate

SOLUTION:

Step 1: Rheumatic chorea is the movement-disorder component of acute rheumatic fever, driven by a streptococcal-triggered immune attack on the brain.

Step 2: Because antirheumatic therapy barely touches the chorea, doctors fall back on symptomatic control with anticonvulsants such as valproate and carbamazepine and neuroleptics such as haloperidol.

Step 3: The first-line, preferred agent for stubborn chorea is valproate, while probenecid (a gout drug) is irrelevant here.

Valproate

Quick Tip: An anticonvulsant that boosts GABA is the preferred symptomatic agent.

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102. At $pK_a = pH$, which of the following is true for a drug?

- (A) Concentration of drug is 50% ionic and 50% non-ionic
- (B) Absorption of drug is 50% ionic and 50% ionic
- (C) Concentration of drug is 75% ionic and 25% non-ionic
- (D) Concentration of drug is 25% ionic and 75% non-ionic

Correct Answer: (A) Concentration of drug is 50% ionic and 50% non-ionic

SOLUTION:

Step 1: Drug ionization is governed by the Henderson-Hasselbalch relationship, where pK_a is the negative logarithm of the acid dissociation constant.

Step 2: Setting the pH numerically equal to the pK_a makes the log term vanish because $\log 1 = 0$, which forces the concentrations of charged and uncharged drug to be identical.

Step 3: Equal concentrations translate directly to a 50:50 split, so half the drug is ionized and half is non-ionized at $pK_a = pH$.

50% ionic and 50% non-ionic

Quick Tip: When pH equals pK_a , the log of the ratio is zero, so the split is even.

• • •

103. The physiological dose of hydrocortisone (mg/kg/day) is:

- (A) 5 mg/kg/day
- (B) 10 mg/kg/day
- (C) 15 mg/kg/day
- (D) 20 mg/kg/day

Correct Answer: (B) 10 mg/kg/day

SOLUTION:

Step 1: The adrenal cortex releases two main steroids each day - cortisol (hydrocortisone) and aldosterone - and the question asks for the baseline cortisol output.

Step 2: The accepted physiological figure for hydrocortisone is about 10 mg daily, peaking in the morning, contrasted with the tiny 0.125 mg of aldosterone.

Step 3: Reading off the choices, the value that matches this normal secretion rate is 10, making it the physiological dose.

10 mg/kg/day

Quick Tip: Recall the normal daily cortisol secretion, mostly released in the morning.

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104. What is the mechanism of action of colchicine in acute gout?

- (A) Inhibition of purine metabolism
- (B) Inhibition of uric acid conversion
- (C) Migration of leukocytes
- (D) Leukocyte and lymphocyte migration inhibition and microtubular inhibition

Correct Answer: (D) Leukocyte and lymphocyte migration inhibition and microtubular inhibition

SOLUTION:

Step 1: Gout flares ignite when needle-like urate crystals drop into the joint fluid and white cells rush in. As they engulf the crystals they spill glycoprotein and lysosomal enzymes that amplify the inflammation.

Step 2: Colchicine, a plant alkaloid, works upstream by binding tubulin and preventing microtubules from forming. Without functioning microtubules, leukocytes and lymphocytes cannot crawl into the joint, and glycoprotein release is suppressed.

Step 3: Notice that colchicine never touches uric acid levels - it neither cuts its synthesis nor speeds its excretion - so the anti-purine options are wrong. The full and most accurate statement is inhibition of leukocyte and lymphocyte migration plus microtubule inhibition.

Leukocyte and lymphocyte migration inhibition and microtubular inhibition

Quick Tip: It binds tubulin and stops white cells from migrating, without altering uric acid.



105. Basiliximab is an:

- (A) IL-1 receptor antagonist
- (B) Anti-CD3 antibody
- (C) IL-2 receptor antagonist
- (D) TNF inhibitor

Correct Answer: (C) IL-2 receptor antagonist

SOLUTION:

Step 1: Basiliximab is an anti-CD25 monoclonal antibody, CD25 being the alpha subunit of the IL-2 receptor found on activated T-cells.

Step 2: Because it clamps onto this receptor subunit with high affinity, it stops interleukin-2 from triggering the T-cell, so functionally it behaves as an IL-2 receptor antagonist.

Step 3: Clinically it guards transplanted organs against rejection, clears in roughly a week, and may provoke anaphylaxis or infections. The remaining labels - IL-1 antagonist, anti-CD3 and TNF inhibitor - describe other drugs, leaving the IL-2 receptor antagonist as the answer.

IL-2 receptor antagonist

Quick Tip: It targets CD25, the alpha chain of the IL-2 receptor.



106. Pirenzepine is used in the treatment of:

- (A) Gastric ulcer
- (B) Glaucoma
- (C) Hypertension
- (D) Congestive cardiac failure

Correct Answer: (A) Gastric ulcer

SOLUTION:

Step 1: Recall that gastric acid output from parietal cells is partly driven by vagal cholinergic stimulation acting on M_1 muscarinic receptors.

Step 2: Pirenzepine is the prototype selective M_1 blocker. Because it preferentially hits M_1 rather than M_2 or M_3 , it dampens acid secretion with fewer systemic antimuscarinic effects.

Step 3: A drug that lowers acid output is logically used for an acid-related disease, namely gastric (peptic) ulcer.

Step 4: Glaucoma, hypertension, and heart failure have unrelated mechanisms, so they are ruled out.

Gastric ulcer

Quick Tip: Think of the selective M_1 anticholinergic that cuts gastric acid secretion.

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107. Which of the following antipsychotics is most associated with increased prolactin secretion?

- (A) Olanzapine
- (B) Ziprasidone
- (C) Clozapine
- (D) Risperidone

Correct Answer: (D) Risperidone

SOLUTION:

Step 1: Hyperprolactinemia from antipsychotics tracks with how strongly the drug blocks D_2 receptors in the tuberoinfundibular tract.

Step 2: Rank the agents by D_2 affinity. Clozapine, olanzapine, and ziprasidone are loose or transient D_2 binders and tend to leave prolactin near normal.

Step 3: Risperidone binds D_2 tightly and persistently, and it does not readily cross into the brain to spare the pituitary, so circulating prolactin climbs significantly during therapy.

Step 4: Therefore the agent that stands out for raising prolactin is risperidone.

Risperidone

Quick Tip: The most potent D_2 blocker among the atypicals raises prolactin the most.

• • •

108. Which of the following is a glucocorticoid synthesis inhibitor?

- (A) Mifepristone
- (B) Flutamide
- (C) Finasteride
- (D) Metyrapone

Correct Answer: (D) Metyrapone

SOLUTION:

Step 1: Cortisol is built in the adrenal cortex through a chain of CYP enzymes; the final step adding the 11-hydroxyl group uses 11 β -hydroxylase.

Step 2: Knock out that last hydroxylation and cortisol output falls. Metyrapone does exactly this by inhibiting 11 β -hydroxylase, leaving 11-deoxycortisol to accumulate.

Step 3: The remaining options act at receptors or other pathways: mifepristone blocks the glucocorticoid receptor, flutamide blocks the androgen receptor, and finasteride blocks dihydrotestosterone formation.

Step 4: Only metyrapone interrupts actual cortisol synthesis.

Metyrapone

Quick Tip: Which agent blocks 11-beta-hydroxylase in the adrenal cortex?

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109. Which of the following statements is incorrect with respect to prasugrel?

- (A) Not a prodrug
- (B) P2Y purinergic receptor blocker
- (C) Has strong antiplatelet activity
- (D) Causes intracranial hemorrhage in TIA patients

Correct Answer: (A) Not a prodrug

SOLUTION:

Step 1: This is a negative-stem item, so the correct choice is the false statement about prasugrel.

Step 2: Verify each true fact. Prasugrel belongs to the thienopyridine family, undergoes liver conversion to its active metabolite (so it is a prodrug), and then irreversibly shuts off the platelet $P2Y_{12}$ ADP receptor.

Step 3: Its activation is fast and near-complete, which is why its antiplatelet effect is potent and reliable, and why it carries a high bleeding risk that contraindicates it in prior stroke or TIA.

Step 4: The only statement that contradicts this profile is the claim that it is not a prodrug.

Not a prodrug (this statement is incorrect)

Quick Tip: Prasugrel, like clopidogrel, needs hepatic activation - so one option is plainly false.

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110. Q-T prolongation is most characteristically seen with which drug?

- (A) Quinidine
- (B) Amiodarone
- (C) Magnesium sulfate
- (D) Lignocaine

Correct Answer: (A) Quinidine

SOLUTION:

Step 1: QT prolongation reflects delayed ventricular repolarization, usually from blockade of the rapid delayed-rectifier potassium current.

Step 2: Quinidine, a class IA drug, is the textbook offender; the resulting polymorphic ventricular tachycardia is named Torsades de Pointes, and quinidine heads the list of culprit drugs.

Step 3: Lignocaine works oppositely (class IB shortens the action potential), and magnesium sulfate is the antidote given to suppress Torsades rather than cause it.

Step 4: So the single best answer for marked QT prolongation is quinidine.

Quinidine

Quick Tip: Which class IA antiarrhythmic is the classic cause of Torsades de Pointes?

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111. Sacubitril is a:

- (A) ACE inhibitor
- (B) Neutral endopeptidase inhibitor
- (C) Calcium channel inhibitor
- (D) Beta adrenergic blocker

Correct Answer: (B) Neutral endopeptidase inhibitor

SOLUTION:

Step 1: The combination drug sacubitril/valsartan is an ARNI, and the angiotensin receptor part is valsartan, so sacubitril must supply the other mechanism.

Step 2: Sacubitril is activated to its metabolite, which blocks neprilysin (the neutral endopeptidase that degrades natriuretic peptides, bradykinin, and adrenomedullin).

Step 3: Blocking this enzyme keeps beneficial vasodilatory and natriuretic peptides around longer, helping unload the failing heart.

Step 4: Therefore sacubitril is correctly classed as a neutral endopeptidase inhibitor, not an ACE inhibitor or any of the other classes.

Neutral endopeptidase (neprilysin) inhibitor

Quick Tip: It is the neprilysin-blocking half of the valsartan combination used in heart failure.

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112. Niacin therapy is relatively contraindicated in diabetes because it:

- (A) Increases the blood sugar levels
- (B) Causes scleroderma
- (C) Is difficult to give by injection
- (D) Increases the metabolism of oral hypoglycemic drugs

Correct Answer: (A) Increases the blood sugar levels

SOLUTION:

Step 1: Niacin is used to lower LDL and triglycerides and to raise HDL, but it has an unwanted action on carbohydrate handling.

Step 2: It promotes insulin resistance and reduces glucose tolerance, which pushes fasting and post-meal glucose upward.

Step 3: In someone who already has diabetes, this hyperglycemic effect can destabilize control, so niacin is used cautiously or avoided.

Step 4: The cause therefore is its tendency to raise blood glucose, not

scleroderma, injection issues, or drug metabolism changes.

It increases blood sugar levels

Quick Tip: Niacin worsens glucose tolerance and insulin resistance.

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113. Endothelin acts through which second messenger / receptor pathway?

- (A) cAMP
- (B) cGMP
- (C) Na⁺ receptors
- (D) Calcium receptors

Correct Answer: (B) cGMP

SOLUTION:

Step 1: Endothelin-1 is the strongest natural vasoconstrictor and comes from endothelial cells, binding *ET_A* and *ET_B* G-protein coupled receptors.

Step 2: Through the endothelial *ET_B* receptor it triggers nitric oxide release, and NO drives guanylate cyclase to generate cyclic GMP in the underlying smooth muscle.

Step 3: The expected answer here is therefore the cGMP pathway, which is listed as option B.

Step 4: The other choices (cAMP, sodium, or calcium receptors) do not represent this route, so they are excluded.

cGMP

Quick Tip: Endothelin acting on endothelial receptors releases NO, which raises this cyclic nucleotide.

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114. Which is the centrally acting alpha-2 agonist muscle relaxant?

- (A) Diazepam
- (B) Bromocriptine
- (C) Tizanidine
- (D) Methocarbamol

Correct Answer: (C) Tizanidine

SOLUTION:

Step 1: The clue 'alpha-2 agonist' narrows the field to drugs sharing clonidine-like central action.

Step 2: Tizanidine fits exactly: it stimulates central alpha-2 receptors, cutting the release of excitatory amino acids in spinal interneurons and boosting inhibitory glycine signaling.

Step 3: The net result is reduced spasticity and fewer painful spasms while preserving voluntary strength, which is why it is favored in neurological spasticity.

Step 4: Diazepam (GABAergic), bromocriptine (dopaminergic), and methocarbamol (non-adrenergic central relaxant) do not match the alpha-2 mechanism.

Tizanidine

Quick Tip: Which clonidine-like central alpha-2 agonist is used to relieve spasticity?

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115. Apixaban is a:

- (A) Antithrombin inhibitor
- (B) Direct factor Xa inhibitor
- (C) Platelet activator
- (D) Clotting factor XII

Correct Answer: (B) Direct factor Xa inhibitor

SOLUTION:

Step 1: The 'xa' in the names of apixaban and rivaroxaban hints directly at factor Xa.

Step 2: Apixaban binds the active site of factor Xa without needing antithrombin as a cofactor, hence 'direct' Xa inhibition.

Step 3: By halting Xa it stops thrombin generation, which is why it prevents and treats venous thromboembolic disease such as DVT and PE.

Step 4: It is therefore not an antithrombin-dependent agent, not a platelet activator, and certainly not a clotting factor itself.

Direct factor Xa inhibitor

Quick Tip: The drug name ending in -xaban points to its target enzyme.

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116. Anaerobes are intrinsically resistant to which class of antibiotics?

- (A) Beta lactam antibiotics
- (B) Aminoglycosides
- (C) Azithromycin
- (D) Metronidazole

Correct Answer: (B) Aminoglycosides

SOLUTION:

Step 1: Aminoglycosides need an oxygen-powered transport step to cross the bacterial membrane and reach the ribosome.

Step 2: Anaerobes, by definition, do not run aerobic oxidative metabolism, so they cannot energize this uptake; the antibiotic is effectively locked out.

Step 3: This is classic intrinsic resistance, a built-in trait of the organism rather than an acquired plasmid or mutation.

Step 4: By contrast metronidazole is actually activated inside anaerobes and is their drug of choice, so it is the opposite of the answer.

Aminoglycosides

Quick Tip: Which antibiotic needs oxygen-dependent uptake that anaerobes cannot provide?

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117. Which of the following is NOT a bacteriostatic antibiotic?

- (A) Clindamycin
- (B) Vancomycin
- (C) Tetracycline
- (D) Cephalosporins

Correct Answer: (B) Vancomycin

SOLUTION:

Step 1: The task is to spot the bactericidal drug hidden among bacteriostatic ones.

Step 2: Protein-synthesis blockers like tetracycline and clindamycin merely stop bacterial multiplication, so they are bacteriostatic.

Step 3: Vancomycin attacks the cell wall (binding D-Ala-D-Ala to block peptidoglycan cross-linking), which kills the organism outright, making it bactericidal.

Step 4: Hence the one that does not fit the bacteriostatic group is vancomycin.

Vancomycin

Quick Tip: Which cell-wall-active agent kills rather than just inhibits growth?

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118. Which of the following causes melanosis coli?

- (A) Senna
- (B) Sorbitol
- (C) Magnesium sulphate
- (D) Bisacodyl

Correct Answer: (A) Senna

SOLUTION:

Step 1: Melanosis coli is the dark pigment deposition in colonic mucosa seen with long-term laxative abuse.

Step 2: The culprits are the anthranoid (anthraquinone) plant-derived stimulant laxatives, namely senna, aloe, and cascara sagrada.

Step 3: From the options, senna is the only anthranoid agent, so it is the cause; chronic use also carries a possible association with increased colonic cancer risk.

Step 4: Osmotic agents (sorbitol, magnesium sulphate) and the non-anthranoid stimulant bisacodyl do not produce this pigmentation.

Senna

Quick Tip: Think anthranoid (anthraquinone) stimulant laxative.

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119. Which is the antibiotic of choice for a bedridden patient with catheter-related UTI and pneumonia?

- (A) Amoxicillin
- (B) Beta lactam antibiotic with a beta lactamase inhibitor
- (C) 3rd generation cephalosporins
- (D) 2nd generation cephalosporins

Correct Answer: (B) Beta lactam antibiotic with a beta lactamase inhibitor

SOLUTION:

Step 1: In a debilitated, catheterized inpatient with both a urinary and a respiratory infection, the likely pathogens frequently produce beta-lactamase enzymes that destroy simple penicillins.

Step 2: The rational pick is a beta lactam paired with a beta lactamase inhibitor; the inhibitor shields the antibiotic, restoring its broad activity against these organisms.

Step 3: This combination therefore gives potent, dependable coverage for the UTI and pneumonia together.

Step 4: Unprotected amoxicillin would be inactivated, and the second- or third-generation cephalosporin choices are less optimal for this resistance-prone setting.

Beta lactam with a beta lactamase inhibitor

Quick Tip: Resistant organisms make beta-lactamase, so you need an inhibitor combination.

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120. Mycoplasma is intrinsically resistant to which antibiotic?

- (A) Ceftriaxone
- (B) Cephalosporins
- (C) Aminoglycosides
- (D) Fluoroquinolones

Correct Answer: (A) Ceftriaxone

SOLUTION:

Step 1: The defining feature of mycoplasma is the absence of a peptidoglycan cell wall.

Step 2: Any antibiotic whose mechanism is to disrupt cell wall building has nothing to act on, so it fails; ceftriaxone, a beta lactam cephalosporin, is exactly such a drug.

Step 3: Hence mycoplasma is naturally resistant to ceftriaxone and to all cell-wall-targeting agents.

Step 4: Treatment instead relies on macrolides, tetracyclines, or fluoroquinolones, which strike protein synthesis or DNA replication and are unaffected by the missing wall.

Ceftriaxone

Quick Tip: No cell wall means cell-wall-active beta lactams cannot work.

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121. Tadalafil should not be given together with:

- (A) Vasodilators
- (B) Antibiotics
- (C) Vasoconstrictors
- (D) Valproate

Correct Answer: (A) Vasodilators

SOLUTION:

Step 1: Tadalafil blocks phosphodiesterase-5, sustaining cGMP-mediated smooth-muscle relaxation and vasodilation.

Step 2: If another vasodilating drug (classically a nitrate) is added, the two effects stack, producing a steep and potentially dangerous drop in blood pressure.

Step 3: For that reason vasodilators are contraindicated alongside tadalafil.

Step 4: The other options - antibiotics, vasoconstrictors, and valproate - lack this additive hypotensive risk, so they are not the answer.

Vasodilators

Quick Tip: Adding another vasodilator (like nitrates) to a PDE-5 inhibitor crashes blood pressure.

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122. Estimate the volume of Ringer lactate to be given in the first 8 hours for a 50 kg male with 40% second-degree burns.

- (A) 8 litres
- (B) 4 litres
- (C) 2 litres
- (D) 6 litres

Correct Answer: (B) 4 litres

SOLUTION:

Step 1: Burns resuscitation uses the Parkland formula, where the 24-hour Ringer lactate requirement equals four times the body weight in kg times the percent body surface area burned.

Step 2: Plugging in 50 kg and 40 percent: $4 \times 50 \times 40 = 8000$ mL for the whole first day.

Step 3: The protocol front-loads fluid by giving one half within the first 8 hours: $\frac{8000}{2} = 4000$ mL.

Step 4: So 4 litres is infused in those first 8 hours, with the other half spread across the following 16 hours and adjusted to keep urine output near 50 mL/hr.

4 litres

Quick Tip: Parkland: $4 \times \text{kg} \times \% \text{TBSA}$, then give half in the first 8 hours.

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123. A posthumous child is one who is:

- (A) Delivered after the death of the biological mother
- (B) Delivered after the death of the biological father
- (C) Born after the death of both parents
- (D) Abandoned by the parents

Correct Answer: (B) Delivered after the death of the biological father

SOLUTION:

Step 1: The word 'posthumous' literally means occurring after death, and in this legal context the relevant death is that of the father.

Step 2: A posthumous child is therefore one already conceived who is then born after the biological father has died.

Step 3: This carries inheritance and legitimacy implications, which is why the definition centers on the father.

Step 4: The scenarios involving the mother's death, both parents' death, or abandonment are distractors and do not describe a posthumous child.

Delivered after the death of the biological father

Quick Tip: It refers to birth after the father has died.

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124. The M'Naghten rule comes under which section of the IPC?

- (A) CrPC 84
- (B) CrPC 48
- (C) IPC 84
- (D) IPC 48

Correct Answer: (C) IPC 84

SOLUTION:

Step 1: The M'Naghten or right-and-wrong test asks whether unsoundness of mind robbed the accused of the ability to know the nature or wrongfulness of the act.

Step 2: Indian criminal law incorporates this principle as a statutory defense of insanity.

Step 3: The relevant provision is Section 84 of the IPC, which states that nothing is an offence done by a person who, by reason of unsoundness of mind, is incapable of knowing the nature of the act or that it is wrong or against the law.

Step 4: Hence the correct citation is IPC Section 84, not any CrPC section or IPC 48.

IPC 84

Quick Tip: The insanity defense in India is codified under IPC Section 84.

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125. Bluish discoloration of the gastric mucosa is seen in poisoning with which substance?

- (A) Mercury
- (B) Cadmium
- (C) Amytal sodium (amobarbital)
- (D) Arsenic

Correct Answer: (C) Amytal sodium (amobarbital)

SOLUTION:

Step 1: Forensic color associations of stomach contents help identify the poison: blue, green, yellow, black, white, and slate each map to specific agents.

Step 2: The blue shade corresponds to copper sulfate and to amytal (amobarbital) capsules, whose coloring tints the mucosa.

Step 3: From the listed choices, amytal sodium is the blue-producing poison, so it is the answer.

Step 4: Mercury would render a slate-grey appearance and arsenic shows white particles, neither of which is blue, ruling them out.

Amytal sodium

Quick Tip: Recall the autopsy color chart: blue mucosa points to copper sulfate or amytal capsules.

• • •

126. Muscle pain along with nephropathy is caused by which metal poisoning?

- (A) Arsenic
- (B) Cadmium
- (C) Mercury
- (D) Lead

Correct Answer: (A) Arsenic

SOLUTION:

Step 1: The question pairs two findings, and the trick is that nephropathy is shared by most heavy metals, so it cannot be the discriminator.

Step 2: The decisive clue is the muscle pain, which is characteristically associated with arsenic toxicity.

Step 3: Putting the two together, the metal that produces both myalgia and kidney damage is arsenic.

Step 4: Cadmium, mercury, and lead can damage the kidney too, but they do not fit the myalgia hint, so arsenic is the best answer.

Arsenic

Quick Tip: Nephropathy is nonspecific; the muscle pain clue points to one metal.

• • •

127. Which is the first organ to putrefy?

- (A) Brain
- (B) Heart
- (C) Prostate
- (D) Kidney

Correct Answer: (A) Brain

SOLUTION:

Step 1: After death, microorganisms break down body tissues in a fairly predictable sequence; structures with high moisture and rich vascularity decay

sooner than dense, low-water tissues.

Step 2: If we rank only the four given organs by how soon they decompose, the brain comes first, followed by the heart, then the kidney, with the prostate decaying late along with the uterus.

Step 3: The brain qualifies as the earliest of these because its high lipid and fluid content makes it prone to rapid autolysis and softening, so it is the first to show putrefactive change among the listed organs.

Step 4: The prostate is among the most resistant of soft organs, which is why it is preferred for identification in advanced decomposition, confirming that it is not the earliest to putrefy here.

Brain is the first of the listed organs to putrefy

Quick Tip: The soft, lipid-rich organ in the cranial cavity decays earliest among these.

• • •

128. Locard is famous for:

- (A) Theory of exchange
- (B) Fingerprint study
- (C) Formula for estimation of stature
- (D) System of personal identification using body measurements

Correct Answer: (A) Theory of exchange

SOLUTION:

Step 1: The question asks which contribution is attributed to Locard, a key figure in the development of forensic trace evidence.

Step 2: Locard's lasting legacy is the principle of mutual exchange of material on contact, summarised as every contact leaves a trace; this underpins the collection

of hair, fibre, soil and similar transfer evidence.

Step 3: By elimination, anthropometric body measurement for identification is credited to Bertillon, fingerprint classification to Henry and Galton, and stature estimation formulae to Pearson and Trotter-Gleser, none of which were Locard's work.

Step 4: Hence the contribution belonging to Locard is the exchange principle.

Theory of exchange (Locard's exchange principle)

Quick Tip: Every contact leaves a trace - whose principle is that?

• • •

129. When does the basiocciput fuse with the basisphenoid?

- (A) 18 to 22 years
- (B) 22 to 25 years
- (C) 14 to 16 years
- (D) 12 to 14 years

Correct Answer: (A) 18 to 22 years

SOLUTION:

Step 1: The query concerns the timing of union of the spheno-occipital junction, a key skull-base landmark for estimating age in skeletal remains.

Step 2: Fusion of the basisphenoid with the basiocciput occurs in the late teens to about twenty-one years, so the 18 to 22 year band correctly captures this window.

Step 3: Because this is one of the later cranial unions, finding it fused tells the examiner that growth is essentially complete and the person is at least in early adulthood.

Step 4: The options at 12 to 14 and 14 to 16 years correspond to earlier developmental events and are therefore incorrect for this particular synchondrosis.

18 to 22 years

Quick Tip: The spheno-occipital synchondrosis fuses in late teens to early twenties.

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130. What is the smell of a mummified body?

- (A) Odourless
- (B) Putrid
- (C) Pungent
- (D) Offensive

Correct Answer: (A) Odourless

SOLUTION:

Step 1: The question tests the characteristic feature of a mummified corpse, which is a dry form of post-mortem change seen in hot, arid, ventilated environments.

Step 2: In mummification the body loses water quickly and the soft tissues become hard, leathery and brown; this dehydration halts the bacterial breakdown that normally generates malodorous gases.

Step 3: With removal or drying of the gut and viscera, the substrate for foul-smelling decay is gone, so the remains give off essentially no odour.

Step 4: The smells described as putrid, pungent or offensive are all hallmarks of wet putrefaction and do not apply to a properly mummified body.

Odourless

Quick Tip: Drying halts decay, so the gases that smell bad are never produced.

• • •

131. A patient presents with proximal tubule proteinuria. Which metal is most likely associated with it?

- (A) Cadmium
- (B) Mercury
- (C) Gold
- (D) Lead

Correct Answer: (A) Cadmium

SOLUTION:

Step 1: The clue here is proximal tubule proteinuria, which signals damage to the segment of the nephron that normally retrieves small filtered proteins.

Step 2: Among heavy metals, cadmium has a strong affinity for the proximal tubular cells and accumulates there over years, producing tubular injury and leakage of low molecular weight proteins into the urine.

Step 3: This pattern is seen in workers and populations chronically exposed to cadmium and is detected early by raised urinary beta-2 microglobulin, making cadmium the metal that fits the described tubular proteinuria.

Step 4: By contrast, gold and mercury typically trigger immune-mediated glomerular disease with heavy albuminuria, and lead tends to cause interstitial nephropathy, so none of them matches proximal tubular proteinuria as well as cadmium.

Cadmium

Quick Tip: Think of itai-itai disease and low molecular weight tubular proteinuria.

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132. Which of the following constitutional articles is NOT related to children?

- (A) Article 23
- (B) Article 21-A
- (C) Article 42
- (D) Article 24

Correct Answer: (C) Article 42

SOLUTION:

Step 1: The task is to spot the one constitutional provision that does not deal with the welfare of children.

Step 2: Article 21-A (right to education for 6 to 14 years), Article 24 (ban on child labour in hazardous jobs) and Article 23 (protection from trafficking and bonded labour) all extend clear protection to children.

Step 3: Article 42 instead asks the State to secure just and humane working conditions and maternity relief, so its focus is on labourers and mothers rather than on the child.

Step 4: Since the other three articles centre on children and only Article 42 does not, it is the odd one out.

Article 42

Quick Tip: One of these is about humane working conditions and maternity relief, not children.



133. Which of the following statements regarding the Factory Act is correct?

- (A) A child under 14 years can do serious work to earn more money
- (B) Children under 14 years are not employed under the Factory Act
- (C) More than 72 hours of work per week is allowed
- (D) More than 82 hours of work per week is allowed

Correct Answer: (B) Children under 14 years are not employed under the Factory Act

SOLUTION:

Step 1: We must identify the statement that correctly reflects the labour protections written into the Factories Act.

Step 2: A core rule of the Act is the bar on employing any child below the age of 14 in a factory, while those between 15 and 18 are adolescents who require a certificate of fitness to work.

Step 3: On hours, the Act caps weekly work at 48 hours and daily work at 9 hours, with a mandatory rest break, so any claim of 72 or 82 hours a week directly contradicts the statute.

Step 4: The notion that a child under 14 may take on heavy work for higher pay is plainly unlawful, leaving the statement that under-14 children are not employed under the Act as the only correct choice.

Children under 14 years are not employed under the Factory Act

Quick Tip: The Act bans employing children below 14 and caps work at 48 hours a week.



134. The incidence of a disease is 4 per 1000 of population with a duration of 2 years. Calculate the prevalence.

- (A) 8/1000
- (B) 4/1000
- (C) 2/1000
- (D) 6/1000

Correct Answer: (A) 8/1000

SOLUTION:

Step 1: When a disease is in equilibrium, the number of existing cases (prevalence) builds up from the rate of new cases multiplied by how long each case lasts.

Step 2: This is captured by $P = I \times D$, so we simply combine the new-case rate with the mean duration.

Step 3: Plugging in an incidence of 4/1000 and an average duration of 2 years gives

$$P = \frac{4}{1000} \times 2 = \frac{8}{1000}.$$

Step 4: So twice the annual incidence accumulates because each case persists for two years, giving a prevalence of 8 per 1000.

8/1000

Quick Tip: Prevalence = Incidence x Duration.



135. Disposal of cytotoxic and expired drugs is done by which method?

- (A) Dumping
- (B) Autoclave
- (C) Landfill
- (D) Burning

Correct Answer: (C) Landfill

SOLUTION:

Step 1: The question concerns the safe route for getting rid of cytotoxic agents and time-expired medicines, both of which are chemically hazardous.

Step 2: Such drug waste is handled by chemical disposal pathways - secured landfill after encapsulation or inertisation - rather than by methods designed for microbiological waste.

Step 3: Sterilisation by autoclave only inactivates infectious organisms and does nothing to neutralise toxic chemicals, while indiscriminate dumping risks leaching into soil and water.

Step 4: Plain burning is unsuitable for cytotoxics, so from the listed choices the appropriate engineered method is secured landfill.

Landfill (secured/engineered)

Quick Tip: Hazardous chemical drug waste goes to secured landfill, not the autoclave.

• • •

136. For the net reproduction rate (NRR) to be 1, the couple protection rate should be:

- (A) 50%
- (B) 60%
- (C) 55%
- (D) 75%

Correct Answer: (B) 60%

SOLUTION:

Step 1: Couple protection rate measures what fraction of eligible couples are using an approved contraceptive method, and it is a marker of family planning uptake.

Step 2: An NRR of 1 is the demographic target where each generation merely replaces itself, leading to eventual population stabilisation.

Step 3: Demographic experience shows this replacement-level fertility is attainable only when more than 60 percent of eligible couples are effectively protected.

Step 4: So among the options, the threshold couple protection rate associated with NRR equal to 1 is 60 percent.

60%

Quick Tip: NRR = 1 needs couple protection rate above 60%.

• • •

137. The new RNTCP online software to monitor the TB control programme is:

- (A) NIKSHAY
- (B) NICHAY
- (C) E-DOTS
- (D) NIRBHAI

Correct Answer: (A) NIKSHAY

SOLUTION:

Step 1: The question asks for the name of the online platform created under RNTCP to keep a record of TB patients nationwide.

Step 2: That platform is NIKSHAY, a web-based application whose name is built from Hindi words signifying the elimination of tuberculosis.

Step 3: It was set up jointly by the Central TB Division and the National Informatics Centre and rolled out in 2012 to allow case notification, follow-up and programme monitoring online.

Step 4: The remaining choices are distractors that do not correspond to the actual TB surveillance software, confirming NIKSHAY as the answer.

NIKSHAY

Quick Tip: The name combines Hindi words meaning eradication of TB.



138. The unit of study in an ecological study is:

- (A) Population
- (B) Patient
- (C) Community
- (D) Case

Correct Answer: (A) Population

SOLUTION:

Step 1: The key feature being tested is the level at which data are analysed in an ecological study design.

Step 2: Unlike studies that examine individual patients, ecological studies compare aggregate measures across whole populations or communities, correlating group-level exposure with group-level disease rates.

Step 3: Because the figures come from grouped or routinely published statistics, the investigator works with population averages rather than person-level information.

Step 4: Therefore the unit of study is the population, not the individual patient or case.

Population

Quick Tip: Ecological studies analyse groups, not individuals.

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139. In a screening test for diabetes mellitus, out of 1000 population, 90 were positive. The gold standard test was then done, in which 100 were positive. Calculate the sensitivity.

- (A) 90/100
- (B) 100/110
- (C) 80/100
- (D) 100/100

Correct Answer: (A) 90/100

SOLUTION:

Step 1: Sensitivity tells us what proportion of the genuinely diseased people are picked up by the screening test, given by $\frac{a}{a+c}$ with **a** true positives and **c** false negatives.

Step 2: The gold standard fixes the total number of true diabetics at 100, so the

denominator of all diseased persons is 100.

Step 3: Of these, the screen flagged 90 correctly, leaving $100 - 90 = 10$ diseased individuals it failed to detect.

Step 4: Dividing the correctly detected cases by all true cases gives

$$\frac{90}{100},$$

which is the sensitivity.

$$\boxed{90/100}$$

Quick Tip: Sensitivity = true positives / all diseased (true positives + false negatives).

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140. What is the mass chemoprophylaxis for meningococcal meningitis?

- (A) Rifampicin
- (B) Chloramphenicol
- (C) Tetracycline
- (D) Penicillin

Correct Answer: (A) Rifampicin

SOLUTION:

Step 1: Prophylaxis in meningococcal disease aims to clear the bacteria from the throats of close contacts and stop further transmission.

Step 2: The first-line agent for this purpose is rifampicin, dosed twice daily for two days, with the dose adjusted by age (lower in young infants, higher beyond one month).

Step 3: Where rifampicin is unsuitable, a single dose of intramuscular ceftriaxone

or oral ciprofloxacin in adults serves as an alternative, but rifampicin remains the textbook choice.

Step 4: Penicillin treats the established infection but is not used for carrier eradication, and chloramphenicol and tetracycline are not preferred prophylactics, leaving rifampicin as the answer.

Rifampicin

Quick Tip: Drug of choice to clear nasopharyngeal carriage in close contacts.

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141. Which among the following is the active form of chlorine in chlorination?

- (A) Hypochlorite ion
- (B) Hydrogen chloride
- (C) Hypochlorous acid
- (D) Chloride ion

Correct Answer: (C) Hypochlorous acid

SOLUTION:

Step 1: The question targets which chlorine species actually does the killing of microbes during water chlorination.

Step 2: Chlorine in water yields two free forms, hypochlorous acid and the hypochlorite ion, but their germicidal power differs greatly.

Step 3: Hypochlorous acid is the dominant disinfectant; being neutral and small, it slips through the microbial membrane and is many times stronger than the negatively charged hypochlorite ion.

Step 4: Hence the active disinfecting form is hypochlorous acid, while the hypochlorite and chloride ions contribute little or no disinfection.

Hypochlorous acid

Quick Tip: The uncharged species is far stronger than the hypochlorite ion.

• • •

142. Kala-azar is found in all of the following endemic areas EXCEPT:

- (A) West Bengal
- (B) Uttar Pradesh
- (C) Bihar
- (D) Assam

Correct Answer: (D) Assam

SOLUTION:

Step 1: We need to find the state that is not counted among the classical endemic zones for kala-azar in India.

Step 2: Visceral leishmaniasis in India concentrates in the eastern belt, principally Bihar, West Bengal, Jharkhand and Uttar Pradesh.

Step 3: Of the four options, three - West Bengal, Uttar Pradesh and Bihar - fall squarely within this endemic belt.

Step 4: Assam is the one that lies outside this standard endemic grouping, so it is the exception.

Assam

Quick Tip: Bihar, West Bengal, Jharkhand and UP form the endemic belt.

• • •

143. The risk among the exposed divided by the risk among the non-exposed is defined as:

- (A) Relative risk
- (B) Odds ratio
- (C) Attributable risk
- (D) None of the above

Correct Answer: (A) Relative risk

SOLUTION:

Step 1: The phrase risk in exposed over risk in non-exposed points to a ratio measure of association from cohort studies.

Step 2: That ratio is the relative risk, written as $RR = \frac{\text{risk in exposed}}{\text{risk in non-exposed}}$, which tells how many times more likely the outcome is with exposure.

Step 3: Attributable risk is a subtraction of the two risks and the odds ratio compares odds, so neither fits a division of risks.

Step 4: Hence the definition given corresponds to relative risk.

Relative risk

Quick Tip: A ratio (not a difference) of two incidences.

• • •

144. Pasteurization of milk by the holder method is done at:

- (A) 73 degrees C for 20 minutes
- (B) 63 degrees C for 30 minutes
- (C) 72 degrees C for 30 seconds
- (D) 63 degrees C for 30 seconds

Correct Answer: (B) 63 degrees C for 30 minutes

SOLUTION:

Step 1: The task is to recall the standard temperature and time used in the holder method of milk pasteurization.

Step 2: In this low-temperature, long-time approach the milk is held at roughly 63 degrees C for a full 30 minutes, which inactivates pathogens such as the tubercle bacillus.

Step 3: The faster HTST technique instead pushes the temperature to about 72 degrees C for only around 15 seconds before quick chilling.

Step 4: Matching the holder method to its correct pairing eliminates the 73 degree, 30-second and 72 degree 30-second options, leaving 63 degrees C for 30 minutes.

63 degrees C for 30 minutes

Quick Tip: Holder method = low temperature, long time.

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145. The ideal time gap between two live vaccinations is:

- (A) 2 weeks
- (B) 4 weeks
- (C) 8 weeks
- (D) 12 weeks

Correct Answer: (B) 4 weeks

SOLUTION:

Step 1: The point being tested is the spacing rule for two live vaccines that are not co-administered.

Step 2: Live vaccines may be given simultaneously, but if missed, the immune response stirred up by the first live vaccine can interfere with the take of a second one given soon after.

Step 3: To prevent this blunting, guidelines require a minimum separation of four weeks between the two injected live vaccines.

Step 4: So the shorter 2-week gap is inadequate and the recommended interval is 4 weeks.

4 weeks

Quick Tip: Give them together, or separate by at least a month.

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146. A susceptible person develops disease within the range of the incubation period after coming in contact with a primary case. This is measured by:

- (A) Secondary attack rate
- (B) Case fatality rate
- (C) Primary attack rate
- (D) Tertiary attack rate

Correct Answer: (A) Secondary attack rate

SOLUTION:

Step 1: The description - contacts falling ill within one incubation period after an index case - points to a measure of how readily the disease spreads to close contacts.

Step 2: That measure is the secondary attack rate, which counts susceptible contacts who develop disease within the incubation window after exposure to the primary case, divided by all susceptibles exposed.

Step 3: It is widely used to gauge the communicability of an infection, particularly in household and institutional outbreaks.

Step 4: The case fatality rate deals with deaths and the primary attack rate concerns the first wave of cases, so neither fits; the answer is the secondary attack rate.

Secondary attack rate

Quick Tip: Measures spread to contacts within one incubation period.

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147. Out of 100 women offered oral contraceptive pills (OCP) for contraception, 10 women became pregnant when followed for 24 months. What is the Pearl index?

- (A) 10
- (B) 5
- (C) 4
- (D) 2

Correct Answer: (B) 5

SOLUTION:

Step 1: The Pearl index expresses how often a contraceptive method fails, scaled to 100 women using it for one year (100 woman-years).

Step 2: It is computed as $\frac{\text{pregnancies} \times 1200}{\text{woman-months of use}}$, the 1200 coming from 100 women followed for 12 months.

Step 3: With 10 pregnancies over 100 women followed for 24 months, the total exposure is $100 \times 24 = 2400$ woman-months, so

$$\frac{10 \times 1200}{2400} = 5.$$

Step 4: The failure rate therefore works out to 5 pregnancies per 100 woman-years.

5

Quick Tip: Pearl index = (pregnancies x 1200) / total woman-months.

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148. Which of the following does not cause hardness of water?

- (A) Calcium carbonate
- (B) Calcium sulphate
- (C) Calcium bicarbonate
- (D) Magnesium bicarbonate

Correct Answer: (A) Calcium carbonate

SOLUTION:

Step 1: Water hardness reflects how much dissolved Ca^{2+} and Mg^{2+} salt content the water carries. The question asks which listed salt fails to add to that load.

Step 2: Soluble bicarbonates give temporary hardness. Both calcium bicarbonate and magnesium bicarbonate dissolve readily and are knocked out by heating, so they qualify as hardness-producers.

Step 3: Sulphate and chloride salts such as calcium sulphate give permanent hardness that boiling cannot clear. So calcium sulphate also counts as a cause.

Step 4: Calcium carbonate, by contrast, has very low solubility in ordinary water and stays as a precipitate rather than dissolving. Because it is not present in

dissolved form, it cannot raise hardness. Therefore the odd one out is calcium carbonate.

Calcium carbonate

Quick Tip: Hardness needs a soluble salt; this carbonate is practically insoluble.

• • •

149. Which of the following is not an example of direct transmission in communicable diseases?

- (A) Transplacental (vertical)
- (B) Soil
- (C) Respiratory
- (D) STD

Correct Answer: (C) Respiratory

SOLUTION:

Step 1: The key is to separate routes where the host meets the agent without an intermediary (direct) from routes that use an external vehicle or air column (indirect).

Step 2: Transplacental passage is mother-to-fetus by direct continuity, soil contact is direct skin contact with contaminated earth, and STDs pass by direct intimate contact. All three are direct.

Step 3: Airborne or respiratory spread relies on droplet nuclei and dust that stay suspended and travel before being inhaled. Because an air medium carries the agent, this is grouped with indirect transmission.

Step 4: Hence the one that is not direct is respiratory.

Respiratory

Quick Tip: Airborne droplet nuclei travel through a medium, so it is indirect.

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150. Water's view is used to obtain diagnostic information of:

- (A) Maxillary sinus
- (B) Ethmoidal sinuses
- (C) Frontal sinus
- (D) Sphenoid sinus

Correct Answer: (A) Maxillary sinus

SOLUTION:

Step 1: Sinus radiographs are named by how the beam is angled, and each angle best displays a particular sinus group.

Step 2: In the Waters' (occipitomeatal) projection the chin is raised so the orbitomeatal line sits at about **45°** to the beam. This positioning throws the dense petrous temporal bones downward and out of the way.

Step 3: With the petrous shadows removed, the maxillary antra become clearly visible, making this the view of choice for assessing the maxillary sinuses for fluid, opacification or fractures.

Step 4: The frontal and ethmoidal air cells need the Caldwell view, and the sphenoid needs lateral or basal views, so they are not the answer here.

Maxillary sinus

Quick Tip: Occipitomeatal 45 degree view clears the petrous bones off the antra.

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151. Tracheostomy indication is:

- (A) Vocal cord replacement
- (B) Pharynx replacement
- (C) Tracheomalacia
- (D) Foreign body obstructing airway

Correct Answer: (D) Foreign body obstructing airway

SOLUTION:

Step 1: Ask what tracheostomy is meant to achieve - it relieves or bypasses an obstructed or compromised airway and allows long-term ventilation and secretion clearance.

Step 2: Of the four options, vocal cord replacement and pharynx replacement are not recognised clinical entities, so they can be discarded immediately.

Step 3: Tracheomalacia (soft, collapsing trachea) is usually managed with supportive measures, stenting or surgical repair rather than being a primary tracheostomy indication.

Step 4: An impacted foreign body that blocks the airway is an immediate life-threatening obstruction; when it cannot be cleared from above, a surgical airway such as tracheostomy is indicated. This is the correct choice.

Foreign body obstructing airway

Quick Tip: Pick the genuine cause of acute upper airway obstruction.

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152.



Which is the thickened nerve shown here?

- (A) Facial nerve
- (B) Greater auricular nerve
- (C) Vagus nerve
- (D) Glossopharyngeal nerve

Correct Answer: (B) Greater auricular nerve

SOLUTION:

Step 1: A nerve that can be seen and is enlarged superficially over the neck must be a cutaneous nerve lying just under the skin, which immediately narrows the field to a cervical plexus branch.

Step 2: The greater auricular nerve fits perfectly. It is formed from **C2** and **C3** ventral rami, with the larger share from **C2**, and carries sensation from the ear, the skin over the parotid and mastoid, and the deep parotid fascia.

Step 3: Its course is distinctive - it wraps around the posterior edge of sternocleidomastoid at Erb's point and runs up across the muscle, making it the classic superficial neck nerve that is visible or palpable when thickened.

Step 4: Cranial nerves VII, X and IX run deep and cannot present as a visible subcutaneous cord, so they are ruled out, leaving the greater auricular nerve as the answer.

Greater auricular nerve

Quick Tip: Superficial C2-C3 cutaneous nerve crossing sternocleidomastoid.



153. Caldwell's view is used for:

- (A) Maxillary sinus
- (B) Frontal sinus
- (C) Ethmoidal sinus
- (D) All of the above

Correct Answer: (B) Frontal sinus

SOLUTION:

Step 1: Each named sinus projection is defined by its beam angle, and the Caldwell uses a 20° caudal tilt of the beam to the orbitomeatal line in an occipitofrontal direction.

Step 2: With this modest tilt the petrous bones are thrown down to the level of the inferior orbital rim, opening up the upper face on the film.

Step 3: The result is a clear display of the frontal sinuses, which is the chief purpose of this view, with the ethmoid cells visible as well.

Step 4: Because the maxillary antra need the Waters' projection, the best single answer for Caldwell's view is the frontal sinus.

Frontal sinus

Quick Tip: Occipitofrontal 20 degree view best shows the frontal sinus.



154. Presbyopic correction in an old patient is:

- (A) +1 D
- (B) +2 D
- (C) +3 D
- (D) +4 D

Correct Answer: (C) +3 D

SOLUTION:

Step 1: Reading vision depends on accommodation, which steadily declines with age; presbyopia is corrected by adding a plus lens to make up the deficit.

Step 2: The required add is graded by age - roughly +1 D in the early forties, climbing through +1.5 to +2 D in the fifties.

Step 3: Once accommodation is nearly exhausted in old age, the add plateaus at its highest practical value, conventionally taken as +3 D.

Step 4: A +4 D add is not a standard presbyopic prescription, so for an elderly patient the correct near add is +3 D.

+3 D

Quick Tip: Near add rises with age and tops out around this plus value in the elderly.

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155. 100 day glaucoma is seen in which of the following conditions?

- (A) Central retinal vein occlusion (CRVO)
- (B) Neovascular glaucoma
- (C) Central retinal artery occlusion (CRAO)
- (D) Steroid induced glaucoma

Correct Answer: (A) Central retinal vein occlusion (CRVO)

SOLUTION:

Step 1: The clue is the time link - a glaucoma named for appearing around the hundredth day after a vascular ocular event.

Step 2: Following an ischaemic central retinal vein occlusion, blood backs up, the retina becomes hypoxic, and repeated haemorrhages occur.

Step 3: The ischaemic retina releases angiogenic factors that grow new vessels on the iris and in the drainage angle; these vessels and the fibrovascular membrane choke aqueous outflow and the pressure climbs.

Step 4: Because this rubeotic glaucoma typically emerges about three months after the occlusion, the originating condition is CRVO.

Central retinal vein occlusion (CRVO)

Quick Tip: Rubeotic glaucoma about 3 months after a retinal vein blockage.

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156. Roth spots are seen in:

- (A) Uveal melanoma
- (B) Acute leukaemia
- (C) Both a and b
- (D) None of the above

Correct Answer: (B) Acute leukaemia

SOLUTION:

Step 1: A Roth spot is identified as a retinal bleed with a distinctive white or pale core, named after Moritz Roth.

Step 2: That central whiteness represents fibrin and platelet clot, focal ischaemia, inflammatory or infectious material, or, in malignancy, collections of tumour cells.

Step 3: The classic systemic associations are leukaemia and infective (subacute bacterial) endocarditis, along with diabetes, severe anaemia, hypertension and other ischaemic states.

Step 4: Uveal melanoma is not a cause of Roth spots, so between the two listed entities the correct one is acute leukaemia.

Acute leukaemia

Quick Tip: White-centred retinal haemorrhage classically links to a blood cancer.

• • •

157. The yoke muscle of the right lateral rectus is:

- (A) Left medial rectus
- (B) Left superior rectus
- (C) Left lateral rectus
- (D) Left inferior oblique

Correct Answer: (A) Left medial rectus

SOLUTION:

Step 1: Conjugate eye movements rely on yoke muscles - one muscle in each eye that fire together so both eyes point the same way.

Step 2: Consider gaze to the right: the right eye must turn outward, which is the job of the right lateral rectus.

Step 3: At the same instant the left eye must turn inward toward the nose to stay aligned, and the muscle that adducts the left eye is the left medial rectus.

Step 4: Since these two work in concert for rightward gaze, the yoke partner of the right lateral rectus is the left medial rectus.

Left medial rectus

Quick Tip: For rightward gaze, the partner that adducts the other eye.

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158. Severe (hyperacute) conjunctivitis is caused by:

- (A) Neisseria
- (B) Staphylococcus
- (C) Streptococcus
- (D) Haemophilus

Correct Answer: (A) Neisseria

SOLUTION:

Step 1: Match the clinical intensity to the organism: ordinary acute conjunctivitis versus the aggressive hyperacute type with profuse pus.

Step 2: The garden-variety acute cases come from *Staphylococcus aureus*, *Streptococcus pneumoniae* and *Haemophilus influenzae*, which give moderate discharge.

Step 3: A severe, rapidly progressive, copiously discharging conjunctivitis points to *Neisseria gonorrhoeae* (or meningitidis), an organism that can invade the cornea and cause ulcerative keratitis and even perforation.

Step 4: Therefore the cause of severe conjunctivitis among the options is Neisseria.

Neisseria

Quick Tip: Copious purulent hyperacute discharge points to a gram-negative diplococcus.

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159. Which is an example of simple myopic astigmatism among the prescriptions given below?

- (A) Rx (+) sphere
- (B) Rx will be plano (-)
- (C) Rx will be (-) sphere
- (D) (-)(+) (+)(-) on both 90 and 180 degree axis

Correct Answer: (B) Rx will be plano (-)

SOLUTION:

Step 1: Decode each prescription by what the sphere and cylinder signs tell you about the two principal meridians.

Step 2: Simple myopic astigmatism means one meridian focuses on the retina (plano) while the other is short-sighted, so the sphere is plano and the cylinder is minus, i.e. plano with a (-) cylinder.

Step 3: A plain (+) sphere is simple hyperopia, a plain (-) sphere is simple myopia, and a prescription with opposite-sign powers on the 90° and 180° meridians is mixed astigmatism.

Step 4: Matching the definition, the simple myopic astigmatism prescription is the plano (-) one.

Rx will be plano (-)

Quick Tip: One meridian emmetropic, other myopic - plano sphere with minus cylinder.

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160. Blow out fracture of the orbit involves the:

- (A) Floor
- (B) Medial wall
- (C) Lateral wall
- (D) Roof

Correct Answer: (A) Floor

SOLUTION:

Step 1: Picture a ball striking the eye - the pressure inside the orbit spikes and snaps the most fragile wall, sparing the strong rim.

Step 2: The floor of the orbit is exactly that weak point. It carries the infraorbital

nerve and artery in a canal whose roof is only about **0.23 mm** thick, far thinner than the surrounding bone.

Step 3: The lateral floor is more than five times thicker (around **1.25 mm**), so the crack consistently forms over the thin neurovascular channel.

Step 4: Hence a blowout fracture characteristically breaks the orbital floor.

Floor

Quick Tip: Thinnest wall over the infraorbital canal gives way first.

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161.



Which type of retractor is shown in the image?

- (A) Morris retractor
- (B) Czerny retractor
- (C) Richardson retractor
- (D) Lower lid retractor

Correct Answer: (A) Morris retractor

SOLUTION:

Step 1: A retractor is identified by its blade shape and the depth of field it serves; the one pictured has a wide angled blade for deep abdominal work.

Step 2: That description matches the Morris retractor, a favourite of surgeons and gynaecologists for retracting tissue in deep layers.

Step 3: It comes into play when an abdominal incision is opened and later closed,

giving the operator clear vision and room to manoeuvre and repair structures inside the cavity.

Step 4: Since the Czerny, Richardson and lower lid retractors differ in design and purpose, the instrument shown is the Morris retractor.

Morris retractor

Quick Tip: Broad angled-blade deep abdominal retractor used in laparotomy.

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162.



Which of the following statements is true about the suture material in the image?

- (A) Made of rabbit submucosa
- (B) Made of cat submucosa
- (C) Not degraded
- (D) Degraded by enzymatic degradation

Correct Answer: (D) Degraded by enzymatic degradation

SOLUTION:

Step 1: The pictured suture is the classic natural absorbable thread known as catgut.

Step 2: Its real source is the collagen-rich submucosa of sheep intestine or the serosa of cattle, not the gut of a cat or a rabbit.

Step 3: Because it is animal collagen, the body removes it through proteolytic enzymes that digest the protein at the wound site, so it disappears by enzymatic breakdown rather than hydrolysis.

Step 4: Hence the correct statement is that the material is degraded by enzymatic degradation.

Degraded by enzymatic degradation

Quick Tip: Natural collagen suture from sheep or beef, digested by enzymes.

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163. The Van Nuys prognostic index is not based on:

- (A) Age
- (B) Microcalcification
- (C) Size
- (D) ER status

Correct Answer: (D) ER status

SOLUTION:

Step 1: Recall what the VNPI measures in DCIS - it pools four factors into a single score to guide whether wider excision or radiation is needed.

Step 2: Those four components are tumour size, surgical margin width, nuclear grade with necrosis status, and the age of the patient.

Step 3: Receptor status (ER, PR, HER2) is part of invasive cancer prognostication and treatment but is not folded into the Van Nuys score.

Step 4: Therefore the parameter the index is not based on is ER status.

ER status

Quick Tip: VNPI uses size, margin, grade and age - not the receptor profile.

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164. The common cause of chronic pancreatitis is:

- (A) Chronic alcohol
- (B) Chronic pancreatic calculi
- (C) Pancreas divisum
- (D) Gall bladder stones

Correct Answer: (A) Chronic alcohol

SOLUTION:

Step 1: Ask which factor most often drives the long-standing, fibrosing pancreatic damage that defines chronic pancreatitis.

Step 2: Across populations, sustained heavy alcohol use is the dominant aetiology, accounting for as much as 70 percent of cases.

Step 3: Intraductal calculi tend to form as a result of the chronic process, and pancreas divisum is only an occasional anatomical contributor.

Step 4: Gallstones are tied to acute pancreatitis rather than the chronic form, so the leading cause here is chronic alcohol.

Chronic alcohol

Quick Tip: Gallstones cause acute; the chronic form is mostly alcohol related.

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165. The following statement about keloid is true:

- (A) It contains growth factor
- (B) Extended excision is the treatment of choice
- (C) It does not extend beyond the wound
- (D) None of the above

Correct Answer: (A) It contains growth factor

SOLUTION:

Step 1: Distinguish a keloid from an ordinary scar - it is an overgrowth of collagen that spills past the wound edges and tends to come back after removal.

Step 2: The overgrowth is fuelled by raised levels of fibrogenic growth factors (notably TGF-beta) acting on fibroblasts, so the option stating that it contains growth factor is correct.

Step 3: Plain wide excision is a poor sole treatment because cutting a keloid out usually triggers recurrence, often with a larger lesion, so adjuncts like steroid injection or radiotherapy are added.

Step 4: Since a keloid characteristically grows beyond the original wound boundary, the claim that it stays within the wound is wrong, leaving growth factor content as the true statement.

It contains growth factor

Quick Tip: Excess TGF-beta driven scar that recurs after excision and crosses the wound edge.



166. Which of the following layers are cut during fasciotomy?

- (A) Skin
- (B) Skin + subcutaneous fascia
- (C) Skin + subcutaneous tissue + superficial fascia
- (D) Skin + subcutaneous tissue + superficial fascia + deep fascia

Correct Answer: (D) Skin + subcutaneous tissue + superficial fascia + deep fascia

SOLUTION:

Step 1: The goal of a fasciotomy is to release the trapped pressure inside a muscle compartment, which is walled in by the unyielding deep fascia.

Step 2: Because the deep fascia is the structure causing the constriction, decompression is impossible unless that layer itself is divided.

Step 3: Reaching it requires cutting through everything above it in order - skin, subcutaneous tissue, superficial fascia - and then through the deep fascia.

Step 4: So all four layers down to and including the deep fascia are incised, making the answer skin + subcutaneous tissue + superficial fascia + deep fascia.

Skin + subcutaneous tissue + superficial fascia + deep fascia

Quick Tip: To decompress, you must divide the constricting deep fascia.



167. Which statement is not true regarding Crohn's disease?

- (A) Rectum is not involved
- (B) Continuous lesion visualized on endoscopy
- (C) Non caseating granulomas
- (D) Cobblestone appearance

Correct Answer: (B) Continuous lesion visualized on endoscopy

SOLUTION:

Step 1: The task is to find the one option that contradicts the typical features of Crohn's disease.

Step 2: Crohn's classically produces patchy, discontinuous involvement - the so called skip lesions - with normal segments lying between diseased ones throughout the colon and small bowel.

Step 3: Calling the endoscopic picture continuous therefore describes ulcerative

colitis, not Crohn's, so that statement is the false one.

Step 4: Rectal sparing, non-caseating granulomas and the cobblestone mucosa are all genuine Crohn's findings, confirming that the untrue statement is the continuous lesion on endoscopy.

Continuous lesion visualized on endoscopy

Quick Tip: Crohn's gives skip lesions; continuous spread is ulcerative colitis.

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168. Which is the best investigation for carcinoma of the head of pancreas?

- (A) Guided biopsy
- (B) ERCP
- (C) Transduodenal / transperitoneal sampling
- (D) EUS

Correct Answer: (A) Guided biopsy

SOLUTION:

Step 1: The decisive investigation for a suspected pancreatic head cancer is the one that yields tissue for a histological diagnosis.

Step 2: A percutaneous needle biopsy directed by ultrasound or CT can sample the lesion and establish the diagnosis directly.

Step 3: It must be done cautiously because these tumours have a rich blood supply and the procedure carries a risk of bleeding.

Step 4: Compared with ERCP, transduodenal sampling and EUS, the guided biopsy is the option that gives the confirmatory tissue, so it is the best investigation here.

Guided biopsy

Quick Tip: Tissue diagnosis comes from an image-guided needle of the mass.

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169. In congenital hypertrophic pyloric stenosis, the abdominal mass is best demonstrated:

- (A) On palpation over the epigastrium
- (B) In the left hypochondrium
- (C) During feeding
- (D) In the right iliac fossa

Correct Answer: (C) During feeding

SOLUTION:

Step 1: The clue word is "best demonstrated." In pyloric stenosis the diagnostic finding is the palpable pyloric tumour, but a thickened pylorus the size of an olive is hard to feel in an unsettled, dehydrated baby with a rigid abdominal wall.

Step 2: The trick used by clinicians is the test feed. While the mother or nurse offers a bottle, the relaxed and contented infant allows deep palpation; the gastric distension also pushes the pylorus forward. Under these conditions both the firm olive and the left-to-right peristaltic waves of gastric outlet obstruction become apparent. So the answer is during feeding.

Step 3: Rejecting the rest: plain epigastric palpation alone is unreliable for the reasons above; the left hypochondrium and right iliac fossa do not correspond to the pyloric region, which sits in the epigastrium just right of the midline. Definitive confirmation is by ultrasound, and treatment is Ramstedt pyloromyotomy after correcting the hypochloraemic alkalosis.

During feeding

Quick Tip: Think of the test feed, when the relaxed infant lets you feel the olive.

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170. Calculate the Glasgow Coma Scale of a 25-year-old head injury patient who is confused, opens eyes in response to pain, and localises to pain.

- (A) 6
- (B) 11
- (C) 12
- (D) 7

Correct Answer: (B) 11

SOLUTION:

Step 1: Break the stem into the three GCS axes and match each phrase to its numeric value rather than guessing the total.

Step 2: Eye opening: the patient opens the eyes only when a painful stimulus is applied, which scores 2 out of 4 (spontaneous = 4, to voice = 3, to pain = 2, none = 1). Verbal: "confused" equals disoriented conversation, scoring 4 out of 5 (oriented = 5, confused = 4). Motor: "localising pain" means the patient moves a hand toward the painful site, scoring 5 out of 6 (obeys = 6, localises = 5).

Step 3: Sum the parts:

$$E_2 + V_4 + M_5 = 11$$

A score of 11 places the patient in the moderate head injury range (GCS 9 to 12). Options 6, 12 and 7 would require different component scores and do not fit the description.

11

Quick Tip: Eyes to pain (2) + confused speech (4) + localises pain (5).

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171. The RET proto-oncogene is associated with the development of:

- (A) Medullary carcinoma of the thyroid
- (B) Astrocytoma
- (C) Paraganglioma
- (D) Hurthle cell tumour of the thyroid

Correct Answer: (A) Medullary carcinoma of the thyroid

SOLUTION:

Step 1: Identify what RET codes for - a transmembrane receptor tyrosine kinase. Like other such receptors, when a gain-of-function mutation locks it in the active state it triggers uncontrolled proliferation of whichever cells normally express it.

Step 2: Map RET to its tissues. RET is switched on in the thyroid C cells, adrenal medulla and parathyroid precursors. The thyroid C cell tumour that springs from constitutive RET activation is the medullary carcinoma, which secretes calcitonin and clusters in the MEN 2 syndromes. So the correct association is medullary carcinoma of the thyroid.

Step 3: Eliminate the distractors. Astrocytoma is a glial CNS tumour without a RET link. Paraganglioma is the hallmark of succinate dehydrogenase (SDH) mutations. Hurthle cell tumour is a follicular-cell oncocytic neoplasm, distinct from the C-cell origin of RET-driven cancer.

Medullary carcinoma of the thyroid

Quick Tip: RET drives the C-cell (calcitonin) thyroid cancer of MEN 2.

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172. The size cut-off for surgical repair of an asymptomatic abdominal aortic aneurysm is:

- (A) 5.5 cm
- (B) 6.5 cm
- (C) 7.5 cm
- (D) 8.5 cm

Correct Answer: (A) 5.5 cm

SOLUTION:

Step 1: Frame the decision as a balance: small aneurysms are watched, large ones are fixed. The standard diameter that tips an asymptomatic case toward operation needs to be recalled.

Step 2: Guidelines set the operative threshold for an asymptomatic infrarenal abdominal aortic aneurysm at a diameter exceeding 5.5 cm, because beyond this point annual rupture risk climbs steeply. Below this the patient enters a surveillance programme with serial ultrasound. Separately, any aneurysm that becomes symptomatic or enlarges rapidly is repaired regardless of absolute size. Thus 5.5 cm is the answer.

Step 3: Discard 6.5, 7.5 and 8.5 cm - delaying repair to these diameters needlessly increases the chance of fatal rupture, so they are not the recommended cut-offs.

5.5 cm

Quick Tip: Repair an asymptomatic AAA once it exceeds 5.5 cm.

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173. The tendons affected in De Quervain tenosynovitis are those of:

- (A) Abductor pollicis longus and extensor pollicis brevis
- (B) Adductor pollicis longus and extensor pollicis brevis
- (C) Abductor pollicis longus and flexor pollicis brevis
- (D) Adductor pollicis longus and flexor pollicis brevis

Correct Answer: (A) Abductor pollicis longus and extensor pollicis brevis

SOLUTION:

Step 1: Recall the six dorsal wrist compartments. The most radial one, compartment 1, is the site of De Quervain disease, a non-inflammatory thickening

of the tendon sheath that narrows the tunnel.

Step 2: Two tendons run through compartment 1: abductor pollicis longus (which abducts the thumb) and extensor pollicis brevis (which extends the thumb at the metacarpophalangeal joint). Friction of these two swollen tendons against the tight sheath produces radial wrist pain reproduced by the Finkelstein manoeuvre. The answer is therefore this pair.

Step 3: Knock out the wrong options. "Adductor pollicis longus" does not exist as a named muscle, immediately excluding two choices. Flexor pollicis brevis is a thenar muscle in the palm and never traverses the dorsal first compartment, so it cannot be involved.

Abductor pollicis longus and extensor pollicis brevis

Quick Tip: First dorsal compartment of the wrist = APL + EPB.

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174.



A patient with a history of road traffic accident 2 years back now develops pain and swelling at the same site. The X-ray shows the features below. What is the diagnosis?

- (A) Osteogenic sarcoma
- (B) Ewing's sarcoma
- (C) Chronic osteomyelitis
- (D) Multiple myeloma

Correct Answer: (C) Chronic osteomyelitis

SOLUTION:

Step 1: Anchor on the timeline: trauma two years earlier, then late pain and swelling at the identical spot. A slowly evolving lesion seeded by an old injury is far more typical of chronic infection than of an aggressive primary tumour.

Step 2: The radiographic clue described is dense, layered cortical thickening from periosteal new bone - the hallmark of Garre sclerosing (chronic non-suppurative) osteomyelitis, where mild ongoing infection triggers subperiosteal bone laydown in repeated layers. This sclerotic, onion-skinned, often asymptomatic-then-painful pattern confirms chronic osteomyelitis.

Step 3: Filter out the malignancies. Osteosarcoma shows aggressive sunburst spiculation and a Codman triangle, not smooth lamellae. Ewing sarcoma, although it may layer the periosteum, strikes young patients with a destructive moth-eaten lesion and fever, unrelated to prior trauma. Myeloma gives scattered punched-out lytic holes in the elderly. None matches a single sclerotic post-traumatic focus.

Chronic osteomyelitis

Quick Tip: Old trauma site, late pain, layered sclerotic periosteal bone (Garre).

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175. What is meant by a perilunate dislocation?

- (A) Lower radius, scaphoid, lunate and capitate all in the same plane
- (B) Lower radius, scaphoid and capitate in alignment, lunate alone out of plane
- (C) Lower radius, scaphoid and lunate in alignment, capitate alone out of plane
- (D) Both the lunate and capitate are out of plane

Correct Answer: (B) Lower radius, scaphoid and capitate in alignment, lunate alone out of plane

SOLUTION:

Step 1: Picture the central carpal column on a true lateral wrist film: distal radius, then lunate, then capitate should sit in a straight line like cups stacked in cups. A perilunate dislocation breaks this stack because the ligaments tethering the carpus to the lunate tear.

Step 2: When the radioscaphocapitate, scapholunate and lunotriquetral ligaments fail, the capitate and the rest of the carpus swing dorsally off the lunate, yet the lunate remains within the radial socket. So the radius, scaphoid and capitate end up aligned together while the lunate is the odd bone left malpositioned relative to them - exactly option B.

Step 3: Reject the rest: all-in-one-plane means a normal wrist; saying only the capitate is displaced inverts the true finding; and both lunate plus capitate being displaced is the more advanced lunate dislocation, a different stage of the same spectrum.

Radius, scaphoid and capitate aligned; lunate alone out of plane

Quick Tip: Lunate stays in the radius; the capitate and carpus dislocate around it.



176.



Identify the numbered bone in the X-ray below that most commonly fractures when a person falls on an outstretched hand.

- (A) 1
- (B) 2
- (C) 3
- (D) 4

Correct Answer: (A) 1

SOLUTION:

Step 1: Trace the injury mechanism. When the hand is thrust out to break a fall, the impact loads the wrist axially. The bone that bears the brunt of this load at the wrist is the distal end of the radius.

Step 2: Distal radius fracture, also called a wrist fracture, is the result; it causes sudden pain, swelling and a deformed wrist and is the single most frequent fracture from this fall in older people. On the radiograph the radius is the structure labelled 1, making option 1 the answer.

Step 3: Remember the eponyms tied to this bone - Colles, Smith, Barton and Hutchinson - all describe distal radius fracture variants, reinforcing that the

radius (bone 1) is the target. The remaining numbered bones are distractors that do not match the typical fall-on-outstretched-hand fracture.

Bone 1 (distal radius)

Quick Tip: FOOSH in an adult typically breaks the distal radius.

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177. The fallen fragment sign is characteristic of:

- (A) Simple bone cyst
- (B) Osteosarcoma
- (C) Adamantinoma
- (D) Aneurysmal bone cyst

Correct Answer: (A) Simple bone cyst

SOLUTION:

Step 1: Think physically about what the sign requires: a detached bone fragment must be able to sink under gravity, which is only possible inside a cavity filled with thin fluid and no solid tumour matrix or thick septa.

Step 2: A simple (unicameral) bone cyst is a single fluid-filled cavity. When it fractures, a chip of its thin wall breaks off and gravitates to the most dependent part of the cyst, producing the fallen fragment sign. This appearance is regarded as diagnostic of a simple bone cyst.

Step 3: Rule out the rest: osteosarcoma and adamantinoma are solid lesions through which nothing can fall; an aneurysmal bone cyst is multiloculated with blood-fluid levels rather than one open fluid space, so a fragment cannot freely descend. The classic teaching ties the sign to the simple bone cyst.

Simple bone cyst

Quick Tip: A chip sinks through clear fluid - a single-cavity unicameral cyst.

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178. You are an intern in casualty. Among the following fracture patients, who should be your first priority to call the orthopaedic resident about?

- (A) A patient whose finger is blackening
- (B) A patient who cannot extend his arm
- (C) A 10 cm abrasion
- (D) An intra-articular fracture of the elbow joint

Correct Answer: (A) A patient whose finger is blackening

SOLUTION:

Step 1: Apply the emergency triage ladder: life and limb perfusion come before nerve, bone and skin problems. Scan the options for a vascular red flag.

Step 2: A finger turning black after trauma is the vascular emergency - it means the arterial supply is cut off and the tissue is becoming gangrenous. Delay risks permanent loss of the digit, so this patient must be escalated to the orthopaedic resident first. That makes option 1 correct.

Step 3: Compare the others. Failure to extend the arm points to a neuromuscular or tendon injury, important but reversible on a slower timescale. A 10 cm abrasion is purely superficial. An intra-articular elbow fracture is serious orthopaedically yet, lacking ischaemia, is less urgent than a perfusion-threatened finger.

The patient whose finger is blackening

Quick Tip: Vascular compromise (a blackening, ischaemic digit) trumps everything.

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179. In rheumatoid arthritis, which type of cell is prominently present in the hypertrophied synovial lining?

- (A) B cells
- (B) T cells
- (C) Macrophages
- (D) Dendritic cells

Correct Answer: (C) Macrophages

SOLUTION:

Step 1: Separate the synovium into two zones. The thin surface intimal lining and the deeper subintimal stroma behave differently in rheumatoid arthritis, and the question asks specifically about the prominent lining cell.

Step 2: In rheumatoid disease the lining swells from a few cells to 8 to 10 cells deep. This expanded lining is built mainly of fibroblast-like synoviocytes together with macrophages. Of the listed choices, the macrophage is the prominent lining cell, giving option C.

Step 3: Exclude the rest. CD4+ T cells and B cells gather in the sublining to form ectopic lymphoid follicles and sustain autoimmunity, but they sit beneath, not within, the lining layer. Dendritic cells contribute to antigen presentation yet remain numerically minor. So the standout lining cell is the macrophage.

Macrophages

Quick Tip: The thickened RA synovial lining is fibroblasts plus macrophages.

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180. The costal cartilages of the 8th and 9th ribs articulate with each other to form which type of joint?

- (A) Costochondral joint
- (B) Interchondral joint
- (C) Synovial joint
- (D) Costovertebral joint

Correct Answer: (C) Synovial joint

SOLUTION:

Step 1: Identify exactly which connection the question targets. The 8th and 9th costal cartilages do not reach the sternum directly; instead each links to the cartilage above it. So the relevant articulation is between two adjacent costal cartilages.

Step 2: The articulations among the 6th to 10th costal cartilages possess a synovial cavity, making them mobile synovial (plane) joints that permit gliding during breathing. The question asks for the joint type, and that type is synovial. Hence option C.

Step 3: Dismiss the rest. The costochondral joint is the rib-to-its-own-cartilage union and is cartilaginous, not the one described. The costovertebral joint is at the spine, not between cartilages. "Interchondral joint" merely labels the site; the classification being asked for is synovial.

Synovial joint

Quick Tip: Lower costal cartilages glide on each other via small synovial cavities.

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181. Tom Smith septic arthritis refers to:

- (A) Acute gonococcal arthritis
- (B) Smallpox arthritis
- (C) Septic arthritis of infancy
- (D) Chronic pyogenic arthritis

Correct Answer: (C) Septic arthritis of infancy

SOLUTION:

Step 1: Match the eponym to the clinical entity. Tom Smith disease is a historically named infective arthritis, and the key word to recall is that it affects the hip of an infant.

Step 2: It is a pyogenic septic arthritis of the infant hip with an acute course, rapid pus formation and spontaneous or surgical drainage, healing with a destroyed joint. A positive telescope test and a hip that mimics congenital dislocation are characteristic. Therefore it is septic arthritis of infancy, option C.

Step 3: Eliminate the distractors. Gonococcal arthritis is an adult STI complication; smallpox arthritis is viral; chronic pyogenic arthritis is a long-standing form, none of which captures the infantile hip sepsis that defines Tom Smith arthritis.

Septic arthritis of infancy

Quick Tip: Eponym for pyogenic septic arthritis of the infant hip.

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182. Which fontanelle is the last to close?

- (A) Anterolateral
- (B) Anterior
- (C) Lateral
- (D) Occipital

Correct Answer: (B) Anterior

SOLUTION:

Step 1: Order the four fontanelles by their closure timeline rather than by position, since the question is about which shuts last.

Step 2: Going from earliest to latest: posterior (occipital) at 2 to 3 months,

sphenoidal (anterolateral) near 6 months, mastoid (posterolateral) from 6 to 18 months, and finally the anterior fontanelle at 18 to 24 months. The one at the end of this sequence is the anterior fontanelle, so option B is correct.

Step 3: Cross off the rest. The anterolateral and lateral (mastoid) fontanelles close well before two years, and the occipital fontanelle is the very first to close, making them incorrect for the last-to-close question.

Anterior fontanelle

Quick Tip: The diamond-shaped anterior fontanelle closes at 18 to 24 months.

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183. Lesch-Nyhan syndrome is caused by deficiency of which enzyme?

- (A) Hypoxanthine-guanine phosphoribosyltransferase (HGPRT)
- (B) Xanthine oxidase
- (C) Adenine phosphoribosyltransferase (APRT)
- (D) AMP deaminase

Correct Answer: (A) Hypoxanthine-guanine phosphoribosyltransferase (HGPRT)

SOLUTION:

Step 1: Anchor on the purine salvage pathway. Two enzymes recycle free purine bases: HGPRT salvages hypoxanthine and guanine, while APRT salvages adenine. Lesch-Nyhan is the salvage defect with overwhelming clinical features.

Step 2: The missing enzyme in Lesch-Nyhan is HGPRT, coded on the X chromosome, so the disease is X-linked and affects boys. Loss of salvage diverts hypoxanthine and guanine into the degradation route, flooding the body with uric acid. This explains the gout, kidney stones and the hallmark neuro-behavioural picture of self-biting and movement disorder. Therefore option A is correct.

Step 3: Knock out the rest. Xanthine oxidase loss reduces uric acid (xanthinuria), the opposite biochemistry. APRT defect produces adenine-derived stones. AMP deaminase defect is a benign myopathy. Only HGPRT deficiency fits.

Hypoxanthine-guanine phosphoribosyltransferase (HGPRT)

Quick Tip: X-linked purine salvage defect with self-mutilation and high uric acid.

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184. Which vaccine is NOT included in the Mission Indradhanush?

- (A) Tuberculosis
- (B) Measles
- (C) Japanese encephalitis
- (D) Diphtheria

Correct Answer: (C) Japanese encephalitis

SOLUTION:

Step 1: Recall that the rainbow theme of Mission Indradhanush corresponds to seven colours, matching seven diseases the programme set out to cover.

Step 2: The seven are diphtheria, pertussis, tetanus, childhood tuberculosis, polio, hepatitis B and measles. Scan the options against this list: tuberculosis, measles and diphtheria all appear on it, but Japanese encephalitis does not. The one left out is therefore Japanese encephalitis, option C.

Step 3: Confirm by elimination - choosing tuberculosis, measles or diphtheria would be wrong because each is squarely within the original seven, leaving Japanese encephalitis as the only vaccine outside the core Indradhanush list.

Japanese encephalitis

Quick Tip: Indradhanush = 7 diseases (DPT, TB, polio, hepatitis B, measles).

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185.



Identify the condition shown in the CT scan image below.

- (A) Dandy-Walker malformation
- (B) Cerebellar vermis hypoplasia
- (C) Mega cisterna magna
- (D) None

Correct Answer: (A) Dandy-Walker malformation

SOLUTION:

Step 1: Approach the posterior fossa cystic malformations as a spectrum and look for the most severe combination of findings on the scan.

Step 2: Dandy-Walker malformation is defined by three features visible here: an absent or hypoplastic cerebellar vermis, a cyst formed by the dilated fourth ventricle that balloons into a widened posterior fossa, and elevation of the tentorium with the cerebellar hemispheres pushed apart. The presence of all of these together points to Dandy-Walker malformation, so option A is the answer.

Step 3: Distinguish it from the look-alikes. Cerebellar vermis hypoplasia alone shows a small vermis without the large communicating cyst or enlarged fossa. Mega cisterna magna is just a roomy cisterna magna with a normal vermis and fourth ventricle. The combined severe findings rule both of these out.

Dandy-Walker malformation

Quick Tip: Vermian agenesis + cystic 4th ventricle + enlarged posterior fossa.

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186. Which is the most common cause of neonatal blindness?

- (A) *Neisseria gonorrhoeae*
- (B) *Chlamydia trachomatis*
- (C) *Klebsiella*
- (D) *Enterobacter*

Correct Answer: (A) *Neisseria gonorrhoeae*

SOLUTION:

Step 1: Focus on neonatal conjunctivitis (ophthalmia neonatorum), the conjunctival infection of the first month of life caught from the maternal genital tract during delivery.

Step 2: Two pathogens dominate: gonococcus and chlamydia. The key is severity - *Neisseria gonorrhoeae* causes a hyperacute, copiously purulent conjunctivitis that can melt the cornea within days, making it the leading infective cause of blindness in the newborn. That places option A as correct.

Step 3: Eliminate the rest. *Chlamydia trachomatis* gives a less destructive inclusion conjunctivitis with lower blinding potential, while *Klebsiella* and *Enterobacter* are infrequent and not the recognised blinding agents. Hence gonococcus is the answer.

Neisseria gonorrhoeae

Quick Tip: Hyperacute purulent gonococcal conjunctivitis can melt the cornea.

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187. Shoulder dystocia is managed by:

- (A) Sharp flexion of the hip joints towards the abdomen
- (B) Suprapubic pressure
- (C) 90 degree rotation of the posterior shoulder
- (D) Emergency caesarean section

Correct Answer: (B) Suprapubic pressure

SOLUTION:

Step 1: Use the HELPERR mnemonic to organise shoulder dystocia care: Help, Evaluate for episiotomy, Legs (McRoberts), Pressure (suprapubic), Enter manoeuvres, Remove posterior arm, Roll the patient.

Step 2: The first external pressure manoeuvre is suprapubic pressure, applied just above the pubic bone to nudge the wedged anterior shoulder beneath the symphysis. This is a frontline, effective and low-risk step, matching option B as the correct management.

Step 3: Contrast the alternatives. Flexing the hips onto the abdomen is the McRoberts position - useful but a different listed action. A fixed 90 degree posterior-shoulder rotation oversimplifies the internal rotational manoeuvres. Caesarean is reserved for failure of all manoeuvres, not the initial response once the head is out. Thus suprapubic pressure is the best answer.

Suprapubic pressure

Quick Tip: The 'P' in HELPERR - press just above the pubis to free the shoulder.

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188.



Identify the uterine anomaly shown in the hysterosalpingogram (HSG) X-ray below.

- (A) Septate uterus
- (B) Uterus didelphys
- (C) Unicornuate uterus
- (D) Bicornuate uterus

Correct Answer: (C) Unicornuate uterus

SOLUTION:

Step 1: Read the HSG by the number and arrangement of cavities the contrast fills. Each Mullerian anomaly has a signature cavity shape.

Step 2: Here only one elongated, curved cavity is opacified, sitting off the midline with a single fallopian tube. This single-horn, banana-like cavity is the hallmark of a unicornuate uterus, caused by arrested development of one paramesonephric duct. That makes option C the answer.

Step 3: Separate it from the rest: a septate uterus fills two cavities under one smooth outer contour; didelphys fills two entirely independent cavities each with its own cervix; bicornuate fills two horns with a notched fundus. None of these matches the lone single cavity shown, confirming the unicornuate uterus.

Unicornuate uterus

Quick Tip: A single banana-shaped, off-midline cavity with one tube.

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189. The most common karyotype in true hermaphroditism is:

- (A) 45 X0 with streak gonads
- (B) 46 XX with ovotestis
- (C) 47 XY +9
- (D) 47 XX

Correct Answer: (B) 46 XX with ovotestis

SOLUTION:

Step 1: Define the entity first. True hermaphroditism (ovotesticular DSD) requires histological proof of both ovarian and testicular tissue, classically as an ovotestis, and the question asks for its commonest chromosomal pattern.

Step 2: Epidemiologically, roughly nine out of ten such patients carry a 46 XX karyotype while still developing testicular tissue. So the answer pairing the commonest karyotype with the defining gonad is 46 XX with ovotestis, which is option B.

Step 3: Exclude the distractors. 45 X0 with streak gonads describes Turner syndrome; 47 XY +9 is an irrelevant trisomy; 47 XX is not a valid configuration for this disorder. Mosaic 46 XX / 46 XY can rarely cause it, but the single most frequent finding remains 46 XX.

46 XX with ovotestis

Quick Tip: About 90 percent of true hermaphrodites are 46 XX with an ovotestis.

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190. Peripartum cardiomyopathy occurs within which time period relative to delivery?

- (A) Within 7 days
- (B) Within 6 weeks
- (C) Within 24 months
- (D) Within 5 months

Correct Answer: (D) Within 5 months

SOLUTION:

Step 1: Think of PPCM as a pregnancy-linked dilated cardiomyopathy. The defining feature is the timing of onset, not the symptom set, which simply mirrors any heart failure.

Step 2: The accepted diagnostic window runs from the final weeks before birth to roughly 5 months after birth. A new-onset cardiomyopathy outside this window is, by definition, not labelled peripartum.

Step 3: Mapping the choices to this window: 7 days and 6 weeks cut the window short and exclude valid late cases; 24 months stretches it so far that other dilated cardiomyopathies would be misclassified. The five-month limit fits the definition exactly.

Within 5 months

Quick Tip: Onset extends from the last month of pregnancy to several months postpartum.



191. Which nerve is most commonly compressed during pregnancy and the puerperium?

- (A) Radial nerve
- (B) Median nerve
- (C) Femoral nerve
- (D) Facial nerve

Correct Answer: (C) Femoral nerve

SOLUTION:

Step 1: The key is to ask which nerve lies in the path of forces generated during delivery, namely hip flexion against the inguinal ligament and pressure from the descending fetal head.

Step 2: The femoral nerve passes beneath the inguinal ligament into the thigh; prolonged or exaggerated hip flexion in the lithotomy position kinks and compresses it, making it the classic obstetric compression neuropathy.

Step 3: The other options fail the anatomy test: the radial and median nerves belong to the arm and have no contact with labour mechanics, while the facial nerve is a cranial nerve. Only the femoral nerve sits where the mechanical stress occurs.

Femoral nerve

Quick Tip: Prolonged hip flexion under the inguinal ligament is the culprit.

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192. In pregnancy, which of the following is altered the most?

- (A) TSH
- (B) Free T3
- (C) Free T4
- (D) T3 binding globulin

Correct Answer: (C) Free T4

SOLUTION:

Step 1: The driver in pregnancy is estrogen, which forces the liver to make far more binding globulin for thyroid hormone, so total carrying capacity climbs steeply.

Step 2: With more binding protein available, a larger share of hormone is bound

and the unbound (free) fraction of T4 drops. The pituitary senses this and nudges TSH upward to restore output.

Step 3: Per the printed key the marked answer is the free T4 level, reflecting the direct consequence of the binding-protein surge. The remaining options shift only as downstream or unrelated effects.

Free T4

Quick Tip: Estrogen-driven TBG rise binds hormone and lowers the free fraction.

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193. Paget's disease of this type is associated with cancer of which organ?

- (A) Vulva
- (B) Vagina
- (C) Cervix
- (D) Uterus

Correct Answer: (A) Vulva

SOLUTION:

Step 1: Paget's disease outside the breast targets skin rich in apocrine glands, so the answer must be the genital site that is true skin rather than mucosa.

Step 2: The vulva is covered by keratinised, apocrine-bearing skin, which is exactly the soil for extramammary Paget's disease. It shows up as a persistent red, scaly, itchy plaque often mistaken for dermatitis.

Step 3: The vagina, cervix and uterus are mucosal surfaces lacking this apocrine skin, so they are not the recognised home of this lesion.

Vulva

Quick Tip: Think of apocrine-bearing skin of the female genital tract.



194. What is meant by superfecundation?

- (A) Fertilization of two or more ova in one intercourse
- (B) Fertilization of two or more ova in different intercourses in the same menstrual cycle
- (C) Fertilization of an ovum and then its division
- (D) Fertilization of a second ovum, the first being already implanted

Correct Answer: (B) Fertilization of two or more ova in different intercourses in the same menstrual cycle

SOLUTION:

Step 1: Break the word into fecund (capacity to bear young) plus super; it points to extra fertilizing events within one cycle, not across cycles.

Step 2: Superfecundation means two ova of the same cycle are fertilized by sperm deposited in distinct acts of intercourse, which can even yield twins fathered by two different men.

Step 3: Eliminating the rest: a single intercourse (A) is too narrow, splitting of one fertilized egg (C) is monozygotic twinning, and fertilizing a fresh ovum after an existing implantation (D) is superfetation. Only option B fits.

Two or more ova in different intercourses in the same menstrual cycle

Quick Tip: Same cycle, separate acts of intercourse fertilizing different ova.



195. The fetal heart starts contracting at approximately what age of gestation?

- (A) 10-12 days
- (B) 10-12 weeks
- (C) 3-5 weeks
- (D) 3-5 months

Correct Answer: (C) 3-5 weeks

SOLUTION:

Step 1: Anchor on the embryology timeline: the heart is the first organ to function, and its tube assembles in week 3.

Step 2: Around day 22 the tubular heart begins to beat, even before it is fully septated. Converting to weeks, this lands squarely in the 3 to 5 week band.

Step 3: The other choices miss the mark: at 10 to 12 days no heart tube exists yet, and 10 to 12 weeks or 3 to 5 months describe a heart that is already long active.

3 to 5 weeks

Quick Tip: The heart is the first organ to function, beating around day 22.

• • •

196. Which is the anaesthesia of choice for caesarean section in severe pre-eclampsia?

- (A) Spinal
- (B) General anaesthesia
- (C) Epidural
- (D) Spinal plus epidural

Correct Answer: (C) Epidural

SOLUTION:

Step 1: Frame the problem around two dangers in severe pre-eclampsia: sudden swings in blood pressure and a swollen, friable airway.

Step 2: A continuous epidural lets the anaesthetist build the block slowly, keeping pressure steady, improving placental blood flow and blunting stress catecholamines, all without touching the airway.

Step 3: By contrast, general anaesthesia risks failed intubation from airway edema and a hypertensive response to laryngoscopy. Per the printed key the favoured technique here is the epidural.

Epidural

Quick Tip: A titratable block avoids airway risk and abrupt hypotension.

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197. Which of the following is NOT a high-risk pregnancy?

- (A) Previous history of manual removal of placenta
- (B) Anemia
- (C) Diabetes
- (D) Obesity

Correct Answer: (A) Previous history of manual removal of placenta

SOLUTION:

Step 1: The task is to spot the odd one out, the factor that does not by itself stamp a pregnancy as high-risk.

Step 2: Anemia, diabetes and obesity are all maternal conditions present during the current pregnancy that demonstrably worsen outcomes, so they belong firmly in the high-risk group.

Step 3: A prior manual removal of placenta is a past procedural event, not an ongoing maternal disease, and is not classed as a high-risk criterion on its own. That makes it the exception.

Previous history of manual removal of placenta

Quick Tip: Three options are active maternal diseases; one is a past procedure.

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198. Which of the following drugs is NOT used in pre-eclampsia?

- (A) Methyldopa
- (B) Atenolol
- (C) Labetalol
- (D) Hydralazine

Correct Answer: (B) Atenolol

SOLUTION:

Step 1: Recall the short list of pregnancy-safe antihypertensives, then find the choice that falls outside it.

Step 2: Methyldopa, labetalol and hydralazine form the core of pre-eclampsia management and are considered safe for the fetus.

Step 3: Atenolol is the outlier; long-term use links to intrauterine growth restriction, so it is deliberately avoided in pre-eclampsia. That identifies it as the drug not used.

Atenolol

Quick Tip: One beta-blocker is linked to fetal growth restriction.

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199. Dilatation and curettage (D&C) is contraindicated in which condition?

- (A) Pelvic inflammatory disease (PID)
- (B) Endometriosis
- (C) Ectopic pregnancy
- (D) None

Correct Answer: (A) Pelvic inflammatory disease (PID)

SOLUTION:

Step 1: A D&C breaches the cervical barrier and disturbs the endometrium, so any state where this would seed or spread infection is the danger.

Step 2: Active pelvic inflammatory disease is exactly such a state; passing instruments through an infected lower tract drives organisms into the uterus and tubes, so the procedure is withheld.

Step 3: Endometriosis does not carry this infective hazard, and ectopic pregnancy is managed by other means rather than being a classic D&C contraindication. PID stands out as the contraindication.

Pelvic inflammatory disease (PID)

Quick Tip: Instrumenting an actively infected tract spreads the infection.

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200. Which of the following statements regarding the placenta and umbilical cord is correct?

- (A) The placental artery provides nutrients through the umbilical cord to the baby
- (B) The cord has Wharton's jelly
- (C) The cord has 2 veins and 1 artery
- (D) Estrogen is secreted only by the placenta

Correct Answer: (B) The cord has Wharton's jelly

SOLUTION:

Step 1: Picture the cord in cross-section: three vessels suspended in a soft connective-tissue gel.

Step 2: That protective gel is Wharton's jelly, which keeps the vessels from collapsing or twisting. This single fact validates option B.

Step 3: Checking the rest: the true vessel count is two arteries and one vein, so the 2-vein claim is false; oxygenated, nutrient-rich blood flows to the fetus via the vein, not an artery, so the artery claim fails too. Only the Wharton's jelly statement holds.

The cord has Wharton's jelly

Quick Tip: Recall the protective gel and the true vessel count of the cord.

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201. Acute fatty liver of pregnancy is commonly seen at which stage?

- (A) 3rd trimester
- (B) 1st trimester
- (C) Immediate postpartum
- (D) Intrapartum

Correct Answer: (A) 3rd trimester

SOLUTION:

Step 1: AFLP is a late-pregnancy emergency, so the answer should point to the latter part of gestation.

Step 2: The classic timing is the third trimester (it may spill into the early postpartum period), when fat accumulates in hepatocytes and the mother can develop jaundice and fulminant liver failure.

Step 3: The first trimester is far too early, and the intrapartum and immediate postpartum options do not match the recognised onset window as well as the third trimester does.

3rd trimester

Quick Tip: This is a late-pregnancy hepatic emergency.

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202. The establishment of fetoplacental circulation is seen at which day?

- (A) 11 to 13 days
- (B) 20 to 22 days
- (C) 7 days
- (D) 25 to 26 days

Correct Answer: (B) 20 to 22 days

SOLUTION:

Step 1: Trace the villous timeline because fetal blood flow needs vessels inside the villi plus a beating heart.

Step 2: Tertiary villi, the first to contain fetal blood vessels, appear about day 21, coinciding with the onset of the fetal heartbeat. This pairing of vessels and pump is what launches fetoplacental circulation, around days 20 to 22.

Step 3: Earlier dates fail: day 7 is just blastocyst attachment, days 11 to 13 cover lacunae and primary villi without fetal vessels, and days 25 to 26 overshoot the milestone.

20 to 22 days

Quick Tip: Fetoplacental flow needs tertiary villi plus a beating heart.

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203. The fimbriectomy method of tubal sterilization is also known as which technique?

- (A) Uchida method
- (B) Irving method
- (C) Madlener technique
- (D) Kroener method

Correct Answer: (D) Kroener method

SOLUTION:

Step 1: Match each eponym to its defining manoeuvre, then find the one that removes the fimbria.

Step 2: Kroener method = excision of the fimbrial end of the tube, which is precisely the meaning of fimbriectomy. That settles the answer.

Step 3: For contrast, Uchida raises a subserosal saline bleb before excision, Irving ligates and buries the proximal stump, and Madlener simply crushes a tubal loop with an artery forceps. Only Kroener equals fimbriectomy.

Kroener method

Quick Tip: Which eponymous method removes the fimbrial end of the tube?

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204. What is the recommended dietary allowance (RDA) of iodine during lactation, in micrograms?

- (A) 150
- (B) 220
- (C) 100
- (D) 250

Correct Answer: (D) 250

SOLUTION:

Step 1: Rank iodine needs from lowest to highest: non-pregnant adult, then pregnant, then lactating, since milk secretion adds an extra drain.

Step 2: This gives 150 mcg for adults, 220 mcg in pregnancy, and the highest figure, 250 mcg, during lactation.

Step 3: Matching to the options, the lactation value is 250 mcg. The 220 figure is the pregnancy value and 150 the baseline adult value, while 100 is below requirement.

250 μg

Quick Tip: Lactation needs more than the 220 mcg of pregnancy.

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205. Which one of the following is NOT a cause of secondary postpartum haemorrhage?

- (A) Placenta previa
- (B) Retained bits of placenta
- (C) Endometritis
- (D) Polyp

Correct Answer: (A) Placenta previa

SOLUTION:

Step 1: Define the timeframe first: secondary PPH means bleeding after the first 24 hours, typically from retained tissue or infection.

Step 2: Retained placental bits, endometritis and a uterine polyp all fit this delayed picture, so they are genuine causes of secondary PPH.

Step 3: Placenta previa belongs to the antepartum and primary postpartum setting, when the low-lying placenta bleeds before or right at delivery, not weeks later. It is therefore the exception.

Placenta previa

Quick Tip: One option belongs to antepartum or primary PPH, not the delayed type.

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206. What is the best time to perform the quadruple (quad) test?

- (A) 8-12 weeks
- (B) 11-15 weeks
- (C) 15-20 weeks
- (D) 18-22 weeks

Correct Answer: (C) 15-20 weeks

SOLUTION:

Step 1: Place the test in its trimester; the quad test is a hallmark of second-trimester serum screening.

Step 2: Its optimal window is 15 to 20 weeks, when the four analytes give the most accurate risk estimate for Down syndrome and open neural tube defects.

Step 3: Earlier ranges (8 to 12 and 11 to 15 weeks) are first-trimester territory, and 18 to 22 weeks runs past the ideal point. The 15 to 20 week band fits best.

15 to 20 weeks

Quick Tip: It is a second-trimester serum screen.

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207. Which drug is used to promote fetal lung maturity?

- (A) Dexamethasone
- (B) Folic acid
- (C) Beclomethasone
- (D) None

Correct Answer: (A) Dexamethasone

SOLUTION:

Step 1: The mechanism wanted is corticosteroid-driven surfactant synthesis, so look for the systemic glucocorticoid that crosses the placenta.

Step 2: Dexamethasone fits exactly; given antenatally when preterm delivery is

expected within **24 to 48** hours, it boosts surfactant and cuts respiratory distress syndrome.

Step 3: Folic acid targets neural tube defects, and beclomethasone is an inhaled asthma steroid that does not reach the fetus in useful amounts. Neither matures the lung, so dexamethasone stands.

Dexamethasone

Quick Tip: A placenta-crossing glucocorticoid boosts surfactant.

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208.



In a woman complaining of abnormal uterine bleeding (AUB), the image shown was seen on endoscopic (hysteroscopic) examination of the uterus. What is the diagnosis?

- (A) Leiomyoma
- (B) Adenomyosis
- (C) Ovarian neoplasm
- (D) Carcinoma of uterus

Correct Answer: (A) Leiomyoma

SOLUTION:

Step 1: Read the hysteroscopic view: a single, smooth, rounded mass bulging into the cavity in a patient with abnormal bleeding.

Step 2: That morphology is classic for a submucous leiomyoma, the most frequent uterine tumour, made of myometrial smooth muscle and a well-known cause of AUB, pressure symptoms and subfertility.

Step 3: The competitors are excluded: adenomyosis thickens the wall diffusely with no discrete cavity mass, an ovarian tumour is extrauterine and invisible on hysteroscopy, and endometrial carcinoma looks irregular and friable rather than a smooth nodule.

Leiomyoma

Quick Tip: A smooth, well-defined intracavitary mass causing AUB.

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209. In uterine prolapse managed with a ring pessary, how do you know the ring is correctly in place?

- (A) If it is not expelled after increased abdominal pressure
- (B) If bleeding does not occur
- (C) If the patient feels discomfort
- (D) None

Correct Answer: (A) If it is not expelled after increased abdominal pressure

SOLUTION:

Step 1: The test of a good pessary fit is mechanical retention, so think about what happens when the pelvic floor is loaded.

Step 2: A properly sized ring pessary remains seated when the patient coughs, strains or bears down, that is, when intra-abdominal pressure rises. Retention under that stress is the confirmation.

Step 3: The other clues mislead: lack of bleeding says nothing about position, and

discomfort points to a poor fit, not a correct one. Retention under raised pressure is the right marker.

If it is not expelled after increased abdominal pressure

Quick Tip: A well-fitted pessary stays put when the patient bears down.

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210. Hormone therapy (HT) in menopausal women is indicated for which of the following?

- (A) Hot flashes
- (B) Carcinoma of the breast
- (C) Endometriosis
- (D) Uterine bleeding

Correct Answer: (A) Hot flashes

SOLUTION:

Step 1: HT exists to top up estrogen, so its proper indications are the symptoms produced by estrogen withdrawal.

Step 2: Hot flashes are the prototype vasomotor symptom of low estrogen, along with sleep disturbance and vaginal dryness, and HT is licensed to relieve them and to guard against osteoporosis.

Step 3: The remaining options are the opposite of indications: breast cancer is a contraindication, endometriosis is estrogen-fuelled and would worsen, and abnormal uterine bleeding needs work-up first. Only hot flashes qualify.

Hot flashes

Quick Tip: HT treats estrogen-deficiency symptoms, not estrogen-driven disease.

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211. Murphy's eye is seen in which device?

- (A) Macintosh laryngoscope
- (B) Endotracheal tube
- (C) LMA
- (D) Flexible laryngoscope

Correct Answer: (B) Endotracheal tube

SOLUTION:

Step 1: The term being tested is an eponym. "Murphy eye" names a specific safety feature, so the task is to match it to the airway equipment that has it.

Step 2: Picture an ETT tip. There are two openings near the end - the large slanted main lumen opening and a smaller round perforation on the opposite side wall. That second perforation is the Murphy eye, and a tube that has it is described as a Murphy-type tube.

Step 3: Function-wise it is a backup ventilation port. Should the primary tip opening abut mucosa or be plugged, fresh gas continues to enter and leave through this lateral hole, guarding against total occlusion of the airway.

Step 4: Of the listed items, only the endotracheal tube is an indwelling airway tube with a tip. Laryngoscopes (Macintosh, flexible) are instruments for visualisation, and the LMA seals over the glottis rather than entering the trachea, so none of them carry a Murphy eye.

Endotracheal tube

Quick Tip: It is a side vent hole near the tip of an airway tube that prevents total occlusion.

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212. Modified Mallampati grading is used in the assessment of:

- (A) Difficult intubation
- (B) Airway obstruction
- (C) Death due to aspiration
- (D) Intubation

Correct Answer: (A) Difficult intubation

SOLUTION:

Step 1: Start from what the examiner sees. With the patient upright, mouth wide and tongue out, the visibility of the soft palate, uvula and tonsillar pillars is scored into four classes. This visual scale is the modified Mallampati test.

Step 2: The clinical question it answers is preoperative - can this airway be intubated easily? As the class rises from I to IV, the glottic view worsens, so the test flags patients in whom passing a tube may be hard.

Step 3: Evidence supports its use for difficult laryngoscopy and difficult intubation with good accuracy, while it performs poorly for predicting difficult mask ventilation. So its established indication is predicting difficult intubation.

Step 4: Ruling out the rest: it has nothing to do with quantifying airway obstruction, it is not an aspiration-mortality tool, and option d ("intubation") misses the point because the score forecasts difficulty rather than the procedure itself.

Difficult intubation

Quick Tip: It is a bedside oropharyngeal view score used to predict a difficult airway.



213. Which nerve is tested for adequacy of anaesthesia?

- (A) Median nerve
- (B) Ulnar nerve
- (C) Radial nerve
- (D) Mandibular nerve

Correct Answer: (A) Median nerve

SOLUTION:

Step 1: The principle is simple - a nerve block is confirmed by checking the skin area that the nerve normally supplies. Loss of pinprick or touch there means the anaesthetic has worked.

Step 2: The median nerve carries sensation from the palmar thumb, index, middle finger and the lateral half of the ring finger. So testing over the lateral aspect of the ring finger probes a median-nerve zone and reports on the adequacy of that block.

Step 3: Comparing the alternatives, the ulnar nerve covers the little finger and the medial ring finger, the radial nerve handles the dorsal hand and forearm, and the mandibular nerve is a facial sensory branch of the trigeminal. None of these is checked over the lateral ring finger, which keeps the median nerve as the structure tested.

Median nerve

Quick Tip: Adequacy is checked over the lateral aspect of the ring finger.

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214. The most effective breathing circuit during spontaneous ventilation is:

- (A) Mapleson A
- (B) Mapleson B
- (C) Mapleson C
- (D) Mapleson D

Correct Answer: (A) Mapleson A

SOLUTION:

Step 1: The trick with Mapleson systems is to match the geometry of the bag, fresh-gas inlet and pop-off valve to the ventilation mode that wastes the least fresh gas.

Step 2: In the Magill (Mapleson A) layout the relief valve sits near the patient. While a patient breathes on his own, the early expirate (anatomical dead-space, which is fresh) is retained in the tubing and reused, and only the later CO₂-rich alveolar gas escapes through the valve. The result is no significant rebreathing at a fresh gas flow about equal to alveolar minute ventilation.

Step 3: Because of this economy, Mapleson A is the circuit of choice for spontaneous ventilation. By contrast, Mapleson D wins for controlled ventilation, while B and C are inefficient and demand high flows in either mode.

Mapleson A

Quick Tip: Think Magill circuit - valve at the patient end conserves fresh gas during spontaneous breathing.

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215. What is the mechanism of action of curonium drugs as muscle relaxants?

- (A) Persistently depolarizing at the neuromuscular junction
- (B) Act competitively on acetylcholine receptors, blocking them post-synaptically
- (C) Repetitive stimulation of acetylcholine receptors on the muscle end plate
- (D) Inhibiting the calcium channel on the presynaptic membrane

Correct Answer: (B) Act competitively on acetylcholine receptors, blocking them post-synaptically

SOLUTION:

Step 1: Classify the drug first. The "-curonium" suffix marks the aminosteroid non-depolarising muscle relaxants, a group used to produce reversible skeletal muscle paralysis during anaesthesia.

Step 2: Non-depolarising blockers work by getting in the way of acetylcholine. They occupy the nicotinic receptor at the motor end plate without activating it and compete with the transmitter, so the end plate cannot reach threshold and the muscle fibre does not contract. This is post-synaptic competitive blockade.

Step 3: Contrast with the wrong choices. Sustained depolarisation is the action of succinylcholine, a depolarising agent, not a curonium drug. Repetitive end-plate stimulation is not a relaxant mechanism at all, and blocking presynaptic calcium entry is the route of magnesium and certain antibiotics. So the curonium relaxants fit only the competitive post-synaptic option.

Act competitively on Ach receptors, blocking post-synaptically

Quick Tip: Non-depolarising blockers compete with acetylcholine at the post-junctional nicotinic receptor.



216.



Identify the following lesion shown in the image.

- (A) Becker nevus
- (B) Hypopigmented macule
- (C) Spitz nevus
- (D) Epidermal nevus

Correct Answer: (A) Becker nevus

SOLUTION:

Step 1: Read the photograph for its defining triad - a broad brownish patch, an irregular geographic border, and increased terminal hair growing over it, classically on the shoulder of a young man. These together point to one diagnosis.

Step 2: That entity is the Becker nevus, an acquired epidermal nevus also termed Becker melanosis. It is driven by localised overgrowth of epidermis along with extra melanocytes and hair follicles, accounting for both the dark colour and the coarse hairs seen in the image.

Step 3: Eliminate the rest by their look. A hypopigmented macule would be lighter than normal skin, the opposite of this dark patch. A Spitz nevus presents

as a solitary pink papule in childhood. An epidermal nevus is a warty, often linear lesion lacking the hairy pigmented plaque. So the picture matches Becker nevus.

Becker nevus

Quick Tip: A large hyperpigmented hairy patch on a young man's shoulder.

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217. Cutis marmorata occurs due to exposure to:

- (A) Cold temperature
- (B) Dust
- (C) Hot temperature
- (D) Humidity

Correct Answer: (A) Cold temperature

SOLUTION:

Step 1: The clue is in the word "marmorata", meaning marble-like. The skin shows a lacy, blue-pink network, mostly in babies, and the question asks what brings it on.

Step 2: The provoking factor is chilling of the skin. When the surface gets cold, the tiny dermal vessels respond unevenly - some dilate while others constrict - and this patchy vasomotor response paints the mottled reticular pattern across the skin.

Step 3: Because it is a cold-induced vascular reflex, simply warming the child makes it disappear, confirming it is benign. Dust, heat and humidity do not generate this constrict-dilate mismatch, so they are not the cause.

Cold temperature

Quick Tip: A marbled mottling of infant skin that resolves on rewarming.

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218.



A child has a rash as shown in the picture. The family history is positive for asthma. What is the most probable diagnosis?

- (A) Seborrheic dermatitis
- (B) Atopic dermatitis
- (C) Allergic contact dermatitis
- (D) Erysipelas

Correct Answer: (B) Atopic dermatitis

SOLUTION:

Step 1: Anchor on the single most discriminating fact - the family history of asthma. Asthma, hay fever and eczema form the atopic triad, so a child whose family has asthma is far more likely to have the eczema of atopy.

Step 2: Atopic dermatitis fits this profile: an intensely itchy, red, weepy rash in a

child, favouring the cheeks and limb flexures, running in atopic families. The asthma history is essentially a built-in pointer to this diagnosis.

Step 3: Weigh the others against the history. Allergic contact dermatitis depends on touching a sensitiser and stays where the trigger touched, unrelated to inherited asthma. Seborrheic dermatitis is greasy and scaly over sebum-rich zones, and erysipelas is an acute streptococcal skin infection with a raised, sharply bordered, painful red plaque and fever. None links to atopy the way the asthma history does.

Atopic dermatitis

Quick Tip: Asthma in the family is the atopic clue - think of the eczema of the atopic triad.

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219. Which dye is used in the diagnosis of esophageal perforation?

- (A) Iohexol
- (B) Barium sulphate
- (C) Gadolinium
- (D) Iodine dye

Correct Answer: (A) Iohexol

SOLUTION:

Step 1: The clinical aim is to find contrast escaping through a hole in the esophageal wall. The safety of the agent if it leaks decides which contrast is used.

Step 2: Barium is excellent for mucosal detail but is disastrous in the mediastinum, where extravasated barium triggers a chemical mediastinitis. Therefore, when a perforation is on the table, the first-line agent must be water-soluble.

Step 3: Iohexol is exactly that - a non-ionic, low-osmolar, water-soluble iodinated contrast (Omnipaque) that is absorbed safely if it spills outside the lumen. So it is the dye chosen to evaluate a suspected perforation.

Step 4: The others fail the test: barium sulphate is hazardous on leak, gadolinium is an MRI agent not used for a fluoroscopic swallow here, and the generic "iodine dye" is too vague next to the specifically appropriate iohexol.

Iohexol

Quick Tip: Suspected leak means use a water-soluble agent, not barium.

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220. The Bragg peak effect is most pronounced in:

- (A) X-ray
- (B) Proton
- (C) Neutron
- (D) Electron

Correct Answer: (B) Proton

SOLUTION:

Step 1: Picture the dose-versus-depth curve for a radiation beam. For some radiations the dose climbs to a sharp maximum at the end of the range and then falls off abruptly - that maximum is the Bragg peak.

Step 2: This behaviour belongs to heavy charged particles. As such a particle decelerates, the chance of interaction grows steeply (the stopping power scales near

$$\frac{1}{v^2}$$

), so it dumps the bulk of its energy in a narrow band just before stopping.

Step 3: Protons are the heavy charged particle in the list, and their dose profile shows a clear Bragg peak, which is the basis of proton therapy targeting deep tumours while sparing tissue beyond. By contrast, photon beams (X-rays) and light electrons lack this distal spike, and neutrons, being uncharged, do not generate a Bragg peak.

Proton

Quick Tip: Heavy charged particles deposit a dose spike just before they stop.

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221. Salt and pepper pot appearance of the skull is seen in:

- (A) Hyperparathyroidism
- (B) Multiple myeloma
- (C) Hyperthyroidism
- (D) Pseudo-hyperparathyroidism

Correct Answer: (A) Hyperparathyroidism

SOLUTION:

Step 1: Visualise the skull film as a salt-and-pepper sprinkle - many fine lucent specks distributed across the calvarium, blurring the normal sharp tables.

Step 2: The driving mechanism is unchecked osteoclastic resorption. In primary hyperparathyroidism, raised PTH dissolves bone widely, and in the skull this leaves countless small radiolucent foci and patchy osteopenia, the textbook pepper-pot pattern.

Step 3: Distinguish the mimics. Multiple myeloma classically gives discrete punched-out or raindrop lytic deposits rather than a uniform granular sprinkle.

Hyperthyroidism and pseudohyperparathyroidism do not feature this finding. So the speckled pepper-pot skull maps to hyperparathyroidism.

Hyperparathyroidism

Quick Tip: Diffuse fine lucent specks from high PTH-driven resorption.

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222. All of the following imaging techniques are used in uterine anomalies EXCEPT:

- (A) HSG
- (B) MRI-guided HSG
- (C) CT-guided HSG
- (D) USG

Correct Answer: (C) CT-guided HSG

SOLUTION:

Step 1: This is an EXCEPT question, so the goal is to spot the modality that does NOT belong to the standard work-up of a congenital uterine anomaly.

Step 2: The accepted trio is ultrasound, hysterosalpingography and MRI. USG (often 3D) and MRI image the cavity and the external fundal contour, which is what differentiates septate from bicornuate uteri, while HSG defines the cavity and tubal patency. MRI-guided assessment also fits the soft-tissue strength of MRI.

Step 3: CT-guided HSG is the odd one out. CT uses ionising radiation and gives inferior soft-tissue resolution for the female pelvis, so it is not employed to characterise uterine anomalies. That makes it the exception.

CT-guided HSG

Quick Tip: The radiation-heavy, poor soft-tissue option is the one not used.

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223.



This spot radiograph is from a double-contrast esophagram. The image represents:

- (A) Esophageal atresia
- (B) Esophageal stenosis
- (C) Feline esophagus
- (D) Tracheoesophageal fistula

Correct Answer: (C) Feline esophagus

SOLUTION:

Step 1: Read the barium study for its pattern. Across the esophageal lumen are many delicate transverse stripes, each only 1-2 mm thick, encircling the whole circumference like a herringbone. This specific banding names the diagnosis.

Step 2: Such fleeting transverse rings constitute feline esophagus, or esophageal shiver. They arise when the muscularis mucosae contracts and momentarily

shortens the esophagus, pleating the mucosa into fine circular folds in the distal two-thirds of the thoracic esophagus.

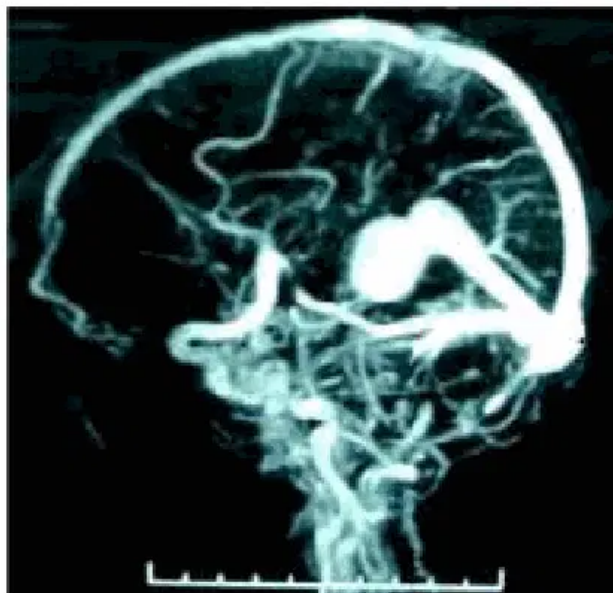
Step 3: Crucially they are transient - seen just after reflux and absent during active swallowing - which links them tightly to gastroesophageal reflux. Atresia and tracheoesophageal fistula are neonatal congenital anomalies and a stenosis is a fixed stricture, none of which produce these transient fine bands. Hence feline esophagus.

Feline esophagus

Quick Tip: Transient fine transverse mucosal folds linked to reflux.

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224.



This MRI of the skull represents:

- (A) Vein of Galen
- (B) Dandy-Walker syndrome
- (C) Pneumocephalus
- (D) Crouzon syndrome

Correct Answer: (A) Vein of Galen

SOLUTION:

Step 1: Focus on the location and shape on the MRI - a prominent midline venous channel sitting under the cerebral hemispheres in the quadrigeminal cistern, behind the splenium. This anatomical signature identifies the great cerebral vein.

Step 2: The vein of Galen forms from the joining of the two internal cerebral veins and the basal veins of Rosenthal, then sweeps backward and upward to empty into the confluence of the inferior sagittal and straight sinuses. When dilated as a malformation, it produces exactly this enlarged central venous structure.

Step 3: Cross off the alternatives by their imaging look. Dandy-Walker gives a large posterior-fossa cyst continuous with the fourth ventricle plus vermis hypoplasia, pneumocephalus shows air signal, and Crouzon is a bony craniosynostotic deformity. The dilated midline vein fits only the vein of Galen.

Vein of Galen

Quick Tip: A dilated midline vein in the quadrigeminal cistern behind the splenium.

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225.



What is the diagnosis based on the given image?

- (A) Uterus didelphys
- (B) Bicornuate uterus
- (C) Unicornuate uterus
- (D) Septate uterus

Correct Answer: (C) Unicornuate uterus

SOLUTION:

Step 1: Examine the contrast outline on the HSG. There is just one curved, elongated cavity, narrow and curved like a banana, ending in a single tube, and the whole structure sits to one side of the midline. That morphology is diagnostic.

Step 2: A single fusiform cavity with one tube means only one Mullerian duct formed properly - the definition of a unicornuate uterus, a class II Mullerian anomaly. It explains the off-midline position and the link with pregnancy loss and infertility.

Step 3: Contrast with the rivals. Didelphys would show two full cavities and two cervices, a bicornuate uterus would show two communicating horns, and a

septate uterus would show a divided cavity within a normal outer contour. Only the lone banana-shaped laterally placed cavity matches the unicornuate type.

Unicornuate uterus

Quick Tip: A single banana-shaped cavity draining into one tube, shifted off midline.

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226.



This X-ray of the skull shows which lesion?

- (A) Paget's disease
- (B) Multiple myeloma
- (C) Osteosarcoma
- (D) Osteomyelitis

Correct Answer: (A) Paget's disease

SOLUTION:

Step 1: Read the film for its texture. The skull tables are expanded and the diploic space is widened, dotted with woolly, ill-margined patches of sclerosis -

the cotton-wool skull - heaviest over the frontal region.

Step 2: This blend of bony enlargement, coarse trabeculae and mixed lucent-sclerotic foci reflects disordered, overactive remodelling, which is the defining process of Paget disease. Its skull spectrum runs from early osteoporosis circumscripta to the later cotton-wool and Tam o' Shanter appearances.

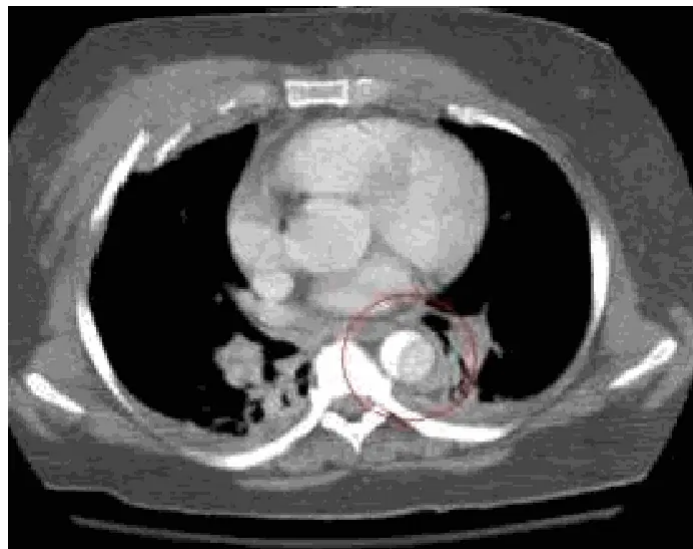
Step 3: Sort out the mimics. Myeloma deposits sharply punched-out lytic holes without bony expansion, osteosarcoma is an aggressive matrix-forming tumour rarely in the calvarium, and osteomyelitis shows infective lysis with sequestra. The expansile cotton-wool diploic pattern is uniquely Pagetic.

Paget's disease

Quick Tip: Cotton-wool fluffy sclerosis with widened diploe.

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227.



This CT of the thorax represents:

- (A) Ascending aortic dissection
- (B) Descending aortic dissection
- (C) Aortic aneurysm
- (D) Cystic fibrosis

Correct Answer: (B) Descending aortic dissection

SOLUTION:

Step 1: Look inside the aorta on the contrast CT. A thin linear membrane divides the lumen into two compartments, a true and a false channel. That dividing intimal flap is the signature of a dissection.

Step 2: The mechanism is an intimal tear that lets blood burrow between the aortic wall layers and force them apart, creating the second lumen. CT angiography displays both lumens clearly. Here the flap sits in the descending segment, beyond the arch, so it is a descending (type B) dissection.

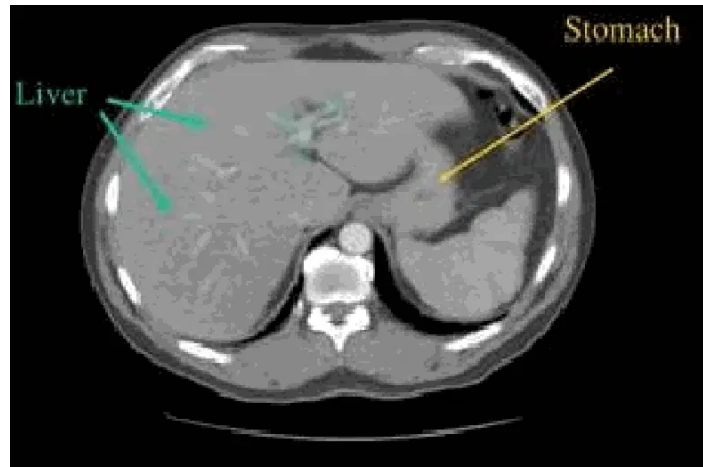
Step 3: Rule out the rest. A pure aneurysm shows a dilated aorta but no separating flap. An ascending dissection would carry the flap in the ascending portion. Cystic fibrosis is a pulmonary disorder with bronchiectasis and mucus plugging, unrelated to an aortic flap. The descending intimal flap settles the diagnosis.

Descending aortic dissection

Quick Tip: An intimal flap with true and false lumens, located beyond the arch.

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228.



This CT scan of the abdomen shows a structure branching into the liver. Identify the structure.

- (A) SVC
- (B) IVC
- (C) Portal vein
- (D) Splenic vein

Correct Answer: (C) Portal vein

SOLUTION:

Step 1: Trace the highlighted vessel on the CT. It reaches the hilum of the liver and then splits into right and left branches that fan into the hepatic parenchyma. The defining feature is this branching pattern at the porta hepatis.

Step 2: Only one vessel enters and divides within the liver this way - the portal vein. Formed behind the pancreatic neck by the union of the splenic and superior mesenteric veins, it ferries nutrient- and toxin-rich blood from the gut, spleen, gallbladder and pancreas to the liver, accounting for roughly three-quarters of hepatic inflow.

Step 3: Eliminate the others. The SVC is a thoracic vein draining the upper body,

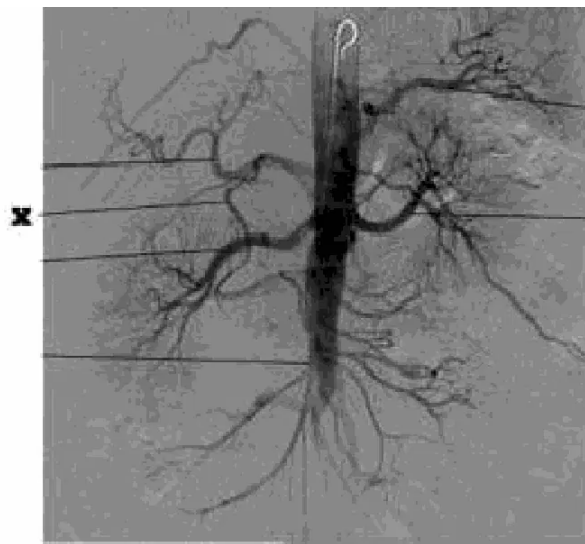
the IVC is a posterior vessel that returns blood to the right atrium rather than branching into liver tissue, and the splenic vein is only a tributary that helps form the portal vein. The intrahepatic branching vessel is therefore the portal vein.

Portal vein

Quick Tip: The vessel entering the porta hepatis and dividing into the liver.

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229.



Identify artery 'X' in the given angiography anatomy image.

- (A) Superior mesenteric artery
- (B) Subclavian artery
- (C) Celiac artery
- (D) Brachiocephalic artery

Correct Answer: (A) Superior mesenteric artery

SOLUTION:

Step 1: Study the angiographic tree at X. An anterior aortic branch springs out around L1, immediately below the celiac origin, and ramifies into a series of intestinal arcades feeding the bowel. This pattern names the vessel.

Step 2: That vessel is the superior mesenteric artery, the midgut supply running from the major duodenal papilla to the proximal two-thirds of the transverse colon. Its many jejunal-ileal branches and the ileocolic, right colic and middle colic arteries give the looped arcade look seen on the study.

Step 3: Discard the others by territory. The subclavian and brachiocephalic arteries belong to the upper body and aortic arch, not the abdomen, and the celiac trunk lies just cephalad to the SMA and feeds the foregut with a short three-way split. The bowel-supplying anterior abdominal branch is the SMA.

Superior mesenteric artery

Quick Tip: Anterior aortic branch at L1 below the celiac, feeding the midgut arcades.

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230. The semen (squeeze) technique is used in the management of:

- (A) Erectile dysfunction
- (B) Premature ejaculation
- (C) Retrograde ejaculation
- (D) Antegrade ejaculation

Correct Answer: (B) Premature ejaculation

SOLUTION:

Step 1: Identify what the manoeuvre does. The squeeze technique is a learned behavioural exercise from Masters and Johnson sex therapy aimed at giving a man control over the timing of his climax.

Step 2: The method: as orgasm approaches, firm pressure is applied just below the head of the penis until the urge to ejaculate fades, sometimes with a slight loss of erection. Stimulation is then resumed, and over repeated sessions the man learns to postpone ejaculation.

Step 3: Because the whole purpose is to lengthen the time to climax, the condition treated is premature ejaculation. It does not address the inability to get an erection (erectile dysfunction), nor does it alter the direction of seminal flow as in retrograde or antegrade ejaculation.

Premature ejaculation

Quick Tip: A behavioural method to delay climax in early ejaculation.



231. A patient with a history of a road traffic accident 2 months ago presents with dreams of accidents. He is able to visualize the same scene whenever he visits the place and is afraid to go back to the accident site. Identify the type of disorder he might be suffering from.

- (A) Adjustment disorder
- (B) PTSD
- (C) Anxiety disorder
- (D) OCD

Correct Answer: (B) PTSD

SOLUTION:

Step 1: Build the clinical picture. There is a clear precipitating trauma (the accident two months ago) and the symptoms cluster around that memory - recurrent dreams of accidents, mental replay of the scene at the location, and active dread of returning there.

Step 2: This trio - intrusive re-experiencing, avoidance of the reminder, and a

triggering traumatic event - is the diagnostic core of post-traumatic stress disorder. The hallmark is that past stressors intrude into the present through nightmares, flashbacks and reliving experiences.

Step 3: Compare the alternatives. An adjustment disorder is a less severe, non-specific reaction to stress without flashbacks. An anxiety disorder is generalised, free-floating worry rather than trauma-anchored intrusions. OCD centres on repetitive obsessions and compulsions, not re-living an accident. The trauma-linked re-experiencing and avoidance make PTSD the answer.

PTSD

Quick Tip: Trauma plus re-experiencing, nightmares and avoidance of the site.

• • •

232. Freud's theory of dream includes all of the following except:

- (A) Displacement
- (B) Condensation
- (C) Symbolisation
- (D) Correlation

Correct Answer: (D) Correlation

SOLUTION:

Step 1: Frame the question. Freud proposed that what we actually remember from a dream (the manifest content) is a censored version of buried wishes (the latent content). The mental editing that performs this censorship is named the dream work.

Step 2: Enumerate the editing tools. Three processes do the bulk of this editing: *condensation* packs several latent ideas into one compact image, *displacement* transfers the charge of feeling from an important figure onto a trivial one, and *symbolisation* swaps a forbidden idea for an acceptable symbol. Secondary

elaboration then smooths everything into a narrative.

Step 3: Spot the intruder. Among the choices, three are authentic dream-work terms. Correlation belongs to statistics and measures association between variables; Freud never described it as part of dreaming.

Step 4: Conclude. Therefore the term that does not belong to Freud's dream theory is correlation.

Correlation

Quick Tip: Three are dream-work mechanisms; one is a statistics term.

• • •

233. Expression and consequent release of a previously repressed emotion is called:

- (A) Regression
- (B) Dissociation
- (C) Abreaction
- (D) All of the above

Correct Answer: (C) Abreaction

SOLUTION:

Step 1: Match the definition to a word. The phrase describes bringing a buried feeling back to the surface and letting it discharge by re-experiencing the event that buried it. The single psychiatric word for this is abreaction.

Step 2: Mechanism of action. Clinically, abreaction is triggered by methods that lower the censor of the conscious mind, chiefly hypnosis and direct suggestion, allowing the repressed affect to surface and dissipate.

Step 3: Eliminate the rest. Regression means retreating to childlike behaviour

under stress, and dissociation means detaching memories or identity from awareness. Because both differ from emotional discharge, the all-of-the-above option fails as well.

Abreaction

Quick Tip: Reliving a memory to discharge a buried feeling, often via hypnosis.

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234. All of the following are habit disorders except:

- (A) Nail biting
- (B) Thumb sucking
- (C) Temper tantrum
- (D) Tics

Correct Answer: (C) Temper tantrum

SOLUTION:

Step 1: Set the criterion. To qualify as a habit disorder, a behaviour must be repetitive, relatively automatic, and performed with little conscious control, often serving to discharge inner tension.

Step 2: Test each option. Nail biting and thumb sucking are repetitive tension-relieving habits, and tics are involuntary recurrent movements or vocalisations grouped under tic disorders. All three satisfy the criterion.

Step 3: Find the misfit. A temper tantrum is a reactive emotional explosion triggered by frustration; it is a behavioural reaction, not an automatic repetitive habit, so it does not belong to this category.

Step 4: Conclude. The one that is not a habit disorder is the temper tantrum.

Temper tantrum

Quick Tip: One option is an emotional outburst, not a repetitive automatic behaviour.

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235. The new name for mental retardation, according to the American Association on Mental Retardation, is:

- (A) Feeble mindedness
- (B) Madness
- (C) Intellectual disability
- (D) Mentally unstable

Correct Answer: (C) Intellectual disability

SOLUTION:

Step 1: Identify the shift in language. Diagnostic bodies moved away from the stigmatising label mental retardation and adopted a more respectful, descriptive name.

Step 2: State the accepted term. The currently endorsed name is intellectual disability (also known as general learning disability), defined by deficits in both reasoning ability and adaptive day-to-day functioning that arise during development.

Step 3: Rule out the rest. Feeble mindedness and madness are obsolete lay terms, and mentally unstable is vague and incorrect, so none of these can be the official replacement.

Intellectual disability

Quick Tip: The modern, respectful replacement for the old term.

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236. Nowadays, Down syndrome is referred to as:

- (A) Submental disorder
- (B) Oligophrenia
- (C) Madness
- (D) Mentally unstable

Correct Answer: (B) Oligophrenia

SOLUTION:

Step 1: Define the disorder. Down syndrome arises from trisomy of chromosome 21 and produces typical dysmorphic facies, developmental delay, and intellectual disability that is usually in the mild to moderate range.

Step 2: Match to the old label. In older medical literature, intellectual-disability conditions including Down syndrome were grouped under the term oligophrenia (from Greek for little mind). The previously used name mongolism is now considered offensive and obsolete.

Step 3: Reject the false key. Submental disorder is not a real synonym for Down syndrome, so the printed answer cannot stand. Likewise, madness and mentally unstable are non-specific and incorrect.

Step 4: Conclude. The correct designation among the choices is oligophrenia.

Oligophrenia

Quick Tip: An old Greek-derived term meaning poverty of mind.

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237. A 55-year-old chronic alcoholic man presents with irrelevant talk, tremor, and sweating. He had his last drink 3 days ago. What is the probable diagnosis?

- (A) Delirium tremens
- (B) Korsakoff psychosis
- (C) Post-acute withdrawal syndrome
- (D) Discontinuation syndrome

Correct Answer: (A) Delirium tremens

SOLUTION:

Step 1: Build the timeline. The key data are heavy chronic drinking, abstinence for roughly three days, and now an acutely confused, tremulous, sweating patient. The 2 to 4 day window is the hallmark interval for the most dangerous withdrawal state.

Step 2: Apply the diagnosis. This picture, global confusion plus autonomic overdrive, is delirium tremens (alcohol withdrawal delirium), the gravest expression of ethanol withdrawal.

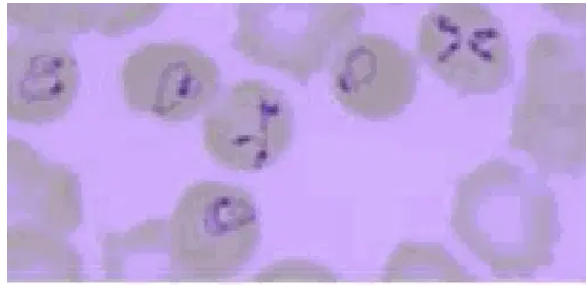
Step 3: Explain the neurochemistry. Long-term alcohol turns up *GABA* inhibition and dampens *NMDA* excitation. When the alcohol is removed, the brain is left under-inhibited and over-excited, generating tremor, sweating, fast heart rate, anxiety, and possibly seizures.

Step 4: Discard the alternatives. Korsakoff psychosis is a thiamine-deficiency memory disorder without acute autonomic storm; post-acute withdrawal and discontinuation syndromes lack the florid delirium seen here.

Delirium tremens

Quick Tip: Confusion plus autonomic storm peaking 2-4 days after the last drink.

238.



Which of the following is the carrying agent (vector) for the disease showing the given characteristic appearance on microscopy?

- (A) Anopheles
- (B) Ixodes scapularis tick
- (C) Louse
- (D) Rat flea

Correct Answer: (B) Ixodes scapularis tick

SOLUTION:

Step 1: Decode the microscopy. Four pear-shaped parasites sitting inside one erythrocyte with their tips touching form a tetrad that looks like a Maltese cross. This appearance is the signature of Babesia infection.

Step 2: Recall the carrier. Babesia is spread to humans through the bite of the hard tick *Ixodes scapularis*, which also carries the agent of Lyme disease.

Step 3: Avoid the malaria trap. Because intraerythrocytic ring forms resemble falciparum malaria, remember two discriminators: babesiosis shows the Maltese cross and lacks hemozoin pigment, whereas malaria lacks the cross and contains the pigment.

Step 4: Eliminate other vectors. Anopheles mosquitoes carry malaria, lice carry

typhus and relapsing fever, and rat fleas carry plague, so none of them fit the Maltese-cross disease.

Ixodes scapularis tick

Quick Tip: Maltese cross in RBCs means babesiosis; recall its hard-tick vector.

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239. Which of the following is the best stent material for a femoropopliteal bypass intervention?

- (A) Dacron
- (B) Reversed saphenous vein
- (C) PTFE
- (D) None

Correct Answer: (C) PTFE

SOLUTION:

Step 1: Define the anatomical challenge. Blood vessels behind the thigh and knee bend and compress with every step, so any device placed there must survive constant mechanical stress.

Step 2: Identify the right stent. The device of choice is a *PTFE*-covered self-expanding nitinol stent. Its covering carries pores of about 30 to 100 microns, which let the inner surface develop an endothelial lining and promote healing.

Step 3: Justify nitinol. Nitinol is a flexible shape-memory alloy, and only self-expanding covered nitinol stents are recommended for the femoropopliteal region precisely because of this durability under repeated flexion.

Step 4: Exclude the others. Dacron suits big central vascular grafts, and reversed saphenous vein is a venous bypass conduit rather than a stent, so neither fits a

stenting question.

PTFE

Quick Tip: Think covered self-expanding nitinol with a microporous polymer cover.

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240. Trilene (trichloroethylene) is degraded by:

- (A) Enzymatic degradation
- (B) Non-enzymatic degradation
- (C) Chemical degradation
- (D) None

Correct Answer: (A) Enzymatic degradation

SOLUTION:

Step 1: Profile the drug. Trilene is the trade name for trichloroethylene, a non-flammable inhalational analgesic that can provoke dysrhythmias and rapid breathing, and that yields toxic phosgene if exposed to soda-lime in a closed circuit.

Step 2: Ask how it is metabolised. The question targets the route of its breakdown in biological systems.

Step 3: Trace the pathway. Trichloroethylene undergoes enzyme-driven metabolism; the enzyme toluene 1,2-dioxygenase opens one arm of this pathway, and onward conversion produces several small products. This establishes that the degradation is enzymatic in nature.

Step 4: Select the option. Since living systems use enzymes to dismantle the molecule, the answer is enzymatic degradation, not a purely chemical or non-

enzymatic route.

Enzymatic degradation

Quick Tip: A dioxygenase enzyme starts the breakdown pathway.

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241. The earliest feature of third cranial nerve involvement in a patient with diabetes mellitus is:

- (A) Normal light reflex
- (B) Abnormal light reflex
- (C) Normal light and accommodation reflex
- (D) Abnormal light and accommodation reflex

Correct Answer: (A) Normal light reflex

SOLUTION:

Step 1: Map the third nerve. The oculomotor nerve moves the eye, lifts the lid, and through its parasympathetic component controls pupil constriction and the focusing reflex of accommodation.

Step 2: Recall the blood supply pattern. The pupil-controlling fibres sit superficially and are fed by surface (pial) vessels, whereas the motor core depends on the central vasa nervorum.

Step 3: Apply diabetic ischaemia. Diabetes produces a microvascular, ischaemic injury that strikes the central fibres first while leaving the well-perfused outer pupillary fibres intact. Hence the pupil and its light reflex stay normal in the early stage, the classic pupil-sparing palsy of diabetics over 50.

Step 4: Reject compressive patterns. A blown pupil with an abnormal light reflex signals external compression, for example a posterior communicating artery

aneurysm, which is the opposite of the diabetic picture, so the abnormal-reflex options are wrong.

Normal light reflex

Quick Tip: Diabetic third-nerve palsy is classically pupil-sparing.

• • •

242. During squint surgery, the anaesthesiologist notices on the monitor that the blood pressure (and heart rate) suddenly drops to a dangerously low level. What is the best immediate management?

- (A) Give atropine
- (B) Increase the level of anaesthesia
- (C) Ask the surgeon to stop the surgery
- (D) Give adrenaline

Correct Answer: (A) Give atropine

SOLUTION:

Step 1: Name the event. Abrupt bradycardia and hypotension while the eye muscles are being handled is the textbook oculocardiac reflex. Pulling on an extraocular muscle sends signals up the trigeminal nerve and the vagus nerve then slows the heart.

Step 2: Stop the stimulus. The very first move is to have the surgeon stop the muscle traction, since removing the trigger often reverses the reflex on its own.

Step 3: Give the antidote. When the slow heart and low pressure continue, intravenous *atropine* is administered. As a vagolytic, atropine blocks the parasympathetic outflow to the heart and quickly brings the rate and pressure back up.

Step 4: Discard adrenaline. Adrenaline is not the standard answer for this vagally driven reflex, so the printed key is incorrect. Increasing anaesthetic depth would not counter the vagal bradycardia either. The correct definitive drug is atropine.

Give atropine

Quick Tip: Vagal bradycardia from eye-muscle traction needs an antimuscarinic.

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243. All of the following belong to the special visceral efferent column except:

- (A) Glossopharyngeal nerve
- (B) Nucleus ambiguus
- (C) Vagus nerve
- (D) Trigeminal nerve

Correct Answer: (B) Nucleus ambiguus

SOLUTION:

Step 1: Recall the functional column. The special visceral efferent column drives the striated muscles that develop from the branchial arches, such as the muscles of mastication, facial expression, pharynx, and larynx.

Step 2: Identify the members. The nerves containing *SVE* fibres are cranial nerves V, VII, IX, X, and XI.

Step 3: Separate nucleus from nerve. Among the options, the trigeminal, glossopharyngeal, and vagus are SVE nerves. The nucleus ambiguus is the source nucleus of SVE fibres for IX, X, and XI, but it is a nucleus rather than a nerve, so it does not belong in a list of SVE nerves.

Step 4: Conclude. The exception in this set is the nucleus ambiguus.

Quick Tip: Three options are SVE nerves; one is a brainstem nucleus.

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244. Which of the following conditions is NOT caused by parvovirus B19?

- (A) Roseola infantum
- (B) Aplastic anemia in sickle cell disease
- (C) Fetal hydrops
- (D) Erythema infectiosum

Correct Answer: (A) Roseola infantum

SOLUTION:

Step 1: Know the virus biology. Parvovirus B19 has a tropism for erythroid progenitor cells, which explains both its anaemic complications and its characteristic exanthem.

Step 2: Tally the true associations. B19 triggers a transient aplastic crisis when it hits patients with ongoing haemolysis like sickle cell disease, it crosses the placenta early in pregnancy to cause hydrops fetalis, and it is the agent of erythema infectiosum, the slapped-cheek fifth disease.

Step 3: Find the impostor. Roseola infantum, also called exanthem subitum or sixth disease, is a herpesvirus illness caused by HHV-6 (and HHV-7), so it has no link to parvovirus B19.

Step 4: Conclude. The disease not produced by parvovirus B19 is roseola infantum.

Roseola infantum

Quick Tip: One rash here is a herpesvirus (HHV-6) disease, not a parvovirus one.

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245. Which of the following statements is NOT true about the iliolumbar ligament?

- (A) Upper fibres are attached to the iliac crest
- (B) Lower fibres are attached to the base of the sacrum
- (C) It helps maintain lumbosacral joint stability
- (D) Upper attachment is to the transverse process of T12

Correct Answer: (D) Upper attachment is to the transverse process of T12

SOLUTION:

Step 1: Locate the structure. The iliolumbar ligament is a stout band stretching from the tip of the L5 transverse process to the inner lip of the iliac crest behind.

Step 2: Restate its anatomy. Its upper fibres anchor onto the iliac crest, its lower fibres reach the base of the sacrum, and overall it braces the lumbosacral junction against shearing forces.

Step 3: Check each claim. The statements about iliac-crest attachment, sacral attachment, and lumbosacral stability all match the true anatomy.

Step 4: Catch the error. The ligament springs from the transverse process of L5, not from T12, so claiming a T12 origin is incorrect. That false statement is the answer.

Upper attachment to transverse process of T12

Quick Tip: This ligament arises from L5, not from a thoracic vertebra.

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246. Where is the placement location for an auditory brainstem implant?

- (A) Scala tympani
- (B) Recess of the 4th ventricle
- (C) Internal auditory canal (IAC)
- (D) Back of the ear

Correct Answer: (B) Recess of the 4th ventricle

SOLUTION:

Step 1: Define the implant's job. Unlike a cochlear implant, an auditory brainstem implant skips the cochlea and cochlear nerve entirely and feeds signals straight to the cochlear nucleus in the brainstem.

Step 2: Recall who needs it. It is offered to NF2 patients who lose cochlear nerve function after acoustic tumour removal and to children born with absent or malformed cochleae or cochlear nerves.

Step 3: Pinpoint the site. To reach the cochlear nucleus, the surgeon lays the electrode array in the lateral recess of the fourth ventricle, typically during the same operation that removes the tumour.

Step 4: Reject the others. A cochlear implant array goes into the scala tympani; the internal auditory canal merely transmits the nerve; and the post-auricular area holds only the external speech processor. Hence the recess of the fourth ventricle is correct.

Recess of the 4th ventricle

Quick Tip: The ABI must reach the cochlear nucleus in the brainstem.

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247. Which condition is associated with congenital adrenal hypoplasia?

- (A) Male pseudohermaphroditism
- (B) Female pseudohermaphroditism
- (C) True pseudohermaphroditism
- (D) Sequential pseudohermaphroditism

Correct Answer: (A) Male pseudohermaphroditism

SOLUTION:

Step 1: Identify the genetic basis. Congenital adrenal hypoplasia in its X-linked form stems from loss or mutation of the *DAX* – 1 gene, which devastates the adult adrenal cortex.

Step 2: Recall DAX1's reach. Beyond the adrenal, DAX1 governs proper development of the hypothalamic-pituitary-gonadal axis, so its failure impairs androgen production and signalling.

Step 3: Predict the genital outcome. A genetic male with deficient or ineffective androgen action becomes under-masculinised, the picture of male pseudohermaphroditism.

Step 4: Contrast with hyperplasia. Excess adrenal androgens in congenital adrenal hyperplasia virilise females (female pseudohermaphroditism), the opposite scenario, while true and sequential pseudohermaphroditism are not features of adrenal hypoplasia. Thus the associated condition is male pseudohermaphroditism.

Male pseudohermaphroditism

Quick Tip: DAX-1 loss means deficient androgens in a genetic male.

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248. Which of the following is true regarding ataxia telangiectasia?

- (A) Increase in AFP (alpha-fetoprotein)
- (B) Increases the risk of squamous cell carcinoma
- (C) Autosomal dominant
- (D) None of the above

Correct Answer: (A) Increase in AFP (alpha-fetoprotein)

SOLUTION:

Step 1: Characterise the syndrome. Ataxia-telangiectasia, also called Louis-Bar syndrome, is an autosomal recessive neurodegenerative condition combining cerebellar incoordination with dilated small vessels and a defective DNA-repair system.

Step 2: Pick the true statement. A reliable marker of the disease is raised serum *AFP* (alpha-fetoprotein), so the statement about increased AFP is correct.

Step 3: Round out the picture. The faulty DNA repair drives a high risk of haematological malignancies, especially lymphoma and leukaemia, and patients also show oculomotor apraxia, dysarthria, and immunodeficiency with frequent infections.

Step 4: Knock out the false claims. The malignancy risk is lymphoreticular, not squamous cell carcinoma, and the inheritance is recessive rather than dominant, so only the AFP statement survives.

Increase in AFP

Quick Tip: Look for the classic raised tumour-marker, and note it is recessive.

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249. A diabetic patient develops hypopyon 2 days after cataract surgery. What is the management?

- (A) Intravitreal antibiotics
- (B) Eye drops
- (C) Surgery
- (D) No treatment required

Correct Answer: (A) Intravitreal antibiotics

SOLUTION:

Step 1: Interpret the signs. Pus in the front chamber of the eye within days of intraocular surgery, especially in a diabetic, signals acute postoperative endophthalmitis, a sight-threatening infection inside the eye.

Step 2: Decide the route. Because the bacteria sit deep within the vitreous, an effective drug level can only be reached by injecting directly into that space.

Step 3: Apply the treatment. The accepted urgent management is intravitreal injection of antibiotics, typically broad-spectrum agents such as vancomycin and ceftazidime, usually combined with a diagnostic vitreous tap.

Step 4: Exclude the weaker options. Eye drops do not penetrate to the vitreous, withholding treatment courts irreversible blindness, and vitrectomy is held back for the most severe presentations. Therefore intravitreal antibiotics is the answer.

Intravitreal antibiotics

Quick Tip: Post-op hypopyon means endophthalmitis; the drug must reach the vitreous.

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250. According to the ISNT rule, what is the thinnest part of the neuro-retinal rim?

- (A) Inferior
- (B) Superficial
- (C) Temporal
- (D) Medial

Correct Answer: (C) Temporal

SOLUTION:

Step 1: Spell out the mnemonic. ISNT stands for Inferior, Superior, Nasal, Temporal, listed from the thickest to the thinnest segment of the normal neuro-retinal rim.

Step 2: Read off the answer. Because Temporal is the last letter, the rim is thinnest on the temporal side and thickest on the inferior side.

Step 3: Note the disease correlation. Glaucomatous damage disturbs this sequence, producing preferential thinning at the inferior and superior poles and a violation of the ISNT rule that helps diagnosis.

Step 4: Dismiss the wrong options. Inferior is the thickest region, and superficial and medial are not even part of the ISNT terminology, leaving temporal as the correct thinnest part.

Temporal

Quick Tip: ISNT goes thickest to thinnest; the last letter is the answer.



251. Leiden thrombophilia is caused by a mutational abnormality of which of the following factors?

- (A) Factor V
- (B) Factor VII
- (C) Factor IX
- (D) Factor X

Correct Answer: (A) Factor V

SOLUTION:

Step 1: Decode the name. The disorder is literally called Factor V Leiden thrombophilia, naming both the factor involved and the city where it was described, and it is the commonest inherited clotting tendency.

Step 2: State the genetic defect. It results from a single mutation in the *Factor V* gene that alters the protein.

Step 3: Trace the consequence. The altered Factor V cannot be cleaved and inactivated by activated protein C, removing a natural brake on coagulation and leaving the patient prone to abnormal venous clots.

Step 4: Rule out the rest. None of Factor VII, IX, or X is implicated in this entity, so the answer must be Factor V.

Factor V

Quick Tip: The condition's own name reveals the clotting factor.



252. Anteversion of the uterus is maintained by which ligament?

- (A) Cardinal ligament
- (B) Uterosacral ligament
- (C) Pubocervical ligament
- (D) Round ligament

Correct Answer: (D) Round ligament

SOLUTION:

Step 1: Picture the resting uterus. Normally the uterus leans forward in both anteversion and anteflexion, with the fundus resting toward the bladder.

Step 2: Find the forward-pulling structure. The round ligament runs from the uterine cornu through the inguinal canal to the labia majora, and its forward traction holds the fundus tilted anteriorly, maintaining anteversion, a function that matters in pregnancy.

Step 3: Clarify the cardinal ligament's job. The cardinal ligament anchors the cervix laterally and supports the uterine angle, giving structural support rather than controlling the forward tilt.

Step 4: Eliminate the remaining options. The uterosacral ligament tethers the cervix posteriorly to the sacrum and the pubocervical ligament tethers it anteriorly to the pubis, so neither maintains anteversion. The correct answer is the round ligament.

Round ligament

Quick Tip: The ligament running to the labia majora pulls the fundus forward.

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253. Long standing pelvic inflammation may lead to which of the following conditions?

- (A) Pyometra
- (B) Uterine polyposis
- (C) Pseudopregnancy
- (D) Cystic endometrial hyperplasia

Correct Answer: (A) Pyometra

SOLUTION:

Step 1: Trace the mechanism. Chronic pelvic infection inflames and fibroses the cervix, narrowing or sealing the canal so uterine contents can no longer drain.

Step 2: Identify the result. Pus trapped behind this obstruction collects in the endometrial cavity. That walled-off purulent collection inside the uterus is by definition pyometra, classically seen after long standing PID or secondary to cervical stenosis.

Step 3: Exclude the other choices. Polyposis and cystic endometrial hyperplasia arise from unopposed estrogen stimulation of the endometrium, not from infection plus blockage. Pseudopregnancy reflects a false belief or hormonal mimicry of pregnancy and is unrelated to inflammation.

So the chronic-inflammation plus outflow-obstruction pathway points to one entity.

Pyometra

Quick Tip: Think of pus trapped behind an obstructed cervix.

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254.



A red soft to firm swelling on the sternum, biopsied with the histology shown above. What is the diagnosis?

- (A) Hemangioma
- (B) Osteochondroma
- (C) Osteoid osteoma
- (D) Paget disease

Correct Answer: (A) Hemangioma

SOLUTION:

Step 1: Use color as the signpost. A red lesion over bone implies abundant blood vessels, which immediately narrows the list toward a vascular tumor rather than a cartilaginous or sclerotic one.

Step 2: Confirm with pathology. A primary intraosseous hemangioma is a benign, slow growing tumor sitting in the medullary cavity. Under the microscope it is hamartomatous vascular tissue with endothelial-lined channels, sometimes containing fat, smooth muscle, fibrous stroma and thrombi. Although benign, it can rarely behave locally aggressively or fracture when large.

Step 3: Eliminate alternatives. Osteochondroma carries a hyaline cartilage cap over a bony stalk. Osteoid osteoma is a tiny nidus-bearing lesion famous for nocturnal pain easing with aspirin. Paget disease produces thickened, mosaic-patterned bone on biopsy. None give red vascular channels.

The vascular swelling matched to vascular histology yields a single answer.

Hemangioma

Quick Tip: A red bony swelling with vascular channels on histology.

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255. What differentiates delirium from dementia?

- (A) Confusion
- (B) Difficulty in communicating
- (C) Hallucination
- (D) Sudden change

Correct Answer: (D) Sudden change

SOLUTION:

Step 1: Compare the time course. Dementia is a slow erosion of memory and intellect unfolding across months or years. Delirium, the acute confusional state, erupts over days to weeks.

Step 2: Pick the unique feature. Because the symptoms in both overlap, the discriminating element must be the tempo of onset. A sudden, acute shift away from a person's usual mental state signals delirium, often superimposed on existing dementia, with inattention as its core sign.

Step 3: Rule out shared features. Confusion, trouble communicating and hallucinations appear in either disorder and therefore cannot separate them. The abrupt change is what is specific.

Onset speed, not the symptom list, is the deciding factor.

Sudden change

Quick Tip: Compare the speed of onset, not the symptoms themselves.

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256. Genital warts are caused by which virus?

- (A) Herpes simplex
- (B) Human papilloma
- (C) Cytomegalovirus
- (D) Varicella zoster

Correct Answer: (B) Human papilloma

SOLUTION:

Step 1: Classify the growth. A cauliflower-like soft anogenital growth that spreads through sexual contact is the classic picture of condyloma acuminatum.

Step 2: Attribute the agent. Condyloma acuminatum is driven by human papillomavirus, particularly the low-oncogenic-risk subtypes 6 and 11, which infect squamous epithelium and trigger wart formation.

Step 3: Dismiss the others. HSV gives recurrent painful ulcers, CMV produces a mononucleosis-like or congenital illness, and VZV causes vesicular chickenpox and dermatomal shingles. None create genital warts.

The wart-forming epitheliotropic virus is the answer.

Human papilloma virus

Quick Tip: Think of the virus behind condyloma acuminatum.

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257. Which drug regimen is given in a pregnant woman with HIV infection?

- (A) Tenofovir disoproxil fumarate with emtricitabine
- (B) Tenofovir disoproxil fumarate with lamivudine
- (C) Abacavir with lamivudine
- (D) All

Correct Answer: (D) All

SOLUTION:

Step 1: Frame the regimen. Every pregnant patient on ART receives a backbone of two nucleoside reverse transcriptase inhibitors plus a third anchor drug. The question only asks about the NRTI backbone choices.

Step 2: Validate each pair. Tenofovir disoproxil fumarate with emtricitabine, tenofovir disoproxil fumarate with lamivudine, and abacavir with lamivudine are all recognized preferred two-NRTI combinations that traverse the placenta. Abacavir is used only when HLA-B5701 testing is negative.

Step 3: Conclude. Because all three options are individually correct backbones, the inclusive choice captures them together.

No single backbone is exclusively right, so the combined option wins.

All

Quick Tip: All three are valid two-NRTI backbones in pregnancy.

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258. Which of the following structures develops from the dorsal mesentery?

- (A) Greater omentum
- (B) Lesser omentum
- (C) Liver
- (D) Diaphragm

Correct Answer: (A) Greater omentum

SOLUTION:

Step 1: Split the embryonic suspensions. The gut hangs by a dorsal mesentery posteriorly and a ventral mesentery anteriorly, and each gives rise to distinct adult structures.

Step 2: Follow the dorsal sheet. Its stomach segment, the dorsal mesogastrium, balloons inferiorly to form the apron-like greater omentum, while its colonic segment forms the mesocolon.

Step 3: Assign the distractors elsewhere. The ventral mesentery produces the lesser omentum and the falciform ligament, and it also houses the developing liver. The diaphragm has multiple separate origins. Therefore only the greater omentum maps to the dorsal mesentery.

The dorsal mesogastrium is the key link.

Greater omentum

Quick Tip: Dorsal mesogastrium of the stomach becomes which apron?



259.



What is the structure seen in the given X-ray below?

- (A) Stent
- (B) Surgical clips
- (C) Foley catheter
- (D) Intravesical wire

Correct Answer: (A) Stent

SOLUTION:

Step 1: Note the shape and path. The film reveals a thin radiopaque line with characteristic curled tips that follows the ureter from the kidney down to the bladder.

Step 2: Name it. That double-J or pig-tailed configuration is diagnostic of a ureteric stent, a urological catheter anchored above in the renal pelvis and below in the bladder to maintain urine drainage. Common indications include obstruction from stones, malignant compression, benign strictures and retroperitoneal fibrosis.

Step 3: Exclude alternatives. Surgical clips appear as short dense dots, a Foley shows a balloon within the bladder, and an intravesical wire stays inside the bladder. None trace the ureter with curled ends.

The J-shaped ureteric tube settles the diagnosis.

Stent

Quick Tip: Curled J-shaped tube running along the ureter.

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260.



What is the diagnosis based on the following X-ray?

- (A) Uterine Fibroid
- (B) Bladder Carcinoma
- (C) Bladder stone
- (D) Renal Tuberculosis

Correct Answer: (C) Bladder stone

SOLUTION:

Step 1: Locate the densities. Several smooth oval opacities sit in the center of the bony pelvis, matching where the urinary bladder lies.

Step 2: Match the pattern. A plain KUB is the first-line imaging for urinary stones, and bladder calculi classically present as round-to-oval, sometimes laminated,

radiopaque shadows in the pelvic midline. Calcium-containing stones are dense enough to be seen, while pure uric acid stones are radiolucent.

Step 3: Eliminate other choices. Fibroids show coarse popcorn calcification in the uterus, bladder cancer is a non-calcified soft tissue lesion, and renal TB calcifies the kidney itself. None give multiple discrete pelvic stones.

Central, oval, radiopaque pelvic lesions point to one answer.

Bladder stone

Quick Tip: Oval radiopaque shadows centrally in the pelvis.

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261. By which method is foreign DNA introduced into a cell by a virus or viral vector?

- (A) Transduction
- (B) Transcription
- (C) Lysogenic conversion
- (D) Transformation

Correct Answer: (A) Transduction

SOLUTION:

Step 1: Focus on the carrier. The key word is that a virus or viral vector physically delivers the DNA into the cell.

Step 2: Name the process. Genetic transfer mediated by a bacteriophage or viral vector is termed transduction, the mechanism by which DNA is shuttled from one bacterium into another inside a viral particle.

Step 3: Separate the rest. Transcription is DNA-to-RNA synthesis. Lysogenic conversion describes new traits a host gains once a prophage is incorporated. Transformation is the direct uptake of free DNA without any vector. Only one

involves a virus as the courier.

The viral courier mechanism gives the answer.

Transduction

Quick Tip: Which transfer uses a phage as the courier?

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262. Which one of the following shows allosteric inhibition?

- (A) Malonic acid & succinate
- (B) 2,3 BPG
- (C) Amino acid alanine & pyruvate kinase
- (D) Citrate

Correct Answer: (B) 2,3 BPG

SOLUTION:

Step 1: Recall the concept. A true allosteric inhibitor docks at a regulatory site away from the catalytic site and reduces substrate binding affinity across the protein's subunits.

Step 2: Spot the classic example. 2,3-BPG is the standard illustration: it slots into a central pocket of hemoglobin and decreases oxygen affinity of every subunit, stabilizing the tense (deoxy) state. This is negative allosteric modulation in its purest form.

Step 3: Discard the others. Malonate versus succinate is a competitive inhibition pair at the succinate dehydrogenase active site, not an allosteric one. The remaining options do not give the clean classic allosteric picture that 2,3-BPG does.

The hemoglobin regulator is the textbook allosteric inhibitor.

Quick Tip: Which molecule lowers hemoglobin oxygen affinity at a separate site?

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263. Which of the following is seen in seropositive rheumatoid arthritis?

- (A) Multiple joints affected
- (B) Symmetrical joint symptoms
- (C) Joint pain and swelling
- (D) All

Correct Answer: (D) All

SOLUTION:

Step 1: Set the definition. A positive rheumatoid factor in the serum defines seropositive rheumatoid arthritis, a chronic autoimmune joint disease.

Step 2: Catalog the presentation. The disease is a symmetrical inflammatory polyarthritis: it strikes many joints at once, mirrors itself on both sides of the body, and produces pain and swelling, particularly in the hands and feet, alongside morning stiffness and nodules.

Step 3: Conclude. Since every listed feature, multiple joint involvement, symmetry, and pain with swelling, is genuinely part of the picture, all of them apply together.

All three descriptors fit, so the combined choice is right.

All

Quick Tip: Symmetrical, polyarticular, painful and swollen - all true.



264. Which of the following is not seen in the anterior mediastinum?

- (A) Thyroid tumour
- (B) Thymoma
- (C) Lymphoma
- (D) Neurogenic tumor

Correct Answer: (D) Neurogenic tumor

SOLUTION:

Step 1: Recall the compartment contents. The anterior mediastinum normally houses the thymus, lymph nodes and possible retrosternal thyroid, sitting in front of the pericardium.

Step 2: Use the four Ts mnemonic. Anterior mediastinal masses are Thymoma, Teratoma, Thyroid lesions and Terrible lymphoma. That accounts for thymoma, lymphoma and thyroid tumor among the options.

Step 3: Find the exception. Neurogenic tumors grow from the nerves and sympathetic chain that run in the posterior mediastinum, so they are characteristic of the posterior, not anterior, compartment.

The nerve-derived tumor belongs posteriorly, making it the outlier.

Neurogenic tumor

Quick Tip: Remember the four Ts; nerves sit at the back.



265. Struvite stone is caused by which metal?

- (A) Magnesium
- (B) Calcium
- (C) Sodium & potassium
- (D) Both (a) & (b)

Correct Answer: (A) Magnesium

SOLUTION:

Step 1: Break down the chemistry. A struvite calculus, the classic infection stone formed in alkaline urine by urease-producing organisms, has the formula magnesium ammonium phosphate hexahydrate.

Step 2: Extract the metal ion. From $\text{MgNH}_4\text{PO}_4 \cdot 6\text{H}_2\text{O}$ the metal cation is magnesium, paired with ammonium and phosphate.

Step 3: Eliminate alternatives. Calcium drives oxalate and phosphate stones, while sodium and potassium are not structural cations of struvite. So neither calcium-based option fits.

The defining cation of triple phosphate stones is clear.

Magnesium

Quick Tip: Triple phosphate equals magnesium ammonium phosphate.

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266. Which of the following statements about Graves disease is false?

- (A) Results in hyperthyroidism
- (B) Autoimmune disorder
- (C) Common in male
- (D) Referred as toxic diffuse goitre

Correct Answer: (C) Common in male

SOLUTION:

Step 1: Build the profile. Graves disease is an autoimmune thyroid disorder where TRAb antibodies drive excess thyroid hormone production, producing hyperthyroidism and a diffusely enlarged toxic goitre.

Step 2: Check sex distribution. The disease overwhelmingly favors women, occurring roughly ten times more often in females than males, typically in women under forty.

Step 3: Identify the incorrect claim. Because three statements (hyperthyroidism, autoimmune, toxic diffuse goitre) are accurate, the false statement is the one calling it common in males, since it is far more common in females.

The sex-distribution claim is the false statement.

Common in male

Quick Tip: Graves is far more common in women, not men.

• • •

267. Aldosterone synthesis is stimulated by which of the following?

- (A) ACTH
- (B) Hyperkalemia
- (C) Hyponatremia
- (D) Exogenous steroids

Correct Answer: (B) Hyperkalemia

SOLUTION:

Step 1: Rank the regulators. The zona glomerulosa responds to several signals, but their potency runs hyperkalemia > angiotensin II > ACTH > hyponatremia.

Step 2: Justify the top stimulus. A rise in plasma potassium is the dominant trigger because aldosterone then drives renal potassium loss, closing a tight feedback loop that keeps body potassium balanced.

Step 3: Dismiss the rest. ACTH contributes only a small diurnal rhythm, not steady control. High sodium suppresses aldosterone, so hypernatremia is wrong, and only low sodium weakly stimulates it. External steroids play no stimulatory role.

The most powerful physiological driver is the potassium signal.

Hyperkalemia

Quick Tip: Which electrolyte rise most strongly drives aldosterone?

• • •

268. Which of the following is false about Alzheimer's disease?

- (A) One in 10 people age 65 and older has Alzheimer's disease.
- (B) Alzheimer's disease is curable.
- (C) Causes dementia
- (D) All of the above

Correct Answer: (B) Alzheimer's disease is curable.

SOLUTION:

Step 1: Frame the condition. Alzheimer's disease is a relentless, progressive brain disorder and the leading cause of dementia, marked by memory loss and confusion.

Step 2: Verify the true claims. Epidemiology supports about one in ten over age 65 being affected, and dementia is its defining clinical syndrome, so both are accurate.

Step 3: Expose the falsehood. Treatments such as cholinesterase inhibitors only temporarily relieve cognitive and behavioral symptoms; they neither stop nor reverse the disease. Therefore calling Alzheimer's curable is incorrect.

No cure exists, so the curable statement is the false one.

Alzheimer's disease is curable

Quick Tip: Treatments only ease symptoms; there is no cure.

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269. Which of the following is true about vitamin K?

- (A) Anticoagulant
- (B) Prolonged use of antimicrobials leads to deficiency
- (C) Dietary allowance is 15-20 mg
- (D) All of the above

Correct Answer: (B) Prolonged use of antimicrobials leads to deficiency

SOLUTION:

Step 1: Establish the function. Vitamin K is required for the liver to make prothrombin and the other vitamin-K-dependent clotting factors, making it essential for coagulation rather than an anticoagulant.

Step 2: Validate the antibiotic link. Intestinal bacteria contribute a meaningful share of vitamin K. Long courses of antibiotics suppress these bacteria, lowering vitamin K availability and risking deficiency, especially with poor dietary intake. This option holds true.

Step 3: Discard the wrong options. Labeling it an anticoagulant inverts its true clot-promoting action. The stated requirement of 15-20 mg confuses milligrams with the correct microgram-range allowance. Both are false.

Only the antibiotic-deficiency statement survives scrutiny.

Prolonged antimicrobial use leads to deficiency

Quick Tip: Gut bacteria make vitamin K; antibiotics reduce it.

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270. Which drug needs continuous monitoring of prothrombin time?

- (A) Aspirin
- (B) Lepirudin
- (C) Digoxin
- (D) Coumadin

Correct Answer: (D) Coumadin

SOLUTION:

Step 1: Recognize the agent. Coumadin is the brand name for warfarin, a coumarin anticoagulant taken orally for thromboembolic prophylaxis and treatment.

Step 2: Connect mechanism to monitoring. By inhibiting the vitamin-K-dependent factors II, VII, IX and X, warfarin lengthens the prothrombin time. Clinicians track this PT as the INR and adjust the dose continuously to stay within the safe therapeutic window.

Step 3: Rule out the alternatives. Aspirin acts on platelets and needs no PT titration, lepirudin (a thrombin inhibitor) is followed by aPTT, and digoxin is guided by serum levels and ECG changes, not PT.

The vitamin-K-antagonist anticoagulant is the PT-monitored drug.

Coumadin

Quick Tip: The vitamin K antagonist is followed by PT or INR.

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271. Which of the following are risk factors for cutaneous lymphoma?

- (A) Age
- (B) Gender
- (C) Weakened immune system
- (D) All

Correct Answer: (D) All

SOLUTION:

Step 1: Frame the disease. Cutaneous lymphoma is influenced by demographic and immune-related risk factors, each given as an option here.

Step 2: Confirm them one by one. Increasing age is important, with peak incidence in the fifth and sixth decades. Sex is relevant because most subtypes favor men. Immune compromise from HIV/AIDS or from transplant immunosuppression independently increases risk.

Step 3: Combine the findings. Because every listed factor, age, gender, and a weakened immune system, genuinely contributes to risk, they all hold true together.

All listed contributors are real risk factors.

All

Quick Tip: Older age, male sex and immunosuppression all count.

• • •

272. Which is not included in AIDS related complex?

- (A) Ectopic pregnancy
- (B) Recurrent genital candidiasis
- (C) Generalised lymphadenopathy
- (D) Chronic diarrhea

Correct Answer: (A) Ectopic pregnancy

SOLUTION:

Step 1: Recall the syndrome. The AIDS related complex is the symptomatic intermediate phase of HIV (class B), where immune suppression produces constitutional symptoms and opportunistic conditions.

Step 2: Match the options. Recurrent genital candidiasis, generalized (persistent) lymphadenopathy and chronic diarrhea are all classic ARC manifestations reflecting failing immunity.

Step 3: Spot the unrelated entry. Ectopic pregnancy is a gynecological event caused by abnormal implantation, with no link to immune compromise or HIV staging. It does not belong to ARC.

The non-immunological gynecological condition is the exception.

Ectopic pregnancy

Quick Tip: One option is purely obstetric, not immune-related.

• • •

273. Which is the treatment of choice for irradiation in chordoma?

- (A) Protons
- (B) Electrons
- (C) Gamma radiation
- (D) 3D-CRT

Correct Answer: (A) Protons

SOLUTION:

Step 1: Characterize the lesion. A chordoma is a slow, locally invasive tumor derived from notochord remnants, found mainly at the clivus and sacrum, lying right next to the brainstem and cord.

Step 2: State the therapeutic problem. These tumors resist radiation and require large doses for control, but the surrounding neural structures cannot tolerate stray dose. The ideal beam must concentrate energy at the target and stop abruptly beyond it.

Step 3: Select protons. Proton beams exploit the Bragg peak to dump their energy at a defined depth with minimal exit dose, allowing high tumor doses with maximal sparing of the brainstem and cord. Electrons penetrate too shallowly, while gamma and 3D-CRT photons deposit more dose in healthy tissue.

The high-precision charged-particle beam is the radiation of choice.

Protons

Quick Tip: Bragg-peak charged particles spare the nearby brainstem.

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274.



A woman presents with massive pulmonary thromboembolism. The gross appearance of the liver at autopsy is shown. Which of the following statements best characterizes the patient's condition?

- (A) Metastasis from pulmonary embolism
- (B) Angiosarcoma
- (C) Colonic adenocarcinoma with metastasis
- (D) Locally invaded hepatocellular carcinoma

Correct Answer: (C) Colonic adenocarcinoma with metastasis

SOLUTION:

Step 1: A liver covered by many separate nodules of tumor points to secondary spread, because a primary growth would usually form one dominant mass with local infiltration.

Step 2: Venous blood from the large bowel travels via the portal vein straight to the liver. This anatomical route explains why bowel cancers preferentially lodge in hepatic tissue.

Step 3: Roughly 10% to 25% of colorectal cancer patients have liver secondaries at the time of bowel surgery, and surgical resection of isolated hepatic deposits is the most effective therapy.

Step 4: Angiosarcoma is a rare vascular malignancy, hepatocellular carcinoma is typically solitary and locally invasive, and there is no tumor that arises from a pulmonary embolus. Hence the multinodular liver here is metastatic colonic adenocarcinoma.

Colonic adenocarcinoma with metastasis

Quick Tip: Which abdominal cancer drains via the portal vein straight to the liver?

• • •

275. Which of the following statements is FALSE about the Measles-Rubella (MR) vaccination campaign launched by WHO?

- (A) Children from 9 months to less than 15 years are vaccinated
- (B) Targets congenital rubella syndrome (CRS), responsible for irreversible birth defects
- (C) India has not yet launched this campaign
- (D) Will replace the routine immunization measles vaccine

Correct Answer: (C) India has not yet launched this campaign

SOLUTION:

Step 1: Three of these statements are correct facts about the MR drive; only one is wrong, and that wrong one is the answer.

Step 2: The MR campaign is one of the world's largest vaccination efforts, covering every child aged 9 months up to under 15 years with a single Measles-Rubella shot, so options 1 and 2 are valid.

Step 3: Following the mass campaign, MR vaccine is folded into the routine schedule and takes the place of the measles-only vaccine, confirming option 4 as true.

Step 4: India was an active participant and launched the campaign, committing to measles elimination and rubella control by 2020. The statement that India has not launched it is therefore the false one.

India has not yet launched this campaign

Quick Tip: Did India actually launch the MR campaign or not?

• • •

276. Which of the following is TRUE regarding Hemophilia A?

- (A) Serum levels of factor VIII are decreased
- (B) Deficiency of factor IX
- (C) PT is increased
- (D) PTT is decreased

Correct Answer: (A) Serum levels of factor VIII are decreased

SOLUTION:

Step 1: Match each clotting factor to its hemophilia type. Factor VIII deficiency equals hemophilia A; factor IX deficiency equals hemophilia B.

Step 2: Since the patient has hemophilia A, the missing protein is factor VIII, so its measured plasma level falls. This validates the first option.

Step 3: Factor VIII belongs to the intrinsic clotting cascade, which the PTT (aPTT) tests. A deficiency therefore prolongs the PTT rather than shortening it, so the option claiming PTT is decreased is false.

Step 4: PT reflects the extrinsic and common pathways and is unaffected in hemophilia A, so the option stating PT is increased is also incorrect. Deficiency of factor IX is a different disease entirely.

Serum levels of factor VIII are decreased

Quick Tip: Hemophilia A maps to which clotting factor?

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277. Marked bleeding is seen in which of the following conditions?

- (A) von Willebrand disease
- (B) Haemophilia A
- (C) Haemophilia B
- (D) Acute lymphoblastic leukemia (ALL)

Correct Answer: (D) Acute lymphoblastic leukemia (ALL)

SOLUTION:

Step 1: Compare the bleeding mechanisms. Hemophilias and von Willebrand disease impair coagulation factors or platelet adhesion in a defined, usually graded manner.

Step 2: In acute lymphoblastic leukemia, malignant lymphoblasts crowd out the bone marrow, sharply reducing platelet production. Severe thrombocytopenia is a hallmark and drives heavy spontaneous bleeding.

Step 3: While von Willebrand disease is the most common inherited bleeding disorder and the hemophilias cause joint and soft-tissue bleeds, the marrow failure of ALL can produce the most striking, widespread hemorrhage among these options.

Step 4: Hence the recall key marks ALL as the condition with marked bleeding.

ALL

Quick Tip: Which condition causes severe thrombocytopenia from marrow failure?

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278. Reed-Sternberg cells are found in:

- (A) Hodgkin's disease
- (B) Sickle cell anaemia
- (C) Thalassemia
- (D) Chronic myeloid leukemia (CML)

Correct Answer: (A) Hodgkin's disease

SOLUTION:

Step 1: Identify the disease by its signature cell. The Reed-Sternberg cell, with its owl-eye double nucleus, defines one specific lymphoma.

Step 2: These B-cell-derived giant cells sit against a background of reactive lymphocytes and carry the immunophenotype CD30+ and CD15+ while being CD20- and CD45-, which is characteristic of Hodgkin lymphoma.

Step 3: Finding these cells is essential to confirm Hodgkin lymphoma; not finding them strongly argues against the diagnosis.

Step 4: The remaining options are hemoglobinopathies (sickle cell, thalassemia) and a myeloproliferative disorder (CML), none of which feature Reed-Sternberg cells. Hence the answer is Hodgkin's disease.

Hodgkin's disease

Quick Tip: Owl-eye giant cells are the hallmark of which lymphoma?

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279. A bedridden patient experiences acute chest pain that is worsened by breathing. Which imaging technique would be most helpful?

- (A) USG
- (B) X-ray chest
- (C) Ventilation perfusion scan
- (D) CT scan

Correct Answer: (D) CT scan

SOLUTION:

Step 1: Pleuritic chest pain in an immobilized patient strongly suggests pulmonary embolism, supported by dyspnea, tachypnea, and possible hemoptysis.

Step 2: The aim of imaging is to visualize the clot within the pulmonary arteries quickly and reliably.

Step 3: Contrast-enhanced CT (CT pulmonary angiogram) directly images the filling defect of the embolus, is non-invasive, and has largely replaced conventional pulmonary angiography in routine practice, so it is the most helpful technique here.

Step 4: Plain chest radiograph and ultrasound lack sensitivity for clot, and the V/Q scan is a backup when CT or contrast is contraindicated. Therefore the CT scan is selected.

CT scan

Quick Tip: Which non-invasive scan has replaced pulmonary angiography for PE?

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280. Chordoma arises from:

- (A) Pharyngeal bursa
- (B) Notochord
- (C) Rathke's pouch
- (D) Luschka's bursa

Correct Answer: (B) Notochord

SOLUTION:

Step 1: Trace the embryological origin. The notochord is the midline structure of the developing axial skeleton, and its leftover cells can later become a tumor.

Step 2: These notochordal remnants persist along the midline from the skull base to the sacrum, which is exactly where chordomas appear, most often at the clivus and the sacrum.

Step 3: Histologically, the tumor is divided into conventional, chondroid, and dedifferentiated subtypes, all sharing the notochordal origin.

Step 4: Rathke's pouch is the embryological source of craniopharyngioma, while the pharyngeal and Luschka bursae are unrelated to this tumor. Hence chordoma arises from the notochord.

Notochord

Quick Tip: Which midline embryonic structure leaves remnants along the spine?

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281. What is the effect of progesterone-only pills?

- (A) Completely suppresses ovulation
- (B) Thins the lining of the uterus
- (C) Thickens the cervical mucus
- (D) All of the above

Correct Answer: (D) All of the above

SOLUTION:

Step 1: The progestin-only pill works through several contraceptive actions, so we should check each listed effect.

Step 2: By making cervical secretions thick and hostile, it blocks sperm from ascending into the uterus, satisfying the cervical mucus effect.

Step 3: It additionally suppresses ovulation and renders the endometrium thin and atrophic, so a fertilized ovum cannot implant. These cover the ovulation and uterine lining effects.

Step 4: Because every individual statement is a genuine action of the minipill, the combined choice is correct.

All of the above

Quick Tip: POPs act on mucus, ovulation, and endometrium together.

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282. Which metal results in "saturnine gout" formation?

- (A) Cadmium
- (B) Lead
- (C) Beryllium
- (D) Mercury

Correct Answer: (B) Lead

SOLUTION:

Step 1: The clue is the word "saturnine," historically tied to the metal lead through its old alchemical symbol Saturn.

Step 2: Chronic lead poisoning damages the kidneys and disturbs purine handling, so urate accumulates and deposits in joints, producing gout.

Step 3: A well-known route of exposure is moonshine or illicitly distilled liquor contaminated with lead, which classically triggers this form of gout.

Step 4: The other metals listed produce distinct toxic syndromes and are not associated with this gouty arthritis. Therefore lead is the answer.

Lead

Quick Tip: "Saturnine" is the alchemical name linked to which metal?

• • •

283. Which drug decreases bone resorption in osteoporosis?

- (A) Teriparatide
- (B) Risedronate
- (C) Cortisone
- (D) Cimetidine

Correct Answer: (B) Risedronate

SOLUTION:

Step 1: Anti-resorptive therapy in osteoporosis means inhibiting osteoclast-driven bone breakdown, so we look for the bisphosphonate.

Step 2: Risedronate, an aminobisphosphonate, binds bone mineral and poisons osteoclasts, cutting down resorption and slowing remodelling. This makes it the correct anti-resorptive agent.

Step 3: Teriparatide is the opposite kind of drug, an anabolic PTH analog that stimulates new bone formation rather than reducing resorption.

Step 4: Cortisone worsens bone density and can induce osteoporosis, and cimetidine has no role in bone metabolism. Hence risedronate is the drug that decreases bone resorption.

Risedronate

Quick Tip: Which option is a bisphosphonate that poisons osteoclasts?

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284. Phenylketonuria is due to deficiency of:

- (A) Phenylalanine
- (B) Phenylalanine hydroxylase (PAH)
- (C) Phenylene
- (D) All of these

Correct Answer: (B) Phenylalanine hydroxylase (PAH)

SOLUTION:

Step 1: PKU is a single-enzyme metabolic block inherited in an autosomal recessive manner, so we must name the missing enzyme.

Step 2: The defective enzyme is phenylalanine hydroxylase, encoded on chromosome 12 (12q22-q24.1), where more than 400 disease-causing mutations have been described.

Step 3: Without functional PAH, phenylalanine cannot be turned into tyrosine, so it accumulates and overflows into the phenylketone pathway, producing phenylpyruvate detectable in urine.

Step 4: Phenylalanine is the substrate that rises, not the deficiency, and "phenylene" is not a metabolic player, so the deficiency is of phenylalanine hydroxylase.

Phenylalanine hydroxylase (PAH)

Quick Tip: Which enzyme converts phenylalanine to tyrosine?

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285. Regarding the management of intracranial haematoma, which statement is NOT correct?

- (A) MRI is needed to assess haemorrhage
- (B) GCS assessment helps in prognosis
- (C) Haematoma must always be operated
- (D) All of the above

Correct Answer: (C) Haematoma must always be operated

SOLUTION:

Step 1: We need the statement that does not hold true. Management of a haematoma is individualized to its size, site, and symptoms.

Step 2: Imaging like MRI genuinely assesses the bleed and the GCS genuinely guides prognosis, so those two are valid statements.

Step 3: The claim that every haematoma must be operated is incorrect, because asymptomatic or small collections are simply observed and many superficial

bruises are handled conservatively with the RICE approach.

Step 4: Surgical drainage is reserved for selected symptomatic or critically located haematomas, not for all. Therefore the false statement is that a haematoma must always be operated.

Haematoma must be operated

Quick Tip: Is surgery mandatory for every haematoma?

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286. In the Maastricht classification of donation after cardiac death, what does category (stage) 3 represent?

- (A) Awaiting cardiac arrest
- (B) Brought in dead
- (C) Unsuccessful resuscitation
- (D) Cardiac arrest after brain-stem death

Correct Answer: (A) Awaiting cardiac arrest

SOLUTION:

Step 1: The Maastricht system sorts donors after cardiac death into ordered categories, so we recall each one in sequence.

Step 2: Category I covers patients brought in dead (uncontrolled), and category II covers those after failed resuscitation (uncontrolled).

Step 3: Category III is the controlled scenario of a patient awaiting cardiac arrest, where withdrawal of treatment is planned and death is expected, allowing a controlled organ retrieval.

Step 4: Category IV is cardiac arrest occurring in a patient already brain-stem

dead. Thus stage 3 is awaiting cardiac arrest.

Awaiting cardiac arrest

Quick Tip: Category III is the controlled, planned-withdrawal scenario.

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287. What is a cause of cardiogenic shock other than myocardial infarction?

- (A) Acute mitral regurgitation
- (B) Ventricular septal rupture
- (C) Isolated right ventricular shock
- (D) All of the above

Correct Answer: (D) All of the above

SOLUTION:

Step 1: Beyond pump failure from infarction, cardiogenic shock can stem from mechanical and right-heart problems, so we evaluate each option.

Step 2: Sudden severe mitral regurgitation collapses forward cardiac output, a classic cause of acute cardiogenic shock.

Step 3: A ruptured ventricular septum creates a large left-to-right shunt that starves the systemic circulation, and isolated right ventricular failure cannot fill the left ventricle, both leading to shock.

Step 4: Since every listed entity independently produces cardiogenic shock, together with tamponade and cardiac rupture, the inclusive option is correct.

All of the above

Quick Tip: Each mechanical and right-sided cause can produce shock.

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288. Nitric oxide acts by increasing:

- (A) BRCA 1
- (B) BRCA 2
- (C) Interleukin
- (D) cGMP

Correct Answer: (D) cGMP

SOLUTION:

Step 1: Recall the NO signaling pathway. Endothelial NO is a gas that crosses easily into nearby smooth muscle cells.

Step 2: Inside the cell, NO stimulates soluble guanylate cyclase to convert GTP into cyclic GMP, raising intracellular cGMP levels.

Step 3: Elevated cGMP behaves as a second messenger like cAMP, switching on protein kinases that relax the muscle and dilate the vessel.

Step 4: The other choices, the BRCA genes and interleukins, belong to DNA repair and immune signaling and have nothing to do with NO. Hence NO acts by increasing cGMP.

cGMP

Quick Tip: NO stimulates guanylate cyclase to make which messenger?

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289. Periodic acid-Schiff (PAS) positive macrophages are seen in:

- (A) Whipple's disease
- (B) Crohn's disease
- (C) AIDS
- (D) None of the above

Correct Answer: (A) Whipple's disease

SOLUTION:

Step 1: The hallmark histology here is foamy macrophages stuffed with PAS-positive, diastase-resistant material in the intestinal mucosa.

Step 2: This appearance is the textbook finding of Whipple's disease, caused by *Tropheryma whipplei*, which fills the macrophages with bacterial glycoprotein.

Step 3: Although disseminated *Mycobacterium avium* in AIDS can also load macrophages with PAS-positive bacilli, those organisms are acid-fast, whereas Whipple's bacilli are not, so acid-fast staining separates the two.

Step 4: Crohn's disease shows non-caseating granulomas, not PAS-positive macrophages. Therefore the classic answer is Whipple's disease.

Whipple's disease

Quick Tip: Foamy PAS-positive macrophages full of *T. whipplei*.

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290. A boy presents with multiple non-suppurative osteomyelitis along with sickle cell anaemia. What is the most likely causative organism?

- (A) Salmonella
- (B) S. aureus
- (C) H. influenzae
- (D) Enterobacter species

Correct Answer: (A) Salmonella

SOLUTION:

Step 1: The key modifier in this stem is sickle cell anaemia, which changes the usual microbiology of osteomyelitis.

Step 2: Normally S. aureus dominates osteomyelitis at all ages, but sickle cell patients have functional asplenia and bone infarcts that predispose them to Salmonella seeding.

Step 3: This well-known board association means that multiple bony infections in a child with sickle cell disease are most likely due to Salmonella species.

Step 4: The other organisms relate to neonatal, pediatric, or adult osteomyelitis without the sickle cell link, so they are not the best answer. Hence Salmonella is chosen.

Salmonella

Quick Tip: Sickle cell plus osteomyelitis equals which organism?

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291. The term "pathology" refers to:

- (A) Work
- (B) Function
- (C) Details
- (D) Explains

Correct Answer: (A) Work

SOLUTION:

Step 1: This is a definition question about what the word pathology denotes.

Step 2: Pathology is understood as the study of how a disease works, covering its causes, mechanisms, and consequences.

Step 3: Practically, it is the branch of medicine that examines tissue and body samples in the laboratory for diagnosis and forensic analysis, again centered on how disease processes operate.

Step 4: Among the choices, the option that best maps to "the way a disease works" is work, so the remaining options are set aside.

Work

Quick Tip: Pathology = the way a disease works.



292. A 1-year-old child weighing 6 kg has acute gastroenteritis with sunken eyes and a skin pinch that goes back very rapidly (severe dehydration). What is the appropriate IV fluid management?

- (A) RL infusion 120 ml in the first hour followed by 360 ml over the next 5 hours
- (B) RL infusion 180 ml in the first hour followed by 420 ml over the next 5 hours
- (C) RL infusion 180 ml in the first hour followed by 480 ml over the next 5 hours
- (D) RL infusion 240 ml in the first hour followed by 360 ml over the next 5 hours

Correct Answer: (B) RL infusion 180 ml in the first hour followed by 420 ml over the next 5 hours

SOLUTION:

Step 1: Treat severe dehydration with rapid IV fluids using weight-based dosing for a 6 kg infant.

Step 2: The resuscitation bolus is 30 mL/kg, so the first-hour volume is

$$30 \text{ mL/kg} \times 6 \text{ kg} = 180 \text{ mL.}$$

Step 3: The maintenance-replacement phase for a child under 12 months is 70 mL/kg over 5 hours, giving

$$70 \text{ mL/kg} \times 6 \text{ kg} = 420 \text{ mL.}$$

Step 4: Adding these, the regimen is 180 mL in the first hour then 420 mL over the next 5 hours, which singles out the matching option.

180 ml in the first hour, then 420 ml over 5 hours

Quick Tip: Bolus 30 mL/kg, then 70 mL/kg over 5 hours for a 6 kg infant.

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293. What constitutes the Malpighian layer of the skin?

- (A) Stratum corneum and stratum lucidum
- (B) Stratum corneum and stratum spinosum
- (C) Stratum spinosum and stratum basale
- (D) Stratum basale and stratum granulosum

Correct Answer: (C) Stratum spinosum and stratum basale

SOLUTION:

Step 1: Identify which epidermal strata are grouped as the Malpighian (germinative) layer.

Step 2: The Malpighian layer comprises the two deepest living layers of the epidermis, the stratum basale and the stratum spinosum, where keratinocytes are generated and begin maturing.

Step 3: Named after Marcello Malpighi, it is the proliferative zone of the skin; occasional narrower usages refer to just one of these layers, but the accepted pairing is basale and spinosum.

Step 4: The granulosum, lucidum, and corneum are the upper, increasingly keratinized layers and are excluded. Hence the Malpighian layer is the spinosum plus basale.

Stratum spinosum and stratum basale

Quick Tip: The two deepest living epidermal layers form it.

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294. Regarding gout, which of the following is the underlying metabolic basis?

- (A) Uric acid nephrolithiasis
- (B) Deficiency of the enzyme involved in purine metabolism
- (C) Increase in serum urate concentration
- (D) Renal disease involving the interstitial tissues

Correct Answer: (B) Deficiency of the enzyme involved in purine metabolism

SOLUTION:

Step 1: The question targets the fundamental metabolic defect behind gout rather than its clinical complications.

Step 2: Gout arises when purine breakdown is faulty because of a missing enzyme in the purine pathway, so purines are not fully processed for renal excretion and uric acid builds up.

Step 3: This enzymatic shortfall raises serum urate, and urate crystals then precipitate in joints to cause the painful attacks.

Step 4: Stone formation, raised serum urate, and interstitial nephropathy are downstream effects, while the enzyme deficiency in purine metabolism is the core cause per this recall key.

Deficiency of enzyme in purine metabolism

Quick Tip: Look for the root enzymatic defect, not a complication.

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295. Oxygen therapy may NOT be useful (and may be harmful) in:

- (A) Asthma
- (B) Pneumonia
- (C) Subglottic stenosis
- (D) Pulmonary fibrosis

Correct Answer: (D) Pulmonary fibrosis

SOLUTION:

Step 1: The trick is to spot the condition where extra oxygen aggravates rather than helps lung pathology.

Step 2: High oxygen concentrations generate reactive oxygen species; in oxidative-injury states such as paraquat poisoning, bleomycin lung, and pulmonary fibrosis, this worsens the damage.

Step 3: By contrast, asthma and pneumonia cause hypoxaemia that oxygen directly corrects, and subglottic stenosis benefits from oxygenation while the narrowed airway is managed.

Step 4: Hence, among the options, pulmonary fibrosis is the setting where oxygen therapy may not be useful.

Pulmonary fibrosis

Quick Tip: Oxygen worsens oxidative lung injury states.

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296. A newborn baby with a heart rate of less than 60 beats per minute can be resuscitated by all of the following EXCEPT:

- (A) Chest compression
- (B) Oxygen therapy
- (C) Tactile stimulation
- (D) Slapping the back

Correct Answer: (D) Slapping the back

SOLUTION:

Step 1: The question asks which maneuver is NOT part of neonatal resuscitation when the heart rate is under 60.

Step 2: Approved interventions are ventilation with oxygen, chest compressions, and gentle tactile stimulation, all of which are safe and evidence-based.

Step 3: Tactile stimulation means soft measures like rubbing the back or flicking the feet, not forceful blows.

Step 4: Slapping the back is outdated and potentially injurious to a newborn, so it is the exception. Therefore slapping the back is the answer.

Slapping the back

Quick Tip: Which maneuver is forceful and not recommended in newborns?

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297. Mobitz type 2 second-degree AV block is seen in all of the following EXCEPT:

- (A) Hypothyroidism
- (B) Coronary artery disease
- (C) Sarcoidosis
- (D) Cushing syndrome

Correct Answer: (D) Cushing syndrome

SOLUTION:

Step 1: The task is to find the condition NOT linked to Mobitz type 2 second-degree AV block.

Step 2: The conduction system can be damaged by ischaemia (coronary artery disease, MI), inflammation (myocarditis), and infiltration (sarcoidosis, haemochromatosis), all of which can produce this block, so those options are real causes.

Step 3: Metabolic and systemic causes such as myxoedema from hypothyroidism, Lyme disease, and neuromuscular disorders are also documented, confirming hypothyroidism as a cause.

Step 4: Cushing syndrome, a state of cortisol excess, is not on the list of recognized causes of this AV block, making it the exception.

Cushing syndrome

Quick Tip: Which endocrine excess is not a known cause of AV block?

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298. On what basis can one diagnose acute respiratory distress syndrome (ARDS) in a child?

- (A) Onset within 7 days of a known clinical insult
- (B) Respiratory failure not fully explained by cardiac failure or fluid overload
- (C) Presence of left ventricular dysfunction
- (D) All of the above

Correct Answer: (D) All of the above

SOLUTION:

Step 1: Diagnosing ARDS in a child requires checking several defining features together.

Step 2: The illness should begin within a week of a recognized triggering insult, satisfying the timing requirement.

Step 3: The hypoxaemic respiratory failure must not be attributable purely to heart failure or fluid overload, so the cardiac status, including any left ventricular dysfunction, has to be evaluated and accounted for.

Step 4: Since each of these considerations feeds into the diagnosis, the inclusive option covering all of them is correct.

All of the above

Quick Tip: ARDS criteria combine timing, oxygenation, and cardiac exclusion.

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299. A 6-year-old boy developed life-threatening shock; his CT scan showed a large amount of ascites, bowel wall thickening, and poor or absent enhancement of a strangulated bowel segment. Surgical exploration revealed gangrenous bowel. Which of the following is TRUE about the bowel anastomosis?

- (A) It should be done in continuous layers as it takes less time
- (B) It should be done with catgut
- (C) It should be done by single-layer seromuscular Lembert sutures
- (D) It should be done by a single layer taking the submucosa

Correct Answer: (C) It should be done by single-layer seromuscular Lembert sutures

SOLUTION:

Step 1: Recognize the diagnosis: an internal (transmesenteric) hernia has strangulated the small bowel, producing gangrene that must be resected and the ends rejoined.

Step 2: The favoured anastomotic method here is a single-layer technique using seromuscular Lembert sutures.

Step 3: The Lembert suture is an inverting stitch that approximates the serosa and muscularis without piercing the lumen, keeping the join clean; it may be placed continuous or interrupted.

Step 4: Choosing continuous closure merely for speed, using catgut, or a single layer that grabs the submucosa do not represent the recommended seromuscular Lembert approach. Hence the correct statement is the single-layer seromuscular Lembert anastomosis.

Single-layer seromuscular Lembert sutures

Quick Tip: Inverting suture that does not enter the bowel lumen.

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300. In ACLS, which drug can be given following ventricular fibrillation after cardiac arrest, other than epinephrine?

- (A) Amiodarone
- (B) Dopamine
- (C) Adenosine
- (D) Atropine

Correct Answer: (A) Amiodarone

SOLUTION:

Step 1: After cardiac arrest, the shockable rhythm VF is managed with prompt defibrillation and high-quality CPR.

Step 2: Pharmacology in the shockable algorithm pairs epinephrine, repeated every 3 to 5 minutes, with an antiarrhythmic drug to help convert and stabilize the rhythm.

Step 3: The first-line antiarrhythmic is amiodarone, given as 300 mg initially and 150 mg if a second dose is needed, with lidocaine as an alternative.

Step 4: Dopamine, adenosine, and atropine address shock, SVT, and bradycardia respectively, not refractory VF. Therefore the additional drug besides epinephrine is amiodarone.

Amiodarone

Quick Tip: Which antiarrhythmic is first-line for refractory VF in ACLS?