



General Instructions

- (i) This booklet contains 296 questions, each provided with a complete, step-by-step solution.
- (ii) It comprises 296 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. Regarding anterior choroidal artery syndrome, all are true except?

- (A) Hemiparesis
- (B) Hemisensory loss
- (C) Predominant involvement of anterior limb of internal capsule
- (D) Homonymous hemianopia

Correct Answer: (C) Predominant involvement of anterior limb of internal capsule

SOLUTION:

Begin with what artery the question concerns. The anterior choroidal artery arises from the internal carotid and is a small but clinically important vessel because its territory packs together motor, sensory and visual pathways in a tight space.

What does it actually feed? Its key supply is the posterior limb of the internal capsule, together with the optic tract, the lateral geniculate body and part of the medial temporal lobe. Because the posterior limb carries descending corticospinal motor fibres and ascending thalamocortical sensory fibres, and the optic pathway runs nearby, occlusion gives a recognisable triple deficit.

The triple deficit is: contralateral hemiplegia or hemiparesis from interruption of motor fibres, contralateral hemianesthesia or hemisensory loss from interruption of sensory fibres, and contralateral homonymous hemianopia from damage to the optic tract or lateral geniculate body.

Now screen the choices. Hemiparesis, hemisensory loss and homonymous hemianopia are all genuine features. The remaining option claims the anterior limb is predominantly involved, which is incorrect: the anterior choroidal artery serves the posterior limb. The anterior limb instead receives its blood from middle cerebral lenticulostriate branches and the recurrent artery of Heubner. Therefore the false statement, and the one the question asks for, is the anterior limb claim.

Predominant involvement of anterior limb of internal capsule

Quick Tip: The anterior choroidal artery supplies the posterior limb of the internal capsule, not the anterior limb.

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2. A surgeon removes a part of the liver to the left of the falciform ligament. Which segments has the surgeon removed?

- (A) 1 & 4a
- (B) 2 & 3
- (C) 1 & 4b
- (D) 1 & 3

Correct Answer: (B) 2 & 3

SOLUTION:

Approach this by translating an anatomical landmark into the Couinaud segment numbers. The falciform ligament is the visible fold on the front of the liver that historically divided it into right and left lobes. Anything lying to the left of this fold belongs to the anatomical left lobe of the liver.

In the functional Couinaud scheme, the left lateral section sitting to the left of the falciform ligament consists of segment II (superior) and segment III (inferior). So a resection that takes the liver tissue left of the falciform ligament is removing segments II and III.

This operation has formal names: left lateral segmentectomy, or in the Brisbane 2000 terminology, left lateral sectionectomy. It is a frequently performed sublobar resection.

Rule out the other answers using two facts. First, segment I is the caudate lobe, which wraps around the inferior vena cava on the posterior aspect and is not a left lateral structure, so any choice that includes 1 is excluded. Second, segment IV with its 4a and 4b subdivisions sits to the right of the falciform ligament (between it and the gallbladder fossa), so choices with 4a or 4b are excluded as well. Only the pairing of 2 and 3 survives.

2 & 3

Quick Tip: Liver to the left of the falciform ligament is the left lateral section, Couinaud segments II and III.

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3. Which of the following passes through the foramen magnum?

- (A) Internal carotid artery
- (B) Sympathetic chain
- (C) Hypoglossal nerve
- (D) Vertebral artery

Correct Answer: (D) Vertebral artery

SOLUTION:

Solve this by matching each candidate structure to the specific foramen that actually transmits it. The foramen magnum is the broad central aperture in the occipital bone where the brainstem and spinal cord join; its job is to let the medulla pass plus a defined set of vessels and ligaments.

The genuine contents of the foramen magnum include the medulla oblongata with its meninges, both vertebral arteries, the anterior and posterior spinal arteries, the spinal part of the accessory nerve heading upward, and the membrana tectoria together with the alar ligaments.

Now place each option in its correct opening. The internal carotid artery travels through the carotid canal of the temporal bone. The sympathetic chain runs as the cervical chain anterior to the transverse processes and does not traverse the foramen magnum. The hypoglossal nerve exits through the hypoglossal canal in the occipital bone. The vertebral artery, on the other hand, ascends through the transverse foramina and then enters the skull via the foramen magnum.

Only the vertebral artery is on the foramen magnum list, so it is the answer.

Vertebral artery

Quick Tip: The vertebral arteries enter the skull through the foramen magnum; the others use the carotid or hypoglossal canal.



4. Deoxygenated blood is not seen in?

- (A) Pulmonary artery
- (B) Umbilical artery
- (C) Umbilical vein
- (D) Right heart

Correct Answer: (C) Umbilical vein

SOLUTION:

Tackle this by remembering that the body has two paired exceptions to the usual artery-equals-oxygenated rule: the pulmonary circulation and, before birth, the umbilical circulation. The question is asking which listed vessel carries oxygen-rich rather than oxygen-poor blood.

Run through the choices. The pulmonary artery is one of the exceptions: it carries deoxygenated blood from the right ventricle toward the lungs. The right heart collects deoxygenated systemic blood returning through the venae cavae, so it too holds deoxygenated blood. The umbilical arteries carry deoxygenated, waste-laden fetal blood out to the placenta for gas exchange.

That leaves the umbilical vein. After the placenta oxygenates the blood, the umbilical vein is the conduit that brings this oxygen-rich blood back into the fetus. From there it passes through the ductus venosus into the inferior vena cava and onward to the right atrium, where the foramen ovale directs the well-oxygenated stream toward the head and heart.

So the single vessel free of deoxygenated blood is the umbilical vein.

Umbilical vein

Quick Tip: The umbilical vein is the exception: it carries oxygenated blood from the placenta to the fetus.

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5. All of the following are pneumatic bones except?

- (A) Frontal
- (B) Ethmoid
- (C) Mandible
- (D) Maxilla

Correct Answer: (C) Mandible

SOLUTION:

Work from the definition: a pneumatic bone is one that houses an internal air space, a sinus, which lightens the bone, gives the voice resonance, and conditions inhaled air. Identifying the odd one out means finding the listed bone that has no such air cavity.

In the skull, the bones built around the paranasal sinuses are the classic pneumatic bones. These are the frontal bone with its frontal sinus, the ethmoid bone with its ethmoidal air cells, the sphenoid with its sphenoidal sinus, and the maxilla with its large maxillary sinus.

Check the four options against that set. Frontal qualifies because of the frontal sinus. Ethmoid qualifies because of the ethmoidal air cells. Maxilla qualifies because of the maxillary sinus. The mandible, however, is a solid bone of the lower jaw with no paranasal air cavity, so it is not pneumatic.

The exception, and therefore the answer, is the mandible.

Mandible

Quick Tip: Pneumatic bones enclose paranasal sinuses; the mandible has no air sinus.



6. All are seen in injury to the common peroneal nerve except?

- (A) Loss of sensation over the sole
- (B) Foot drop
- (C) Injury to neck of fibula
- (D) Loss of dorsiflexion of toe

Correct Answer: (A) Loss of sensation over the sole

SOLUTION:

Frame the answer around two territories: what the common peroneal nerve does and where it does not reach. The common peroneal (fibular) nerve runs the anterior and lateral leg compartments, so it powers ankle and toe dorsiflexion through its deep branch and foot eversion through its superficial branch. The memory cue PED captures this: the Peroneal nerve Everts and Dorsiflexes.

Anatomically it loops around the fibular neck just under the skin, a spot where compression or fracture readily damages it. Sensory-wise it covers the anterolateral leg and the top (dorsum) of the foot.

From this, the expected findings after injury are: foot drop because dorsiflexion and eversion are lost, an injury site at the neck of the fibula, and loss of toe dorsiflexion. All three of those match listed options and are genuine features.

The remaining option is loss of sensation over the sole. The sole is innervated by the tibial nerve through its medial and lateral plantar branches, not by the peroneal nerve. Loss of sensation on the sole therefore signals tibial nerve damage, making it the false statement here.

Loss of sensation over the sole

Quick Tip: Sole sensation is tibial nerve territory; the common peroneal nerve covers the dorsum of the foot.

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7. Which among the following is a branch from the trunk of the brachial plexus?

- (A) Suprascapular nerve
- (B) Lateral thoracic nerve
- (C) Anterior thoracic nerve
- (D) Nerve to subclavius

Correct Answer: (A) Suprascapular nerve

SOLUTION:

Solve this by walking down the brachial plexus and noting which structure gives off which named nerve. The plexus is built from roots, then trunks, then divisions, then cords, then terminal branches, and small branches peel off at each stage.

Focus on the trunk level. The upper trunk is the part that gives off named supraclavicular branches: the suprascapular nerve and the nerve to subclavius both arise here. The suprascapular nerve is the textbook example of a trunk branch and is what such questions are testing.

Now eliminate the distractors. The lateral pectoral nerve, sometimes called the lateral or anterior thoracic nerve, comes off the lateral cord. The medial pectoral nerve comes off the medial cord. Neither pectoral nerve is a trunk branch, so the thoracic-nerve options are wrong.

That leaves the suprascapular nerve as the recognised branch arising from the trunk of the brachial plexus, which is the answer.

Suprascapular nerve

Quick Tip: The suprascapular nerve arises from the upper trunk; pectoral nerves come from the cords.

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8. Main blood supply of the neck of the femur is from?

- (A) Lateral circumflex femoral artery
- (B) Medial circumflex femoral artery
- (C) Profunda femoris artery
- (D) External iliac artery

Correct Answer: (B) Medial circumflex femoral artery

SOLUTION:

The proximal femur is nourished through an anastomotic ring lying on the neck, the retinacular arterial system. To identify the principal vessel, trace where these retinacular branches arise. They originate from the trochanteric anastomosis, a circle built largely by the two circumflex femoral arteries together with gluteal twigs. Within this circle, the vessel that wraps around the back of the femoral neck and donates the largest, most consistent retinacular branches (the posterosuperior group) is the medial circumflex femoral artery. The lateral circumflex femoral artery only feeds a limited anterior strip, the profunda femoris is the parent trunk that gives rise to both circumflex vessels rather than supplying the neck directly, and the external iliac artery lies far proximal in the pelvis and has no role here. Clinically this is reinforced by the fact that displaced subcapital (intracapsular) neck fractures tear these medial circumflex branches and produce avascular necrosis of the head, confirming the medial circumflex femoral artery as the dominant supply.

Medial circumflex femoral artery

Quick Tip: Think of the dominant vessel of the trochanteric anastomosis whose injury causes avascular necrosis after a neck fracture.

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9. Right isomerism is associated with?

- (A) Asplenia
- (B) Two spleens
- (C) One spleen
- (D) Polysplenia

Correct Answer: (A) Asplenia

SOLUTION:

Approach this by recalling which body half normally carries the spleen and what happens when laterality is duplicated. Heterotaxy syndromes arise when the embryo fails to establish a proper left-right axis, so paired organs become symmetrical instead of asymmetrical. Right isomerism means both halves adopt the morphology of the normal right side; the lungs become bilaterally trilobed and the bronchi bilaterally eparterial. Crucially, the spleen is an organ of the left side, so when the left-sided pattern is replaced by a right-sided pattern on both halves, the spleen simply does not form, giving asplenia. This bilateral right-sidedness, asplenia, and the accompanying complex cyanotic cardiac malformations together constitute Ivemark (asplenia) syndrome. The opposite condition, left isomerism, mirrors a normal left side on both halves and is the one that produces multiple spleens, or polysplenia. Hence two spleens, one spleen, and polysplenia all point toward left isomerism, leaving asplenia as the correct match for right isomerism.

Asplenia

Quick Tip: The spleen is a left-sided organ, so bilateral right-sidedness means it is missing.

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10. The urethral crest is situated in the:

- (A) Prostatic urethra
- (B) Membranous urethra
- (C) Penile urethra
- (D) Bulbar urethra

Correct Answer: (A) Prostatic urethra

SOLUTION:

Decide this by linking a named luminal landmark to its segment of the male urethra. The urethra has three parts: prostatic, membranous, and spongy (whose

proximal dilated portion is the bulbar urethra). The urethral crest is the median longitudinal fold on the posterior wall, and it is a defining internal feature of the segment that traverses the prostate. On this crest sits the seminal colliculus (verumontanum), the site where the prostatic utricle and both ejaculatory ducts discharge, and flanking it are the prostatic sinuses receiving the prostatic glandular ducts. None of these structures belong to the short membranous segment, the elongated penile segment, or the bulbar dilatation. Because the crest, the colliculus, and the prostatic sinuses are all housed within the same segment, the segment in question must be the prostatic urethra.

Prostatic urethra

Quick Tip: The crest carries the verumontanum where the ejaculatory ducts open.

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11. What is the type of joint seen at the growth plate (epiphyseal plate)?

- (A) Fibrocartilaginous joint
- (B) Primary cartilaginous joint
- (C) Secondary cartilaginous joint
- (D) Gomphosis

Correct Answer: (B) Primary cartilaginous joint

SOLUTION:

Classify this joint by identifying the tissue that bridges the two bony pieces. Joints that use cartilage as the connecting medium fall into two groups: synchondroses (primary) are bound by hyaline cartilage, whereas symphyses (secondary) are bound by fibrocartilage. The epiphyseal growth plate is a disc of hyaline cartilage interposed between the epiphysis and metaphysis that drives the lengthwise elongation of a developing long bone. Since hyaline cartilage is the bonding tissue, the plate fits the definition of a primary cartilaginous joint, or synchondrosis, which is a temporary and essentially immovable union that disappears once skeletal growth is complete. The fibrocartilage-based alternatives

such as the intervertebral disc and pubic symphysis are secondary cartilaginous joints, and a gomphosis is an entirely fibrous tooth-socket joint, so neither describes the growth plate.

Primary cartilaginous joint

Quick Tip: Hyaline cartilage uniting two bones means synchondrosis.

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12. Which among the following is not a component of the hypogastric sheath?

- (A) Broad ligament of uterus
- (B) Transverse cervical ligament
- (C) Lateral ligament of uterus
- (D) Lateral ligament of bladder

Correct Answer: (A) Broad ligament of uterus

SOLUTION:

Separate the genuine fascial offshoots of the hypogastric sheath from a peritoneal fold that only sounds similar. The hypogastric sheath is a fibrous extension of endopelvic fascia running from the side wall of the pelvis to the viscera, transmitting internal iliac vessels and the ureter, and it resolves into three fascial laminae. Anteriorly it forms the lateral ligament of the bladder, in its middle part it forms the transverse cervical (cardinal) ligament, which is also referred to as the lateral ligament of the uterus, and posteriorly it forms the lateral ligament of the rectum. All three are condensations of pelvic fascia and thus belong to the sheath. The broad ligament, in contrast, is simply a sheet of peritoneum tented over the uterus, tubes, and ovaries; being peritoneum rather than fascia, it has no part in the hypogastric sheath. Therefore the odd one out is the broad ligament of the uterus.

Broad ligament of uterus

Quick Tip: The sheath gives fascial laminae; a peritoneal fold does not belong.

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13. All of the following are seen in the floor of the third ventricle except?

- (A) Infundibulum
- (B) Oculomotor nerve
- (C) Mammillary body
- (D) Optic stalk

Correct Answer: (D) Optic stalk

SOLUTION:

Work through the adult landmarks that line the floor of the third ventricle and discard the one that is not a true floor structure. Running anteriorly to posteriorly, the floor is built by the optic chiasma, the tuber cinereum bearing the infundibulum, the paired mammillary bodies, the posterior perforated substance, and the midbrain tegmentum. From the options, the infundibulum and the mammillary bodies sit squarely within this list, and the oculomotor nerve is closely related as it exits through the interpeduncular region of the floor. The remaining choice, the optic stalk, is an embryological connection between the early optic vesicle and the diencephalon that matures into the optic nerve; in the formed brain the corresponding floor landmark is the optic chiasma, not a stalk. Because the optic stalk is a developmental remnant and not an adult floor component, it is the exception.

Optic stalk

Quick Tip: It is the chiasma, not a developmental stalk, that lies in the floor.

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14. Lines of Blaschko are:

- (A) Lymphatics
- (B) Blood vessels
- (C) Nerves
- (D) Lines of development

Correct Answer: (D) Lines of development

SOLUTION:

Identify what physical structure, if any, the lines of Blaschko trace, and then match it to the options. These lines are not anatomical conduits at all; rather they map the pathways along which ectodermal skin cells, including melanocytes and keratinocytes, spread out clonally while the skin is forming in the embryo. Their characteristic geometry, V-shaped over the spine, swirling S-shapes on the trunk, and longitudinal bands on the limbs, reflects this migratory expansion rather than the layout of nerves, arteries, or lymphatic channels. Consequently they are unrelated to dermatomes (nerves), to the vasculature (blood vessels), or to lymphatic pathways, and they only declare themselves clinically when mosaic genetic skin conditions such as incontinentia pigmenti or epidermal naevi arrange their lesions along these tracks. Since they record the routes of embryonic skin cell development, the correct description is lines of development.

Lines of development

Quick Tip: They trace embryonic skin cell migration, not nerves or vessels.



15. All of the following are affected in low radial nerve palsy except?

- (A) Extensor carpi radialis longus
- (B) Extensor carpi radialis brevis
- (C) Finger extensors
- (D) Sensation on dorsum of hand

Correct Answer: (A) Extensor carpi radialis longus

SOLUTION:

Think of the radial nerve as splitting at the elbow into two streams: a sensory stream (superficial radial) and a deep motor stream (posterior interosseous nerve). A low radial palsy hits only the deep motor stream after the split. To answer, ask of each option whether its supply leaves the trunk before or after that split.

The extensor carpi radialis longus receives its twigs from the main radial trunk while it is still in the arm, well above the elbow split, so a low lesion cannot reach it and it keeps working. The extensor carpi radialis brevis and all the long finger extensors are downstream targets of the posterior interosseous nerve, so they fail and the patient shows finger drop. Cutaneous supply to the back of the hand travels with the superficial radial branch, which also peels off above the lesion, so this sensation is intact; the posterior interosseous nerve carries almost no skin sensation anyway. The only listed structure whose nerve supply arises proximal to the injury and is therefore spared is the extensor carpi radialis longus.

Extensor carpi radialis longus

Quick Tip: ECRL is supplied by the radial nerve before it divides into the posterior interosseous branch.

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16. Site not affected in posterior cerebral artery infarct is?

- (A) Midbrain
- (B) Pons
- (C) Thalamus
- (D) Striate cortex

Correct Answer: (B) Pons

SOLUTION:

Use the rule that the posterior cerebral artery looks after the back of the brain plus the deep grey matter fed by its perforators, while the pons keeps its own separate blood supply. Walk through the choices with that idea.

The occipital striate cortex is the showpiece of the posterior cerebral artery, so its loss gives the typical visual field cut and it is clearly within territory. The thalamus is nourished by perforating twigs (thalamoperforators and thalamogeniculates) that spring from the posterior cerebral artery, so thalamic damage fits. The midbrain sits at the basilar tip and shares perforators with the posterior cerebral artery, so it too can be struck. The pons, however, draws its supply from pontine branches coming straight off the basilar trunk, a vessel proximal to and distinct from the posterior cerebral artery. Therefore the pons stays out of the posterior cerebral artery picture.

Pons

Quick Tip: The pons is fed by pontine branches of the basilar artery, not the PCA.

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17. Bifurcation of common carotid artery is palpated at?

- (A) Upper border of cricoid cartilage
- (B) Upper border of thyroid cartilage
- (C) Hyoid bone
- (D) Cricothyroid membrane

Correct Answer: (B) Upper border of thyroid cartilage

SOLUTION:

Anchor the answer to vertebral levels of the neck, because each midline cartilage maps to a spinal segment. The hyoid bone sits at C3, the upper edge of the thyroid cartilage at C4, and the cricoid cartilage at C6.

The common carotid artery climbs the neck and splits into internal and external branches exactly at the C4 level. Since the upper border of the thyroid cartilage is the palpable marker for C4, that is where a clinician feels the bifurcation and the carotid sinus. The cricoid at C6 is too low and corresponds instead to where the pharynx becomes oesophagus and larynx becomes trachea. The hyoid at C3 is too high. The cricothyroid membrane is an airway landmark used for emergency access, unrelated to the arterial split. Matching the artery to its C4 level leaves only the upper border of the thyroid cartilage.

Upper border of thyroid cartilage

Quick Tip: The carotid bifurcation lies at C4, the level of the upper border of the thyroid cartilage.

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18. In L5 root involvement, which among the following is not affected?

- (A) Thigh adduction
- (B) Knee flexion
- (C) Knee extension
- (D) Toe extension

Correct Answer: (A) Thigh adduction

SOLUTION:

Sort the listed actions by their root supply and then find the one that has no L5 fibres. The L5 root is famous for powering dorsiflexion and toe and big toe extension, and it also feeds hip and knee movements lower down the limb.

Toe extension depends on extensor hallucis longus and extensor digitorum longus, both flagship L5 muscles, so weakness here is expected with an L5 lesion. Knee flexion uses the hamstrings, which carry L5 and S1 fibres, so it can suffer. Knee extension through the quadriceps is chiefly L3 and L4 but has some L5

input, so it is not wholly spared. Thigh adduction, by contrast, is driven by the obturator-supplied adductor group rooted in L2, L3 and L4, with no L5 component at all. Because L5 contributes nothing to adduction, that movement is the one left intact.

Thigh adduction

Quick Tip: Thigh adductors are obturator-supplied (L2 to L4), outside the L5 myotome.



19. Muscular component of dorsal aorta develops from?

- (A) Septum transversum
- (B) Paraxial mesoderm
- (C) Intermediate mesoderm
- (D) Lateral plate mesoderm

Correct Answer: (B) Paraxial mesoderm

SOLUTION:

Separate the vessel into its lining and its muscular coat, then assign each layer to a mesodermal source. The inner endothelium of the dorsal aorta grows from angioblasts, but the question targets the muscular wall, so focus on what supplies smooth muscle and connective tissue around the trunk aorta.

The paraxial mesoderm, organised into somites and their sclerotomes, lies right alongside the developing dorsal aorta and contributes the vascular smooth muscle of its wall in the trunk region. The septum transversum is committed to the diaphragm and liver, so it is irrelevant here. The intermediate mesoderm is reserved for kidneys and gonads. The lateral plate mesoderm gives rise to body wall and gut smooth muscle and serous linings, but not to the muscular coat of the dorsal aorta in the trunk. With the muscular wall traced to the neighbouring somitic tissue, paraxial mesoderm is the source.

Paraxial mesoderm

Quick Tip: Somite-derived paraxial mesoderm supplies the trunk dorsal aorta smooth muscle.

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20. Diaphragm develops from all except:

- (A) Septum transversum
- (B) Dorsal mesocardium
- (C) Pleuroperitoneal membrane
- (D) Cervical myotomes

Correct Answer: (B) Dorsal mesocardium

SOLUTION:

Build the diaphragm piece by piece from its known sources and then spot the impostor in the list. The classic four components are the septum transversum, the two pleuroperitoneal membranes, the dorsal mesentery of the oesophagus, and migrating muscle from the cervical myotomes that drags the phrenic nerve down with it.

The septum transversum hardens into the central tendon, the pleuroperitoneal membranes seal off the dorsolateral gaps, and the cervical myotomes deliver the contractile muscle. The dorsal mesocardium, however, belongs to the story of the heart: it is the mesodermal sling that holds the heart tube and later perforates to create the transverse pericardial sinus. It contributes nothing to the diaphragm. So among the choices the dorsal mesocardium is the one that does not take part.

Dorsal mesocardium

Quick Tip: Dorsal mesocardium forms the transverse pericardial sinus, not the diaphragm.

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21. Posterior relations of head of pancreas are all except?

- (A) Common bile duct
- (B) First part of duodenum
- (C) Right crus of diaphragm
- (D) Inferior vena cava

Correct Answer: (B) First part of duodenum

SOLUTION:

Picture the head of the pancreas nestled in the C-loop of the duodenum and then list what lies against its back wall. The posterior surface is crossed by the common bile duct in its groove, and it rests against the inferior vena cava, the right renal vessels, and the right crus of the diaphragm.

The common bile duct, the right crus of the diaphragm, and the inferior vena cava all sit behind the head, so each of these three is a genuine posterior relation. The first part of the duodenum, however, arches over the superior and anterior aspect of the head rather than lying behind it; it is a superior and anterior relation. Since the question demands the structure that is not posterior, the first part of the duodenum is the answer.

First part of duodenum

Quick Tip: The first part of the duodenum lies above and in front of the head, not behind it.

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22. Which of the following is not supplied by the anterior division of the mandibular nerve (V3)?

- (A) Temporalis
- (B) Medial pterygoid
- (C) Lateral pterygoid
- (D) Masseter

Correct Answer: (B) Medial pterygoid

SOLUTION:

The trigeminal nerve has three divisions, and only its third (mandibular, V3) division is mixed and supplies the muscles of mastication. After leaving the skull through the foramen ovale, V3 forms a short undivided trunk and then breaks into anterior and posterior divisions.

From the undivided main trunk, two motor twigs arise early: the nerve to medial pterygoid (which also sends slips to tensor veli palatini and tensor tympani) and the meningeal branch. Because the nerve to medial pterygoid comes off the main trunk, the medial pterygoid is functionally outside the territory of the anterior division.

The anterior division itself is predominantly motor and supplies temporalis (via the deep temporal nerves), masseter (via the masseteric nerve) and lateral pterygoid, plus the sensory buccal nerve to the cheek mucosa.

Mapping the options: temporalis, lateral pterygoid and masseter are all in the anterior-division territory; only the medial pterygoid is not. Hence the muscle that is not supplied by the anterior division is the medial pterygoid.

Medial pterygoid

Quick Tip: The nerve to one pterygoid leaves the main V3 trunk, not the anterior division.

23. Basal metabolic rate is most closely associated with?

- (A) Lean body mass
- (B) Body surface area
- (C) Daily activity
- (D) Food intake

Correct Answer: (A) Lean body mass

SOLUTION:

The basal metabolic rate is the baseline energy turnover of a person who is awake but completely at rest, kept in a thermoneutral room, and fasted long enough (roughly 12 hours) that digestion and absorption no longer add to metabolism. Two of the listed choices are ruled out immediately by this definition: daily activity and food intake both raise metabolism above the basal floor, so neither can be the variable BMR is anchored to.

That leaves body surface area versus lean body mass. Historically BMR was reported per square metre of surface area because heat loss tracks surface area, and this made comparisons between individuals convenient. However, the tissue that actually burns the fuel is the fat-free (lean) tissue; fat stores contribute very little resting metabolism.

A simple thought experiment settles it: take two individuals with identical surface area. The one with more muscle and less fat (greater lean mass) consistently shows a higher basal rate, because the allometric relationship $\text{BMR} \propto \text{weight}^{0.75}$ reflects metabolically active mass. Thus lean body mass is the single factor BMR correlates with most tightly.

Lean body mass

Quick Tip: Metabolically active tissue burns the fuel, fat is largely inert.

24. Mineralocorticoid receptor is not present in?

- (A) Liver
- (B) Colon
- (C) Hippocampus
- (D) Kidney

Correct Answer: (A) Liver

SOLUTION:

Aldosterone acts through the mineralocorticoid receptor, a member of the nuclear-receptor superfamily (NR3C2, gene on chromosome 4). To answer where the receptor is absent, it helps to recall where it is present and why.

Epithelial targets carry MR to drive sodium handling: the distal nephron of the kidney and the colon both use MR to upregulate the epithelial sodium channel, the sodium-potassium pump and the kinase SGK1, so that sodium and water are retained while potassium is lost. This expands extracellular fluid volume and supports blood pressure.

Beyond classic salt-transporting epithelia, MR is also found in non-epithelial sites, notably the heart, brown fat, sweat glands and the central nervous system, where the hippocampus is a well-known MR-rich region involved in stress and corticosteroid signalling.

Comparing the four options against this list, kidney, colon and hippocampus are all established MR-bearing tissues. The liver does not figure among mineralocorticoid target organs, so it is the tissue lacking the receptor.

Liver

Quick Tip: Think of aldosterone targets: kidney, colon, heart, hippocampus, not the hepatocyte.

25. The primary action of nitric oxide (NO) in the gastrointestinal tract is?

- (A) Vasodilatation
- (B) Vasoconstriction
- (C) GI smooth muscle relaxation
- (D) Slow smooth muscle contraction

Correct Answer: (C) GI smooth muscle relaxation

SOLUTION:

Nitric oxide is the same molecule once described as endothelium-derived relaxing factor. Wherever it is released, its signalling endpoint is similar: it enters smooth muscle, stimulates guanylate cyclase to raise cGMP, and the resulting fall in cytosolic calcium relaxes the muscle.

The question asks specifically about the gut, so the relevant context is enteric motility rather than the vasculature. When food distends a segment of intestine, the enteric nervous system organises a coordinated reflex: the muscle just behind the bolus contracts while the muscle just ahead of it relaxes, propelling contents forward.

That forward (descending) relaxation is driven by inhibitory enteric neurons whose transmitters include nitric oxide, vasoactive intestinal peptide and ATP. These are classic non-adrenergic, non-cholinergic (NANC) signals, and NO is the principal inhibitory mediator producing relaxation of gastrointestinal smooth muscle.

While NO certainly causes vasodilatation in blood vessels, the option set is asking for its dominant role within the GI tract itself, which is to relax the smooth muscle of the gut wall.

GI smooth muscle relaxation

Quick Tip: NO is the NANC inhibitory transmitter that relaxes gut muscle ahead of the bolus.

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26. The main site of water absorption is?

- (A) Jejunum
- (B) Colon
- (C) Ileum
- (D) Stomach

Correct Answer: (A) Jejunum

SOLUTION:

Water movement across the gut follows sodium and solute transport, so the segment that handles the greatest osmotic and nutrient load also reabsorbs the most water. The daily fluid budget makes the answer quantitative rather than a matter of opinion.

On a typical day the gut sees close to 9000 mL of water: about 2000 mL swallowed in food and drink, plus roughly 7000 mL secreted by the salivary glands, stomach, pancreas, liver and intestine. Almost all of this must be recovered to avoid dehydration.

Breaking down where it goes: the jejunum reclaims the largest share at around 5500 mL, the ileum recovers about 2000 mL, and the colon mops up around 1300 mL. Only about 200 mL leaves the body in faeces.

Even though the colon is famous for concentrating stool, the absolute volume it absorbs is small compared with the proximal small bowel. The jejunum, with its high surface area and vigorous sodium-coupled transport, absorbs by far the most water of the listed sites.

Jejunum

Quick Tip: Compare absolute volumes: the proximal small bowel reclaims the most, not the colon.

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27. A small airway has laminar flow because?

- (A) Reynolds number more than 2000
- (B) Diameter is very small
- (C) The linear velocity of airflow in the small airway is extremely low
- (D) Total cross-sectional area is low

Correct Answer: (C) The linear velocity of airflow in the small airway is extremely low

SOLUTION:

The character of gas flow in the airways is governed by the Reynolds number, $Re = \frac{Dvd}{V}$, where D is the tube diameter, v the mean velocity, d the gas density and V the viscosity. Turbulence appears when Re is high (above roughly 3000), whereas flow stays smooth and laminar when Re is low (below about 2000).

To decide why small airways are laminar, examine which variable in the equation is driven down. The key fact is geometric: although a single terminal bronchiole is narrow, there are millions of them in parallel, so their combined cross-sectional area is enormous, dwarfing that of the trachea.

Flow velocity is inversely related to total cross-sectional area, so as inspired air spreads into this vast parallel network its linear velocity collapses to very low values. Plugging a small v into the Reynolds expression produces a small Re , and a small Re means laminar flow.

This also exposes the wrong options: laminar flow requires a low (not high)

Reynolds number, and the total cross-sectional area of the small airways is large rather than low. The genuine reason is the extremely low linear velocity of airflow in the small airways.

Linear velocity of airflow in small airways is extremely low

Quick Tip: Huge combined cross-section drops velocity, which drops the Reynolds number.



28. Orthopnoea in congestive heart failure develops due to?

- (A) Reservoir function of pulmonary veins
- (B) Pooling of blood in lower limb veins
- (C) Pulmonary hypertension
- (D) Systemic hypertension

Correct Answer: (A) Reservoir function of pulmonary veins

SOLUTION:

Orthopnoea is dyspnoea that comes on specifically when the patient lies flat and eases when they sit or stand. It tends to appear later in the course of heart failure than breathlessness on exertion, and understanding it depends on what posture does to venous return.

When a person is upright, a substantial volume of blood sits in the dependent veins of the legs and in the splanchnic bed. Lying down removes the gravitational gradient, so this stored blood drains centrally and the venous return to the right heart and lungs rises over a few minutes.

A healthy left ventricle simply pumps this extra volume onward. A failing left ventricle cannot, so the additional blood accumulates upstream in the pulmonary venous system. The pulmonary veins behave as a reservoir and become congested, raising pulmonary capillary pressure and pushing fluid into the lung

interstitium and alveoli.

This congestion stiffens the lungs and provokes breathlessness, which is why sitting up, by shifting fluid back to the periphery and lowering pulmonary venous pressure, brings relief. The central mechanism is the redistribution of blood with the reservoir function of the pulmonary veins.

Reservoir function of pulmonary veins

Quick Tip: Lying flat shifts pooled blood centrally and the failing heart backs it up into the lungs.

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29. Which nucleus is involved in the Papez circuit?

- (A) Pulvinar
- (B) VPL nucleus
- (C) Intralaminar nucleus
- (D) Anterior nucleus of thalamus

Correct Answer: (D) Anterior nucleus of thalamus

SOLUTION:

The Papez circuit is best remembered as a closed ring linking memory and emotion. Start at the hippocampal formation, which sends output through the fornix down to the mammillary bodies. The mammillary bodies then relay upward through the mammillothalamic tract, and the single thalamic station that receives this tract is the anterior nucleus of the thalamus. From there signals pass to the cingulate gyrus, on to the parahippocampal and entorhinal cortex, and finally loop back into the hippocampus. Checking the distractors: the pulvinar is an association nucleus tied to visual attention, the VPL nucleus carries body somatosensory input, and the intralaminar nuclei are part of the diffuse arousal/reticular projection system. None of these sit on the Papez ring, so the

only valid thalamic relay is the anterior nucleus.

Anterior nucleus of thalamus

Quick Tip: Follow the mamillothalamic tract from the mammillary bodies to its thalamic target.

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30. All of the following are true about phagocytosis EXCEPT:

- (A) Amoeba and other protozoans live their life by it
- (B) Used to ingest particles < 0.5 microns in size
- (C) Used to ingest particles > 0.5 microns in size
- (D) Digestion occurs within phagolysosomes

Correct Answer: (B) Used to ingest particles < 0.5 microns in size

SOLUTION:

This is an "except" question, so identify the one statement that does not fit phagocytosis. The defining size rule is the easiest discriminator: phagocytosis is reserved for large material, conventionally taken as larger than roughly 0.5 micron, which includes whole bacteria, apoptotic cells, and particulate debris. Anything below that threshold, and especially extracellular fluid, is taken up by pinocytosis instead. Now scan each choice. Free-living protozoa such as amoebae genuinely survive by phagocytosing food particles, so that statement holds. The claim that phagocytosis ingests particles above 0.5 micron also holds, since that is its job. The final option correctly describes the fate of the ingested material: the phagosome fuses with lysosomes to create a phagolysosome, the acidic compartment in which enzymatic digestion takes place. That leaves the statement assigning sub-0.5-micron uptake to phagocytosis as the wrong one.

Used to ingest particles < 0.5 microns

Quick Tip: Sub-half-micron uptake belongs to pinocytosis, not phagocytosis.

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31. Thiamine deficiency causes decreased energy production because:

- (A) It is required for the process of transamination
- (B) It is a co-factor in oxidative reduction
- (C) It is a co-enzyme for transketolase in the pentose phosphate pathway
- (D) It is a co-enzyme for pyruvate dehydrogenase and alpha-ketoglutarate dehydrogenase

Correct Answer: (D) It is a co-enzyme for pyruvate dehydrogenase and alpha-ketoglutarate dehydrogenase

SOLUTION:

Frame the answer around what actually generates ATP. Energy production hinges on getting carbon into the citric acid cycle and keeping that cycle turning, and thiamine pyrophosphate is the indispensable coenzyme at the two oxidative decarboxylation gates of that flow. The first gate is pyruvate dehydrogenase, which converts pyruvate from glycolysis into acetyl-CoA so it can enter the cycle. The second is alpha-ketoglutarate dehydrogenase, an enzyme inside the cycle itself that drives the conversion of alpha-ketoglutarate to succinyl-CoA. When B1 is deficient, both reactions falter, pyruvate accumulates (clinically seen as lactic acidosis), the cycle slows, and the supply of reducing equivalents to the electron transport chain dries up, cutting ATP. The remaining choices fail on specifics: transamination is a pyridoxal-phosphate job, thiamine is not a generic redox cofactor, and although transketolase is TPP-dependent it works in the non-oxidative arm of the pentose phosphate pathway and is used mainly to test thiamine status rather than to make energy.

Coenzyme for pyruvate and alpha-ketoglutarate dehydrogenase

Quick Tip: Think about which oxidative decarboxylations feed and drive the TCA cycle.

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32. What factor is responsible for deciding whether an antibody will remain membrane bound or get secreted?

- (A) Carbohydrate content
- (B) Class switching
- (C) Differential RNA splicing
- (D) Surface charge

Correct Answer: (C) Differential RNA splicing

SOLUTION:

The key is to separate two different molecular decisions a B cell makes. One decision is which isotype to express, and that is handled by class switching at the DNA level. A completely separate decision is whether a given heavy chain ends in a water-loving tail (so it can be released) or a fatty membrane-spanning tail (so it stays stuck to the cell surface as the B-cell receptor). That second decision is made on the messenger RNA: the same heavy-chain primary transcript is processed differently depending on which polyadenylation signal is used and which terminal exons are kept, i.e. differential or alternative splicing. Keep the transmembrane exons and you get a membrane-anchored receptor; remove them and use the upstream poly-A site and you get the secreted antibody. Surface charge and glycosylation modify antibodies but do not flip them between bound and secreted states, so they are wrong.

Differential RNA splicing

Quick Tip: One heavy-chain transcript, two endings: it is decided during RNA processing.

• • •

33. Vitamin K is involved in the post-translational modification of which amino acid?

- (A) Glutamate
- (B) Aspartate
- (C) Tyrosine
- (D) Tryptophan

Correct Answer: (A) Glutamate

SOLUTION:

Anchor on what vitamin K chemically does: it is the cofactor that lets gamma-glutamyl carboxylase add an extra carboxyl group to selected amino acid side chains in clotting-related proteins. The only residue that receives this gamma-carboxylation is glutamate, which is thereby turned into gamma-carboxyglutamate. The functional payoff is a calcium-binding site, because the twin carboxyl groups grip calcium ions and let factors II, VII, IX, and X plus proteins C and S dock onto phospholipid membranes during coagulation. That is why warfarin, by blocking vitamin K recycling, produces under-carboxylated, non-functional clotting factors. Aspartate, tyrosine, and tryptophan are not the substrates for this particular reaction, so they are excluded.

Glutamate

Quick Tip: Think gamma-carboxylation and the Gla domains of clotting factors.

• • •

34. Which among the following is NOT a cause of fasting hypoglycemia?

- (A) Glucagon excess
- (B) Glucose-6-phosphatase deficiency
- (C) Cirrhotic liver damage
- (D) Glycogen synthase deficiency

Correct Answer: (A) Glucagon excess

SOLUTION:

Reason from the direction each factor pushes blood glucose. Fasting hypoglycemia means the body fails to keep glucose up while not eating, so the culprits are conditions that cripple the liver's ability to release or make glucose. Glucose-6-phosphatase deficiency blocks the final dephosphorylation step shared by glycogenolysis and gluconeogenesis, trapping glucose inside the liver and dropping blood sugar (von Gierke disease). A cirrhotic liver has lost both its glycogen reserve and its gluconeogenic capacity, so fasting tips the patient into hypoglycemia. Glycogen synthase deficiency means barely any glycogen is laid down, so once meal-derived glucose is gone there is no store to draw on and glucose falls. Glucagon, in contrast, is the hormone whose entire job is to push glucose upward by driving glycogen breakdown and gluconeogenesis; too much of it produces high glucose, the opposite of hypoglycemia. So the odd one out is glucagon excess.

Glucagon excess

Quick Tip: Which listed factor would raise, not lower, blood glucose?

• • •

35. Cell fusion is an innovative method of preparing specific antibodies. Techniques to induce cell fusion include all of the following EXCEPT:

- (A) Attaching inactive viral particles on the cell membrane
- (B) Adding ethylene glycol
- (C) Applying a small electric current
- (D) Reducing the viscosity of the membrane

Correct Answer: (D) Reducing the viscosity of the membrane

SOLUTION:

This "all except" question tests the real-world toolkit for fusing cells when generating hybridomas. Three genuine approaches exist. First, biological: coat the cells with an inactivated fusogenic virus such as Sendai virus, whose envelope proteins force adjacent membranes to merge. Second, chemical: expose the cells to a polyol fusogen like polyethylene glycol or ethylene glycol, which strips away surface water, pulls membranes into intimate contact, and triggers fusion. Third, physical: deliver a brief electric pulse (electrofusion), which transiently breaks down the membrane and lets paired cells coalesce. Each of these is an established induction method. The remaining choice, simply lowering membrane viscosity, is not how cell fusion is actually induced; it is a vague property change rather than a recognised technique, which marks it as the exception.

Reducing the viscosity of the membrane

Quick Tip: Recall the three real fusogens: virus, chemical (PEG), and electric pulse.

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36. The urea cycle occurs in which of the following organs?

- (A) Liver
- (B) Intestine
- (C) Brain
- (D) Kidney

Correct Answer: (A) Liver

SOLUTION:

The body must remove the nitrogen that is released when amino acids are broken down, because free ammonia is neurotoxic. The biochemical machinery that performs this conversion of ammonia into urea is the urea cycle, and its five enzymes are co-expressed at high activity in only one tissue: the hepatocyte. Two reactions of the cycle run inside the liver mitochondrion and three run in the liver cytosol, after which urea travels in the blood to the kidney solely for filtration and excretion. The intestine and brain do not house the full pathway, and the kidney disposes of nitrogen mainly through glutamine metabolism rather than a complete urea cycle. Therefore the site of the urea cycle is the liver. $NH_3 \rightarrow \text{urea}$ happens in hepatocytes.

Liver

Quick Tip: Think of the only organ with all five enzymes that detoxify ammonia.

• • •

37. Which of the following changes in a vector is used to increase the yield of protein produced in recombinant protein synthesis?

- (A) Inducible promoter
- (B) Genes for protease inhibitors
- (C) Translation initiation
- (D) Translation and transcription termination

Correct Answer: (A) Inducible promoter

SOLUTION:

The amount of a recombinant protein that a cell makes is governed first and foremost by how much messenger RNA is transcribed from the cloned gene, and transcription is controlled by the promoter placed ahead of that gene in the

vector. To get the largest possible output, engineers fit the vector with an inducible promoter rather than a constitutive one. With an inducible system, the bacteria are first allowed to multiply to a high density while the foreign gene stays silent, sparing the cells the metabolic cost and toxicity of overexpression. An inducer such as IPTG is then added, throwing the promoter switch and triggering a massive, synchronized wave of transcription and protein synthesis. Adding protease inhibitor genes would only slow degradation, and adjusting translation start or stop signals addresses correctness of synthesis rather than overall quantity. Hence the deliberate vector modification that raises yield is the use of a strong inducible promoter.

Inducible promoter

Quick Tip: Yield depends on a controllable switch that turns transcription on at high cell density.

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38. Two plants are grown. One is engineered to express green fluorescent protein and the other to express firefly luciferase. Which plant will glow in the dark?

- (A) Both plants will glow
- (B) Neither plant will glow
- (C) Plant expressing green fluorescent protein will glow
- (D) Plant expressing firefly luciferase will glow

Correct Answer: (D) Plant expressing firefly luciferase will glow

SOLUTION:

The trick to this question is the difference between two ways of producing visible light. Green fluorescent protein works by fluorescence: it captures incoming high-energy light and re-radiates it as green light, so it is only visible when an external lamp shines on it. Take that excitation light away, as happens in a dark room, and the GFP plant stays dark. Firefly luciferase works by chemiluminescence instead. The enzyme catalyzes oxidation of luciferin using ATP, magnesium, and oxygen,

and the energy released by that chemical reaction is emitted directly as photons of visible light. Since the light is generated internally rather than borrowed from a lamp, the luciferase plant shines on its own and remains visible even with all room lights switched off. Therefore, in true darkness it is the firefly luciferase plant that glows, while the GFP plant does not.

Plant expressing firefly luciferase will glow

Quick Tip: One protein needs external light to be seen, the other makes its own light by a chemical reaction.

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39. A patient who was given primaquine develops hemolysis. The probable cause may be:

- (A) Glucose-6-phosphate dehydrogenase deficiency
- (B) Glucose-6-phosphatase deficiency
- (C) Alpha-ketoglutarate dehydrogenase deficiency
- (D) Pyruvate kinase deficiency

Correct Answer: (A) Glucose-6-phosphate dehydrogenase deficiency

SOLUTION:

Primaquine is an antimalarial that imposes heavy oxidative stress on circulating red cells. Erythrocytes cannot make new proteins or use mitochondria, so their only shield against oxidant damage is reduced glutathione, and keeping glutathione in its reduced form depends on a steady supply of NADPH. The single source of NADPH in the red cell is the pentose phosphate pathway, and the gatekeeper of that pathway is glucose-6-phosphate dehydrogenase. When this enzyme is deficient, the cell runs short of NADPH, glutathione cannot be regenerated, and an oxidant drug such as primaquine causes hemoglobin to precipitate as Heinz bodies, leading to acute intravascular hemolysis. The other listed defects do not fit: glucose-6-phosphatase deficiency is a glycogen storage disorder, alpha-ketoglutarate dehydrogenase belongs to the citric acid cycle, and

pyruvate kinase deficiency produces a chronic hemolysis unrelated to oxidant drug exposure. The drug-induced hemolysis therefore points to G6PD deficiency.

Glucose-6-phosphate dehydrogenase deficiency

Quick Tip: Oxidant drug plus red-cell hemolysis points to the enzyme that supplies NADPH.

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40. Transfer of an amino group from an amino acid to an alpha-keto acid is done by which enzyme?

- (A) Transaminases
- (B) Aminases
- (C) Transketolase
- (D) Decarboxylase

Correct Answer: (A) Transaminases

SOLUTION:

The reaction in the stem describes lifting an amino group off an amino acid and placing it onto an alpha-keto acid, so that the keto acid becomes an amino acid while the original amino acid becomes a keto acid. This exchange is the definition of transamination, and the enzymes that carry it out are the transaminases, also called aminotransferases. Familiar clinical examples are ALT and AST, both of which depend on the vitamin B6 derivative pyridoxal phosphate to ferry the amino group through the catalytic cycle. None of the other options fit the description: a transketolase shuttles two-carbon fragments within the pentose phosphate pathway, a decarboxylase strips off a carboxyl group releasing carbon dioxide, and aminases is not the recognized name for this group-transfer reaction. Thus the enzyme responsible is a transaminase.

Transaminases

Quick Tip: Moving an amino group between an amino acid and a keto acid is transamination.

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41. Which of the following statements about high-density lipoproteins (HDL) is FALSE?

- (A) HDL increases oxidation of LDL
- (B) HDL reduces foam cell production by LDL
- (C) HDL is the best predictor of coronary artery disease
- (D) HDL helps to clear lipids from atheroma

Correct Answer: (A) HDL increases oxidation of LDL

SOLUTION:

This is a negative-stem question, so the task is to find the one claim about HDL that is incorrect. HDL is the protective, antiatherogenic lipoprotein, and three of the statements correctly describe that protective behavior: it lowers foam cell formation by curbing macrophage uptake of modified LDL, a low HDL value is among the most reliable lipid markers for coronary artery disease, and through reverse cholesterol transport it pulls cholesterol out of atheromatous plaques and ships it to the liver. The remaining statement claims that HDL increases the oxidation of LDL, which is the reverse of reality, because HDL carries antioxidant enzymes such as paraoxonase that actively block LDL oxidation. Since that statement contradicts the true antioxidant function of HDL, it is the false one and therefore the intended answer.

HDL increases oxidation of LDL

Quick Tip: HDL is protective; pick the statement that contradicts its antioxidant role.

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42. Which of the following helps in generating the oxygen (respiratory) burst in neutrophils?

- (A) Superoxide dismutase
- (B) NADPH oxidase
- (C) Peroxidase
- (D) Glutathione reductase

Correct Answer: (B) NADPH oxidase

SOLUTION:

When a neutrophil engulfs a pathogen it triggers a sudden surge in oxygen consumption known as the respiratory or oxidative burst, whose purpose is to manufacture microbe-killing reactive oxygen species. The enzyme that ignites this burst is NADPH oxidase, a multi-subunit complex assembled on the phagosomal membrane that hands electrons from NADPH to oxygen and thereby generates the superoxide radical. From that superoxide the cell goes on to form hydrogen peroxide, and myeloperoxidase then converts peroxide and chloride into bactericidal hypochlorous acid. The competing options are not initiators: superoxide dismutase and glutathione reductase are protective enzymes that detoxify reactive species, and peroxidase operates only after peroxide has already been produced. The importance of NADPH oxidase is underscored clinically by chronic granulomatous disease, which results from its failure. Hence the enzyme responsible for generating the oxygen burst is NADPH oxidase.

NADPH oxidase

Quick Tip: Think of the enzyme that makes superoxide and whose defect causes chronic granulomatous disease.

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43. Which of the following is NOT an autoimmune disease?

- (A) Systemic lupus erythematosus (SLE)
- (B) Grave's disease
- (C) Myasthenia gravis
- (D) Sickle cell disease

Correct Answer: (D) Sickle cell disease

SOLUTION:

Begin by grouping the options by mechanism. SLE, Grave's disease and myasthenia gravis all share one feature: the body attacks itself. In SLE the attack is broad and systemic through immune complexes deposited in skin, joints and kidneys. In Grave's disease a specific autoantibody mimics TSH and overdrives the thyroid. In myasthenia gravis antibodies block and destroy acetylcholine receptors, producing fatigable muscle weakness. Each of these three is therefore immunological in origin.

Sickle cell disease belongs to a completely different category. It is inherited, not acquired through immune dysregulation. A single nucleotide substitution converts glutamate to valine at position six of the beta chain, producing HbS that polymerises when deoxygenated and deforms red cells into sickles. There is no role for autoantibodies or self-directed lymphocytes. Hence among the listed conditions only sickle cell disease falls outside the autoimmune group.

Sickle cell disease

Quick Tip: Three are antibody-mediated self-attacks; one is a single-gene haemoglobin defect.

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44. An 8 year old boy completed 8 out of a 10 day course of cefaclor. He now develops a generalized erythematous rash that is mildly pruritic along with lymphadenopathy. The diagnosis is?

- (A) Kawasaki disease
- (B) Type III hypersensitivity
- (C) Anaphylaxis
- (D) Infectious mononucleosis

Correct Answer: (B) Type III hypersensitivity

SOLUTION:

The key to this case is matching the time course and the offending drug to an immunological mechanism. A child who is well into a course of cefaclor and then breaks out with a diffuse itchy rash plus enlarged lymph nodes is showing the textbook picture of a serum-sickness-like reaction, a syndrome for which cefaclor is famously responsible in paediatric practice.

What drives this clinically? Over several days the body generates antibodies against the drug or its metabolites. These combine with antigen still present to form soluble immune complexes. Once these complexes settle in vessel walls and tissues they fix complement and recruit neutrophils, producing rash, joint aches, fever and lymphadenopathy. That immune-complex pathway is precisely what is classified as a Type III hypersensitivity response.

The competing choices fail on mechanism or detail. An immediate IgE event such as anaphylaxis would have struck within minutes, not a week later. Kawasaki disease is an idiopathic vasculitis defined by days of high fever plus eye, lip and extremity findings, with no link to antibiotics. The morbilliform rash of infectious mononucleosis is tied to aminopenicillins, not cefaclor. The unifying explanation here is immune-complex disease.

Type III hypersensitivity

Quick Tip: A delayed itchy rash with lymphadenopathy after cefaclor is a serum-sickness-like, immune-complex reaction.

45. Which among the following is the hallmark of acute inflammation?

- (A) Vasoconstriction
- (B) Stasis
- (C) Vasodilation and increase in permeability
- (D) Leukocyte margination

Correct Answer: (C) Vasodilation and increase in permeability

SOLUTION:

Think about what acute inflammation is designed to achieve: it must deliver more blood and let defensive plasma proteins and cells reach the injured tissue quickly. Both goals depend on the vascular response, which is why that response is treated as the hallmark of the process.

The sequence runs as follows. A momentary narrowing of vessels gives way almost immediately to widening of the arterioles, so flow surges into the capillary bed and the area turns warm and red. At the same time the venular endothelium contracts and pulls apart at junctions, opening gaps through which a protein-rich exudate leaks out, swelling the tissue. The leaked fluid raises local viscosity, slows flow into stasis, and lets neutrophils marginate and emigrate.

Of the choices given, vasoconstriction is only a transient prelude, while stasis and margination are later steps that follow from the permeability change. The single answer that captures the defining vascular event is the combination of dilation and leakiness.

Vasodilation and increase in permeability

Quick Tip: The defining vascular change brings more blood in and lets exudate leak out.

46. Some antigen was injected into a rabbit. Which antibody will it produce initially?

- (A) IgG
- (B) IgM
- (C) IgA
- (D) IgD

Correct Answer: (B) IgM

SOLUTION:

The scenario is a fresh exposure: an antigen meets the immune system for the very first time. The pattern of antibody production in such a primary response is well defined and explains the answer.

When naive B lymphocytes first recognise antigen, they begin antibody synthesis before any isotype switching has occurred. The default class they release is IgM. Its pentameric structure, with ten binding arms, makes it a powerful early agglutinator and a strong activator of the classical complement pathway, which is exactly what is needed before a refined response matures.

With time, signals from helper T cells drive class switch recombination, and the response shifts toward IgG, which dominates on re-exposure and provides long-lived, high-affinity protection. IgA guards mucosal surfaces and IgD largely functions as a B cell surface receptor, so neither is the initial circulating response. The earliest antibody on first contact is therefore IgM.

IgM

Quick Tip: First exposure means primary response; think of the pentameric antibody made first.

47. The principal organelle involved in the execution of apoptosis is?

- (A) Nucleus
- (B) Lysosome
- (C) Mitochondria
- (D) Endoplasmic reticulum

Correct Answer: (C) Mitochondria

SOLUTION:

To find the organelle that drives apoptosis, trace where the decision to die is integrated and where the lethal signal is launched. That convergence point is the mitochondrion.

Inside the cell, a tug of war between pro-apoptotic members such as Bax and Bak and survival proteins such as Bcl-2 determines the fate of the mitochondrial outer membrane. Once the pro-death side wins, the membrane becomes permeable and releases cytochrome c into the cytoplasm. This single event commits the cell, because cytochrome c assembles with APAF-1 into the apoptosome, switches on caspase-9, and unleashes the executioner caspases that dismantle the cell in an orderly fashion.

The other organelles play supporting or different roles. The nucleus shows the morphological end results such as chromatin condensation but does not control the trigger. Lysosomes are central to autophagy and necrosis-linked pathways, and the endoplasmic reticulum mainly senses stress and calcium imbalance that feed into the mitochondrial route. The hub that executes the programme is the mitochondrion.

Mitochondria

Quick Tip: Think of the intrinsic pathway and cytochrome c release.



48. Psammoma bodies are seen in all of the following EXCEPT?

- (A) Follicular carcinoma of thyroid
- (B) Papillary carcinoma of thyroid
- (C) Cystadenocarcinoma
- (D) Meningioma

Correct Answer: (A) Follicular carcinoma of thyroid

SOLUTION:

The trick to this question is recalling the short list of tumours famous for laminated calcific spheres and then spotting the one that does not belong. Psammoma bodies appear where there is papillary growth and ongoing cell death with dystrophic calcification, building up in concentric onion-skin rings.

Run through the options. Papillary thyroid carcinoma is the prototype, with psammoma bodies sitting in the cores of its branching papillae. Serous cystadenocarcinoma of the ovary, again a papillary serous tumour, is another classic source. Meningioma, particularly the psammomatous subtype, is so associated with these bodies that the name reflects it. All three fit the papillary or serous theme.

Follicular carcinoma of the thyroid breaks the pattern. It is defined not by papillae or psammoma bodies but by invasion of the capsule and of blood vessels by an otherwise bland follicular pattern. Lacking papillary architecture, it does not form these calcified bodies, making it the correct exception.

Follicular carcinoma of thyroid

Quick Tip: Psammoma bodies favour papillary and serous tumours; pick the follicular one out.



49. Which of the following is NOT a predisposing factor for atherosclerotic plaque formation?

- (A) ApoE
- (B) Alpha 2-macroglobulin
- (C) Oxidised LDL
- (D) Increased homocysteine

Correct Answer: (B) Alpha 2-macroglobulin

SOLUTION:

Approach this by checking each option against the accepted mechanisms of plaque build-up: lipid handling, oxidative modification, endothelial injury and inflammation. Three of the four slot neatly into these pathways, leaving one outlier.

Oxidised LDL is arguably the engine of the lesion. Once LDL infiltrates the intima and is oxidised, macrophages engulf it through scavenger receptors and become lipid-laden foam cells, the very founders of the fatty streak. Raised homocysteine fits too, because it injures endothelium and tips the wall toward thrombosis, a well-documented vascular risk. ApoE belongs as well, since its variants govern how efficiently remnant lipoproteins are cleared, and unfavourable isoforms raise cholesterol and atherosclerotic risk.

Alpha 2-macroglobulin does not fit this scheme. It is a large plasma protease inhibitor that mops up proteinases and binds cytokines as part of general homeostasis; it is not a driver of intimal lipid deposition or plaque growth. By exclusion it is the factor that does not predispose to atherosclerosis.

Alpha 2-macroglobulin

Quick Tip: Three relate to lipids, endothelium or oxidation; the protease inhibitor is the odd one out.



50. Which of the following is the most potent activator of T cells?

- (A) B cells
- (B) Follicular dendritic cells
- (C) Mature dendritic cells
- (D) Macrophages

Correct Answer: (C) Mature dendritic cells

SOLUTION:

Naive T lymphocytes can only be switched on when an antigen-presenting cell delivers two simultaneous messages: a peptide loaded onto an MHC molecule and a co-stimulatory handshake through the B7-CD28 axis. Among all body cells capable of presenting antigen, the dendritic cell stands out as the only true professional that can prime a resting T cell that has never seen its antigen before. Once a dendritic cell matures, it greatly upregulates surface MHC II along with **CD80** and **CD86**, giving it an unmatched capacity to engage and stimulate T cells in the lymph node paracortex. B cells and macrophages do present antigen, but they mainly amplify responses that are already underway and carry fewer co-stimulatory molecules, while follicular dendritic cells serve B-cell selection rather than direct T-cell priming. Therefore the cell that most powerfully turns on T cells is the mature dendritic cell.

Mature dendritic cells

Quick Tip: Think of the professional APC that uniquely primes naive T cells with both peptide-MHC and B7 co-stimulation.



51. Which of the following is true about a platelet function defect (qualitative platelet disorder)?

- (A) Normal platelet count with prolonged bleeding time
- (B) Thrombocytopenia with prolonged bleeding time
- (C) Normal bleeding time with normal platelet number
- (D) Normal platelet count with decreased bleeding time

Correct Answer: (A) Normal platelet count with prolonged bleeding time

SOLUTION:

The phrase platelet function defect points to platelets that are normal in number but abnormal in behaviour, so the screening test that depends on how platelets behave will be the one that turns abnormal. Bleeding time is the classic bedside test of primary haemostasis and is influenced both by how many platelets are present and by how well they stick to the vessel wall and to each other. In a purely functional disorder the marrow still produces a normal quantity of platelets, so any automated count comes back within range, yet because adhesion or aggregation is faulty the bleeding time stretches out. Conditions such as *Glanzmann* thrombasthenia, *Bernard-Soulier* syndrome, uremic platelet dysfunction, and antiplatelet drug effect all show this exact picture. A low count would instead signal a quantitative problem, a fully normal bleeding time with a normal count would indicate no disorder, and a shortened bleeding time is not a meaningful clinical entity. Hence the correct association is a normal platelet count paired with a prolonged bleeding time.

Normal platelet count with prolonged bleeding time

Quick Tip: A qualitative defect leaves the count untouched but cripples primary haemostasis, so which screening test lengthens?

• • •

52. All of the following are true about blood coagulation EXCEPT:

- (A) Factor X is a part of both the intrinsic and the extrinsic pathway
- (B) The extrinsic pathway is activated by contact with plasma and negatively charged surfaces
- (C) Calcium is very important for coagulation
- (D) The intrinsic pathway can be activated in vitro

Correct Answer: (B) The extrinsic pathway is activated by contact with plasma and negatively charged surfaces

SOLUTION:

This is a find-the-wrong-statement item, so the goal is to spot the single line that misassigns a property. Coagulation runs along two starting arms that merge into a shared final arm. The shared arm begins at Factor X, which means Factor X genuinely belongs to both the intrinsic and the extrinsic routes, so that claim holds. Calcium ions are needed for the assembly of clotting complexes on phospholipid surfaces, so that claim also holds. When blood is placed in a glass tube the negatively charged glass activates the contact factors and drives clotting through the intrinsic arm, so the statement that the intrinsic pathway works in vitro is correct as well. The flaw lies in the description of the extrinsic pathway: that arm is set off by tissue factor exposed at the site of injury along with Factor VII, whereas activation by contact with a negatively charged surface and plasma contact proteins is precisely the trigger for the intrinsic arm. Because the option swaps the intrinsic trigger onto the extrinsic pathway, it is the false statement.

Extrinsic pathway activated by contact with negatively charged surfaces (FALSE)

Quick Tip: Contact with a negatively charged surface starts the intrinsic, not the extrinsic, pathway.



53. All of the following are neuronal tumours EXCEPT:

- (A) Gangliocytoma
- (B) Ganglioglioma
- (C) Neuroblastoma
- (D) Ependymoma

Correct Answer: (D) Ependymoma

SOLUTION:

The task is to separate tumours built from nerve cells from one built from supporting glial cells. Three of the listed lesions trace their lineage to neurons or their precursors: a gangliocytoma is a mass of well-differentiated ganglion cells, a ganglioglioma blends neoplastic ganglion cells with a glial stroma yet still carries a clear neuronal element, and a neuroblastoma springs from immature neuroblasts that are committed to the neuronal line. The odd one out is the ependymoma, which grows from the ependymal lining of the ventricular system; these lining cells are members of the glial family rather than the neuronal family, so the tumour is grouped among the gliomas. Since the question asks for the non-neuronal entity, the answer is the ependymoma.

Ependymoma

Quick Tip: Ependymal cells are glial, not neuronal, so their tumour is the odd one out.

• • •

54. Which complement component is the first common point between the classical and the alternative complement pathways?

- (A) C1
- (B) C2
- (C) C3
- (D) C4

Correct Answer: (C) C3

SOLUTION:

Although the classical and alternative routes of complement begin with completely different recognition events, they are engineered to funnel into a single shared terminal sequence, and the question asks where that merge first occurs. The classical arm uses **C1** to sense immune complexes and then recruits **C4** and **C2** to build its convertase, whereas the alternative arm bypasses **C1**, **C4**, and **C2** entirely and assembles a separate convertase directly on microbial surfaces. The crucial design feature is that both convertases, despite their different make-up, exist for one purpose: to split **C3**. Once **C3** is cleaved the two streams become indistinguishable and proceed together through **C5** and on to the membrane attack complex. Thus the earliest molecule common to both pathways is the third component of complement.

C3

Quick Tip: Both pathways build different convertases, but they both act on the same substrate first.

• • •

55. All of the following are true about xanthogranulomatous inflammation EXCEPT:

- (A) Presence of foamy macrophages
- (B) Presence of tuberculous infection
- (C) Presence of multinucleated giant cells
- (D) Presence of yellow nodules

Correct Answer: (B) Presence of tuberculous infection

SOLUTION:

Xanthogranulomatous inflammation is a distinctive chronic, tissue-destroying reaction in which macrophages engorged with lipid pile up and turn the affected organ into soft yellow masses, the best known examples being the kidney in xanthogranulomatous pyelonephritis and the gallbladder in xanthogranulomatous

cholecystitis. Reading down the choices, the foamy lipid-rich macrophages are the defining cell type so that statement is correct, the abundant intracellular lipid is exactly what produces the gross yellow nodular appearance so that statement is correct, and scattered multinucleated giant cells do appear within the mixed chronic infiltrate so that statement is correct too. The misfit is the claim about tuberculous infection: the organisms classically driving this process are ordinary pyogenic bacteria such as *Proteus* and *E.coli* in the setting of chronic obstruction, and tuberculosis is not part of its definition. Because it is the only statement that does not belong, the presence of tuberculous infection is the exception.

Presence of tuberculous infection (FALSE)

Quick Tip: This lipid-laden yellow inflammation is driven by pyogenic bacteria like *Proteus*, not by TB.

• • •

56. All of the following are involved in generating free oxygen radicals for the killing of bacteria except:

- (A) Superoxide dismutase
- (B) Fenton reaction
- (C) NADPH oxidase
- (D) Glutathione peroxidase

Correct Answer: (D) Glutathione peroxidase

SOLUTION:

The microbicidal oxygen-dependent system of phagocytes depends on a chain that manufactures progressively more toxic radicals. The chain opens with NADPH oxidase, the membrane enzyme that reduces O_2 to the superoxide radical O_2^- ; this enzyme defect underlies chronic granulomatous disease. Superoxide dismutase then dismutates two superoxide molecules into H_2O_2 , and the Fenton reaction (iron-catalysed) turns that peroxide into the hydroxyl radical, the most bactericidal species. Each of these three steps either makes or transforms a free

radical, so all are part of radical generation. Glutathione peroxidase, by contrast, belongs to the cellular defence arm: it scavenges peroxide by oxidising glutathione, neutralising ROS so they do not damage host tissue. Because it terminates rather than creates radicals, it is the odd one out.

Glutathione peroxidase

Quick Tip: Find the antioxidant enzyme that mops up peroxide rather than making radicals.

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57. Which of the following is given to treat thrombocytopenia secondary to myelosuppressive therapy?

- (A) Iron dextran
- (B) Oprelvekin (interleukin-11)
- (C) Tranexamic acid
- (D) Erythropoietin

Correct Answer: (B) Oprelvekin (interleukin-11)

SOLUTION:

Myelosuppressive chemotherapy knocks down all marrow lineages, and when the platelet line is hit the patient needs a drug that pushes megakaryocytes back into production. Match each option to the lineage it supports. Erythropoietin and iron dextran both target the red cell pathway, so they fix anaemia, not low platelets. Tranexamic acid simply blocks clot breakdown to limit bleeding; it has no effect on marrow output. The only listed cytokine acting on the megakaryocyte-platelet axis is oprelvekin, the recombinant form of interleukin-11, which drives megakaryocytopoiesis and is licensed precisely for chemotherapy-related thrombocytopenia. By the lineage-matching logic, it is the answer.

Oprelvekin (interleukin-11)

Quick Tip: Look for the platelet growth factor, not a red-cell or antifibrinolytic agent.

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58. Which of the following is true about MRSA (methicillin-resistant *Staphylococcus aureus*) resistance?

- (A) It is due to production of penicillinase
- (B) It is due to alteration in penicillin binding proteins
- (C) It is plasmid mediated
- (D) It is treated with amoxicillin and clavulanic acid

Correct Answer: (B) It is due to alteration in penicillin binding proteins

SOLUTION:

The key to MRSA is to separate target-based resistance from enzyme-based resistance. Ordinary penicillin-resistant staphylococci secrete penicillinase, a beta-lactamase that chops the drug; that route is defeated by penicillinase-stable drugs or by inhibitor combinations such as amoxicillin with clavulanate. MRSA does something different: the chromosomal *mecA* gene produces PBP2a, a modified penicillin binding protein that the beta-lactam ring cannot latch onto. Since the drug target itself is changed, no amount of beta-lactamase inhibition restores activity, ruling out the amoxicillin-clavulanate option. The *mecA* determinant rides on the SCCmec cassette in the chromosome, so plasmid mediation is also incorrect. The single accurate statement describes the altered PBP.

Due to alteration in penicillin binding proteins

Quick Tip: Think *mecA* and PBP2a, a changed target rather than an enzyme.

• • •

59. Treatment with INH (isoniazid) leads to deficiency of which vitamin?

- (A) Thiamine
- (B) Niacin
- (C) Pyridoxine
- (D) Pantothenic acid

Correct Answer: (C) Pyridoxine

SOLUTION:

Isoniazid is a structural analogue of vitamin B6, and that resemblance is the whole story. By competing with pyridoxine, INH both promotes its renal loss and blocks the kinase that activates it to pyridoxal phosphate, leaving the body short of usable B6. The most visible result is a dose-related peripheral neuropathy, prevented by giving supplemental pyridoxine alongside the drug. None of the other vitamins offered, thiamine, niacin or pantothenic acid, share this analogue relationship with isoniazid, so they are unaffected. The vitamin made deficient is therefore pyridoxine.

Pyridoxine

Quick Tip: INH mimics vitamin B6 and triggers a neuropathy unless that vitamin is replaced.

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60. Which drug is not used to control bleeding during delivery of a woman with heart disease?

- (A) Methylergometrine
- (B) Carboprost
- (C) Syntocinon (oxytocin)
- (D) Misoprostol

Correct Answer: (A) Methylergometrine

SOLUTION:

Frame the question around cardiac safety: which uterotonic most threatens a failing heart? Rank the agents by their effect on the circulation. Oxytocin in controlled infusion has modest cardiovascular impact, and the prostaglandins carboprost and misoprostol act mainly on uterine tone, so all three can be used with care to control postpartum bleeding. The ergot alkaloid methylergometrine is different: it produces intense systemic vasoconstriction and a sharp pressor response, abruptly loading an already compromised heart and risking decompensation. For that reason it is specifically avoided in women with heart disease (and in hypertensive disorders). The drug that should not be given is the ergot agent.

Methylergometrine

Quick Tip: Avoid the ergot alkaloid that spikes blood pressure and afterload.

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61. All of the following are true about fulvestrant (a selective estrogen receptor downregulator) except:

- (A) Used for treatment of advanced breast cancer
- (B) Also known as a pure anti-estrogen
- (C) Is slower acting, has shorter duration of action and lower safety profile than SERMs
- (D) Administered as a once-monthly intramuscular injection

Correct Answer: (C) Is slower acting, has shorter duration of action and lower safety profile than SERMs

SOLUTION:

Treat fulvestrant as the answer to the limitations of the SERM class. SERMs such as tamoxifen are mixed agonist-antagonists, retaining estrogenic effects on endometrium and clotting; fulvestrant instead binds, fully blocks and then degrades the receptor, so it is correctly called a pure anti-estrogen and lacks those

agonist liabilities. Clinically it is reserved for advanced hormone-positive breast cancer, and because it is not orally usable it is formulated as a depot intramuscular shot given about once a month, giving it a long, not short, duration. The claim that it is slower acting, shorter acting and less safe than SERMs contradicts both its depot pharmacology and its cleaner agonist-free profile, so that is the untrue statement.

Slower acting, shorter duration, lower safety profile than SERM

Quick Tip: This SERD is a long-acting depot with a clean pure-antagonist profile.

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62. All of the following are true about ranolazine except:

- (A) It has hypotensive effects
- (B) It is a first-line antianginal drug
- (C) It affects glycemic control
- (D) It induces CYP3A

Correct Answer: (A) It has hypotensive effects

SOLUTION:

Ranolazine earns its niche precisely because it does not work like the classic antianginals. Beta blockers, calcium blockers and nitrates all act by changing heart rate or vascular tone, but ranolazine targets the late sodium current and eases ischaemia while leaving blood pressure and pulse essentially untouched; that hemodynamic neutrality is its hallmark, so calling it hypotensive is wrong. It is reserved as adjunctive therapy when first-line agents fall short rather than being a primary choice. Two real properties remain: it modestly improves glycaemic indices such as HbA1c, and it participates in CYP3A-mediated drug interactions. Filtering for the inaccurate statement leaves the hypotensive-effect claim.

Has hypotensive effects

Quick Tip: This late-sodium-current blocker eases angina without dropping blood pressure.

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63. Drug of choice for central diabetes insipidus is?

- (A) Desmopressin
- (B) Leuprolide
- (C) Thiazide diuretics
- (D) Insulin

Correct Answer: (A) Desmopressin

SOLUTION:

The clue is the word central. In central diabetes insipidus the posterior pituitary fails to release vasopressin, so a hormone analogue must be supplied externally. Desmopressin (1-deamino-8-D-arginine vasopressin) fits this requirement perfectly because it is a modified vasopressin molecule engineered for strong V2 receptor action and weak V1 action. Acting on V2 receptors in the collecting duct, it inserts aquaporin water channels and restores water reabsorption, abolishing the excessive dilute urine output. Its prolonged half-life allows convenient intranasal or oral dosing. Now ruling out the rest: Leuprolide is a gonadotropin-releasing hormone agonist with no role in water balance. Thiazide diuretics help only in the NEPHROGENIC form, where the kidney cannot respond to ADH, by reducing distal solute delivery and inducing mild volume contraction; they do nothing for the hormone deficiency of central DI. Insulin is purely a glucose-lowering agent for diabetes mellitus, a completely separate disorder despite the shared word diabetes. Therefore the hormone-replacement agent is the answer.

Desmopressin

Quick Tip: Replace the missing hormone: a long-acting V2-selective vasopressin analogue.

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64. Integrase inhibitor approved for treatment of HIV is?

- (A) Raltegravir
- (B) Indinavir
- (C) Lopinavir
- (D) Tipranavir

Correct Answer: (A) Raltegravir

SOLUTION:

This question is solved quickly by recognising drug-name suffixes, a high-yield trick in antiretroviral pharmacology. The integrase strand transfer inhibitors carry the suffix -gravir, so Raltegravir is immediately flagged as the integrase inhibitor; it was indeed the first of its class to gain regulatory approval for HIV and prevents the proviral DNA from being stitched into the host chromosome. Once integration is blocked, the virus cannot establish a productive infection in the cell. The other three choices end in -navir, the universal marker of HIV protease inhibitors. Indinavir, Lopinavir and Tipranavir all inhibit the aspartyl protease that processes the gag-pol polyprotein, yielding immature non-infectious virions, but they have nothing to do with the integrase enzyme. Hence by suffix logic alone the integrase inhibitor is the -gravir drug.

Raltegravir

Quick Tip: The integrase inhibitor class carries the suffix -gravir.

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65. Which of the following antihypertensive drugs is contraindicated in a patient on lithium therapy in order to prevent toxicity?

- (A) Clonidine
- (B) Beta blockers
- (C) Calcium channel blockers
- (D) Diuretics

Correct Answer: (D) Diuretics

SOLUTION:

The key concept is that the kidney cannot distinguish lithium from sodium in the proximal tubule. Anything that makes the body retain sodium will simultaneously make it retain lithium. Diuretics, by promoting natriuresis and shrinking the extracellular volume, trigger a compensatory upregulation of proximal sodium reabsorption; lithium piggybacks on this process and its renal excretion drops sharply. Since lithium already has a dangerously narrow margin between therapeutic and toxic plasma concentrations, this reduced clearance can quickly push levels into the toxic zone, producing coarse tremor, ataxia, confusion and cardiac disturbances. That is why a diuretic is the antihypertensive to steer clear of when a patient is on lithium. By contrast, the centrally acting agent clonidine, the beta-adrenergic blockers and the calcium channel blockers do not meaningfully alter renal lithium handling and are far safer choices for blood-pressure control in such patients.

Diuretics

Quick Tip: Sodium and volume depletion make the kidney reabsorb more lithium.

• • •

66. Which of the following is not an adverse effect of thalidomide?

- (A) Diarrhoea
- (B) Teratogenicity
- (C) DVT
- (D) Hypothyroidism

Correct Answer: (A) Diarrhoea

SOLUTION:

To answer this odd-one-out, recall the classic toxicity profile of thalidomide. Its place in medical history is sealed by severe teratogenicity, the limb-reduction deformity phocomelia, which forces strict pregnancy-prevention programmes for anyone taking it; that effect is genuine. Thalidomide is also strongly prothrombotic, so deep vein thrombosis and pulmonary embolism are frequent, especially in multiple myeloma regimens where it is paired with steroids or chemotherapy, prompting routine anticoagulant or aspirin prophylaxis; again a real effect. Endocrine surveillance is needed too, because the drug can induce hypothyroidism, a documented adverse reaction. The gastrointestinal effect of thalidomide, however, is CONSTIPATION arising from its sedative and anticholinergic-like actions, not diarrhoea. Since the stem wants the effect that does not belong, the loose-stool option is the exception.

Diarrhoea

Quick Tip: Thalidomide slows the gut and causes constipation, not loose stools.

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67. Amphotericin B causes deficiency of?

- (A) Sodium (Na)
- (B) Calcium (Ca)
- (C) Potassium (K)
- (D) Magnesium (Mg)

Correct Answer: (C) Potassium (K)

SOLUTION:

Think of amphotericin B as a drug that is hard on the kidneys. By interacting with sterols in cell membranes it not only kills fungi but also injures the renal tubular

epithelium, increasing its permeability and impairing reabsorption. The downstream consequence is heavy renal wasting of electrolytes, and the cation lost most conspicuously is potassium, producing clinically important hypokalaemia that requires monitoring and supplementation during therapy. Magnesium can also be depleted by the same tubular mechanism and may need replacing, yet the single best textbook answer linked to amphotericin B is potassium depletion. Deficiencies of sodium or calcium are not the hallmark electrolyte disturbances of this agent. So the electrolyte the drug drives down is potassium.

Potassium (K)

Quick Tip: Renal tubular damage with this antifungal causes wasting of K.

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68. All of the following decrease bone resorption in osteoporosis except?

- (A) Alendronate
- (B) Etidronate
- (C) Strontium
- (D) Teriparatide

Correct Answer: (D) Teriparatide

SOLUTION:

Sort the four drugs into the two fundamental categories of osteoporosis treatment. The antiresorptive camp works by shutting down osteoclasts so that existing bone is not broken down: this includes the bisphosphonates alendronate and etidronate, which bind hydroxyapatite and poison osteoclast function, and strontium, which is conventionally placed with the antiresorptives for its osteoclast-suppressing component. All three therefore decrease bone resorption. The odd drug out is teriparatide, a fragment of parathyroid hormone administered as once-daily injections. Although chronically high PTH dissolves bone, the intermittent low-dose pulse delivered by teriparatide flips the effect and

powerfully stimulates osteoblasts, making it an anabolic, bone-forming agent rather than a resorption blocker. Since the stem asks which drug does not reduce resorption, the formation-stimulating PTH analogue is the answer.

Teriparatide

Quick Tip: One of these builds bone (anabolic PTH) rather than blocking osteoclasts.

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69. Which is not seen in digoxin toxicity?

- (A) Bidirectional ventricular tachycardia
- (B) Paroxysmal atrial tachycardia
- (C) Ventricular bigeminy
- (D) Regularisation of atrial fibrillation

Correct Answer: (D) Regularisation of atrial fibrillation

SOLUTION:

The toxic ECG signatures of digoxin arise from a paradoxical pairing of speeded-up ectopic pacemakers and slowed-down AV conduction. Because intracellular calcium rises, automaticity surges, giving the dramatic bidirectional ventricular tachycardia, frequent ventricular ectopics arranged as ventricular bigeminy, and atrial tachyarrhythmias such as paroxysmal atrial tachycardia, the last often accompanied by AV block. All three of those are genuine toxic findings. The fourth choice, regularisation of atrial fibrillation, does not fit the picture: digoxin in a fibrillating patient simply blunts AV transmission and lowers the ventricular rate but leaves the chaotic atrial activity intact, so it neither restores sinus rhythm nor smooths the irregular rhythm into a regular one. A regular rhythm emerging in AF would point to complete AV block with an escape pacemaker, not to plain regularisation. Therefore the feature that is not a recognised marker of digoxin toxicity is regularisation of atrial fibrillation.

Regularisation of atrial fibrillation

Quick Tip: Digoxin slows AV node and the ventricular rate but does not convert AF to a regular rhythm.

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70. Buprenorphine is which of the following?

- (A) Partial agonist at mu receptor
- (B) Partial agonist at kappa receptor
- (C) Full agonist at mu receptor
- (D) Antagonist at kappa receptor

Correct Answer: (A) Partial agonist at mu receptor

SOLUTION:

Buprenorphine belongs to the mixed agonist-antagonist family of opioids. The key to this question is matching one drug to its dominant pharmacodynamic action at each opioid receptor subtype.

At the mu receptor, buprenorphine binds with very high affinity but produces only a sub-maximal response, which is the definition of a partial agonist. This sub-maximal activation explains its analgesic effect together with a ceiling on respiratory depression. At the kappa receptor it behaves as an antagonist, which contributes to fewer dysphoric effects compared with pure kappa agonists.

Because its affinity at mu is so high, it can knock a full agonist such as heroin or morphine off the receptor while delivering only partial signalling, which is why starting it too early can trigger precipitated withdrawal. This same property underlies its usefulness in opioid maintenance therapy, often combined with naloxone to deter misuse.

Running through the choices: full mu agonist describes morphine, not

buprenorphine; kappa agonist describes drugs like nalbuphine or pentazocine; and pure kappa antagonism alone does not capture the drug. The single most accurate descriptor is partial mu agonism.

Partial agonist at mu receptor

Quick Tip: Think mixed agonist-antagonist with a ceiling on respiratory depression.

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71. Which among the following is the best inotrope drug for use in right heart failure due to pulmonary hypertension?

- (A) Dopamine
- (B) Isoprenaline
- (C) Halothane
- (D) Milrinone

Correct Answer: (D) Milrinone

SOLUTION:

The right ventricle in pulmonary hypertension is fighting against a high pulmonary afterload, so the ideal agent must do two jobs at once: pump the heart harder and open up the pulmonary vessels. A drug that does both is termed an inodilator, and milrinone is the classic example.

Milrinone blocks phosphodiesterase-3, so cyclic AMP is not broken down. The accumulated cyclic AMP increases calcium availability in cardiac myocytes (more force) and relaxes vascular smooth muscle (less resistance). The fall in pulmonary vascular resistance directly relieves the load on the strained right ventricle, improving its output without leaning on beta receptors that may be downregulated in chronic failure.

Comparing the alternatives clarifies the choice. Dopamine tends to constrict pulmonary vessels and provoke arrhythmias at the doses needed for inotropy.

Isoprenaline drives heart rate up sharply and raises myocardial oxygen demand. Halothane is a volatile anaesthetic that depresses the myocardium rather than supporting it. None of these matches the inodilator profile required for right heart failure secondary to pulmonary hypertension.

Milrinone

Quick Tip: Look for the inodilator that also lowers pulmonary vascular resistance.

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72. Which among the following does not cause hyperpyrexia?

- (A) MAO inhibitors
- (B) Alcohol
- (C) TCAs (tricyclic antidepressants)
- (D) Amphetamine

Correct Answer: (B) Alcohol

SOLUTION:

This is an odd-one-out question about thermoregulation. Three of the listed agents push temperature up; one pulls it down, and that is the answer.

Monoamine oxidase inhibitors flood synapses with serotonin and noradrenaline, and when combined with other serotonergic drugs or tyramine-rich food they can ignite serotonin syndrome or a hyperadrenergic crisis, both of which feature dangerously high temperatures. Tricyclic antidepressants block muscarinic receptors, and the resulting anticholinergic state (hot, dry, flushed skin with impaired sweating) raises core temperature in overdose. Amphetamine is a stimulant that ramps up cellular metabolism, muscle activity and agitation while constricting skin vessels, a recipe for stimulant hyperthermia.

Ethanol behaves in the opposite direction. It dilates skin blood vessels, so heat is lost rapidly to the environment, and it depresses the central nervous system

including hypothalamic temperature control. The practical result, especially in cold surroundings, is a drop in body temperature and a risk of hypothermia rather than fever. Hence alcohol is the agent that does not cause hyperpyrexia.

Alcohol

Quick Tip: Which agent dilates skin vessels and tends to cause hypothermia instead?

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73. All are true about Aprepitant except?

- (A) Agonist at NK1
- (B) Crosses blood brain barrier
- (C) Ameliorates nausea and vomiting of chemotherapy
- (D) Metabolized by CYP3A4

Correct Answer: (A) Agonist at NK1

SOLUTION:

Aprepitant is the prototype small-molecule blocker of the substance P pathway used to control vomiting from cancer chemotherapy. The trick in this except-style question is that one statement reverses its actual pharmacology.

The vomiting reflex is partly driven by substance P binding to neurokinin-1 receptors in the central emetic centres. Aprepitant works by occupying those receptors and preventing substance P from acting, so it is an antagonist, not an agonist. The statement that it is an NK1 agonist is therefore incorrect and is the answer to the question.

The other three statements describe it accurately. Its lipophilic structure allows central nervous system penetration, which it needs because the target receptors are in the brainstem. It is particularly valued for controlling the delayed phase of chemotherapy-induced nausea and vomiting, usually as part of a triple regimen with a 5-HT₃ antagonist and a corticosteroid. Pharmacokinetically it is handled

by CYP3A4 and modulates the same enzyme, which explains its interaction potential with drugs like dexamethasone and certain chemotherapeutic agents.

Agonist at NK1 (false statement)

Quick Tip: Antiemetics block substance P; is aprepitant really an agonist?

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74. Which of the following is true?

- (A) Acetylcholinesterase inhibition by malathion can be reversed by increasing the level of atropine
- (B) Sulphonamide inhibits folate reductase irreversibly
- (C) Fluoroacetate competitively inhibits aconitase
- (D) Ethanol acts by inhibiting aldehyde dehydrogenase when used in methanol poisoning

Correct Answer: (D) Ethanol acts by inhibiting aldehyde dehydrogenase when used in methanol poisoning

SOLUTION:

This statement-validity question requires checking each toxicology claim against the real mechanism and keeping the one that is closest to true.

Starting with the organophosphate option: malathion poisons acetylcholinesterase, and the antidote pairing is atropine for the muscarinic symptoms plus an oxime such as pralidoxime to actually free the enzyme. Atropine alone never reverses the enzyme block, so that statement collapses. Next, sulphonamides are structural mimics of para-aminobenzoic acid and inhibit dihydropteroate synthase in bacterial folate synthesis; folate (dihydrofolate) reductase is a different enzyme targeted by trimethoprim and methotrexate, so that claim is also wrong. Fluoroacetate is the classic example of lethal synthesis: it is converted into fluorocitrate which shuts down aconitase, but the action is not a reversible competitive inhibition, so that wording fails too.

That leaves the methanol antidote statement. Methanol itself is fairly harmless until alcohol dehydrogenase oxidises it to formaldehyde and then formic acid, which cause the metabolic acidosis and blindness. Ethanol is the traditional antidote because it competes for alcohol dehydrogenase and diverts the enzyme away from methanol, buying time for clearance. The printed wording names aldehyde dehydrogenase, which is a small inaccuracy, yet this option still expresses the only correct antidotal concept among the four, making it the best answer.

Ethanol competes for the enzyme in methanol poisoning (best answer)

Quick Tip: Three statements name the wrong enzyme or wrong inhibition type; find the antidote concept that holds.

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75. A schizophrenic patient started on haloperidol 2 days back comes with complaints of torticollis and orofaciolingual movements. What is the diagnosis?

- (A) Acute dystonia
- (B) Tardive dyskinesia
- (C) Parkinsonism
- (D) Akathisia

Correct Answer: (A) Acute dystonia

SOLUTION:

Extrapyramidal side effects of antipsychotics each have a characteristic timeline, and the timeline is the fastest way to crack this question.

The patient has been on haloperidol, a potent D2 blocker, for only two days, and presents with torticollis plus involuntary tongue and facial movements. Reactions that come on within hours to a few days, featuring sudden sustained muscle contractions, abnormal neck posturing, eye rolling or tongue protrusion, define

acute dystonia. It is more common in young males and high-potency agents, exactly the setting described.

The distractors are separated by their own time courses and features. Tardive dyskinesia produces repetitive orofacial movements too, but only after prolonged treatment over many months to years, so a two-day history rules it out. Drug-induced parkinsonism evolves over weeks with rigidity, slowness and tremor. Akathisia is a distressing sense of restlessness that drives constant movement rather than fixed dystonic postures. The acute onset with sustained spasm points firmly to acute dystonia, which is reversed quickly by intramuscular anticholinergics.

Acute dystonia

Quick Tip: Sustained spasms within 2 days of a high-potency antipsychotic point to which reaction?

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76. Mifepristone is used in?

- (A) Molar pregnancy
- (B) Threatened abortion
- (C) Fibroid
- (D) Ectopic pregnancy

Correct Answer: (C) Fibroid

SOLUTION:

Mifepristone is an antiprogesterin, meaning it competitively blocks progesterone receptors, and the question asks which clinical condition genuinely benefits from removing progesterone support.

The most familiar role is in medical abortion combined with a prostaglandin, but among the four choices given the appropriate match is uterine fibroid.

Leiomyomas are progesterone-responsive tumours, so an antiprogesterin can reduce their size and control associated heavy menstrual bleeding, an established medical use of the drug.

The remaining options do not fit. Threatened abortion calls for maintaining the pregnancy, often with progesterone supplementation, so a progesterone blocker would be exactly the wrong choice and is potentially harmful. Molar pregnancy is managed by surgical evacuation of the abnormal tissue rather than by any antiprogesterin. Ectopic pregnancy has a well-defined medical treatment, methotrexate, which halts trophoblast growth; mifepristone is not the standard agent there. By straightforward elimination and by its known therapeutic profile, the correct condition is fibroid.

Fibroid

Quick Tip: An antiprogesterin shrinks a progesterone-driven uterine tumour; methotrexate handles the tubal one.

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77. All of the following are true about erlotinib except?

- (A) Small molecule inhibitor of tyrosine kinase associated with EGFR receptors
- (B) Food delays its absorption
- (C) Acneiform eruptions and diarrhea are its common side effects
- (D) Used in non-small cell lung cancer when there is no response to other chemotherapeutic agents

Correct Answer: (B) Food delays its absorption

SOLUTION:

Erlotinib is an orally active targeted anticancer agent that blocks the intracellular tyrosine kinase region of the EGFR (HER1) signalling pathway, which validates the description in option A as accurate. The key pharmacokinetic point being tested is the meal interaction: a high-fat meal does not slow erlotinib down, it

pushes absorption up so much that bioavailability approaches 100% compared with roughly 60% in the fasted state. Because this can raise drug exposure to potentially toxic levels, the standard instruction is to dose it on an empty stomach, meaning the claim that food delays absorption is the incorrect statement. Reviewing the remaining choices: the dose-limiting and most recognisable toxicities of EGFR-directed therapy are a dose-related acneiform rash over the face and trunk together with diarrhea, confirming option C, and the recognised clinical role of erlotinib is in non-small cell lung cancer, typically as later-line therapy after other regimens have failed, confirming option D. Since the prompt requests the false statement, the food-delays-absorption option stands out as the answer.

Food delays its absorption

Quick Tip: Think about whether food raises or lowers EGFR-inhibitor bioavailability and why it is taken on an empty stomach.

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78. Pulmonary toxicity is seen with?

- (A) Bleomycin
- (B) Cisplatin
- (C) Doxorubicin
- (D) Actinomycin D

Correct Answer: (A) Bleomycin

SOLUTION:

This question maps cytotoxic drugs to their signature end-organ damage. The lung is the target organ for bleomycin, which generates reactive oxygen species and is poorly inactivated in pulmonary tissue because the protective enzyme bleomycin hydrolase is scarce there; the result is interstitial pneumonitis and, with cumulative dosing, irreversible pulmonary fibrosis. Working through the distractors clarifies why they do not fit: cisplatin damages the kidneys and the

inner ear (nephrotoxicity and ototoxicity), doxorubicin and the other anthracyclines damage the heart through a free-radical mediated cardiomyopathy, and actinomycin D mainly suppresses the bone marrow and irritates the gut. Therefore, of the four agents listed, only bleomycin is characteristically associated with lung injury.

Bleomycin

Quick Tip: Which chemotherapy drug is famous for interstitial pneumonitis and pulmonary fibrosis?

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79. All are used in the treatment of hot flushes except?

- (A) Tamoxifen
- (B) Venlafaxine
- (C) Gabapentin
- (D) Paroxetine

Correct Answer: (A) Tamoxifen

SOLUTION:

Hot flushes are the vasomotor symptom of estrogen withdrawal, and several non-hormonal drugs are used to suppress them when hormone replacement is unsuitable. Among the choices, three are legitimate treatments: the SNRI venlafaxine and the SSRI paroxetine both blunt the hypothalamic thermoregulatory instability that drives flushing, with paroxetine even carrying a formal approval for this purpose, while the anticonvulsant gabapentin reliably lowers flush frequency and is particularly helpful for nocturnal episodes. The odd one out is tamoxifen, a selective estrogen receptor modulator whose anti-estrogenic effect in the breast and brain produces hot flushes as one of its most common adverse effects rather than relieving them. Because the question asks which agent is NOT used to treat hot flushes, the answer is the drug that provokes them.

Tamoxifen

Quick Tip: Which listed drug causes hot flushes as a side effect instead of relieving them?

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80. All are true about meglitinides except?

- (A) Decreases postprandial hyperglycemia
- (B) Incidence of hypoglycemia is less common than sulfonylureas
- (C) It decreases insulin resistance
- (D) Causes stimulation of insulin release from pancreas

Correct Answer: (C) It decreases insulin resistance

SOLUTION:

Meglitinides such as repaglinide and nateglinide belong to the insulin secretagogue group rather than the insulin sensitiser group, and this distinction is the heart of the question. They bind a site on the beta-cell ATP-sensitive potassium channel, close it, depolarise the cell and provoke insulin release, which makes the statement about stimulating pancreatic insulin secretion correct. Their pharmacokinetics are deliberately brief: taken just before eating, they produce a quick, short burst of insulin that targets the after-meal glucose rise, so the claim about reducing postprandial hyperglycaemia holds, and that same short duration keeps insulin from lingering between meals, giving them a lower interprandial hypoglycaemia risk than the longer-acting sulfonylureas. What they do NOT do is alter tissue responsiveness to insulin; lowering insulin resistance is the hallmark of metformin and the thiazolidinediones, not of secretagogues. Hence the false statement, and the answer to this except-type question, is that meglitinides decrease insulin resistance.

It decreases insulin resistance

Quick Tip: Are meglitinides insulin secretagogues or insulin sensitizers?

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81. A pregnant mother at 35 weeks of gestation with SLE. Which of the following drugs cannot be used?

- (A) Prednisolone
- (B) Methotrexate
- (C) Sulfasalazine
- (D) Hydroxychloroquine

Correct Answer: (B) Methotrexate

SOLUTION:

Treating lupus in a woman who is 35 weeks pregnant is fundamentally a question of fetal drug safety. The clear answer is the folate antagonist methotrexate: by blocking dihydrofolate reductase it disrupts the rapid cell division of the developing fetus, acting as a powerful teratogen and abortifacient, and is therefore absolutely barred in pregnancy. The other three drugs are acceptable for keeping lupus under control. Prednisolone is extensively broken down by the placental enzyme 11-beta-hydroxysteroid dehydrogenase before it reaches the fetus, so maternal use is permitted; hydroxychloroquine has a strong safety record and current guidance actually advises continuing it throughout gestation because stopping it risks lupus flares; and sulfasalazine is regarded as compatible with pregnancy provided folate is supplemented. Since only one agent must be avoided, the drug that cannot be used is methotrexate.

Methotrexate

Quick Tip: Which of these is a teratogenic folate antagonist contraindicated in pregnancy?

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82. Tolerance in opioids develops to all except?

- (A) Miosis
- (B) Analgesia
- (C) Euphoria
- (D) Nausea and vomiting

Correct Answer: (A) Miosis

SOLUTION:

Chronic opioid exposure blunts most of the drug's actions, but the examiner is asking for the effect that escapes this adaptation. The reliable rule is that tolerance fails to develop to two effects, miosis and constipation, both mediated in ways that do not down-regulate with continued use; consequently pinpoint pupils stay a dependable clue in long-term users and in overdose. By contrast, the pain-relieving (analgesic), mood-elevating (euphoric), and gut-irritating (nausea and vomiting) actions all wane with repeated dosing, so those three options are all subject to tolerance. Mapping this onto the choices, analgesia, euphoria, and nausea/vomiting are eliminated because tolerance does occur to them, leaving miosis as the action to which tolerance does not develop and therefore the answer.

Miosis

Quick Tip: Tolerance does not develop to two opioid effects: constipation and one pupil sign.

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83. All are actions of muscarinic antagonists except?

- (A) Decreases gastric secretion
- (B) Prolongs A-V conduction
- (C) Decreases tracheobronchial secretions
- (D) Causes contraction of radial muscles of the iris

Correct Answer: (D) Causes contraction of radial muscles of the iris

SOLUTION:

Atropine-type muscarinic antagonists work by removing parasympathetic cholinergic tone, and the trick in this item lies in the mechanism of pupil dilation. Three of the listed effects are genuine antimuscarinic actions: blocking muscarinic receptors on parietal cells lowers gastric acid output, blocking them in the airway reduces tracheobronchial secretions (a property exploited in pre-anaesthetic medication), and blocking vagal influence at the heart alters AV nodal conduction. The false statement concerns the iris musculature. Antimuscarinics produce mydriasis, but they achieve it by PARALYSING the muscarinically driven circular sphincter pupillae, allowing the pupil to widen passively; they do not act on the radial dilator muscle, which is under sympathetic (alpha-adrenergic) control. Saying that a muscarinic antagonist contracts the radial muscle of the iris confuses an adrenergic action with a cholinergic-block action, so this is the incorrect option and the answer.

Causes contraction of radial muscles of the iris

Quick Tip: How does atropine dilate the pupil: by contracting the radial muscle or relaxing the sphincter?

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84. Drugs used in the prophylaxis of migraine include all of the following EXCEPT?

- (A) Propranolol
- (B) Flunarizine
- (C) Topiramate
- (D) Levetiracetam

Correct Answer: (D) Levetiracetam

SOLUTION:

Migraine preventives are drugs taken daily to cut down how often and how badly attacks occur, and the recognised classes are beta blockers, calcium antagonists, antiepileptics, and antidepressants. Among the choices, Propranolol represents the beta blocker class and is a textbook first-line preventive. Flunarizine is a calcium channel blocker that is a well established preventive option for recurrent migraine. Topiramate is an antiepileptic that carries a formal indication for migraine prevention and is considered first-line. The odd one out is Levetiracetam: although it is an antiepileptic like topiramate, it has no recognised role in migraine prophylaxis and is reserved for epilepsy management. By elimination, the only agent that does not belong to the migraine prophylaxis list is Levetiracetam.

Levetiracetam

Quick Tip: Three are recognised migraine preventives; one is purely an antiepileptic with no preventive role.

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85. Administration of which of the following drugs requires alkalization of urine?

- (A) Cytosine arabinoside
- (B) Methotrexate
- (C) Cisplatin
- (D) Ifosfamide

Correct Answer: (B) Methotrexate

SOLUTION:

The clue here is the protective measure of raising urine pH, which is used for drugs whose solubility falls sharply in acidic urine. Methotrexate is the classic example: at high doses it tends to crystallise inside the renal tubules, and this crystallisation is pH dependent, being far worse when the urine is acidic. The standard nephroprotection bundle therefore combines generous intravenous

fluids with sodium bicarbonate so that urine pH is pushed above 7, keeping the drug and its metabolite dissolved. Looking at the other agents, cytarabine has no such requirement, cisplatin nephrotoxicity is countered chiefly by saline hydration and forced diuresis rather than alkali, and ifosfamide bladder toxicity is prevented by co-administering mesna. Hence the single drug whose safe delivery hinges on alkalinising the urine is Methotrexate.

Methotrexate

Quick Tip: Think of the drug that crystallises in acidic renal tubules during high-dose therapy.

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86. All of the following are true regarding diabetes mellitus EXCEPT?

- (A) Type 2 diabetes patients never require insulin
- (B) Sliding scale regimen is used in hospitalized patients
- (C) Low evening insulin dose prevents nocturnal hypoglycemia
- (D) Regular insulin is used in the treatment of gestational diabetes

Correct Answer: (A) Type 2 diabetes patients never require insulin

SOLUTION:

To find the false statement, each option is judged against standard diabetes management. The assertion that a person with type 2 diabetes will never need insulin does not hold up, because type 2 disease is progressive: as the pancreatic beta cells decline over the years, and in situations such as serious infection, surgery, pregnancy, or failure of oral drugs, insulin becomes necessary. So this is the incorrect statement and the answer. The remaining options are all accurate. Sliding scale dosing, where each dose tracks the current glucose reading, is a recognised inpatient practice. Reducing the night-time insulin dose is a deliberate strategy to keep blood sugar from dropping too low while the patient sleeps. And regular insulin is an accepted treatment in gestational diabetes precisely because

insulin molecules do not pass the placenta to the fetus. The statement that fails the truth test is therefore the one about type 2 patients never needing insulin.

Type 2 diabetes patients never require insulin

Quick Tip: Type 2 diabetes is progressive; the absolute word "never" is the giveaway.

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87. All are true regarding serotonin syndrome EXCEPT?

- (A) It is not idiosyncratic and unpredictable
- (B) Dantrolene is the drug of choice
- (C) It can be caused by SSRIs
- (D) Features include hyperthermia and hypertension

Correct Answer: (B) Dantrolene is the drug of choice

SOLUTION:

Each statement is checked against the established profile of serotonin syndrome to spot the wrong one. The condition arises in a dose-dependent, foreseeable manner from too much serotonergic stimulation, so calling it predictable rather than idiosyncratic is correct. The pharmacological antidote of choice is cyproheptadine, a blocker of serotonin receptors, which is given together with stopping the trigger drug and supportive cooling and sedation. Dantrolene, by contrast, is the agent reserved for malignant hyperthermia and neuroleptic malignant syndrome, so naming it the drug of choice here is the false claim and hence the answer. The remaining statements stand: SSRIs are a leading cause of the syndrome, and the picture indeed includes high temperature and raised blood pressure as part of the autonomic disturbance. The statement that does not fit is the one nominating dantrolene as first-line treatment.

Dantrolene is the drug of choice

Quick Tip: The antidote here is cyproheptadine; dantrolene belongs to another hyperthermia syndrome.

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88. Regarding tetanus, all are true EXCEPT?

- (A) Heat-resistant spores
- (B) Three doses of vaccine are to be given for primary prevention
- (C) Incubation period is 6 to 10 days
- (D) Person-to-person transmission does not occur

Correct Answer: (B) Three doses of vaccine are to be given for primary prevention

SOLUTION:

Tetanus is a wound infection caused by *Clostridium tetani*, and each statement is tested for accuracy. The organism produces tough terminal spores that withstand heat and persist in soil, so that point is correct. Its incubation typically falls in the region of roughly 6 to 10 days, again a correct description. Because the disease comes from spores in the environment entering a wound, it cannot spread directly between people, so the no person-to-person transmission statement is also correct. The remaining option, framing primary prevention as simply three doses of vaccine, is the one the key identifies as the exception, since complete protection under the immunization programme depends on the full schedule including boosters rather than the three primary doses standing alone. The discordant statement is therefore the one about three doses for primary prevention.

Three doses of vaccine for primary prevention

Quick Tip: Spores survive heat, incubation is short, and it is non-communicable; weigh the vaccine-dose claim.

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89. A farmer from Himachal Pradesh presents with a small ulcer on the leg. After a few days he develops a swelling in the inguinal region which later ulcerates. Which stain can be used to detect the bipolar-stained organisms?

- (A) Albert's stain
- (B) Wayson's stain
- (C) Ziehl-Neelsen staining
- (D) McFadyean's stain

Correct Answer: (B) Wayson's stain

SOLUTION:

The vignette of a primary ulcer with a later ulcerating groin bubo in an agricultural worker points strongly to plague, an infection by *Yersinia pestis*. This organism is famous for its bipolar, safety-pin look, where dye concentrates at the two poles of the cell leaving the middle pale. To bring out this appearance the laboratory uses Wayson's stain, a basic fuchsin and methylene blue preparation that renders the bacilli pale blue with prominent dark bipolar tips. The distractors each belong to a different organism: Albert's stain reveals the volutin granules of the diphtheria bacillus, Ziehl-Neelsen targets acid-fast bacilli like the tubercle bacillus, and McFadyean's reaction is the capsule stain for the anthrax bacillus. Matching the bipolar safety-pin clue to the right stain gives Wayson's stain.

Wayson's stain

Quick Tip: Ulcer plus ulcerating bubo equals plague; pick the stain for safety-pin bipolar bacilli.

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90. Vectors do NOT transmit infection by which of the following routes?

- (A) Ingestion
- (B) Regurgitation
- (C) Rubbing of infected feces
- (D) Contaminated body fluids

Correct Answer: (A) Ingestion

SOLUTION:

Arthropod vectors deliver pathogens through a handful of feeding-related mechanisms, and the task is to find the route that does not belong to vectors. Regurgitation fits, because a vector with a blocked foregut, like the plague flea, vomits infected material into the bite. Rubbing infected feces into the skin fits too, exemplified by the triatomine bug in Chagas disease and the louse in epidemic typhus, where scratching drives the organisms into the wound. Transmission via the vector's contaminated body fluids also fits, as when an infected louse is crushed and its fluids enter abraded skin. Ingestion, however, describes how a person picks up an infection from contaminated food or water; it is a route of human acquisition rather than a mechanism a biting vector employs to pass on disease. Therefore the route not used by vectors is ingestion.

Ingestion

Quick Tip: Three options are vector feeding or contamination mechanisms; one is how the host swallows a pathogen.

• • •

91. All of the following are factors responsible for the resurgence of malaria EXCEPT:

- (A) Drug resistance
- (B) Use of bed nets
- (C) Vector resistance
- (D) Development of newer strains of the parasite

Correct Answer: (B) Use of bed nets

SOLUTION:

The question asks which option does NOT explain why malaria comes back after control efforts.

Think of the three main drivers of malaria resurgence as the parasite, the drug, and the mosquito. First, the parasite can change: new strains that are hardier or harder to treat increase transmission. Second, the drug can fail: when *Plasmodium* becomes resistant to chloroquine and other agents, treated patients stay infectious and the disease spreads again. Third, the mosquito can survive: *Anopheles* vectors that develop resistance to insecticides keep biting and keep transmitting, so case numbers climb.

Now contrast these with insecticide-treated bed nets. A bed net is a barrier intervention. It stops the mosquito from feeding on a sleeping person and kills mosquitoes that land on the treated fabric. Far from causing resurgence, it is one of the most effective tools for reducing malaria. Therefore it cannot be a cause of resurgence and is the odd one out.

Hence the correct answer is the use of bed nets.

Use of bed nets

Quick Tip: Three options worsen transmission; one is a protective barrier method.

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92. Regarding leptospirosis, which of the following is TRUE?

- (A) Rats are the only reservoir
- (B) Fluoroquinolones are the drug of choice
- (C) Person-to-person transmission occurs commonly
- (D) Oro-fecal transmission is the main route

Correct Answer: (A) Rats are the only reservoir

SOLUTION:

Approach this by testing each statement against the known biology of *Leptospira*.

Start with treatment. The recommended agents are penicillin (for severe, hospitalised disease) and doxycycline (for mild disease and chemoprophylaxis). Fluoroquinolones are not the drug of choice, so the fluoroquinolone statement is incorrect.

Next, transmission. Leptospirosis is a classic zoonosis. People get infected when broken skin or mucous membranes contact water, mud, or animal urine carrying the organism. It is not spread mouth-to-gut like typhoid, so the oro-fecal claim is wrong. It is also not spread readily between people, since humans are accidental hosts at the end of the chain, so the person-to-person claim is wrong as well.

That leaves the reservoir statement. Rodents are the principal maintenance hosts that shed the organism in urine and seed the environment. The wording overstates it slightly by saying only rats, but compared with the three plainly false options it is the statement the examiner marked correct.

Therefore the accepted true statement concerns the rodent reservoir.

Rats are the reservoir

Quick Tip: Eliminate the wrong drug, the wrong route, and human-to-human spread first.

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93. A fungus that causes infection in immunocompetent individuals is:

- (A) *Aspergillus*
- (B) *Penicillium*
- (C) *Cryptococcus*
- (D) *Candida*

Correct Answer: (D) *Candida*

SOLUTION:

Sort the four fungi into opportunistic versus those that trouble healthy people.

Aspergillus generally needs a weakened host to invade, for example a neutropenic patient, so it sits in the opportunistic group. *Penicillium*, the agent now called *Talaromyces marneffe*i, is strongly linked to advanced HIV and other immunodeficiency, so it too is opportunistic. *Cryptococcus* is famous for causing meningitis in AIDS patients and other immunosuppressed hosts, placing it in the same opportunistic category.

Now consider *Candida*. It is part of the body's normal flora and lives quietly on skin and mucous membranes. Minor shifts such as antibiotic use, moisture, or local factors are enough to let it cause oral thrush, napkin rash, or vaginal candidiasis even when the immune system is completely normal. This everyday ability to infect healthy people sets it apart.

So the fungus that infects immunocompetent individuals is *Candida*.

Candida

Quick Tip: Which fungus is a normal commensal that causes thrush in healthy people?



94. A 7-month-old child presents with a history of bouts of cough ending with a whoop. The immunization history is not available. What is the best way to confirm the diagnosis?

- (A) Nasopharyngeal swab
- (B) Cough plate culture
- (C) Tracheal aspirate
- (D) Oral swab

Correct Answer: (A) Nasopharyngeal swab

SOLUTION:

Match the suspected organism to the body site where it lives, then pick the sampling method that reaches that site.

The clinical story of repeated coughing fits that finish with a whoop in a baby whose vaccination is uncertain points firmly to *Bordetella pertussis*. This bacterium has a strong preference for the ciliated lining of the nasopharynx, where it attaches and multiplies. To recover it reliably you must sample exactly there.

A swab passed to the posterior nasopharynx collects the organism at its main reservoir and can be sent for culture, PCR, or direct fluorescent antibody testing, giving the best diagnostic yield. The old cough plate technique, where a plate is held before the child's mouth during a coughing bout, captures far fewer organisms and is no longer recommended as the test of choice. A tracheal aspirate samples lower down where the bacterium is sparse, and a plain oral swab misses the nasopharyngeal niche entirely.

Therefore the best confirmatory specimen is a nasopharyngeal swab.

Nasopharyngeal swab

Quick Tip: Sample the site where *Bordetella pertussis* actually colonizes.



95. Aflatoxin is produced by:

- (A) *Aspergillus flavus*
- (B) *Aspergillus niger*
- (C) *Candida albicans*
- (D) Actinomycetes

Correct Answer: (A) *Aspergillus flavus*

SOLUTION:

Use the name of the toxin as the clue and confirm by eliminating the rest.

The word aflatoxin is built directly from *Aspergillus flavus* toxin, which immediately flags the producing organism. Aflatoxins are dangerous mould toxins that grow on poorly stored peanuts and cereals and are well known for damaging the liver and promoting liver cancer. Their recognised producers are *A. flavus* together with *A. parasiticus*.

Now rule out the others. *Aspergillus niger* is the species linked to fungal ear infection rather than aflatoxin production. *Candida albicans* is a yeast that causes thrush and does not make this toxin. Actinomycetes are filamentous bacteria and are unrelated to aflatoxin.

So the source of aflatoxin is *Aspergillus flavus*.

Aspergillus flavus

Quick Tip: The toxin's name is taken from the organism that makes it.



96. The polysaccharide capsule of which of the following bacteria has NO role in its infectivity?

- (A) *Neisseria meningitidis*
- (B) *Pneumococcus*
- (C) *Bordetella pertussis*
- (D) *Haemophilus influenzae*

Correct Answer: (C) *Bordetella pertussis*

SOLUTION:

Identify the three classic encapsulated pathogens, and the odd one out becomes the answer.

A polysaccharide capsule helps bacteria escape being engulfed by phagocytes, which is why capsulated organisms are so invasive. Three of the listed bacteria are textbook capsulated pathogens. *Neisseria meningitidis* relies on its capsule for virulence and uses it for serogrouping and vaccine design. *Streptococcus pneumoniae* depends on its capsule as its main virulence factor, the basis of its polysaccharide vaccines. *Haemophilus influenzae* type b is invasive because of its PRP polysaccharide capsule, which the Hib vaccine targets.

That leaves *Bordetella pertussis*. Its disease-causing power comes from a battery of toxins and surface adhesins, including pertussis toxin, filamentous haemagglutinin, pertactin, adenylate cyclase toxin, and tracheal cytotoxin, rather than from a polysaccharide capsule. So a capsule plays no meaningful part in its infectivity.

Hence the answer is *Bordetella pertussis*.

Bordetella pertussis

Quick Tip: Three are classic capsulated invaders; one relies on toxins and adhesins.



97. About *Campylobacter jejuni*, which of the following is FALSE?

- (A) It is the most common pathogenic strain causing campylobacteriosis in India
- (B) Poultry is the main source of infection
- (C) Humans are the only reservoir
- (D) It is associated with Guillain-Barre syndrome

Correct Answer: (C) Humans are the only reservoir

SOLUTION:

This is a find-the-false-statement item, so verify each claim and the one that fails is the answer.

Campylobacter jejuni is a curved microaerophilic gram-negative rod and the commonest cause of bacterial diarrhoea. The claim that it is the leading pathogenic species causing campylobacteriosis is therefore accurate. The claim that poultry is the principal source also holds, because infection is typically traced to contaminated or undercooked chicken, making it a classic food-borne zoonosis. The link with Guillain-Barre syndrome is likewise correct, since prior *C. jejuni* gastroenteritis can trigger this post-infectious neuropathy through molecular mimicry of nerve gangliosides.

The remaining claim says humans are the only reservoir. This contradicts the very nature of the organism as a zoonosis with broad animal reservoirs including poultry, cattle, and other livestock. Humans are mainly accidental hosts, not the sole reservoir, so this statement is the false one.

Therefore the false statement is that humans are the only reservoir.

Humans are the only reservoir

Quick Tip: It is a zoonosis from poultry, so the human-only reservoir claim cannot be true.



98. Which virus among the following is least likely to cross the placenta?

- (A) Rubella
- (B) Herpes simplex
- (C) HIV
- (D) HBV

Correct Answer: (B) Herpes simplex

SOLUTION:

Transplacental (vertical, in-utero) viral transmission is the focus here. Rubella is the prototype TORCH agent and crosses the placenta with ease, producing the well known congenital rubella triad. HIV reaches the fetus across the placenta during pregnancy and also during delivery and lactation, so it is not the least likely. Hepatitis B virus can infect the fetus in utero, though most neonatal infection occurs at the time of birth, so it too is capable of crossing. Herpes simplex virus behaves differently: the overwhelming majority of neonatal herpes results from direct contact with virus shed in the genital tract during vaginal delivery, and true intrauterine transplacental herpes is uncommon. Comparing the four options, HSV stands out as the agent least dependent on, and least likely to use, the transplacental route.

Herpes simplex

Quick Tip: Neonatal infection here happens mainly during delivery, not in the womb.

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99. About yaws, all are true except:

- (A) Caused by *Treponema pertenue*
- (B) Transmitted non-venereally
- (C) Secondary yaws can involve bones and joints
- (D) Late stages involve the heart and nerves

Correct Answer: (D) Late stages involve the heart and nerves

SOLUTION:

Yaws belongs to the family of endemic treponematoses and is distinguished from syphilis by both its mode of spread and its complications. The organism responsible is *Treponema pallidum* subsp. *pertenue*, classically written as *T. pertenue*, confirming option A. Spread occurs through casual non-sexual skin contact, typically among children in warm humid climates, confirming the non-venereal nature in option B. In its secondary phase the disease disseminates and may damage bone and joint tissue with periostitis and dactylitis, confirming option C. The key contrast with syphilis is that yaws spares the cardiovascular system and the central nervous system; it does not progress to aortitis or neurological disease. Therefore the claim that late-stage yaws involves heart and nerves is the incorrect statement and is the answer being sought.

Late stages involve heart and nerves

Quick Tip: Yaws spares the heart and nervous system, unlike syphilis.

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100. The 'C' in C-reactive protein stands for:

- (A) Capsular polysaccharide in pneumococcus
- (B) Concanavalin-A
- (C) Calretinin
- (D) Cellular

Correct Answer: (A) Capsular polysaccharide in pneumococcus

SOLUTION:

The naming of C-reactive protein is purely historical. When this acute-phase protein was first described, investigators noticed that serum from acutely ill patients precipitated a specific carbohydrate component of the pneumococcal cell,

the C-polysaccharide of *Streptococcus pneumoniae*. Because the protein reacted with this C substance, it was christened C-reactive protein. Thus the 'C' is derived from the pneumococcal C-polysaccharide, which corresponds to option A. The remaining choices are distractors from unrelated areas: concanavalin-A is a lectin used to study glycoproteins, calretinin is a marker employed in pathology, and 'cellular' has no link to the historical naming. Therefore the polysaccharide answer is correct.

Capsular polysaccharide in pneumococcus

Quick Tip: Named because it reacts with a pneumococcal polysaccharide.

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101. A young lady presents with fever, dysuria and pain in the lower abdomen. Uncomplicated acute cystitis was diagnosed. Which among the following is not true?

- (A) Nitrate test positive for the urine sample
- (B) *E. coli* colony count $< 10^3$ bacteria/ml
- (C) 1 pus cell per 7 fields in wet film of patient's urine
- (D) 1 bacillus per oil-immersion field in Gram-stained urine sample

Correct Answer: (B) *E. coli* colony count $< 10^3$ bacteria/ml

SOLUTION:

Confirming a urinary tract infection rests on showing significant bacteriuria together with an inflammatory response. In acute uncomplicated cystitis caused by *E. coli*, several laboratory findings are expected. First, *E. coli* reduces nitrate to nitrite, so a positive nitrite dipstick is anticipated, validating option A. Second, the host responds with pyuria; finding pus cells in the wet film, as in option C, fits the picture of infection. Third, a quick screening method is to Gram-stain an uncentrifuged drop of urine, where seeing at least one organism per oil-immersion field predicts a colony count near 10^5 per ml, supporting option D. The discordant statement is the colony count of fewer than 10^3 per ml. By Kass criteria, counts at or above 10^5 per ml indicate true infection, and symptomatic

women may be diagnosed at 10^2 to 10^3 , but a count below 10^3 is conventionally read as insignificant or contamination and argues against, rather than for, cystitis. That statement is therefore the untrue one.

E. coli colony count $< 10^3$ bacteria/ml

Quick Tip: Significant bacteriuria needs high counts, not fewer than 10^3 /ml.

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102. All are true about Parvovirus except:

- (A) $< 10\%$ spread by transplacental route
- (B) Spread by respiratory route
- (C) It is a DNA virus
- (D) Affects erythroid progenitor cells

Correct Answer: (A) $< 10\%$ spread by transplacental route

SOLUTION:

Parvovirus B19 is the smallest DNA virus that infects humans, built from a single strand of DNA with no envelope, which makes option C accurate. The usual route of person-to-person transmission is inhalation of respiratory droplets, confirming option B, with additional spread via blood products and across the placenta. The hallmark of the virus is its tropism for dividing erythroid precursors, which it reaches through the P blood-group antigen; the resulting halt in red cell production explains aplastic crises and validates option D. The statement that does not hold is the figure for vertical transmission. Maternal infection in pregnancy carries a meaningful risk of crossing to the fetus, with transmission rates classically cited near 30%, far above the under-10% value given. Severe fetal anaemia and hydrops fetalis can follow. Hence the low transplacental figure is the false option.

$< 10\%$ spread by transplacental route

Quick Tip: Vertical transmission of B19 in pregnancy is much higher than 10%.

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103. Sterile pyuria is present in:

- (A) Renal tuberculosis
- (B) Chronic hydronephrosis
- (C) Wilms' tumour
- (D) Neuroblastoma

Correct Answer: (A) Renal tuberculosis

SOLUTION:

Sterile pyuria describes the combination of leukocytes in the urine with a sterile routine culture, and the explanation lies in organisms or processes that inflame the urinary tract but fail to grow on standard media. The prototypical cause is tuberculosis of the kidney and urinary tract, since the tubercle bacillus requires special media such as Lowenstein-Jensen and will not appear on the agar used for ordinary urine culture, while still recruiting pus cells. Among the other options, chronic hydronephrosis is essentially an obstructive structural problem and does not characteristically produce sterile pyuria. The two paediatric tumours, Wilms' tumour and neuroblastoma, present as palpable abdominal masses and may cause haematuria or systemic features but are not linked to sterile pyuria. Renal tuberculosis is therefore the answer.

Renal tuberculosis

Quick Tip: Think of an organism that won't grow on routine urine culture.

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104. Visceral larva migrans is seen in:

- (A) *Strongyloides stercoralis*
- (B) *Ankylostoma duodenale*
- (C) *Toxocara canis*
- (D) *Ascaris lumbricoides*

Correct Answer: (C) *Toxocara canis*

SOLUTION:

Visceral larva migrans arises when larvae of nematodes whose natural host is an animal end up in a human, who is an unsuitable accidental host. Unable to complete their life cycle, the larvae wander through internal organs such as the liver, lungs and eye, producing eosinophilia and organ-specific damage. The agent classically responsible is *Toxocara canis*, the roundworm of dogs; children who ingest embryonated eggs from contaminated soil develop this syndrome. The other listed worms behave differently in humans: *Strongyloides stercoralis* and *Ankylostoma duodenale* enter through the skin and establish intestinal infection, and *Ascaris lumbricoides* is a true human parasite whose larvae undertake a normal pulmonary transit rather than causing aberrant visceral migration. Hence *Toxocara canis* is the correct choice.

Toxocara canis

Quick Tip: The dog roundworm in which humans are accidental hosts.

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105. Following are true about carbohydrate antigens except?

- (A) Memory
- (B) Polyclonal response
- (C) Highly immunogenic
- (D) T-cell independent immunity

Correct Answer: (A) Memory

SOLUTION:

Carbohydrate antigens belong to the thymus-independent (TI) class of antigens, and the key to this question is recognising the immunological consequences of that classification. Because these antigens engage B cells without recruiting CD4 T-helper cells, they cannot drive germinal-centre reactions. Without a germinal-centre response there is no class switching, no affinity maturation, and crucially no generation of long-lived memory B cells. This is exactly why a plain polysaccharide pneumococcal or meningococcal vaccine must be repeated and why conjugating the sugar to a protein carrier (converting it into a T-dependent antigen) is needed to create durable memory. So memory is the property these antigens do NOT possess. Reviewing the remaining choices confirms the rest are genuine TI features: the response is dominated by polyclonal IgM, the immunity itself is T-cell independent, and the antigens can be presented by repeating epitopes that crosslink B-cell receptors. The single option that does not belong, the false statement requested by the stem, is therefore Memory.

Memory

Quick Tip: T-independent antigens fail to make memory; pick the property they lack.

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106. An elderly male presents with chest pain and cough with expectoration since 15 days. The bacterium obtained from sputum grows on blood agar and shows gram-positive cocci. Which is the most useful test to identify the organism?

- (A) Bile solubility
- (B) Bacitracin sensitivity
- (C) Catalase test
- (D) Oxidase test

Correct Answer: (A) Bile solubility

SOLUTION:

The vignette describes lobar pneumonia in an older man, and the laboratory clue of gram-positive cocci on blood agar narrows the field to the alpha-haemolytic streptococci. The clinically dominant pathogen in this setting is *Streptococcus pneumoniae*, so the question is really asking how to prove that a green-haemolytic gram-positive coccus is pneumococcus rather than a viridans streptococcus. Two features set pneumococcus apart and both rely on its powerful autolytic enzyme. Bile salts such as sodium deoxycholate activate this autolysin, dissolving the colony, which is the bile solubility test. The same autolysin makes the organism sensitive to optochin (ethylhydrocupreine). Viridans streptococci lack this behaviour and are both bile insoluble and optochin resistant. Working through the other options, the catalase test only separates the staphylococci (positive) from streptococci (negative) and is therefore useless for telling two streptococci apart. Bacitracin sensitivity is the marker for group A beta-haemolytic *Streptococcus pyogenes*. The oxidase test is reserved for gram-negative rods and cocci like *Pseudomonas* and *Neisseria*. Hence the single most useful identifying test for this gram-positive coccus is bile solubility.

Bile solubility

Quick Tip: Bile salts dissolve pneumococcal colonies via its autolysin.

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107. A female presents with signs of meningitis. CSF shows gram-positive bacilli. The most likely organism is?

- (A) *Listeria*
- (B) *Haemophilus influenzae*
- (C) *Pneumococcus*
- (D) *Pseudomonas*

Correct Answer: (A) *Listeria*

SOLUTION:

Solving this question is purely a Gram-stain pattern-matching exercise. The CSF shows gram-positive bacilli, so the answer must be an organism that appears as a gram-positive rod. Run each candidate through its true staining and shape: *Listeria monocytogenes* is a small gram-positive bacillus, *Haemophilus influenzae* is a tiny gram-negative coccobacillus, *Streptococcus pneumoniae* is a lancet-shaped gram-positive diplococcus, and *Pseudomonas aeruginosa* is a motile gram-negative bacillus. The only organism that is both gram-positive and a bacillus is *Listeria*. This fits clinically as well, because *Listeria meningitis* classically strikes vulnerable hosts such as pregnant women, neonates, the elderly, and those with impaired cell-mediated immunity, and it is acquired from contaminated dairy and processed foods. Supporting laboratory features include its end-over-end tumbling motility seen in a hanging-drop preparation at room temperature and its ability to multiply at 4 degrees Celsius. All of this confirms that the gram-positive bacillus causing this meningitis is *Listeria*.

Listeria

Quick Tip: Gram-positive rods in CSF of a vulnerable host means *Listeria*.

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108. A young boy comes with a history of fever and cough since two weeks. He has reduced appetite and weight loss. He is also a known case of congenital heart disease, for which he has taken prophylaxis with penicillin. Sputum examination is normal; however, bronchoscopic lavage cultured on sheep blood agar showed evidence of gram-positive, aerobic, weakly acid-fast branching filaments. What is the likely diagnosis?

- (A) Actinomycosis
- (B) Nocardiosis
- (C) Aspergillosis
- (D) *Mycobacterium tuberculosis*

Correct Answer: (B) Nocardiosis

SOLUTION:

This is a microbe-identification problem disguised as a clinical case, and the entire answer rests on three words from the culture report: aerobic, branching, and weakly acid-fast. The classic organism described by that exact triad is *Nocardia*, typically *Nocardia asteroides*, which produces a subacute pulmonary infection with fever, cough, and weight loss. Its partial acid-fastness is shown using a modified acid-fast stain because, unlike true mycobacteria, it decolourises with weaker acid. The closest mimic is *Actinomyces*, which is also a filamentous branching gram-positive organism, but *Actinomyces* is strictly anaerobic and is completely non-acid-fast, so the aerobic growth on blood agar and the weak acid-fastness rule it out. *Mycobacterium tuberculosis* is strongly acid-fast yet does not grow as branching filaments, eliminating that option, and *Aspergillus* is a mould with septate hyphae that would never stain gram-positive or acid-fast. The clinical backdrop adds support, since this child on penicillin prophylaxis would not be protected against *Nocardia*, an organism best treated with sulfonamides such as cotrimoxazole. Putting the staining characteristics together, the diagnosis is nocardiosis.

Nocardiosis

Quick Tip: Aerobic, branching, weakly acid-fast filaments equal *Nocardia*.

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109. Late-onset endophthalmitis after intraocular lens implantation is most commonly caused by?

- (A) *Staphylococcus epidermidis*
- (B) *Pseudomonas*
- (C) *Streptococcus pyogenes*
- (D) *Propionibacterium acnes*

Correct Answer: (D) *Propionibacterium acnes*

SOLUTION:

The discriminating word in this stem is late onset. Endophthalmitis following cataract surgery with an intraocular lens is classified by how soon symptoms appear, and each time window has its own signature organism. If the infection erupts acutely within the first few weeks, the usual offender is a coagulase-negative staphylococcus such as *Staphylococcus epidermidis* introduced from the patient ocular surface flora. The picture described here, however, is the delayed or chronic variety that smoulders months after surgery with low-grade recurrent inflammation that paradoxically responds to steroids and then relapses. That indolent course is the hallmark of *Propionibacterium acnes*, now called *Cutibacterium acnes*, an anaerobic gram-positive rod that hides within the residual lens capsular bag and resists clearance. The two remaining choices, *Pseudomonas* and *Streptococcus pyogenes*, produce fulminant, rapidly destructive acute endophthalmitis and do not fit a late presentation. Matching the clinical tempo to the organism, the late-onset post-IOL endophthalmitis is most commonly due to *Propionibacterium acnes*.

Propionibacterium acnes

Quick Tip: Chronic, indolent post-cataract endophthalmitis hides in the capsular bag: *P. acnes*.

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110. A sewer worker presented with fever. Lab findings revealed renal failure with increased BUN and serum creatinine. What is the most appropriate drug to give him?

- (A) Cotrimoxazole
- (B) Erythromycin
- (C) Ciprofloxacin
- (D) Benzyl penicillin

Correct Answer: (D) Benzyl penicillin

SOLUTION:

The occupational clue is decisive. Sewer and rice-field workers wade through water polluted by rodent urine and are the textbook risk group for leptospirosis caused by the spirochaete *Leptospira interrogans*. The combination of fever with acute kidney injury, shown by the rising blood urea nitrogen and serum creatinine, indicates severe systemic disease, the icterohaemorrhagic Weil syndrome that also threatens the liver and lungs. Treatment is stratified by severity. Mild ambulatory disease is managed with oral doxycycline, while severe disease with organ dysfunction demands an intravenous bactericidal agent, and the first-line choice is intravenous penicillin G, that is benzyl penicillin, with third-generation cephalosporins like ceftriaxone as equivalent alternatives. Macrolides such as erythromycin or azithromycin are reserved only as substitutes when penicillin cannot be used, for example in true penicillin allergy, so erythromycin is not the most appropriate drug for this severely ill patient. Cotrimoxazole and ciprofloxacin are not standard antileptospiral agents. Matching severe leptospirosis to its drug of choice gives benzyl penicillin.

Benzyl penicillin

Quick Tip: Sewer worker plus fever plus renal failure equals leptospirosis; severe disease needs IV penicillin G.

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111. False about pneumococcus is?

- (A) Capsule aids in virulence
- (B) Commonest cause of otitis media and pneumonia
- (C) Least likely cause of meningitis
- (D) It is bile sensitive

Correct Answer: (C) Least likely cause of meningitis

SOLUTION:

This is a negatively framed question, so the goal is to find the one claim about *Streptococcus pneumoniae* that does not hold true. Take the statements one at a time. The pneumococcal capsule is its single most important virulence determinant because it blocks opsonisation and phagocytosis, so calling the capsule a virulence aid is correct. Epidemiologically, pneumococcus tops the list as a cause of lobar pneumonia and of acute otitis media in children, so that statement is also accurate. The bile sensitivity claim is true as well, since bile salts trigger the organism own autolytic enzyme and dissolve the colony, the very property exploited in the bile solubility test. That leaves the statement that pneumococcus is the least likely cause of meningitis, which is plainly wrong, because *Streptococcus pneumoniae* is actually among the leading causes of acute pyogenic bacterial meningitis across age groups. The false statement, and therefore the answer to this except-style question, is that it is the least likely cause of meningitis.

Least likely cause of meningitis

Quick Tip: Pneumococcus is a leading, not the least likely, cause of meningitis.

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112. Which of the following is FALSE about *Corynebacterium diphtheriae*?

- (A) Toxin production is chromosome mediated
- (B) Damage is caused by toxin production
- (C) Toxin is toxic to heart and neurons
- (D) More common in children

Correct Answer: (A) Toxin production is chromosome mediated

SOLUTION:

To pick the incorrect statement, recall the genetics of toxigenicity in *Corynebacterium diphtheriae*. The capacity to make diphtheria toxin depends on the bacterium being infected (lysogenised) by a temperate corynephage that

carries the *tox* gene. Therefore the toxin gene is phage-encoded, not located on the bacterial chromosome, which makes the claim of chromosome mediated toxin production wrong.

Reviewing the other choices confirms they are all correct. The clinical disease results from the secreted exotoxin rather than tissue invasion, so damage by toxin is true. The toxin acts by ADP-ribosylating elongation factor-2, halting protein synthesis, with the heart (toxic myocarditis) and peripheral and cranial nerves (post-diphtheritic paralysis) being the chief targets, so cardiac and neuronal toxicity is true. Epidemiologically the infection predominantly affects non-immunised young children, so that statement is true as well.

The one factually wrong option is that toxin production is chromosome mediated.

Toxin production is chromosome mediated (it is phage/beta-corynephage mediated)

Quick Tip: Think about which mobile genetic element actually carries the tox gene.

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113. An infant is brought to the casualty with a history of violent shaking by the parents. The most characteristic injury is?

- (A) Long bone fracture
- (B) Ruptured spleen
- (C) Subdural hematoma
- (D) Skull bone fracture

Correct Answer: (C) Subdural hematoma

SOLUTION:

The scenario of an infant subjected to violent shaking corresponds to abusive head trauma, commonly called Shaken Baby Syndrome. The key to answering is understanding the mechanism. An infant has a disproportionately large head, poor neck muscle tone and a soft, water-rich brain, so when shaken the brain

swirls inside the skull. The shearing and rotational stress stretches and ruptures the bridging veins that run from the cortical surface to the dural venous sinuses across the subdural compartment.

Because these veins drain into the subdural space, their rupture collects blood there, producing a subdural hematoma. This finding, together with retinal hemorrhages and signs of diffuse brain injury, makes up the classic triad used to recognise the syndrome.

The remaining options do not fit shaking alone. Fractures of long bones or the skull generally need a direct blow or impact, and splenic rupture points to blunt force to the abdomen rather than oscillation of the head. Thus the most characteristic lesion is bleeding into the subdural space.

Subdural hematoma

Quick Tip: Shaking tears the bridging veins crossing a particular meningeal space.

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114. Gun powder residue on clothing can best be visualized by?

- (A) Magnifying lens
- (B) UV rays
- (C) Infrared rays
- (D) Dye

Correct Answer: (C) Infrared rays

SOLUTION:

This question tests the forensic technique for revealing firearm residue on garments. After a shot, partially burnt and unburnt propellant settles on the clothing as soot and a stippled powder pattern, but on dark, soiled or blood-soaked cloth these deposits are effectively invisible.

The solution lies in the physics of infrared light. Infrared rays pass through superficial blood and dark dyes that absorb visible light, while the carbonaceous powder grains absorb and contrast against the fabric. Photographing the area with infrared film therefore makes the powder tattooing and soot ring stand out clearly, which also helps the examiner judge the firing distance.

Considering why the others fail: a magnifying lens merely magnifies and cannot uncover concealed particles, ultraviolet light is reserved chiefly for detecting biological fluids like seminal stains, and a dye test is a chemical reaction rather than the routine imaging method asked for here. Hence infrared imaging is the answer.

Infrared rays

Quick Tip: Which rays can see through dark, blood-stained cloth to show the powder?

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115. Signature fracture refers to?

- (A) Depressed skull fracture
- (B) Suture displacement fracture
- (C) Contrecoup injury
- (D) Fracture at the foramen magnum

Correct Answer: (A) Depressed skull fracture

SOLUTION:

The term signature fracture is best understood from how it is produced. When the skull is hit by an object that has a small, well-defined striking face and substantial weight, the energy is delivered over a tiny area. Instead of spreading, the force punches the bone inward at that spot.

The result is a localised depression of the cranial vault whose margins mirror the contour of the striking surface, so the fracture literally bears the mark or

signature of the weapon. A square-headed hammer leaves a square defect, the end of a pipe leaves a curved one, and so on, which is forensically valuable for matching a suspected weapon to the wound.

By contrast, suture diastasis is a separation along cranial sutures, a contrecoup lesion is brain damage diametrically opposite the impact, and a ring fracture encircles the foramen magnum after axial loading. None of these imprints the weapon shape. Therefore a signature fracture is a depressed skull fracture.

Depressed skull fracture

Quick Tip: The fracture that carries the imprint or shape of the weapon used.

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116. The rave drug is?

- (A) Ecstasy
- (B) Cocaine
- (C) Heroin
- (D) Amphetamine

Correct Answer: (A) Ecstasy

SOLUTION:

This is a terminology question in forensic toxicology. The phrase rave drug points to the agent most strongly linked with the rave or all-night dance party subculture, where users seek stimulation, sociability and altered perception while dancing for hours.

That agent is MDMA, marketed on the street as Ecstasy. It combines stimulant and mild hallucinogenic, empathy-enhancing actions, which is exactly why it became the signature party substance and earned the nickname rave drug. While its parent class is the amphetamines, the specific named option that the term refers to is Ecstasy, so option D (amphetamine) is too generic and is not selected.

Cocaine is a classic stimulant of abuse and heroin is an opioid, but neither carries the rave label. Hence the correct choice is Ecstasy.

Ecstasy (MDMA)

Quick Tip: The party-drug nickname points to MDMA, not the broad parent class.

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117. Sparrow foot marks (sparrow marks) are seen in?

- (A) Gunshot injuries
- (B) Stab injury of the face
- (C) Vitriolage (acid throwing)
- (D) Windshield glass injury

Correct Answer: (D) Windshield glass injury

SOLUTION:

The clue here is the descriptive name sparrow foot marks, sometimes called crow's feet, which paints a picture of many tiny, angular cuts spreading out like the toe prints of a small bird. The task is to match this appearance to its cause.

Such a pattern arises when fractured glass lacerates the skin. In a vehicle collision the face of an unrestrained passenger is thrown against the windscreen, which crazes and breaks into countless small fragments. These shards produce a cluster of short, irregularly oriented incised wounds over the face, and their radiating layout is what earns the bird-foot description.

Comparing the alternatives: firearm wounds show entry and exit features with soot or tattooing, a stab wound is a single deep penetrating cut, and vitriolage causes chemical burns with dripping splash marks. None reproduces the multiple bird-foot lacerations. Therefore sparrow marks belong to windshield glass injury.

Windshield glass injury

Quick Tip: Multiple tiny radiating facial cuts from shattered glass in a car crash.

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118. A patient presents to the casualty with bluish pigmentation of the conjunctiva, mucous membranes and nails. On examination there is tachycardia and hypotension within one hour of ingestion of a poison. What is the probable poisoning?

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

Correct Answer: (B) Arsenic

SOLUTION:

The diagnostic strategy here is to weigh the speed of onset against the metal-specific signs. The patient deteriorates within an hour of swallowing the poison, showing a fast heart rate and a falling blood pressure, which signals an acute toxic insult driving the patient toward circulatory shock, alongside a striking bluish tint of the conjunctiva, mucosae and nail beds.

Acute arsenic ingestion fits this profile. It is rapidly absorbed and provokes intense gastrointestinal and vascular toxicity, with increased capillary permeability leading to fluid loss, compensatory tachycardia and hypotension, and a bluish discoloration of mucous membranes and nails. This combination of immediate cardiovascular collapse with the described pigmentation is the recognised acute arsenic presentation.

The competing metals behave differently. Lead and mercury intoxication are typically chronic, dominated by neurological, renal and gingival changes rather than a one-hour shock state, and copper poisoning is marked by a metallic taste,

blue-green vomiting, hemolysis and liver damage. Therefore, the most likely agent is arsenic.

Arsenic

Quick Tip: Rapid shock plus bluish mucosae and nails after ingestion points to one heavy metal.

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119. A poison which is luminous, translucent and waxy is

- (A) Iodine
- (B) Ammonium bromide
- (C) Cobra venom
- (D) Yellow phosphorus

Correct Answer: (D) Yellow phosphorus

SOLUTION:

The question asks you to match a description with a poison having three specific physical traits: it glows in the dark (luminous), light passes partly through it (translucent), and it feels waxy.

Yellow phosphorus uniquely fits all three. It is stored under water precisely because, on exposure to air, it undergoes slow oxidation that releases energy as a pale glow, which is the origin of the word phosphorescence. Its texture is soft and waxy and it appears translucent yellow.

Eliminating the rest is straightforward. Iodine forms dark shiny crystals that turn directly into violet vapour and is neither waxy nor luminous. Ammonium bromide is an ordinary white crystalline salt used historically as a sedative. Cobra venom is a liquid mixture of enzymes and neurotoxic proteins, not a solid with optical glow.

Clinically, yellow phosphorus is a powerful hepatotoxic and protoplasmic poison; the breath and excreta may smell of garlic and the stools can be luminous, a sign that strongly points back to this agent.

Hence the poison described is yellow phosphorus.

Yellow phosphorus

Quick Tip: Think of the poison stored under water that glows in the dark and smells of garlic.



120. An auto-rickshaw ran over a child's thigh, leaving a mark of the tyre tracks. This is a

- (A) Contact bruise
- (B) Patterned bruise
- (C) Imprint abrasion
- (D) Pressure bruise

Correct Answer: (B) Patterned bruise

SOLUTION:

The decisive clue here is that the injury carries the shape of the object that caused it, namely the tread of the tyre. In forensic terminology, any contusion that faithfully copies the outline of the striking surface is termed a patterned bruise, sometimes described as an imprint or stamp bruise.

The mechanism is worth understanding. When a heavy tread presses on skin, the ridges squeeze blood out of the directly compressed lines, while blood pools under the grooves between the ridges. The result is a set of parallel marks that recreate the tyre pattern, allowing the investigator to identify the offending vehicle.

Going through the alternatives clarifies the choice. The term contact bruise is generic and does not convey the idea of an object's shape being copied. An imprint abrasion would apply if the surface epidermis were scraped off, but the stem specifies a bruise, which is a deeper bleed into tissue rather than a graze. A pressure bruise is associated with prolonged squeezing such as strangulation marks, which is a different scenario from a wheel passing over a limb.

Therefore the tyre track left on the child's thigh is best classified as a patterned bruise.

Patterned bruise

Quick Tip: A bruise that reproduces the exact shape of the impacting object has a special name.

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121. Dental numbering is done by all of the following except

- (A) FDI two-digit system
- (B) Anatomic and diagrammatic charting
- (C) Palmer notation
- (D) Harder acrogenic method

Correct Answer: (D) Harder acrogenic method

SOLUTION:

This is a "pick the odd one out" question, so the strategy is to validate each option as a real charting method and flag the one that does not exist.

Start with the established systems. The FDI two-digit notation is the world standard recommended by the Federation Dentaire Internationale; the first digit names the quadrant and the second names the tooth. Anatomic and diagrammatic charting is the practical method dentists use to draw the teeth on a chart and record findings. Palmer notation, originally the Zsigmondy system, uses a bracket

symbol for the quadrant together with numbers one to eight for permanent teeth and letters for deciduous teeth.

That leaves the Harder acrogenic method, which is not described in any dental or forensic textbook. It is an invented term placed in the question to act as the exception.

It is also useful to recall the Universal numbering system, which sequentially numbers permanent teeth from 1 to 32, as a fourth legitimate method, none of which is the answer.

So the non-existent, and therefore correct, choice is the Harder acrogenic method.

Harder acrogenic method

Quick Tip: Three of these are real charting systems; one is a made-up name.

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122. An investigator finds 5 independent factors, the presence or absence of which correlates with a disease. Which is the next study you will do?

- (A) ANOVA
- (B) Multiple linear regression
- (C) Multiple logistic regression
- (D) Kruskal-Wallis test

Correct Answer: (C) Multiple logistic regression

SOLUTION:

The single most important detail in this question is the type of the outcome variable. The disease is recorded simply as present or absent, which makes it a binary categorical outcome, and there are five candidate predictors.

The selection of a statistical model follows a simple rule based on the outcome. A

continuous outcome with several predictors calls for multiple linear regression; a binary outcome with several predictors calls for multiple logistic regression. Because the disease state here is dichotomous, logistic regression is the technique that fits, and it conveniently reports adjusted odds ratios for each of the five factors.

Checking the other options confirms this. Multiple linear regression requires a numeric, continuous dependent variable and is therefore inappropriate for a yes or no outcome. ANOVA tests whether the means of a continuous variable differ between groups, again the wrong setting. The Kruskal-Wallis test is the non-parametric counterpart of one-way ANOVA for comparing more than two groups and is not a multivariable predictor model.

Note that the printed key labels multiple linear regression as the answer, but this is a known error in the recall paper. Linear regression cannot model a binary disease outcome, so the statistically valid answer is multiple logistic regression.

Multiple logistic regression

Quick Tip: The outcome is binary (disease present or absent), so which regression handles a yes or no outcome?

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123. Which is not true about diet modification recommendation in a high cardiovascular risk group?

- (A) Cholesterol less than 100 mg/day
- (B) Avoid alcohol
- (C) Fat intake 10% of total calorie intake
- (D) Salt restriction less than 6 gm/day

Correct Answer: (B) Avoid alcohol

SOLUTION:

This is an "odd statement" question, where three options are standard cardiovascular dietary instructions and one is the exception.

The numerically defined targets are the easiest to confirm as genuine recommendations. Keeping dietary cholesterol low, holding total fat to a small fraction of daily calories with attention to reducing saturated fat, and cutting salt to under roughly 5 to 6 grams a day are all part of the heart-protective diet aimed at lowering lipids and blood pressure.

Alcohol is handled differently. Guidance generally advises limiting alcohol to a modest amount rather than stating that it must be completely avoided as a fixed quantitative diet rule. Because the other three options are precise dietary limits and alcohol advice is comparatively qualitative, the recall key treats "avoid alcohol" as the statement that does not belong with the rest.

So, by the printed answer, the exception among these diet-modification statements is the instruction to avoid alcohol.

Avoid alcohol

Quick Tip: Three options are precise numeric diet limits; one is a qualitative alcohol instruction.

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124. All of the following reforms have been proposed in the World Health Report 2008 except

- (A) Social reforms
- (B) Leadership reforms
- (C) Policy reforms
- (D) Economic reforms

Correct Answer: (D) Economic reforms

SOLUTION:

The key is to remember the four reforms set out by the World Health Report 2008, which revived the agenda of primary health care under the banner "Now More Than Ever."

The report grouped its recommendations into four reform areas: universal coverage reforms to improve health equity and fairness, service delivery reforms to make care people-centred, leadership reforms to build more reliable and inclusive governance, and public policy reforms to promote and protect the health of communities.

Mapping the choices, social reforms align with the universal coverage and equity dimension, leadership reforms are listed directly, and policy reforms correspond to public policy reforms. Each of these three is part of the report.

Economic reforms, by contrast, are not among the four reform areas described in the report, which makes it the odd one out.

Therefore the reform not proposed in the World Health Report 2008 is economic reforms.

Economic reforms

Quick Tip: WHR 2008 named four PHC reforms: coverage, service delivery, leadership and public policy.



125. According to McKeown's theory, the reduction in mortality due to tuberculosis is a consequence of

- (A) Increased awareness and knowledge
- (B) Medical advancement
- (C) Behavioural modification
- (D) Social and environmental factors

Correct Answer: (D) Social and environmental factors

SOLUTION:

This question tests the central claim of the McKeown thesis on the decline of infectious-disease deaths.

Thomas McKeown studied long-run mortality data and made the striking observation that deaths from tuberculosis and other infections were already falling steeply well before specific cures or vaccines became available. The arrival of streptomycin and BCG came late in the timeline, after most of the decline had already happened.

From this he concluded that the chief drivers of the falling death rate were rising living standards, especially improved nutrition, together with better social and environmental conditions like cleaner water, improved sanitation, better housing and less crowding. Medical care, in his view, played only a minor role in the historical decline.

Looking at the alternatives, medical advancement is the very factor McKeown argued was not the principal cause, while increased awareness and behavioural change were not the heart of his explanation. The factor he emphasised is captured by social and environmental conditions.

Hence, by McKeown's theory, the drop in tuberculosis mortality is attributed to social and environmental factors.

Social and environmental factors

Quick Tip: McKeown said TB deaths fell before drugs and vaccines, due to better living conditions.

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126. The orthotolidine test is used for assessing the concentration of which of the following in water?

- (A) Chlorine
- (B) Nitrites
- (C) Nitrates
- (D) Fluorine

Correct Answer: (A) Chlorine

SOLUTION:

The question asks which water parameter the orthotolidine (OT) test measures. In public health practice, the OT test is the standard bedside method for checking the adequacy of water chlorination. The reagent orthotolidine combines with chlorine in the sample and develops a yellow tint, and the depth of that colour reflects how much chlorine is present. A free residual chlorine level of **0.5 mg/L** maintained for a one-hour contact time is the accepted marker of effective disinfection, and the OT test is what confirms this in the field. Nitrites and nitrates are indicators of organic or fertiliser contamination and are measured by separate analytical procedures, while fluorine levels are checked to prevent fluorosis using fluoride-specific methods. None of these three are detected by orthotolidine. Therefore the only parameter linked to this test is chlorine.

Chlorine

Quick Tip: Think of the yellow colour test done to check residual disinfectant in chlorinated water.

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127. Which of the following does NOT cause indoor air pollution?

- (A) Carbon monoxide (CO)
- (B) Nitrous oxide
- (C) Radon
- (D) Mercury vapour

Correct Answer: (B) Nitrous oxide

SOLUTION:

This item tests recognition of common indoor air pollutants. The list of agents that contaminate the air inside homes includes products of fuel combustion, radioactive soil gases, tobacco smoke and vapours from household items. Carbon monoxide qualifies because it forms whenever fuel burns incompletely on stoves and heaters. Radon is an inert radioactive gas that rises from the ground and accumulates indoors, and it is a well-documented cause of lung cancer linked to indoor exposure. Mercury vapour enters indoor air from cracked thermometers, fluorescent tubes and some older paints, so it too is an indoor contaminant. The remaining choice, nitrous oxide, is not part of the standard indoor air pollution list. Among nitrogen oxides, it is nitrogen dioxide produced by gas appliances that is the indoor concern, whereas nitrous oxide is chiefly an anaesthetic and greenhouse gas. By elimination, the agent that does not belong is nitrous oxide.

Nitrous oxide

Quick Tip: Three are real indoor pollutants; the odd one out is an anaesthetic gas, not the nitrogen oxide from gas stoves.

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128. Which is the most important and potential agent that can be used in bioterrorism?

- (A) *Yersinia pestis*
- (B) Small pox (*Variola virus*)
- (C) *Mycobacterium tuberculosis*
- (D) *Clostridium botulinum*

Correct Answer: (B) Small pox (*Variola virus*)

SOLUTION:

The task is to identify the single most feared biological weapon among the four agents. Public health agencies rank bioterror organisms into categories, with Category A holding those that combine easy spread, severe illness, high death rates and major potential for social disruption. Plague bacillus, botulinum toxin producer and the smallpox virus all sit in this top tier, while the tuberculosis bacillus does not feature as a priority bioweapon. To choose between the Category A candidates, the deciding factors are transmissibility and population susceptibility. Smallpox stands apart because it passes directly from person to person, the world stopped vaccinating after eradication so almost everyone is now susceptible, and its case fatality is high. These features give it the greatest epidemic and panic potential of any agent on the list, which is why it is consistently named the most dangerous potential bioterrorism agent.

Small pox

Quick Tip: The most contagious agent against a now-unvaccinated, non-immune population is the answer.

• • •

129. Which insect among the following is NOT resistant to DDT?

- (A) *Musca domestica* (housefly)
- (B) *Phlebotomus* (sandfly)
- (C) *Culex fatigans* (mosquito)
- (D) *Anopheles stephensi* (mosquito)

Correct Answer: (B) Phlebotomus (sandfly)

SOLUTION:

Here we must spot the one vector that has stayed sensitive to DDT while the others have become resistant. Decades of heavy DDT spraying produced selection pressure that bred resistance in many insect populations. Houseflies were among the first to lose susceptibility, and the mosquitoes *Culex fatigans* and *Anopheles stephensi* followed, with resistance now common across endemic areas. The sandfly, *Phlebotomus*, is the exception. Because this vector of visceral leishmaniasis remained susceptible, DDT indoor residual spraying stayed effective and formed the backbone of the kala-azar control and elimination strategy in the Indian subcontinent. Reasoning by elimination, the only insect still vulnerable to DDT among the four is the sandfly.

Phlebotomus

Quick Tip: The kala-azar vector controlled by DDT indoor spraying is still susceptible to it.

• • •

130. All of the following are true about biomedical waste disposal EXCEPT:

- (A) Human anatomical waste is disposed in a yellow bag
- (B) Red bag contents can be a potential source of infection
- (C) Black bag is used for incineration ash
- (D) Blue bag contents are disposed in secure landfill

Correct Answer: (D) Blue bag contents are disposed in secure landfill

SOLUTION:

This is an except question on colour-coded biomedical waste handling, so we accept the three correct statements and flag the wrong one. Anatomical human waste goes into the yellow stream destined for incineration, making the first

statement valid. The red category collects contaminated recyclable plastics like used tubing and IV sets, and because these items are soiled with body fluids they are indeed potentially infectious, validating the second statement. Black bags in this scheme accommodate general or ash type discards, which fits the third statement. The blue category, however, is reserved for glassware and metallic sharps that are disinfected and then sent for recycling rather than buried in a secure landfill. Burial in a secure landfill is the route for certain treated or cytotoxic residues, not for blue bag glass. So the statement that does not hold true is the one about blue bag contents going to a secure landfill.

Blue bag contents are disposed in secure landfill

Quick Tip: Glassware in the blue category is recycled after disinfection, not landfilled.

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131. A graph of a normal blood sugar level curve and a diabetic blood sugar level curve was shown, with an area seen overlapping towards the normal glycaemic curve and a cut-off point marked at 120 mg/dL. What does that overlapping area represent?

- (A) True positive
- (B) False positive
- (C) True negative
- (D) False negative

Correct Answer: (D) False negative

SOLUTION:

This problem maps an overlap region on two bell shaped glucose distributions to a screening test category. Picture the diseased (diabetic) curve sitting at higher glucose values and the healthy curve at lower values, with a vertical decision line at 120 mg/dL. People to the right of this line are screened positive and those to the left are screened negative. The four outcome boxes follow from combining true disease status with the screening label. The region described in the stem belongs to the diabetic distribution yet spills over to the left of the cut-off, into the

normal glycaemic zone. That means these individuals genuinely have diabetes but their reading fell below the threshold, so the test calls them negative. A diseased person labelled negative is by definition a false negative, the group that a screening programme dangerously misses. The companion errors would be normals pushed to the right (false positives), while correct calls give true positives and true negatives. Hence the shaded overlap is the false negative fraction.

False negative

Quick Tip: Diseased people whose value falls below the cut-off and are called negative are which category?

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132. All of the following are part of National screening programmes EXCEPT:

- (A) Diabetes mellitus
- (B) Dental caries
- (C) Refractive errors
- (D) Carcinoma cervix

Correct Answer: (B) Dental caries

SOLUTION:

The aim is to find the one condition that is not covered by an organised national screening effort. Screening is justified when a disease is frequent, detectable in an early silent phase, testable by an acceptable method and treatable to better effect when caught early. Diabetes fits and is screened within the national non-communicable disease initiative. Refractive errors are actively looked for during school eye examinations and vision screening drives, qualifying them as a screened condition. Cervical cancer is one of the three cancers (with breast and oral) included in population based screening under the NCD programme. Dental caries, although extremely common, is tackled through oral hygiene promotion, fluoride use and treatment of detected cases rather than through a dedicated

mass screening programme. Working through the choices, the outlier without a national screening programme is dental caries.

Dental caries

Quick Tip: One of these is handled by health education and treatment, not by organised mass screening.

• • •

133. Carrier state is not important in the transmission of which of the following diseases?

- (A) Measles
- (B) Typhoid
- (C) Polio
- (D) Diphtheria

Correct Answer: (A) Measles

SOLUTION:

Group the diseases by whether a person can keep spreading the agent after or without symptoms. Typhoid is the classic example of a chronic carrier (the gallbladder harbours *Salmonella Typhi*, as in the historic case of Typhoid Mary). Diphtheria produces nasopharyngeal carriers who shed the bacillus, and poliomyelitis is propagated mostly by silent sub-clinical infections that function exactly like carriers, with paralytic cases being a tiny fraction. Measles behaves differently: it is a self-limiting acute viral illness whose virus is shed only during active clinical disease through respiratory secretions, roughly four days before to four days after the rash. After recovery the virus is eliminated and lifelong immunity follows, so no chronic or convalescent carrier ever forms. Because measles spreads only from frank cases and never from carriers, it is the disease in which the carrier state is unimportant.

Measles

Quick Tip: Which listed disease has no chronic or sub-clinical carrier and spreads only from acute cases?

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134. What is the denominator used in calculating the maternal mortality rate (ratio)?

- (A) Total number of live births
- (B) Total number of married women
- (C) Total number of births
- (D) Midyear population

Correct Answer: (A) Total number of live births

SOLUTION:

The maternal mortality ratio links deaths from maternal causes to the size of the population at risk of such deaths, which is best represented by women who actually delivered. By international convention the denominator is the number of live births, not all births and not the general population. The standard expression is $MMR = \frac{\text{maternal deaths}}{\text{live births}} \times 100000$. Live births are chosen because birth registration captures them dependably, whereas counting all pregnancies (including early losses) is impractical, and using married women or the midyear population would dilute the measure with people not exposed to the maternal risk. Hence the denominator is the total number of live births.

Total number of live births

Quick Tip: The denominator is per 1,00,000 of what reliably registered birth event?

• • •

135. A population is divided into relevant subgroups and samples are selected randomly from each of these subgroups. What type of sampling is this?

- (A) Simple random sampling
- (B) Stratified sampling
- (C) Cluster sampling
- (D) Systematic sampling

Correct Answer: (B) Stratified sampling

SOLUTION:

Read the procedure carefully: the population is first partitioned into relevant homogeneous subgroups, and then random selection happens within every subgroup. The decisive clue is sampling from within each subgroup, which is the signature of stratified random sampling, where the subgroups are the strata. This differs from cluster sampling, where the population is broken into clusters and only some entire clusters are chosen, with members of unselected clusters never sampled. It also differs from simple random sampling, which ignores subgroups altogether, and from systematic sampling, which selects every k^{th} element from an ordered list. Since each stratum contributes a random sample, the technique is stratified sampling.

Stratified sampling

Quick Tip: Random selection from within every homogeneous subgroup points to which method?

• • •

136. Pearson's coefficient of skewness is given by which of the following formulae?

- (A) (Mean - Mode) / SD
- (B) (Mode - Mean) / SD
- (C) SD / (Mean - Mode)
- (D) SD / (Median - Mode)

Correct Answer: (A) (Mean - Mode) / SD

SOLUTION:

Asymmetry of a distribution is captured by how far apart its central measures lie. Karl Pearson exploited the fact that the mean is pulled toward the tail while the mode stays at the peak, so the difference between them indicates direction and degree of skew. To remove the influence of scale, this difference is divided by the standard deviation, giving the dimensionless first coefficient of skewness $S_k = \frac{\text{Mean} - \text{Mode}}{SD}$. A positive result means the longer tail is on the right (positive skew); a negative result means it is on the left. The reversed and inverted options do not represent this standard formula, so the answer is (Mean - Mode) divided by SD.

$\frac{\text{Mean} - \text{Mode}}{SD}$
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Quick Tip: It is the difference between mean and mode standardised by the spread.

• • •

137. Regarding the Human Development Index (HDI), all of the following are components EXCEPT:

- (A) Life expectancy at birth
- (B) Life expectancy at 1 year of age
- (C) Education
- (D) GDP

Correct Answer: (B) Life expectancy at 1 year of age

SOLUTION:

The HDI condenses development into three pillars: health, education, and living standard. Health is captured by life expectancy at birth, education by schooling indicators, and living standard by income per head (GDP or GNI per capita). The question asks for the false statement, so identify the option that is not one of these three indicators. Life expectancy at birth, education, and GDP are all genuine HDI components, but life expectancy at 1 year of age is not used anywhere in the index. Therefore the exception, and the correct choice for an except-type question, is life expectancy at 1 year of age.

Life expectancy at 1 year of age

Quick Tip: HDI uses life expectancy at birth, not at any later age.

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138. The efficiency of pasteurisation of milk is assessed by which of the following tests?

- (A) Phosphatase test
- (B) Methylene blue test
- (C) Catalase test
- (D) Oxidase test

Correct Answer: (A) Phosphatase test

SOLUTION:

To check whether milk has been pasteurised properly, we look for a heat-sensitive natural marker rather than counting bacteria. Alkaline phosphatase is normally present in raw milk and is destroyed at the same temperature-time conditions required to kill milk-borne pathogens. The phosphatase test searches for any leftover active enzyme: if none is found the test is negative, proving the milk was heated adequately and pasteurisation was effective; a positive test signals under-

heating or contamination with raw milk. By contrast, the methylene blue reduction test grades the bacterial quality of milk, while catalase and oxidase tests are used to characterise bacteria. Thus pasteurisation efficiency is judged by the phosphatase test.

Phosphatase test

Quick Tip: Look for the heat-labile enzyme that disappears with proper heating.

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139. Which among the following is a cardioprotective fatty acid?

- (A) Palmitic acid
- (B) Stearic acid
- (C) Oleic acid
- (D) Omega-3 fatty acids

Correct Answer: (D) Omega-3 fatty acids

SOLUTION:

Sort the choices by how they affect heart health. Palmitic and stearic acids are long-chain saturated fats, the type linked with rising LDL cholesterol and atherosclerosis, so they cannot be the protective option. Oleic acid is monounsaturated and reasonably heart-friendly, yet it is not the standard textbook answer for a cardioprotective fatty acid. The omega-3 polyunsaturated fatty acids, including EPA, DHA, and alpha-linolenic acid, are the recognised cardioprotective fats: they cut triglyceride levels, stabilise heart rhythm, reduce clot formation, and lower coronary disease risk. Therefore, among the given options, omega-3 fatty acids are cardioprotective.

Omega-3 fatty acids

Quick Tip: Think of the polyunsaturated fats from fish oil that lower triglycerides.

• • •

140. Which is a non-deliberate measure for control of mosquitoes?

- (A) Use of alkalinity-causing soaps
- (B) Efforts by the community to prevent development of an environment suitable for mosquitoes
- (C) Use of larvicides
- (D) Use of bed nets against mosquitoes

Correct Answer: (B) Efforts by the community to prevent development of an environment suitable for mosquitoes

SOLUTION:

The question asks which control method works against mosquitoes without being aimed directly at them, that is, a non-deliberate or incidental measure.

Anything labelled deliberate is a targeted antivector action. Adding alkalinity-causing soap to water is a planned chemical modification of breeding sites, so it is deliberate. Larvicides are purpose-made chemicals dropped into water specifically to destroy larvae, again deliberate. Sleeping under a bed net is a planned personal barrier to keep biting mosquitoes away, so it too is deliberate.

By contrast, when a community keeps its surroundings clean, drains stagnant water and improves sanitation for general hygiene, mosquito breeding falls as a side effect rather than as the primary goal. That makes it the non-deliberate measure.

Note that the printed answer key chose the alkalinity soap option, but that is a deliberate chemical step and is medically wrong; the correct choice is the community environmental effort.

Efforts by the community to prevent a mosquito-suitable environment

Quick Tip: Which one fights mosquitoes only as a side effect, not on purpose?

• • •

141. Which of the following is FALSE regarding Japanese encephalitis?

- (A) During epidemics, 2 to 3 cases are seen in a village
- (B) A bite from an infected mosquito is always associated with disease
- (C) About 70% of patients are children below 5 years of age
- (D) The overt disease to inapparent infection ratio is 1:100

Correct Answer: (B) A bite from an infected mosquito is always associated with disease

SOLUTION:

This is a negative-stem question, so we must find the one statement that does not fit the known behaviour of Japanese encephalitis.

JE is an arbovirus spread by *Culex* mosquitoes, kept going in nature by pigs and water birds, and humans are dead-end hosts. A defining feature of JE is that clinical illness is rare relative to the number of infections.

Checking the options: epidemics do show only a handful of cases per village, which fits the sparse clustering of JE. Children, especially the young, form most of the cases, so the paediatric predominance fits. A very low overt-to-inapparent ratio (only a small number show disease for every many infected) also fits the picture of a mostly silent infection.

The statement that an infected mosquito bite always leads to disease contradicts this core fact. Because most infections stay subclinical, a bite seldom produces overt encephalitis. Therefore this is the false statement.

A bite from an infected mosquito is always associated with disease

Quick Tip: Most JE infections are silent, so which absolute claim breaks down?

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142. Which arthropod-transmitted disease is NOT found in India?

- (A) West Nile fever
- (B) Dengue
- (C) Yellow fever
- (D) Sandfly fever

Correct Answer: (C) Yellow fever

SOLUTION:

The task is to spot the vector-borne disease that does not occur in India, even though all the options are spread by arthropods.

Dengue is one of the most common Aedes-borne infections in the country, so it is clearly present. West Nile virus circulates in India through Culex mosquitoes and has caused recorded cases. Sandfly fever, carried by Phlebotomus sandflies, is also encountered in India.

Yellow fever is the odd one out. Its endemic belt lies only in sub-Saharan Africa and tropical South America; Asia, including India, has never reported indigenous yellow fever. Interestingly, India does harbour Aedes aegypti, the vector capable of transmitting it, which is exactly why the country demands proof of yellow fever vaccination from travellers arriving from endemic regions to keep it out.

Yellow fever

Quick Tip: One of these is confined to Africa and South America despite India having its vector.

• • •

143. The most useful indicator for an acute illness is:

- (A) Case fatality rate
- (B) Standardized mortality ratio
- (C) Cause-specific death rate
- (D) Five-year survival rate

Correct Answer: (A) Case fatality rate

SOLUTION:

We need the index that best reflects how dangerous a short-course (acute) illness is.

Think about the denominator each option uses. Case fatality rate divides deaths from the disease by the people who actually had the disease, giving the chance that a diagnosed patient dies. Because acute illnesses resolve quickly, this case-based measure neatly captures their severity and is the standard tool in outbreak investigations.

The standardized mortality ratio is an age-adjusted comparison across populations and tells us nothing direct about how lethal one acute episode is. The cause-specific death rate uses the entire population as its base, so it reflects the overall burden of a cause rather than the risk to a sick individual. The five-year survival rate tracks outcomes over years and is meant for chronic diseases like cancer, not for something that is over in days.

So the case fatality rate is the right pick for an acute illness.

Case fatality rate

Quick Tip: Which rate uses the number of cases (not the whole population) as its denominator over a short period?

• • •

144. Direct standardisation is used to compare the mortality rates between two countries. This is done because of the difference in:

- (A) Causes of death
- (B) Numerators
- (C) Age distribution
- (D) Denominators

Correct Answer: (C) Age distribution

SOLUTION:

The key idea is what makes a raw comparison of death rates between two countries unfair, and what standardisation fixes.

Mortality is strongly tied to age: older people die more often. If one country has many elderly citizens and the other has a young population, the older-skewed country will show a higher crude death rate even if, age for age, the risk is identical. That difference in the age make-up of the two populations is the confounder.

Direct standardisation solves this by taking the age-specific death rates from each country and applying them to one shared standard population structure. The resulting age-adjusted rates strip out the influence of differing age profiles, so any remaining gap reflects real differences in mortality rather than demographics.

It is not about causes of death, nor about reconciling numerators or denominators

in isolation; it is specifically about evening out the age distribution.

Age distribution

Quick Tip: Standardisation removes the confounding effect of one demographic variable between populations.

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145. Onodi cells and Haller cells are associated with the following structures, respectively:

- (A) Optic nerve and orbital floor
- (B) Optic nerve and internal carotid artery
- (C) Optic nerve and ethmoidal air cells
- (D) Orbital floor and internal carotid artery

Correct Answer: (A) Optic nerve and orbital floor

SOLUTION:

Both Onodi and Haller cells are anatomical variants of the ethmoid air cells, and the question asks which neighbouring structure each one threatens.

Start with the Onodi cell. It is the most posterior ethmoid cell that balloons backward and upward into the sphenoid area, wrapping near the optic nerve. Because of this, surgeons must be cautious of optic nerve injury when operating in this region, so the Onodi cell is linked to the optic nerve.

Now the Haller cell, also called the infraorbital ethmoid cell. It grows downward into the floor of the orbit near the maxillary sinus opening, so it is tied to the orbital floor and can obstruct maxillary sinus drainage.

Pairing them in the order asked gives optic nerve for the Onodi cell and orbital

floor for the Haller cell.

Optic nerve and orbital floor

Quick Tip: Onodi sits posteriorly near the optic nerve; Haller sits low in the orbital floor.

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146. Pain sensation from the ethmoid sinus is carried by:

- (A) Frontal nerve
- (B) Lacrimal nerve
- (C) Nasociliary nerve
- (D) Infraorbital nerve

Correct Answer: (C) Nasociliary nerve

SOLUTION:

To find which nerve relays pain from the ethmoid sinus, follow the sensory supply of the air cells back to its parent trunk.

The ethmoid cells receive the anterior and posterior ethmoidal nerves. Both of these are direct branches of the nasociliary nerve, a branch of the ophthalmic division of the trigeminal nerve. So any painful stimulus from ethmoiditis is conveyed through the ethmoidal nerves into the nasociliary nerve.

The distractors supply other territories: the frontal nerve handles the forehead and frontal sinus, the lacrimal nerve serves the lacrimal gland and lateral upper lid, and the infraorbital nerve from the maxillary division covers the maxillary sinus, cheek and upper lip. None of these innervate the ethmoid cells.

Hence the nasociliary nerve is the carrier of ethmoid sinus pain.

Nasociliary nerve

Quick Tip: Trace the anterior and posterior ethmoidal nerves back to their parent branch of V1.

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147. A 5 year old boy, while having dinner, suddenly becomes aphonic and is brought to the casualty with respiratory distress. What should be the next step in management?

- (A) Cricothyroidotomy
- (B) Emergency tracheostomy
- (C) Humidified oxygen
- (D) Heimlich maneuver

Correct Answer: (D) Heimlich maneuver

SOLUTION:

A toddler who abruptly loses voice while eating and then struggles to breathe is choking on aspirated food. The block is purely mechanical, sitting in the larynx or trachea, so the entire treatment logic is about getting the object out fast rather than treating swelling or infection.

Among the offered choices, only one is a non invasive bedside maneuver that can be done in seconds. Abdominal thrusts, the Heimlich maneuver, squeeze the diaphragm upward and spike the pressure beneath the obstruction, popping the bolus out much like a cork. This is precisely why it is taught as the first action for any conscious choking victim.

The remaining options fail the timing and appropriateness test. Surgical airways such as cricothyroidotomy or tracheostomy are escalation steps used only after non surgical attempts do not work and the patient is deteriorating; they are not the opening move. Humidified oxygen helps mucosal conditions, not a solid

object wedged in the airway. So the correct next step remains the abdominal thrust technique.

Heimlich maneuver

Quick Tip: Sudden aphonia while eating plus distress equals choking on a food bolus; expel it first.

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148. Acoustic neuroma most commonly involves which structure?

- (A) Superior vestibular division of the 8th cranial nerve
- (B) Auditory (cochlear) part of the 8th cranial nerve
- (C) 7th cranial nerve
- (D) Inferior vestibular division of the 8th cranial nerve

Correct Answer: (D) Inferior vestibular division of the 8th cranial nerve

SOLUTION:

The clue is in the histology and anatomy rather than the misleading common name. An acoustic neuroma is really a schwannoma, a tumour of the nerve sheath cells, and it grows on the eighth nerve. The eighth nerve has a cochlear part for hearing and a vestibular part for balance, and the vestibular part splits into superior and inferior divisions.

Classic teaching pins the origin to the inferior vestibular division, where the Scarpa ganglion sits close to the internal auditory canal. That is the favoured birthplace of the tumour even though hearing loss is the loudest symptom. The hearing complaints appear because the enlarging mass leans on the neighbouring cochlear fibres.

Working through the wrong choices: the auditory division and the superior vestibular division are not the typical seed site, and the facial nerve is merely a

victim of later compression as the tumour expands toward the cerebellopontine angle. Hence the answer is the inferior vestibular division.

Inferior vestibular division of the 8th cranial nerve

Quick Tip: Vestibular schwannoma, not cochlear; think Scarpa ganglion on the inferior vestibular division.

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149. What is the usual time of occurrence of secondary hemorrhage after tonsillectomy?

- (A) 24 hours
- (B) 12 hours
- (C) 6 days
- (D) 12 days

Correct Answer: (C) 6 days

SOLUTION:

Bleeding after a tonsillectomy is split neatly by timing. Anything in the first day is the early group, called primary or reactionary, and it is tied to a loosened tie or vessels that reopen as the patient warms up and blood pressure normalises. The late group is the secondary bleed.

The secondary bleed has a signature window of roughly the fifth to tenth day, with the sixth day being the textbook peak. The reason is biological: the protective slough that forms over the raw tonsillar bed separates around this time, and if infection has set in it can eat into an underlying vessel and trigger oozing or frank bleeding.

Scanning the options against this logic, both the hour based choices belong to the early reactionary category, and twelve days sits beyond the usual late window. The choice that lands inside the classic secondary interval is six days.

6 days

Quick Tip: Secondary bleed equals slough separation plus infection, classically around the 6th day.

• • •

150. Which of the following is true regarding a ranula?

- (A) It is also known as epulis
- (B) It is a cystic swelling in the floor of the mouth
- (C) It is a type of thyroglossal cyst
- (D) It is a type of mucus retention cyst

Correct Answer: (B) It is a cystic swelling in the floor of the mouth

SOLUTION:

The word ranula comes from the Latin for frog because the bluish translucent swelling under the tongue looks like a frog underbelly. Anatomically it belongs to the floor of the mouth and is linked to the sublingual or submandibular salivary apparatus, forming when saliva collects in a cyst.

Testing the statements one by one clears the picture. Calling it an epulis is wrong, since epulis refers to a localised growth on the gums. Tying it to the thyroglossal cyst is also wrong, because that lesion is a midline neck remnant along the tongue to thyroid descent, nowhere near the floor of mouth. While it is true a ranula is fundamentally a mucus retention or extravasation cyst, the cleanest and most direct defining statement asked here is its location.

So the statement that captures the essence of a ranula is that it is a cystic swelling in the floor of the mouth.

It is a cystic swelling in the floor of the mouth

Quick Tip: Rana equals frog; a translucent cyst sitting in the floor of the mouth.

• • •

151. All of the following are true statements regarding the use of sodium fluoride in the treatment of otosclerosis EXCEPT:

- (A) It inhibits osteoblastic activity
- (B) It is used in the active phase of otosclerosis when the Schwartz sign is positive
- (C) It has an antienzymatic action on proteolytic enzymes toxic to the cochlea
- (D) It is contraindicated in renal failure patients

Correct Answer: (A) It inhibits osteoblastic activity

SOLUTION:

This question hinges on knowing exactly what fluoride does to bone turnover in otosclerosis. The disease starts as soft, vascular, spongy bone; the therapeutic aim of sodium fluoride is to harden it into mature, inactive bone. To do that the drug pushes bone forming activity and curbs bone resorbing activity.

Reading the four lines as true or false: saying the drug inhibits osteoblastic activity contradicts its actual mechanism, because it supports osteoblasts and suppresses osteoclasts. Since the stem wants the odd one out, this contradictory line is the one to pick.

The other three lines are accurate. Treatment is timed to the active, vascular phase flagged by a pink promontory glow known as the Schwartz sign. Fluoride also blunts the destructive proteolytic enzymes that threaten the cochlea. And because the kidney clears fluoride, renal failure makes its use unsafe. Therefore the incorrect statement is the claim that it inhibits osteoblastic activity.

It inhibits osteoblastic activity

Quick Tip: Fluoride hardens spongy bone by favouring osteoblasts; the osteoblast inhibition claim is the false one.

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152. Endolymphatic hydrops is seen in which condition?

- (A) Meniere's disease
- (B) Otosclerosis
- (C) Acoustic neuroma
- (D) Cholesteatoma

Correct Answer: (A) Meniere's disease

SOLUTION:

Start from the meaning of the term. Hydrops means an abnormal accumulation of fluid, and here it is the endolymph swelling the membranous labyrinth of the inner ear. The single condition that this pathological hallmark belongs to is Meniere's disease.

Clinically the swollen endolymphatic space explains the disease picture: recurrent spinning vertigo, hearing that rises and falls, ringing in the ear, and a sense of pressure or fullness. The fluid overload disturbs both the cochlear and vestibular functions, producing this combined symptom set.

The other options have entirely different mechanisms. Otosclerosis is a bony fixation problem at the stapes giving conductive loss; acoustic neuroma is a nerve sheath tumour; cholesteatoma is trapped skin debris in the middle ear. None of them is built around fluid distension of the labyrinth. Thus the correct match is Meniere's disease.

Meniere's disease

Quick Tip: Fluid distension of the labyrinth equals the classic pathology of Meniere's disease.

• • •

153. All of the following are seen in Argyll Robertson pupil EXCEPT:

- (A) Near reflex normal
- (B) Direct light reflex absent
- (C) Consensual light reflex normal
- (D) Visual acuity normal

Correct Answer: (C) Consensual light reflex normal

SOLUTION:

The defining quirk of the Argyll Robertson pupil is light near dissociation, a hallmark of neurosyphilis. The pupil ignores a light stimulus yet still constricts crisply when the eyes focus on a near target. Keeping this rule in mind makes the true and false statements fall out cleanly.

Because the problem lies in the light reflex arc, every light driven response is blunted. That means both the direct response in the stimulated eye and the consensual response in the opposite eye are lost. Therefore the line claiming the consensual light reflex stays normal is incorrect, and since the question seeks the exception, that is the choice to mark.

The accommodation response survives, so a normal near reflex is correct, and the absent direct light reflex is correct. Vision itself is generally unaffected because the sensory visual pathway is intact, so normal visual acuity is also correct. The single wrong statement is the preserved consensual light reflex.

Consensual light reflex normal

Quick Tip: Light near dissociation kills both light reflexes; the consensual normal claim is the odd one out.

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154. A young patient presents to the ophthalmology clinic with loss of central vision. There is no obvious family history. The electroretinogram (ERG) was observed to be normal. Which is the most probable diagnosis?

- (A) Best's disease
- (B) Stargardt's disease
- (C) Retinitis pigmentosa
- (D) Macular hole

Correct Answer: (B) Stargardt's disease

SOLUTION:

Start from the single most discriminating data point: the ERG is normal. The full-field ERG sums signals from all rods and cones across the retina, so any disease that spreads over the whole retina (like retinitis pigmentosa) drags the ERG down. Because the ERG here is preserved, the lesion must be restricted to the macula, where the cell count is too small to move the whole-retina response.

Now narrow within the macular dystrophies. The patient is young, has central vision loss, and lacks an obvious family history. Stargardt's disease is the commonest juvenile macular dystrophy, is inherited in an autosomal recessive pattern (so it frequently looks sporadic), and famously leaves the early full-field ERG normal. Every clue lines up.

Rule out the distractors by their signature tests and inheritance: Best's disease is autosomal dominant and is detected by an abnormal EOG (reduced Arden ratio), not a normal ERG; retinitis pigmentosa abolishes the ERG; and a macular hole is a mechanical defect of older eyes, not a young dystrophy. Therefore the picture is classic for Stargardt's disease.

Stargardt's disease

Quick Tip: Macula-only disease leaves the full-field ERG normal; think of the commonest juvenile macular dystrophy.



155. Damage to the nerve supplying the superior oblique muscle causes diplopia in which direction?

- (A) Horizontal and downwards
- (B) Vertical and downwards
- (C) Horizontal and upwards
- (D) Vertical and upwards

Correct Answer: (B) Vertical and downwards

SOLUTION:

Map the anatomy first: the superior oblique is the only muscle run by the trochlear nerve (CN IV). So this question is really asking what a CN IV palsy looks like.

Next, anchor on the muscle's job. The superior oblique pulls the eye downward when the eye is turned in, with secondary intorsion and abduction. Its headline function in clinical testing is depression in adduction, the motion used when walking downstairs or reading. Lose that function and the affected eye cannot be pulled down properly, so it sits a little high relative to the other eye; the two retinal images therefore split top-to-bottom, which the patient perceives as vertical double vision.

Finally, decide where it peaks. A paralysed extraocular muscle gives the largest image separation in its own field of gaze. Since the superior oblique works on downgaze, the diplopia becomes worst when the patient looks down, which is

exactly why these patients tilt the head and struggle on stairs. Combining direction and gaze position gives vertical diplopia, worst downwards.

Vertical and downwards

Quick Tip: The superior oblique (CN IV) depresses the adducted eye, so its palsy gives vertical diplopia worst on downgaze.

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156. A patient had a running nose and pain over the medial aspect of the eye and was being treated with decongestants for many days. He later developed chemosis, proptosis and diplopia on abduction of the right eye with congestion of the optic disc. What is the probable diagnosis?

- (A) Acute ethmoidal sinusitis
- (B) Orbital cellulitis
- (C) Cavernous sinus thrombosis
- (D) Orbital apex syndrome

Correct Answer: (C) Cavernous sinus thrombosis

SOLUTION:

Read this as an infection that travelled. It began in the nose and medial orbit (ethmoidal/facial territory) and was never properly treated, only masked with decongestants. The face and orbit drain through valveless veins, so pus can flow backward into the cavernous sinus and clot it.

Then check what the cavernous sinus would do if it thromboses. Two things: it dams the venous blood returning from the orbit, and it squeezes the cranial nerves passing through it. The dammed venous outflow gives chemosis, proptosis and a congested, swollen optic disc. The nerve compression gives ophthalmoplegia, and because the abducens (CN VI) sits most medially and most exposed inside the sinus, a failure of abduction (the lateral rectus) is the typical early eye-movement sign, exactly the diplopia on abduction described.

Compare the runners-up. Isolated ethmoidal sinusitis is just nasal disease, with no nerve palsy and no disc congestion. Orbital cellulitis can proptose the eye but does not typically produce the venous disc congestion and cranial nerve pattern of a sinus thrombosis, and orbital apex syndrome would not be preceded by a spreading septic facial focus with such marked venous congestion. The complete septic-plus-venous-plus-CN-VI picture is cavernous sinus thrombosis.

Cavernous sinus thrombosis

Quick Tip: Facial/nasal sepsis spreading back, plus chemosis, proptosis, CN VI palsy and a congested disc, means the cavernous sinus.

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157. A 5-year-old boy presented with leukocoria in the right eyeball, which is diagnosed as diffuse retinoblastoma involving the entire globe, while the other eye had 2 to 3 small lesions in the periphery. What will be the ideal management for this patient?

- (A) Enucleation of both eyes
- (B) Enucleation of the right eye and conservative management for the other eye
- (C) Enucleation of the right eye and focal therapy for the other eye
- (D) 6 cycles of chemotherapy

Correct Answer: (C) Enucleation of the right eye and focal therapy for the other eye

SOLUTION:

Handle the two eyes as two different problems, because bilateral retinoblastoma is staged eye by eye and the goal is to save life first, then vision.

The right eye is described as diffuse tumour filling the entire globe. That is an advanced, blind, unsalvageable eye, and the safest, most definitive step is to remove it. Enucleation takes out the large tumour load and reduces the risk of local and systemic spread, so the right eye is enucleated.

The left eye is the opposite situation: just 2 to 3 small lesions sitting in the periphery, with vision worth preserving. Such small, discrete tumours are the textbook target for eye-conserving focal treatments (laser photocoagulation, cryotherapy, thermotherapy), often supported by chemoreduction. So the left eye gets focal therapy, not removal.

The other options fail the life-versus-sight balance: removing both eyes blinds a child whose second eye is salvageable; watching the globe-filling right eye is dangerous; and chemotherapy by itself cannot clear a fully involved globe. The correct combined plan is enucleate the right eye and apply focal therapy to the left.

Enucleation of the right eye and focal therapy for the other eye

Quick Tip: Stage each eye separately: remove the globe-filling eye, save the lightly involved eye with focal treatment.



158. A tennis player gets hit by a ball on the eye, following which he complains of decreased vision. Which of the following suggests that the injury is due to trauma?

- (A) Optic neuritis
- (B) Pars planitis
- (C) Vitreous base detachment
- (D) Equatorial edema

Correct Answer: (C) Vitreous base detachment

SOLUTION:

Frame the physics of the impact. When a ball hits the eye, the globe is squashed front-to-back and bulges out at its equator in the same instant. That rapid deformation generates strong traction exactly where the vitreous gel is most tightly glued to the eye wall, the vitreous base near the ora serrata.

Because that adhesion is one of the strongest vitreoretinal attachments, it does not give way to inflammation or to slow disease; it tears only when a sudden mechanical force pulls on it. So when you see the vitreous base detached or avulsed, it is a near-specific footprint of blunt trauma, which is precisely the scenario described.

Now dismiss the inflammatory distractors. Optic neuritis is inflammation or demyelination of the optic nerve. Pars planitis is intermediate uveitis, again an inflammatory process. Equatorial edema is a vague, non-diagnostic finding. None of these is created by a mechanical blow, whereas vitreous base detachment is. Hence the trauma marker is vitreous base detachment.

Vitreous base detachment

Quick Tip: Blunt impact tears the strongest vitreoretinal adhesion, so a detached vitreous base signals trauma.

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159. The most common malignant cause for bilateral proptosis in children is?

- (A) Lymphoblastic lymphoma
- (B) Rhabdomyosarcoma
- (C) Acute lymphoblastic leukaemia (ALL)
- (D) Acute myeloid leukaemia (AML)

Correct Answer: (D) Acute myeloid leukaemia (AML)

SOLUTION:

Two filters must both be satisfied: the lesion has to be cancerous, and it has to push out both eyes in a child. That combination points away from a single solid orbital tumour and toward a blood cancer that seeds both orbits.

The entity that does this is the chloroma, also called granulocytic sarcoma, a

tumour-like collection of immature myeloid white cells. Chloromas love the orbit and frequently appear on both sides, producing bilateral proptosis in a child. Since chloromas are built from myeloid blasts, their appearance is a hallmark of acute myeloid leukaemia.

Check the distractors against the two filters. Rhabdomyosarcoma is the most common primary orbital cancer of childhood but is typically one-sided, so it fails the bilateral criterion. ALL is the most frequent childhood leukaemia overall, but the chloroma-driven bilateral orbital picture is the signature of the myeloid (AML) variety. Lymphoblastic lymphoma rarely presents as bilateral childhood proptosis. Thus the bilateral, malignant, chloroma-based presentation maps to AML.

Acute myeloid leukaemia (AML)

Quick Tip: Bilateral orbital chloroma (granulocytic sarcoma) is the malignant marker, and it belongs to AML.



160. Which of the following most commonly presents with bilateral proptosis in children?

- (A) Cavernous haemangioma
- (B) Chloroma
- (C) Fibrous histiocytoma
- (D) Pleomorphic adenoma

Correct Answer: (B) Chloroma

SOLUTION:

Lock onto the descriptor bilateral in a child. A lesion that involves both orbits at once is unlikely to be a solitary, slow benign mass; it is far more likely to be a systemic malignancy depositing in both orbits.

That description fits the chloroma (granulocytic sarcoma), a solid mass of immature myeloid cells linked to acute myeloid leukaemia. Chloromas have a predilection for the paediatric orbit and characteristically appear on both sides, so they are the classic cause of bilateral proptosis in children.

Now eliminate the others, all of which are essentially one-sided, localized growths typical of adults rather than children: cavernous haemangioma is the commonest benign orbital tumour of adults and is unilateral; pleomorphic adenoma is a unilateral lacrimal gland tumour of adults; and fibrous histiocytoma is again a localized, usually unilateral orbital lesion. Only the chloroma satisfies both bilateral and paediatric, so it is the answer.

Chloroma

Quick Tip: Bilateral orbital involvement in a child points to a myeloid leukaemic deposit, the chloroma.

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161. A patient presented with sudden onset of floaters and a sensation of a curtain falling in front of the eye. Which one of the following is the appropriate diagnosis?

- (A) Retinal detachment
- (B) Eales disease
- (C) Vitreous haemorrhage
- (D) Macular hole

Correct Answer: (A) Retinal detachment

SOLUTION:

Begin with the visual clue that is most specific. The complaint of a curtain or shutter coming down over part of the visual field is pathognomonic of the neurosensory retina peeling away from its bed. Because the detached portion of retina can no longer transduce light, the corresponding part of the visual field goes dark, and the patient describes this as a curtain.

Trace the sequence of events. First, the vitreous gel liquefies and tugs on the retina, producing flashes; then a tear forms and pigment plus a little blood disperse into the vitreous, seen as a sudden storm of floaters; finally fluid tracks under the retina and the curtain appears and advances.

Now test each distractor against this story. Eales disease (idiopathic retinal periphlebitis) bleeds into the vitreous and causes abrupt visual loss, but its signature is recurrent haemorrhage in a young adult male, not a marching curtain. Pure vitreous haemorrhage clouds vision globally and gives floaters, yet lacks the well-defined field defect. A macular hole degrades only central vision with distortion. None reproduces the peripheral curtain.

Hence the diagnosis is the separation of the sensory retina.

Retinal detachment

Quick Tip: A descending curtain plus flashes and floaters means the sensory retina has peeled off.

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162. Ophthalmoplegic migraine is defined by which one of the following?

- (A) Headache with irreversible loss of ophthalmic nerve function
- (B) Recurrent transient 3rd nerve palsy associated with headache
- (C) Recurrent transient 3rd, 4th and 6th nerve palsy associated with headache
- (D) Headache with optic neuritis

Correct Answer: (C) Recurrent transient 3rd, 4th and 6th nerve palsy associated with headache

SOLUTION:

Approach this by parsing the two halves of the name. Ophthalmoplegic tells us the eye muscles are paralysed, which can only happen through the nerves that

move the eye, namely cranial nerves III, IV and VI. Migraine tells us the disorder is episodic and headache-related, so the deficit must come and go rather than persist.

Put together, the entity is repeated attacks in which a headache is paired with a temporary palsy of any of the three ocular motor nerves, leaving the patient with squint and double vision that resolves between episodes.

Now eliminate the wrong choices. A definition built on irreversible damage contradicts the recurrent, self-limiting course. Limiting the palsy to the third nerve only is too narrow, since the fourth and sixth are also legitimate targets. Bringing in optic neuritis is off the mark because that involves the second cranial nerve and threatens vision, whereas this disorder spares vision and attacks eye movement.

Therefore the inclusive and correct statement covers all three ocular motor nerves.

Recurrent transient 3rd, 4th and 6th nerve palsy with headache

Quick Tip: Think of every nerve that moves the eye: III, IV and VI, transiently and recurrently.



163. Which of the following drugs is NOT used for the medical treatment of diabetic retinopathy?

- (A) Tamoxifen
- (B) Benfotiamine
- (C) Pyridazinones
- (D) Ruboxistaurin

Correct Answer: (A) Tamoxifen

SOLUTION:

Frame the question around mechanism. Drugs proposed for diabetic retinopathy interrupt the chemical chain set off by chronic high glucose, so look for agents that act on glycation, the protein kinase C pathway, or microvascular oxidative injury, and find the one that does none of these.

Benfotiamine is a fat-soluble form of vitamin B1 that diverts excess glucose metabolites away from the harmful pathways and lowers tissue advanced glycation products, so it fits. Ruboxistaurin is designed specifically to inhibit the beta isoform of protein kinase C, a key driver of retinal vascular leakage, so it also fits. Pyridazinones are vasoactive compounds explored for improving retinal blood flow, so they belong as well.

That leaves tamoxifen. It is an anti-oestrogen for breast cancer with no place in retinopathy therapy, and ironically high or prolonged doses can deposit refractile crystals in the retina and harm vision.

So the agent with no therapeutic role here is tamoxifen.

Tamoxifen

Quick Tip: One of these is a breast-cancer anti-oestrogen, not a retinal protectant.

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164. A girl presented with recurrent occipital headache associated with ataxia and vertigo. Her mother also has similar complaints. The most probable diagnosis is?

- (A) Vestibular neuronitis
- (B) Basilar migraine
- (C) Tension headache
- (D) Cluster headache

Correct Answer: (B) Basilar migraine

SOLUTION:

Localise the problem first. The pain sits at the back of the head and is accompanied by unsteadiness and a spinning sensation, all of which trace to the structures fed by the basilar artery, that is, the brainstem and cerebellum. So the diagnosis must be one that produces episodic brainstem dysfunction.

Layer in the inherited pattern. The mother carries the same complaints, which signals a familial, recurrent disorder. Migraine is strongly heritable, and the basilar subtype, seen mostly in young women, generates exactly these brainstem aura features of vertigo, ataxia, and occipital headache.

Run through the alternatives. Vestibular neuronitis is a one-off attack of severe vertigo from vestibular nerve inflammation, without headache or a family thread. A tension headache is a dull band-like ache lacking any vertigo or imbalance. A cluster headache is an excruciating unilateral eye-centred pain with tearing and nasal stuffiness, again with no ataxia. None of these explains the combined hereditary brainstem picture.

The unifying answer is therefore migraine of the basilar type.

Basilar migraine

Quick Tip: Occipital headache with brainstem signs and a family history equals a posterior-circulation migraine.

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165. A 32-year-old mountaineer has a haematocrit of 70%. What is the possible explanation?

- (A) Polycythemia with relative dehydration
- (B) High altitude cerebral oedema
- (C) High altitude pulmonary oedema
- (D) Haemodilution

Correct Answer: (A) Polycythemia with relative dehydration

SOLUTION:

Start from the number. A packed cell volume of 70% is far above the upper limit of normal, so something is either adding red cells or removing plasma, or both. Work out which of the offered processes does that.

Living at altitude means breathing thin air with little oxygen. The kidney senses the hypoxia and pours out erythropoietin, which expands the red cell population over weeks, a true secondary polycythemia. On top of this, the cold dry mountain air, heavy breathing and limited drinking shrink the plasma compartment, so the blood becomes concentrated and the haematocrit climbs even more.

Now weigh the rivals. Cerebral oedema at altitude shows up as confusion, headache and ataxia, and pulmonary oedema shows up as cough and breathlessness, neither being a haematocrit value. Haemodilution adds water to the blood, which would drop the haematocrit, the opposite of what we see.

The marriage of extra red cells and a dry, contracted plasma volume is the right explanation.

Polycythemia with relative dehydration

Quick Tip: Altitude raises red cell mass and dehydration concentrates the plasma, both lifting the haematocrit.

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166. Tetracycline is used in the prophylaxis of which of the following diseases?

- (A) Cholera
- (B) Brucellosis
- (C) Leptospirosis
- (D) Meningitis

Correct Answer: (A) Cholera

SOLUTION:

Anchor on the exact demand of the stem, which is prevention rather than cure. So we need the disease for which a tetracycline is given to people who are well but exposed, to stop them developing or spreading infection.

During cholera epidemics, household and close contacts of a case are offered a tetracycline, classically a short course, to suppress *Vibrio cholerae* carriage and curb the chain of transmission. This is the textbook setting of tetracycline as a prophylactic.

Compare the others. Brucellosis is managed with prolonged combination therapy that includes a tetracycline for treatment, not routine prevention. Leptospirosis prevention does use doxycycline in high-risk exposure, yet cholera remains the canonical answer paired with tetracycline in this list. Meningococcal contacts receive rifampicin, ciprofloxacin or ceftriaxone, never tetracycline.

The disease whose contacts are shielded with tetracycline is cholera.

Cholera

Quick Tip: Think which epidemic uses a short tetracycline course for close contacts.

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167. A Punnett square is used for which of the following?

- (A) Finding the genotype of offspring
- (B) Statistical analysis
- (C) Anatomical surface area of the human body
- (D) Diseased and non-diseased individuals

Correct Answer: (A) Finding the genotype of offspring

SOLUTION:

Recall the origin and design of the tool. Reginald Punnett created a simple checkerboard in which one parent's gametes head the columns and the other parent's gametes head the rows. Filling each cell pairs one allele from each parent.

The purpose follows directly from the layout. Each filled cell shows one possible combination of alleles in a child, so the completed grid enumerates all genotypes the offspring can have and the proportion of each, which in turn yields the expected phenotype ratios of a cross.

Check the wrong answers against this. It is not a method of statistics, it has no link to estimating body surface area which relies on height and weight formulae, and it is not a way of sorting individuals into diseased and healthy groups.

Its sole job is to predict offspring genotypes from a cross.

Finding the genotype of offspring

Quick Tip: It is the allele-combining grid from genetics, used to predict a cross.

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168. Cavitation is seen in?

- (A) Mycoplasma pneumonia
- (B) Tuberculous pneumonia
- (C) Streptococcal pneumonia
- (D) Staphylococcus pneumonia

Correct Answer: (B) Tuberculous pneumonia

SOLUTION:

Approach this by asking which organism in the list produces tissue necrosis severe enough to leave an air-containing cavity on imaging. Cavitation requires destruction of lung parenchyma followed by drainage of the necrotic material into an airway.

Reactivation pulmonary tuberculosis is the prototype: caseating granulomatous inflammation undergoes central liquefactive necrosis, the softened caseum empties through a bronchus, and a persistent thick-walled cavity (typically in the apical or posterior segments of the upper lobe) results. This is the single most exam-classic answer for lung cavitation.

Comparing the distractors: Mycoplasma drives an atypical interstitial pneumonia with no cavitation; pneumococcal (streptococcal) lobar pneumonia gives dense homogeneous consolidation that resolves without cavity formation; Staphylococcus aureus can cavitate and form pneumatoceles but is the secondary, not the textbook, choice here.

The printed recall key (Streptococcal pneumonia) conflicts with this physiology, since the pneumococcus is a non-cavitating organism, so the medically correct selection is Tuberculous pneumonia.

Tuberculous pneumonia

Quick Tip: Think of the upper-lobe thick-walled cavity of reactivation lung disease, not lobar pneumococcal consolidation.

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169. In pseudohypoparathyroidism, which of the following is true?

- (A) Gain of function mutation in Gs α ;
- (B) Decreased conversion of GTP to GMP
- (C) Decreased inositol triphosphate production
- (D) Decreased formation of cAMP

Correct Answer: (D) Decreased formation of cAMP

SOLUTION:

Frame this around the second-messenger cascade that PTH uses. PTH binds a receptor coupled to Gs; the activated Gs α subunit switches on adenylate cyclase, which manufactures cAMP, the messenger that carries out PTH's renal and skeletal actions.

Pseudohypoparathyroidism is a state of hormone resistance rather than hormone deficiency, so circulating PTH is high but the tissue cannot act on it. In the classic type Ia form, the lesion is an inactivating (loss-of-function) defect of Gs α ; from a GNAS mutation. With a crippled Gs α , adenylate cyclase is poorly stimulated and cAMP output falls; this is why the urinary cAMP response to exogenous PTH is blunted.

Checking the alternatives: a gain-of-function in Gs α would amplify rather than impair signalling, so it is the opposite of the disease; the GTP-to-GMP conversion is not part of this receptor cascade; and inositol triphosphate belongs to the Gq/phospholipase-C arm, which is not how the PTH-Gs axis fails here.

Therefore the correct physiological statement is reduced cAMP generation.

Decreased formation of cAMP

Quick Tip: PTH resistance from a loss-of-function Gs α defect cripples adenylate cyclase output.

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170. The difference between follicular carcinoma and follicular adenoma of the thyroid is?

- (A) Vascular invasion
- (B) Mitosis
- (C) Nuclear pleomorphism
- (D) Tubule formation

Correct Answer: (A) Vascular invasion

SOLUTION:

Start from a key pathology principle: follicular adenoma and follicular carcinoma share the same bland follicular cytology, so what separates them is not how the cells look but whether the tumour has breached its boundaries.

Malignancy in this pair is defined architecturally by invasion. A follicular carcinoma shows transcapsular invasion (tumour pushing all the way through its fibrous capsule) and angioinvasion (tumour within vessels of the capsule or beyond). An adenoma, by contrast, sits entirely within an intact capsule with no vessel involvement.

This is why aspiration cytology alone cannot call follicular carcinoma; you need the whole resected nodule to inspect the capsule and the peripheral vessels under the microscope.

The remaining choices are unhelpful: mitotic activity, nuclear pleomorphism and tubule formation do not reliably separate the two, and the special nuclear changes that pathologists rely on (ground-glass nuclei, nuclear grooves) point toward papillary rather than follicular carcinoma. Hence the discriminating feature is invasion of vessels.

Vascular invasion

Quick Tip: Cytology cannot tell them apart; you need to see the tumour breach its capsule and enter vessels.



171. Which among the following is used for the diagnosis of antiphospholipid antibody syndrome?

- (A) Beta 2 microglobulin antibody
- (B) Anti nuclear antibody
- (C) Anti centromere antibody
- (D) Anti beta 2 glycoprotein I antibody

Correct Answer: (D) Anti beta 2 glycoprotein I antibody

SOLUTION:

Anchor the answer in the formal classification criteria for APS, which require a clinical event (clot or recurrent pregnancy loss) plus a laboratory antibody that stays positive on repeat testing 12 weeks later.

Only three antibody assays count toward the laboratory limb: lupus anticoagulant, anticardiolipin, and anti-beta 2 glycoprotein I. From the choices listed, the one that matches is the anti-beta 2 glycoprotein I antibody, an antibody directed against the plasma cofactor that mediates much of the prothrombotic effect in APS.

The trap option is beta 2 microglobulin antibody, which sounds similar but is a different molecule entirely (beta 2 microglobulin is a tumour and renal marker, not an antiphospholipid target). Antinuclear antibody is the lupus screen, and anti-centromere antibody flags limited scleroderma/CREST; neither is part of the APS criteria.

So the diagnostic test from this set is the anti-beta 2 glycoprotein I antibody.

Anti beta 2 glycoprotein I antibody

Quick Tip: Recall the three APS lab criteria; do not confuse beta 2 glycoprotein I with beta 2 microglobulin.

172. Which is the most reliable objective sign for identifying pulmonary plethora on a chest X-ray?

- (A) Diameter of the main pulmonary artery >16 mm
- (B) Diameter of the left pulmonary artery >16 mm
- (C) Diameter of the descending right pulmonary artery >16 mm
- (D) Diameter of the descending left pulmonary artery >16 mm

Correct Answer: (C) Diameter of the descending right pulmonary artery >16 mm

SOLUTION:

Think about which pulmonary vessel a radiologist can actually measure with confidence on a standard PA chest film. The descending (interlobar portion of the) right pulmonary artery is ideal because it descends vertically next to the right atrial border, is surrounded by air-filled lung, and therefore has crisp, measurable edges.

Pulmonary plethora reflects an overcirculated lung, usually from a left-to-right shunt, and it shows up as dilated pulmonary arteries. Using the descending right pulmonary artery as the yardstick, a diameter above roughly 16 mm is the recognised objective threshold signalling abnormal enlargement and increased flow.

The other arteries fall short as objective markers: the main pulmonary artery and the left pulmonary artery lie partly within or behind the mediastinal shadow, so their borders are not reliably definable, and the descending left pulmonary artery is harder to profile than its right-sided counterpart.

Hence the single most reliable objective sign is a descending right pulmonary artery wider than 16 mm.

Descending right pulmonary artery > 16 mm

Quick Tip: The vertically running interlobar vessel beside the right heart border is the one you can measure cleanly.

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173. Necrotizing lymphadenitis is seen in?

- (A) Kimura disease
- (B) Kikuchi disease
- (C) Hodgkin disease
- (D) Castleman disease

Correct Answer: (B) Kikuchi disease

SOLUTION:

Match the descriptive term in the question to the disease that carries it as a formal synonym. Kikuchi disease is literally named histiocytic necrotizing lymphadenitis, so it is the direct answer.

Clinically it is a self-limiting condition of young (often Asian) women presenting with fever and tender cervical nodes. Under the microscope the lymph node shows well-demarcated zones of paracortical necrosis filled with karyorrhectic nuclear debris and crescentic histiocytes, and importantly there are no neutrophils, which helps separate it from infective suppurative nodes and from lupus lymphadenitis.

The distractors each have their own signature pattern: Kimura disease is eosinophil-rich lymphoid hyperplasia, Hodgkin disease is defined by Reed-Sternberg cells, and Castleman disease shows the onion-skin germinal-centre and vascular changes of angiofollicular hyperplasia. None of these is a necrotizing lymphadenitis.

Therefore the answer is Kikuchi disease.

Kikuchi disease

Quick Tip: One of these conditions is literally named histiocytic necrotizing lymphadenitis.

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174. NARP syndrome is seen in which type of disorder?

- (A) Mitochondrial function disorder
- (B) Glycogen storage disorder
- (C) Lysosomal storage disorder
- (D) Lipid storage disorder

Correct Answer: (A) Mitochondrial function disorder

SOLUTION:

Decode the acronym first: NARP means Neuropathy, Ataxia and Retinitis Pigmentosa, a triad pointing to a defect in cellular energy generation.

The molecular cause is a point mutation in mitochondrial DNA, the m.8993T>G change in MT-ATP6, which disrupts a subunit of ATP synthase (complex V) and therefore cripples oxidative phosphorylation. Since the gene sits in the mitochondrial genome, the disease is transmitted maternally, and a heavier burden of the identical mutation tips the phenotype into maternally inherited Leigh syndrome, both facts confirming its mitochondrial nature.

None of the storage-disease categories fit: glycogen storage diseases, lysosomal storage diseases and lipid storage diseases each stem from specific enzyme deficiencies in carbohydrate, lysosomal or lipid metabolism rather than from a failure of the respiratory chain.

Hence NARP belongs to the mitochondrial functional disorders.

Mitochondrial function disorder

Quick Tip: Neuropathy, Ataxia, Retinitis Pigmentosa from an MT-ATP6 mutation points to one organelle.

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175. Superior vena cava syndrome is most commonly caused by?

- (A) Lymphoma
- (B) Small cell lung carcinoma
- (C) Non small cell lung carcinoma
- (D) Secondary tumours

Correct Answer: (B) Small cell lung carcinoma

SOLUTION:

SVC syndrome is the clinical picture that follows compression or invasion of the superior vena cava: the patient develops swelling of the face and arms, engorged neck and chest wall veins, headache and breathlessness that worsen on bending forward. The question asks for the single most frequent underlying cause.

Almost all modern cases are due to cancer rather than infection. Within malignant causes, primary lung tumours dominate because the SVC runs right next to the central airways and right-sided mediastinal nodes. Of the lung cancer subtypes, small cell lung carcinoma is characteristically central and bulky and grows quickly, so it tops the list of specific causes of SVC obstruction.

Working through the choices: lymphoma is a recognised but less common malignant cause; non small cell lung carcinoma causes SVC syndrome but less often than the small cell type; secondary (metastatic) tumours account for only a minority. Therefore the best answer is small cell lung carcinoma.

Small cell lung carcinoma

Quick Tip: Think of the central, fast-growing, mediastinal lung cancer subtype.

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176. Which of the following is not included in parenteral nutrition?

- (A) Fat
- (B) Carbohydrate
- (C) Fibres
- (D) Micronutrients

Correct Answer: (C) Fibres

SOLUTION:

Parenteral nutrition means feeding through a vein when the intestine cannot be used. Because the formula goes straight into the circulation, only substances that can be made into a sterile solution or an emulsion can be given. The task is to spot the component that does not belong in such a mixture.

A complete PN bag carries dextrose to supply calories, an intravenous lipid emulsion to provide essential fatty acids and energy, amino acids for tissue building, and a full panel of micronutrients which means vitamins, electrolytes and trace minerals. All four of these are routinely present.

Fibre is different. It is a non-absorbable carbohydrate that works only inside the colon, providing stool bulk and feeding gut bacteria. It is neither absorbed nor infusible, so it serves no purpose and is never added to an intravenous feed. Hence the component excluded from parenteral nutrition is fibre.

Fibres

Quick Tip: Which component needs a working colon to act and cannot be infused into a vein?

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177. All are true about pheochromocytoma except?

- (A) 90% are malignant
- (B) 95% occur in the abdomen
- (C) They secrete catecholamines
- (D) They arise from sympathetic ganglions

Correct Answer: (A) 90% are malignant

SOLUTION:

This is a single-best-answer where three options are correct and one is false; the false one is the answer. Pheochromocytoma is a tumour of chromaffin tissue best remembered through the classic rule of 10s.

Apply the rule of 10s: approximately ten percent are malignant, ten percent bilateral, ten percent extra-adrenal, ten percent paediatric and ten percent familial. The direct consequence is that around ninety percent of these tumours behave in a benign fashion. So a claim that ninety percent are malignant inverts the true figure and is wrong.

Checking the remaining statements confirms them: about ninety five percent sit within the abdomen, mainly in the adrenal medulla; the tumour characteristically pours out catecholamines causing episodic hypertension, palpitations, sweating and headache; and it originates from chromaffin cells of the sympathetic chain. Since these three are true, the exception is the malignancy figure.

90

Quick Tip: Recall the rule of 10s and which percentage gets reversed here.



178. Intraoperative myocardial infarction is best diagnosed by:

- (A) ECG
- (B) Invasive arterial pressure
- (C) Central venous pressure
- (D) Transoesophageal echocardiography

Correct Answer: (D) Transoesophageal echocardiography

SOLUTION:

During surgery a patient under anaesthesia cannot complain of angina, so the anaesthetist must rely on monitors to catch a developing heart attack. The question asks which monitor gives the most reliable and earliest warning.

The key physiological fact is the ischaemic cascade: when a region of myocardium loses its blood supply it stops contracting normally almost immediately. This regional wall motion abnormality precedes ST-segment shifts on the ECG and precedes any fall in blood pressure. A tool that images wall motion will therefore alarm first.

Transoesophageal echocardiography sits the ultrasound probe in the oesophagus just behind the left atrium, giving a clear continuous view of how each segment of the ventricle moves. This makes it the most sensitive intraoperative detector of new ischaemia. The ECG lags behind and can miss the posterior wall, while invasive arterial and central venous pressures only change once pump function has already failed. Hence TEE is the best answer.

Transoesophageal echocardiography

Quick Tip: What detects a regional wall motion abnormality before the ECG does?



179. ECG is poor at detecting ischaemia in areas supplied by?

- (A) Left anterior descending artery
- (B) Left circumflex artery
- (C) Left coronary artery
- (D) Right coronary artery

Correct Answer: (B) Left circumflex artery

SOLUTION:

The 12-lead ECG is not equally good at seeing every part of the heart. The leads are arranged to look at the front, the side and the bottom of the left ventricle, which means certain regions are poorly represented. The question is which coronary territory falls into that blind spot.

Each artery maps to specific leads. The left anterior descending feeds the front wall and is captured by the chest leads. The right coronary artery feeds the inferior wall and shows up in the inferior leads. The left main is a short trunk that gives off both the descending and circumflex branches. The left circumflex, however, supplies the posterolateral wall, and no standard lead points directly at this surface.

Because of this gap, ischaemia in the circumflex distribution often causes only minor reciprocal changes or none at all on the routine tracing, making it the most commonly overlooked territory. Therefore the ECG is poorest at detecting ischaemia supplied by the left circumflex artery.

Left circumflex artery

Quick Tip: Which wall of the left ventricle has no dedicated standard ECG lead?



180. A patient with a history of discharge from the right ear for the past 1 year presented with severe earache. The discharge was cultured and the organism was found to be gram positive cocci. CT scan shows ring enhancement. The least likely cause is?

- (A) *Pseudomonas*
- (B) *Streptococcus pneumoniae*
- (C) *Staphylococcus*
- (D) *Haemophilus influenzae*

Correct Answer: (B) *Streptococcus pneumoniae*

SOLUTION:

Read the timeline carefully. Discharge that has run for a whole year is chronic, not acute, so this is chronic suppurative otitis media. The new severe pain together with a CT scan showing a ring-enhancing lesion signals that the chronic ear infection has spread inside the skull to form a brain abscess.

The microbiology of chronic ear disease differs from that of acute otitis media. Chronic suppurative otitis media and its abscess complications are dominated by *Pseudomonas* and by *Staphylococcus* species, and the culture here grew gram positive cocci which fits *Staphylococcus* and *Streptococcus* well. These organisms are the usual suspects in this scenario.

By contrast, *Streptococcus pneumoniae* and *Haemophilus influenzae* are the hallmark organisms of ACUTE otitis media in children, not of long-standing chronic disease. Of the four choices, *Streptococcus pneumoniae* is the organism least expected in this chronic, abscess-forming picture, so it is the least likely cause.

Streptococcus pneumoniae

Quick Tip: Chronic ear disease favours *Pseudomonas* and Staph; which option is an acute otitis media bug?

181. A 15 day old baby came with a history of seizures. Blood tests revealed Ca 5 mg/dl, PO₄ 9 mg/dl, PTH 30 pg/ml (normal 10 to 60). What is the most probable diagnosis?

- (A) Pseudohypoparathyroidism
- (B) Vitamin D deficiency
- (C) Hyperparathyroidism
- (D) Hypoxic ischaemic encephalopathy (HIE)

Correct Answer: (A) Pseudohypoparathyroidism

SOLUTION:

Start by translating the lab values. A calcium of 5 mg/dl is clearly low and accounts for the neonatal seizures, the phosphate of 9 mg/dl is high, and the PTH of 30 pg/ml sits in the middle of the stated normal range. The diagnosis must explain all three findings together.

Use the calcium and phosphate together first. Low calcium with high phosphate is characteristic of a parathyroid hormone effect that is missing at the tissue level, because PTH normally lowers phosphate by promoting its renal excretion. Vitamin D deficiency would instead give a low or low-normal phosphate, so it does not fit.

Now bring in the PTH. If the parathyroid glands were simply failing, the PTH would be low. Instead it is normal, which is actually inappropriate, because such severe hypocalcaemia should be driving PTH sky-high. A normal PTH that cannot correct the calcium indicates resistance of the bones and kidneys to PTH, which is the definition of pseudohypoparathyroidism. Hyperparathyroidism is excluded by the low calcium, and hypoxic ischaemic encephalopathy does not create this biochemical triad.

Pseudohypoparathyroidism

Quick Tip: Low calcium plus high phosphate plus a PTH that is not low equals resistance to PTH.

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182. Which among the following is not used in the diagnosis of insulinoma?

- (A) Fasting glucose test
- (B) Xylulose test
- (C) C-peptide levels
- (D) Insulin / glucose ratio

Correct Answer: (B) Xylulose test

SOLUTION:

Insulinoma produces excess insulin from pancreatic beta cells, leading to fasting hypoglycaemia with symptoms relieved by glucose (Whipple triad). The diagnostic strategy is to catch the tumour secreting insulin while the patient is hypoglycaemic. A monitored prolonged fast lowers glucose, and the failure of insulin to switch off is the cornerstone finding, so the fasting glucose test is central. To confirm the insulin is the body's own and not injected, C-peptide is measured; since it is released molecule-for-molecule with native insulin, a raised C-peptide level locates the source as the pancreas. The insulin to glucose ratio is then derived from these paired values, and an inappropriately high ratio during low glucose points to the tumour. Among the listed choices, only the xylulose test is unrelated to insulin biology. Xylulose handling is assessed in pentose metabolism and pentosuria, with nothing to say about beta-cell function, so it cannot diagnose insulinoma. Eliminating the three genuine endocrine assays leaves the xylulose test as the odd one out.

Xylulose test

Quick Tip: Three options test insulin biology; one is a pentose metabolism test.

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183. All are true about nesidioblastosis except:

- (A) Hypoglycemic episodes are seen
- (B) Occurs in adults more than children
- (C) Histopathology shows hyperplasia of islet cells
- (D) Diazoxide is used for treatment

Correct Answer: (B) Occurs in adults more than children

SOLUTION:

Nesidioblastosis describes a diffuse beta-cell disorder of the pancreas in which insulin is poured out without normal feedback control. The dominant clinical picture is repeated low blood sugar, because the unchecked insulin keeps driving glucose down, so the statement about hypoglycaemic episodes holds true. Looking at the tissue, the gland shows islet-cell hyperplasia with beta cells appearing to bud from duct lining, confirming the histopathology statement. Treatment begins medically with diazoxide, an agent that opens potassium-ATP channels on the beta cell and shuts down insulin output, validating that option. The single statement that does not fit is the claim about age distribution. This is fundamentally a neonatal and infantile entity, the leading cause of persistent hypoglycaemia in newborns, and it is far more common in children than in adults. Hence the assertion that it occurs more in adults than children is the wrong statement.

Occurs in adults more than children

Quick Tip: Think of the leading cause of persistent neonatal hypoglycaemia.



184. Gold standard test for diagnosis of laryngopharyngeal reflux?

- (A) 24-hour double-probe pH monitoring
- (B) Flexible endoscopy
- (C) Barium swallow
- (D) Laryngoscopy

Correct Answer: (A) 24-hour double-probe pH monitoring

SOLUTION:

To label a patient as having laryngopharyngeal reflux with certainty, a clinician must prove that acid is physically reaching the throat rather than rely on appearance alone. The investigation that delivers this proof is ambulatory pH testing performed over a full day using two sensors, one positioned low in the oesophagus and the other high near the larynx and pharynx. By logging every acid event over twenty-four hours, this double-probe study directly measures pharyngeal acid exposure, which is exactly what defines the disease, making it the reference standard. The competing options all fall short. Flexible endoscopy and laryngoscopy reveal mucosal changes such as redness and swelling that overlap heavily with other irritants and therefore lack specificity. A barium swallow is mainly an anatomical study and misses the intermittent acid exposure of LPR. Since only one test objectively quantifies acid reaching the upper airway, the dual-probe twenty-four-hour pH monitor stands out.

24-hour double-probe pH monitoring

Quick Tip: Look for the test that objectively measures acid reaching the pharynx.

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185. Least common cause of ambiguous genitalia in a female child?

- (A) Placental steroid sulfatase deficiency
- (B) Fetal aromatase deficiency
- (C) WT-4 mutation
- (D) Congenital adrenal hyperplasia (CAH)

Correct Answer: (A) Placental steroid sulfatase deficiency

SOLUTION:

When a chromosomally female baby shows ambiguous genitalia, the underlying theme is usually too much androgen acting on the developing external genitalia. Ranking the options by how often they explain this picture clarifies the answer. Congenital adrenal hyperplasia sits at the top, since enzyme blocks such as 21-hydroxylase deficiency redirect steroid synthesis toward androgens and virilise the female infant, so it is the leading cause. Aromatase deficiency is the next logical culprit because, without the enzyme that turns androgens into oestrogens, androgen levels climb in the fetus and masculinise the genitalia. Disturbances in the WT pathway interfere with gonadal differentiation and can therefore generate disorders of sex development as well. That leaves placental steroid sulfatase deficiency, whose principal consequences are reduced maternal oestriol and X-linked ichthyosis in the child rather than virilisation of the female external genitalia. Because it rarely produces ambiguous genitalia, it is the least common cause among the choices.

Placental steroid sulfatase deficiency

Quick Tip: Which listed enzyme defect causes ichthyosis and low maternal estriol rather than virilisation?

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186. What will you give to treat hypothyroidism in a patient with ischemic heart disease?

- (A) Low dose of levothyroxine
- (B) Normal dose of levothyroxine
- (C) Do not give levothyroxine
- (D) Thyroid extract

Correct Answer: (A) Low dose of levothyroxine

SOLUTION:

A patient with coronary artery disease who is also hypothyroid presents a balancing problem. The hypothyroid state cannot simply be ignored, because leaving it untreated raises cholesterol and depresses cardiac performance, yet thyroid hormone itself speeds the heart and raises its oxygen requirement. Loading such a heart with a full dose of levothyroxine at once can tip an already compromised coronary supply into angina or even infarction. The accepted strategy, therefore, is to begin replacement gently, using a small starting dose and increasing it in small increments over several weeks while watching for chest pain or rhythm disturbance. This start-low go-slow plan lets the myocardium adapt to the rising metabolic demand. The other choices are inferior, a normal full dose is hazardous, completely withholding hormone fails to treat the disease, and crude thyroid extract delivers an erratic hormone mix. The correct management is a cautious low starting dose of levothyroxine.

Low dose of levothyroxine

Quick Tip: Start low and go slow to spare the ischaemic myocardium.

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187. A 35-year-old female has proximal weakness of muscles, ptosis and easy fatiguability. The best test to diagnose her condition is:

- (A) Muscle biopsy
- (B) CPK
- (C) Edrophonium test
- (D) EMG

Correct Answer: (C) Edrophonium test

SOLUTION:

A young woman whose muscles tire quickly, whose eyelids droop and whose weakness is proximal and fluctuating is pointing strongly toward myasthenia

gravis, a failure of transmission across the neuromuscular junction caused by antibodies against acetylcholine receptors. Because the problem is too little effective acetylcholine signalling, a drug that boosts acetylcholine should temporarily reverse the signs. That is exactly what the edrophonium test does, by briefly blocking the enzyme that breaks down acetylcholine, it raises transmitter levels at the junction, and within seconds the ptosis lifts and strength improves before fading again. This dramatic transient response confirms the junctional nature of the disease and is the best diagnostic choice here. Tests aimed at the muscle itself, such as creatine kinase or muscle biopsy, stay normal because the muscle fibres are intact. Electromyography can show decremental responses but is not the single best listed answer for this textbook presentation. The edrophonium test wins.

Edrophonium test

Quick Tip: A drug that boosts acetylcholine briefly reverses ptosis and weakness.

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188. Compliance is decreased in all except:

- (A) Pulmonary congestion
- (B) COPD
- (C) Decreased surfactant
- (D) Pulmonary fibrosis

Correct Answer: (B) COPD

SOLUTION:

Compliance tells us how readily the lung stretches for a given pressure, so conditions that stiffen the lung drop compliance, while conditions that destroy elastic tissue raise it. Working through the options, pulmonary congestion soaks the lung with fluid, and a waterlogged lung resists expansion, so its compliance falls. A shortage of surfactant lets surface tension climb, pulling alveoli toward collapse and making the lung harder to inflate, again a reduction in compliance,

the hallmark of neonatal and adult respiratory distress. Pulmonary fibrosis lays down dense scar and collagen, producing a rigid, restrictive lung with strikingly low compliance. The outlier is chronic obstructive pulmonary disease. In emphysema the alveolar walls and the elastic framework are broken down, so recoil is lost and the lung becomes flabby and over-distensible, which means compliance actually goes up. Since every other choice lowers compliance and COPD raises it, COPD is the exception.

COPD

Quick Tip: Loss of elastic recoil in emphysema makes the lung easier, not harder, to inflate.

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189. A 70-year-old patient presents with intermittent myoclonic jerks of recent onset, and the EEG shows bilateral periodic spike-wave complexes. What is the most probable diagnosis?

- (A) Herpes simplex encephalitis
- (B) Lewy body dementia
- (C) Alzheimer's disease
- (D) Creutzfeldt-Jakob disease (CJD)

Correct Answer: (D) Creutzfeldt-Jakob disease (CJD)

SOLUTION:

Begin from the single most specific clue in the vignette: periodic spike-wave activity on EEG appearing together with myoclonic jerking. Among neurodegenerative and infectious causes of dementia, this electro-clinical pairing is essentially a signature of a transmissible spongiform encephalopathy. Sporadic Creutzfeldt-Jakob disease classically strikes around the seventh decade and is defined by a rapidly progressive dementia, startle myoclonus, and the periodic synchronous discharges that the EEG demonstrates here. Now contrast the distractors. Alzheimer's disease evolves over years as a gradual memory-led

decline and does not produce periodic complexes early. Lewy body dementia is recognised by fluctuating attention, well-formed visual hallucinations and spontaneous parkinsonism rather than EEG periodicity. Herpes simplex encephalitis is an acute febrile illness with temporal-lobe involvement and lateralised epileptiform discharges, a separate picture. Because only the prion disease unites recent myoclonus with bilateral periodic spikes in a 70-year-old, the diagnosis is settled.

rapid dementia + myoclonus + periodic EEG spikes ⇒ CJD

Creutzfeldt-Jakob disease (CJD)

Quick Tip: Rapidly progressive dementia with myoclonus and periodic EEG complexes in an elderly patient.

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190. Which of the following is NOT a disorder of protein misfolding?

- (A) Alzheimer's disease
- (B) Tuberculosis
- (C) Cystic fibrosis
- (D) Creutzfeldt-Jakob disease (CJD)

Correct Answer: (B) Tuberculosis

SOLUTION:

The question asks you to find the one entry that does not belong to the family of conformational, or protein-misfolding, diseases, so screen each item for an abnormally folded protein at the heart of its pathogenesis. Alzheimer's disease qualifies because amyloid-beta plaques and tau tangles are aggregates of misshapen protein. Creutzfeldt-Jakob disease qualifies because the prion protein itself converts from its normal alpha-helical form to a pathological beta-sheet-rich form that self-propagates. Cystic fibrosis qualifies because the common delta-F508 mutation yields a CFTR channel that cannot fold correctly and is targeted for premature degradation. That leaves tuberculosis, whose cause is wholly

different: it is a chronic granulomatous infection by *Mycobacterium tuberculosis*, with no misfolded host protein driving the disease. By elimination the exception is the infectious entry.

misfolding = {Alzheimer, CJD, cystic fibrosis}, **infection** = TB

Tuberculosis

Quick Tip: Three are conformational diseases; one is a bacterial infection.

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191. A 12-year-old boy presents with hematemesis, melena and splenomegaly. What is the most probable diagnosis?

- (A) Non-cirrhotic portal fibrosis (NCPF)
- (B) Cirrhosis
- (C) Malaria with DIC
- (D) Extrahepatic portal venous obstruction (EHPVO)

Correct Answer: (D) Extrahepatic portal venous obstruction (EHPVO)

SOLUTION:

Frame the case as portal hypertension because the triad of hematemesis, melena and splenomegaly points to bleeding gastro-oesophageal varices fed by a high portal pressure. The decisive variable is the patient's age. In the paediatric population the commonest reason for variceal haemorrhage with an enlarged spleen but otherwise normal hepatic synthetic function is blockage of the portal vein outside the liver, that is extrahepatic portal venous obstruction, often from a portal cavernoma. Work through the rivals: non-cirrhotic portal fibrosis is a disease of young and middle-aged adults; cirrhosis would be unusual in a 12-year-old and would carry stigmata of liver failure; malaria complicated by disseminated intravascular coagulation produces fever and generalised bleeding, not a clean picture of variceal bleed with splenomegaly. The child's preserved liver and the pre-hepatic level of obstruction make EHPVO the best fit.

child + variceal bleed + splenomegaly + normal liver ⇒ EHPVO

Extrahepatic portal venous obstruction (EHPVO)

Quick Tip: Most common cause of variceal bleeding in a child with preserved liver function.

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192. About diabetes insipidus, all of the following are true EXCEPT:

- (A) The water deprivation test is diagnostic
- (B) Before doing the test, hypoadrenalism (cortisol deficiency) should first be corrected
- (C) Hypothyroidism does not affect the diagnostic test
- (D) Pre-test serum osmolality of 288 mOsm/kg is in the normal range

Correct Answer: (C) Hypothyroidism does not affect the diagnostic test

SOLUTION:

Because the stem is phrased as all-true-except, the task is to expose the single incorrect statement while confirming the other three. Start with what is genuinely correct. The water deprivation test, judged by urine concentration and the subsequent response to desmopressin, is indeed the established diagnostic manoeuvre for diabetes insipidus. It is also standard teaching that glucocorticoid deficiency must be replaced before testing, since cortisol is needed for the kidney to excrete a free-water load and its absence can blunt or hide the polyuria of DI. A serum osmolality reading of 288 sits comfortably inside the normal band of roughly 275 to 295, so that statement holds too. The remaining option claims hypothyroidism is irrelevant to the test, but thyroid hormone, like cortisol, is permissive for free-water clearance; untreated hypothyroidism can distort the water deprivation result. That statement is therefore the false one the question is hunting for.

cortisol and thyroid hormone both required for normal free-water excretion

Hypothyroidism does not affect the diagnostic test (FALSE statement)

Quick Tip: Like cortisol, thyroid hormone is permissive for free-water excretion.

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193. Which of the following is a poor prognostic factor in acute lymphoblastic leukemia (ALL)?

- (A) Hyperdiploidy
- (B) $t(9;22)$ and $t(4;11)$
- (C) Age 2 to 8 years
- (D) Total leukocyte count < 50000

Correct Answer: (B) $t(9;22)$ and $t(4;11)$

SOLUTION:

Approach the item by sorting each factor into the favourable or unfavourable column of ALL risk stratification. Three of the four listed features carry a good outlook: hyperdiploidy with a chromosome count above 50 predicts an excellent response; presentation at an age of roughly 2 to 8 years lies in the low-risk window; and a leukocyte count under 50000 at diagnosis is itself a favourable threshold. The single entry that signals a bad outcome is the cytogenetic pair $t(9;22)$ and $t(4;11)$. The first is the Philadelphia chromosome producing BCR-ABL, and the second is an MLL gene rearrangement seen often in infant ALL; both are linked to chemoresistance and frequent relapse. Therefore the translocations are the adverse factor the question wants.

good = {hyperdiploidy, age 2-8, TLC < 50000 }, poor = $t(9;22)$, $t(4;11)$

$t(9;22)$ and $t(4;11)$

Quick Tip: The Philadelphia chromosome and MLL rearrangement signal a bad outcome.



194. The acid-base status of a patient is as follows: pH 7.45, pCO₂ 30 mm Hg, pO₂ 105 mm Hg. The patient has partially compensated:

- (A) Metabolic acidosis
- (B) Metabolic alkalosis
- (C) Respiratory acidosis
- (D) Respiratory alkalosis

Correct Answer: (D) Respiratory alkalosis

SOLUTION:

Interpret the blood gas in the standard sequence. First the pH of 7.45 tips toward the alkaline side, so whatever the primary disturbance is, it is an alkalosis. Next look at carbon dioxide: a pCO₂ of 30 is below the normal range, and since carbon dioxide is an acid gas, removing it pushes the pH upward. That means the respiratory system, not the metabolic side, is the engine of the alkalosis here, so the primary problem is a respiratory alkalosis produced by hyperventilation. Finally, gauge compensation. If the alkalosis were uncompensated the pH would be clearly high, but it has been dragged back to merely the upper normal limit by the kidneys excreting bicarbonate; because the pH has not fully normalised this is partial compensation. Putting the pieces together gives a respiratory alkalosis that is partially compensated.

↑ pH + ↓ pCO₂ ⇒ respiratory alkalosis (partially compensated)

Respiratory alkalosis

Quick Tip: High-normal pH with a low pCO₂ driving the change.



195. Clue cells are seen in:

- (A) Bacterial vaginosis
- (B) Vaginal candidiasis
- (C) Chlamydial vaginosis
- (D) Trichomoniasis

Correct Answer: (A) Bacterial vaginosis

SOLUTION:

Anchor on the definition of a clue cell: it is a vaginal squamous epithelial cell so heavily coated by adherent coccobacilli that its normally sharp margin becomes stippled and ill-defined. That coating organism is *Gardnerella vaginalis*, and the presence of clue cells is one of the Amsel diagnostic criteria, sitting beside a vaginal pH greater than 4.5, a thin grey homogeneous discharge and a positive amine whiff test. Now reject the other choices by their own hallmarks. Candidal infection is identified by pseudohyphae and budding yeasts with a thick white discharge. Chlamydial disease relies on nucleic acid amplification testing and has no clue-cell finding. Trichomoniasis is recognised by motile pear-shaped flagellates on saline wet mount. Only one entity owns the clue cell, and that is bacterial vaginosis.

epithelial cell + adherent coccobacilli (*Gardnerella*) ⇒ bacterial vaginosis

Bacterial vaginosis

Quick Tip: Epithelial cells studded with *Gardnerella* coccobacilli.



196. Hemoglobin H (HbH) disease is seen in which of the following?

- (A) Deletion of 3 alpha genes
- (B) Deletion of all 4 alpha genes
- (C) Deletion of 3 beta genes
- (D) Deletion of all 4 beta genes

Correct Answer: (A) Deletion of 3 alpha genes

SOLUTION:

Alpha thalassemia is graded by the number of functional alpha globin genes lost out of the normal four. Think of it as a sliding scale: lose one gene and the person is a clinically silent carrier; lose two and they have the mild alpha thalassemia trait; lose three and the imbalance becomes large enough that surplus beta chains accumulate; lose all four and no alpha chains are made at all, producing Hb Bart and fatal hydrops fetalis in utero.

Hemoglobin H is specifically the tetramer formed by four beta chains (β_4) when there is a severe shortage of alpha chains to pair with them. This degree of shortage occurs only when three of the four alpha genes are deleted, leaving a single working alpha gene. That single gene cannot supply enough alpha chains, so the leftover beta chains self-associate into HbH.

Matching the options: 4-gene deletion is hydrops fetalis (not HbH), and beta gene deletions cause beta thalassemia, not alpha-related HbH. Only the 3 alpha gene deletion fits.

Deletion of 3 alpha genes

Quick Tip: HbH is beta₄ tetramer from severe alpha chain shortage, one step short of hydrops fetalis.

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197. A 50 year old woman has a history of a sprained ankle 2 months back followed by apparent recovery. She now complains of severe pain in that ankle with inability to flex the foot. On local examination the physician notes edema and shiny skin. What is the probable diagnosis?

- (A) Fibromyalgia
- (B) Complex regional pain syndrome type 1
- (C) Complex regional pain syndrome type 2
- (D) Peripheral neuropathy

Correct Answer: (B) Complex regional pain syndrome type 1

SOLUTION:

Start from the timeline. A minor ankle sprain should settle within a few weeks, yet two months later this patient has worsening, severe, regionally confined pain that is far out of proportion to the trivial original trauma. Layered on top of the pain are objective changes confined to the same limb: swelling and abnormally shiny skin. That combination of out-of-proportion pain plus autonomic and trophic skin changes is the signature of complex regional pain syndrome.

The only remaining decision is which subtype. The two subtypes are separated by a single question: was there a real nerve injury? If a specific peripheral nerve was damaged, it is CRPS type 2 (causalgia). If the triggering event was trauma but no major nerve lesion can be pinned down, it is CRPS type 1 (the older term being reflex sympathetic dystrophy). An ordinary ligamentous ankle sprain damages soft tissue, not a named nerve, so this is type 1.

The distractors do not fit: fibromyalgia is a diffuse, bilateral pain disorder without trophic skin change, and a peripheral neuropathy produces a symmetrical sensory deficit rather than a shiny, swollen, exquisitely painful single ankle.

Complex regional pain syndrome type 1

Quick Tip: Disproportionate regional pain plus shiny skin after a sprain with no named nerve injury equals CRPS type 1.

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198. Which among the following is an early sign of magnesium toxicity?

- (A) Depression of deep tendon reflexes
- (B) Respiratory depression
- (C) Cardiac arrest
- (D) Decreased urine output

Correct Answer: (A) Depression of deep tendon reflexes

SOLUTION:

Magnesium toxicity is best understood as a dose-dependent escalation of neuromuscular and cardiac blockade, because magnesium competes with calcium at the neuromuscular junction and the cardiac conduction system. As the serum concentration creeps up, the body gives warning signs in a predictable order, and clinicians exploit that order for safety monitoring.

The very first thing to vanish is the deep tendon reflex arc, since neuromuscular transmission is the most sensitive to magnesium excess. Only at higher concentrations do you see drowsiness, then depression of the respiratory drive, and at the highest levels heart block and arrest. This is exactly why, when magnesium sulphate is run for seizure prophylaxis in pre-eclampsia and eclampsia, the nurse checks the knee jerk repeatedly; an absent patellar reflex is the trigger to halt the infusion long before breathing or the heart is threatened.

So among the choices, respiratory depression and cardiac arrest are late and ominous, and low urine output is what predisposes to magnesium accumulation rather than an early effect of it. The earliest sign is reflex depression.

Depression of deep tendon reflexes

Quick Tip: Loss of the knee jerk is the bedside trigger to stop magnesium before breathing or the heart is hit.

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199. Which of the following is true about gastric carcinoma?

- (A) Occult bleeding in stool is not seen
- (B) It is associated with achlorhydria or hypochlorhydria
- (C) It is always squamous cell carcinoma
- (D) It is radiosensitive

Correct Answer: (B) It is associated with achlorhydria or hypochlorhydria

SOLUTION:

Work through each claim against what is known about stomach cancer. First, type: gastric cancer is essentially synonymous with adenocarcinoma because it grows from the mucus-secreting glandular lining; squamous histology is not the rule, so the absolute statement that it is always squamous is wrong.

Second, acid: a low-acid stomach is a danger zone. Long-standing atrophic gastritis, autoimmune destruction of parietal cells (as in pernicious anemia), and *Helicobacter pylori* driven atrophy all reduce hydrochloric acid, and this hypochlorhydric or achlorhydric mucosa is a classic background for malignant change. This makes the achlorhydria association the correct true statement.

Third, bleeding: an ulcerating tumour sheds blood slowly into the lumen, so faecal occult blood testing is often positive rather than negative, contradicting the first option. Fourth, treatment: the tumour responds poorly to radiotherapy and is managed primarily by resection, so calling it radiosensitive is incorrect.

Only the acid-related statement survives scrutiny.

Associated with achlorhydria or hypochlorhydria

Quick Tip: Gastric cancer is an adenocarcinoma, often radioresistant, bleeds occultly, and arises on a low-acid stomach.

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200. Which of the following is true in ketoacidosis?

- (A) Decreased HCO_3^-
- (B) Increased levels of lactate
- (C) Glucose level < 250 mg/dl
- (D) Normal anion gap

Correct Answer: (A) Decreased HCO_3^-

SOLUTION:

Frame ketoacidosis as an acid load problem. The body is generating large amounts of ketoacids because of insulin deficiency and unrestrained fat breakdown. Every ketoacid releases a hydrogen ion, and the immediate chemical defence against any acid load is bicarbonate, the principal extracellular buffer. As bicarbonate neutralises those hydrogen ions it is used up, so the measured serum bicarbonate drops. That falling bicarbonate is the true statement here.

The other options describe either the wrong disorder or the wrong direction. Elevated lactate belongs to lactic acidosis, a separate high anion gap acidosis, not to ketoacidosis. The anion gap in ketoacidosis is widened, not normal, precisely because the negatively charged ketoanions are unmeasured by routine electrolytes. And in the textbook diabetic presentation, blood glucose is markedly elevated, usually far above 250 mg/dl, so a sub-250 value is not characteristic.

Putting the chemistry together, the consistent and defining finding is consumption of bicarbonate.

Decreased HCO_3^-

Quick Tip: Ketoacids consume bicarbonate and widen the anion gap; lactate belongs to lactic acidosis.

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201. In a 7 year old child following surgery for craniopharyngioma, which hormone should be given first?

- (A) Growth hormone
- (B) Steroids
- (C) Prolactin
- (D) Thyroxine

Correct Answer: (B) Steroids

SOLUTION:

After a craniopharyngioma is removed, the pituitary and hypothalamus are often left unable to drive their target glands, so the child can lose multiple hormone axes at once. The examiner is testing priority: when several replacements are needed, which goes in first.

The answer is governed by which missing hormone can kill fastest. Loss of the adrenal axis, meaning insufficient cortisol because ACTH is gone, is the immediate danger because cortisol is essential for vascular tone and the stress response; without it the patient can slide into hypotensive adrenal crisis. So glucocorticoids take top priority.

There is also a pharmacological trap that reinforces this order. If thyroxine is started before cortisol is replaced, the rise in metabolic rate accelerates cortisol utilisation and can unmask or trigger a full adrenal crisis. Hence steroids must always precede thyroxine. Growth hormone and gonadal steroids are addressed much later once the patient is stable, and prolactin is not given as replacement therapy at all.

Therefore the first hormone to administer is the steroid.

Steroids

Quick Tip: Replace cortisol before thyroxine to avoid precipitating adrenal crisis.



202. A patient presents with a high TSH and a low T4. What is the probable diagnosis?

- (A) Grave's disease
- (B) Hashimoto's disease
- (C) Pituitary failure
- (D) Hypothalamic failure

Correct Answer: (B) Hashimoto's disease

SOLUTION:

Read the two numbers together. A low T4 tells you there is too little thyroid hormone, and a high TSH tells you the pituitary is shouting at the thyroid to make more. When the controller (pituitary, via TSH) is clearly active but the output hormone (T4) is still low, the failure must lie downstream, in the thyroid gland itself. That defines primary hypothyroidism.

This single observation eliminates the central causes. If the problem were pituitary failure or hypothalamic failure, the gland would not be receiving its signal, so TSH would be low or inappropriately normal alongside the low T4, not high. A high TSH proves the pituitary axis is intact.

It also eliminates Graves disease, which is the mirror image: an overactive thyroid with high T4 and suppressed TSH. The remaining and by far the most frequent cause of a failing thyroid in an iodine replete population is autoimmune Hashimoto thyroiditis, in which antibodies progressively destroy the gland.

Hashimoto's disease

Quick Tip: High TSH with low T4 equals primary hypothyroidism, most often Hashimoto thyroiditis.



203. Blood examination of a patient revealed low serum calcium, elevated phosphorus and elevated PTH. Which of the following investigations is least contributory to the diagnosis?

- (A) Urine myoglobin
- (B) cAMP response to PTH
- (C) Vitamin D levels
- (D) Serum creatinine levels

Correct Answer: (A) Urine myoglobin

SOLUTION:

The laboratory triad here is hypocalcaemia, hyperphosphataemia and a raised parathyroid hormone. When calcium is low yet PTH is high, the gland is working hard; the problem is that the target tissues are not listening. Coupled with a high phosphate, this is the signature of pseudohypoparathyroidism, a state of end-organ resistance to PTH.

Now weigh each option as a diagnostic lever. Measuring the cyclic AMP that the kidney generates in response to injected PTH (the Ellsworth-Howard challenge) directly demonstrates the resistance and is therefore highly informative. Checking vitamin D status is useful too, because a deficient vitamin D state can also drive PTH upward, but it characteristically lowers phosphate rather than raising it, so the result helps you separate the two scenarios. Serum creatinine screens for renal failure, which produces an identical-looking picture through secondary hyperparathyroidism, so it earns its place.

Urine myoglobin, by contrast, is a marker of muscle injury and rhabdomyolysis. It tells you nothing about the parathyroid-calcium-phosphate axis and adds no diagnostic value here. The printed key naming vitamin D is incorrect, since vitamin D measurement genuinely narrows the differential; the truly redundant test is urine myoglobin.

Quick Tip: Which listed test has nothing to do with the calcium-phosphate-PTH axis?

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204. A 40-year-old patient has a single kidney with an exophytic mass of 4 cm size at its lower pole. Which among the following is the best course of action?

- (A) Partial nephrectomy
- (B) Radical nephrectomy with dialysis
- (C) Radical nephrectomy with immediate renal transplant
- (D) Observation

Correct Answer: (A) Partial nephrectomy

SOLUTION:

Picture the dilemma: the patient owns a single kidney, and that kidney now carries a 4 cm solid lump bulging out of the lower pole. A solid renal mass of this size is treated as renal cell carcinoma, so it cannot be ignored, yet the kidney must also be protected because it is the patient's only one.

This is exactly the setting where nephron-sparing surgery is mandatory. The classic mandatory indications for partial nephrectomy are a solitary kidney, tumours in both kidneys, and poor baseline renal function, all situations where taking the whole organ would force the patient onto dialysis. A 4 cm tumour that projects outward from the surface is technically straightforward to shell out while leaving the rest of the kidney intact, and for such small (T1a) cancers the cure rate matches that of complete kidney removal.

Removing the whole kidney and committing the patient to lifelong dialysis, or to a transplant with its immunosuppression burden, is needless overtreatment. Simply watching a probable cancer is also wrong. The correct, function-

preserving and oncologically sound choice is to excise only the tumour.

Partial nephrectomy

Quick Tip: Only one kidney plus a small T1a tumour means preserve function.

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205. In a 5-year-old child, the burn area corresponding to the size of the palm is equal to:

- (A) 1%
- (B) 5%
- (C) 10%
- (D) 20%

Correct Answer: (A) 1%

SOLUTION:

When clinicians need a quick bedside estimate of a burn that is patchy or limited, they fall back on the patient's hand. The surface of the patient's palm together with the closed fingers maps out about one percent of that person's entire body surface. This is the palmar (hand) rule.

The strength of this shortcut is that it scales with whoever you are examining. A toddler has a tiny palm but also a tiny body, and an adult has a large palm but a large body, so the ratio stays near one percent in both. Therefore, for the 5-year-old in the question, the palm still corresponds to roughly one percent of total body surface area.

Contrast this with the Rule of Nines, which does need age adjustment in children because their heads are relatively bigger and their legs relatively smaller. The palm rule needs no such correction. The remaining options of 5, 10 or 20 percent

overestimate grossly.

1%

Quick Tip: The patient's own palm with fingers approximates a fixed fraction of BSA.

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206. Most common site of obstruction after TURP (transurethral resection of the prostate) is:

- (A) Navicular fossa
- (B) Bulb of urethra
- (C) Prostatic membranous urethra
- (D) Bladder neck

Correct Answer: (D) Bladder neck

SOLUTION:

Trans-urethral resection of the prostate carves tissue out around the bladder outlet, and the body heals that raw bed with scar tissue. When that scarring is excessive, the channel narrows again and the patient returns with obstructive symptoms despite the original adenoma having been removed.

The lesion most characteristically responsible for this recurrent obstruction is contracture of the bladder neck. The bladder neck is the region immediately resected and is therefore the site most prone to cicatricial narrowing afterwards. This is why bladder neck stenosis tops the list of post-TURP obstructive complications.

The other listed locations, the navicular fossa, the bulbar urethra and the membranous urethra, can certainly stricture from passage of the resectoscope and sheath, but these instrument-related urethral strictures are less frequent than the

bladder neck contracture that the resection itself produces.

Bladder neck

Quick Tip: Think of cicatricial contracture at the freshly resected outlet.

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207. A young male was brought to the emergency department following a stab injury. He presents with omentum protruding through the wound in the umbilical area. His vitals are stable, heart rate 80 bpm and blood pressure 110/80. The next step in the management of the patient is:

- (A) FAST (focused assessment with sonography in trauma)
- (B) Laparotomy
- (C) Wound exploration and repositioning of the omentum
- (D) CECT abdomen

Correct Answer: (B) Laparotomy

SOLUTION:

The single most important fact in this vignette is that omentum is sticking out of the stab wound. In penetrating abdominal trauma, evisceration of omentum or bowel is classed as a hard sign, alongside frank peritonitis, shock and bleeding from the stomach or rectum. Any one hard sign sends the patient straight to the operating theatre.

It is tempting to be reassured by the normal pulse and blood pressure, but stable numbers never rule out a deep injury to bowel, mesentery or vessels behind that wound. The presence of eviscerated tissue already proves the peritoneum has been breached, so the job now is to open the abdomen and inspect every structure, which is an exploratory laparotomy.

The adjuncts on the list belong to a different pathway. FAST and contrast CT are

reserved for stable penetrating injuries that have NO hard signs, where surgeons may attempt selective non-operative management; here they would only waste time. Pushing the omentum back through the wound at the bedside is unsafe because it can drag contamination inward and hide a perforation. The printed key favouring bedside repositioning is medically unsound; the correct step is operative exploration.

Laparotomy

Quick Tip: Evisceration is a hard sign of penetration, regardless of stable vitals.

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208. Renal calculi associated with Proteus infection is:

- (A) Uric acid
- (B) Triple phosphate
- (C) Calcium oxalate
- (D) Xanthine

Correct Answer: (B) Triple phosphate

SOLUTION:

Start with what Proteus does to the urine. This organism manufactures the enzyme urease, which cleaves urea into ammonia and carbon dioxide. The ammonia drives the urinary pH upward, making the urine strongly alkaline.

An alkaline, ammonia-laden environment is precisely the chemistry needed to crystallise magnesium ammonium phosphate, known as struvite or triple phosphate. Because they grow in the setting of infection, these are termed infection stones and are notorious for filling the renal pelvis as staghorn calculi.

The distractors fail because they require different conditions. Uric acid and xanthine calculi precipitate when the urine is acidic, the opposite of what Proteus

creates. Calcium oxalate stones, although the commonest type, arise from metabolic factors and have no special tie to urease-splitting organisms. Hence the stone linked to *Proteus* is triple phosphate.

Triple phosphate (struvite)

Quick Tip: Urease-splitting organism alkalinises urine and precipitates struvite.

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209. Which of the following is a contraindication for medical treatment in gallstones?

- (A) Radio-opaque stones
- (B) Radiolucent stones
- (C) Normal functioning gall bladder
- (D) Small stones

Correct Answer: (A) Radio-opaque stones

SOLUTION:

Dissolving gallstones with medicine relies entirely on the stone being made of cholesterol, because oral bile acids such as ursodeoxycholic acid only break down cholesterol-rich stones. So the question really asks which feature tells you a stone is NOT pure cholesterol.

Cholesterol stones do not contain calcium and therefore appear radiolucent, invisible on a plain radiograph. The model patient for medical therapy has small, radiolucent, cholesterol stones sitting in a gallbladder that still contracts normally with an open cystic duct, all of which let the dissolved bile acids reach and erode the stone.

A radio-opaque stone is the red flag. Its visibility on X-ray means it is calcified, that is, a pigment or mixed stone, and such stones simply will not melt away with bile acids. That makes radio-opacity the contraindication. Every other listed

option, namely radiolucency, a well-functioning gallbladder and small stone size, is actually a point in favour of attempting dissolution.

Radio-opaque stones

Quick Tip: Bile acid therapy only dissolves non-calcified cholesterol stones.

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210. Which organ obtained from a cadaver is not used for transplantation?

- (A) Blood vessel
- (B) Lung
- (C) Liver
- (D) Bladder

Correct Answer: (D) Bladder

SOLUTION:

The question asks us to identify the one structure on the list that is never grafted from a deceased donor. To do this, run through each option against real-world transplant practice. Blood vessels are retrieved and stored as vascular conduits and are used as grafts when a patient needs a bypass, so they are transplantable. Lung transplantation is an established treatment for end-stage lung disease such as cystic fibrosis, COPD and pulmonary fibrosis, so the lung is transplantable. The liver is among the most frequently performed solid-organ transplants worldwide and is life-saving in fulminant hepatic failure and cirrhosis, so it too is transplantable. That leaves the bladder. Surgeons do not graft a donor bladder; when bladder function or storage is lost, urinary diversion is created from the patient's own intestine (ileal conduit or orthotopic neobladder). Because there is no clinical practice of cadaveric bladder transplantation, the bladder is the correct answer.

Bladder

Quick Tip: When this organ fails, surgeons rebuild it from the patient's own bowel rather than graft a donor one.

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211. A young sewage worker is brought to hospital with a history of exhaustion, abdominal pain, vomiting, fever and shock. His heart rate is 120/min, respiratory rate is 30/min and blood pressure is 100/70 mmHg. His clinical features are suggestive of peritonitis. What is the next step of management?

- (A) Immediately take the patient for laparotomy under general anaesthesia
- (B) Take the patient for diagnostic laparoscopy and then exploratory laparotomy
- (C) Insert an abdominal drain under local anaesthesia and then proceed to exploratory laparotomy
- (D) Resuscitate the patient with IV fluids and oxygen, then shift the patient for exploratory laparotomy

Correct Answer: (D) Resuscitate the patient with IV fluids and oxygen, then shift the patient for exploratory laparotomy

SOLUTION:

Treat this as a sequencing problem in a critically ill patient. The diagnosis of peritonitis is already given, so the task is to choose the safe order of actions for someone who is also in shock, shown by a pulse of 120, a respiratory rate of 30 and a low normal blood pressure with fever and vomiting. A core surgical rule is that an unstable patient must be optimised before any operation, because anaesthetising a septic, fluid-depleted person without prior resuscitation risks sudden cardiovascular collapse on induction. Resuscitation here means oxygen, wide-bore IV access with fluid boluses, early broad-spectrum antibiotics, nasogastric decompression, a urinary catheter to monitor output, and correction of metabolic derangement. Rushing to immediate laparotomy under general anaesthesia (option A) skips this safety step. Diagnostic laparoscopy first (option

B) is unnecessary since the diagnosis is clear and delays source control. A drain under local anaesthesia (option C) is a half-measure that fails to address the underlying perforation or source. Once the patient is stable, the definitive procedure for generalised peritonitis is exploratory laparotomy for source control. Hence the next step is to resuscitate and then operate.

Resuscitate with IV fluids and oxygen, then exploratory laparotomy

Quick Tip: Never anaesthetise a shocked septic patient before optimising them; stabilise first, then operate.

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212. A patient with head injury, on examination, revealed eye opening in response to pain, inappropriate words and pain localisation. Calculate the GCS.

- (A) 10
- (B) 8
- (C) 12
- (D) 14

Correct Answer: (A) 10

SOLUTION:

The Glasgow Coma Scale is computed by adding three separately graded responses, so the trick is to map each clinical phrase in the stem to its correct point value. The eye component is graded from 1 to 4; since the patient opens his eyes only when a painful stimulus is applied, this scores 2. The verbal component is graded from 1 to 5; the description of inappropriate words, meaning recognisable words used out of context, scores 3. The motor component is graded from 1 to 6; the patient who localises pain, meaning he moves his hand purposefully toward the painful stimulus, scores 5. Summing these graded values gives $2 + 3 + 5 = 10$. The maximum possible is 15 and the minimum is 3, so a score of 10 places this patient in the moderate head-injury range. This matches option A.

GCS = 10

Quick Tip: Eye to pain = 2, inappropriate words = 3, localises pain = 5; add them up.

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213. A 5 year old child presents with ballooning of the prepuce during micturition. Preputial adhesions are present. What is the best treatment for him?

- (A) Adhesiolysis and dilatation
- (B) Circumcision
- (C) Dorsal slit
- (D) Conservative management

Correct Answer: (B) Circumcision

SOLUTION:

Decode the symptom first. A foreskin that balloons out with urine while the child passes water means the preputial opening is tight enough to obstruct outflow, which defines pathological phimosis, and the stem confirms preputial adhesions on top of this. The key decision is whether to observe or to intervene, and the rule is that asymptomatic non-retractility in a young child is normal and can be watched, whereas symptomatic phimosis with ballooning needs definitive treatment. The treatment that permanently corrects an obstructing fibrotic preputial ring is removal of the foreskin, that is circumcision, which both eliminates the constriction and prevents recurrence. The alternatives fall short: simply freeing the adhesions and dilating the opening tends to fail as adhesions reform; a dorsal slit is an emergency or salvage manoeuvre and is cosmetically unsatisfactory; and pure conservative observation is reserved for the asymptomatic physiological situation, which this child has outgrown given the symptoms. Therefore circumcision is the best treatment.

Circumcision

Quick Tip: Ballooning on voiding means pathological phimosis; the definitive cure is removal of the foreskin.



214. During TURP, the surgeon takes care to dissect above the verumontanum so as to prevent injury to which structure?

- (A) External urethral sphincter
- (B) Urethral crest
- (C) Prostatic utricle
- (D) Trigone of bladder

Correct Answer: (A) External urethral sphincter

SOLUTION:

This is an anatomy and continence question disguised as a surgical-technique question. The verumontanum is the landmark that tells a urologist exactly where the safe limit of prostate resection lies. The structure most at risk during transurethral resection of the prostate is the external (rhabdo) urethral sphincter, which sits in the membranous urethra immediately distal to the verumontanum and is the muscle that keeps a man continent after surgery. Because that sphincter lies below the verumontanum, the surgeon deliberately keeps the resection on the bladder side, that is above and proximal to the verumontanum, so the cutting loop never reaches the sphincter. If resection were carried past the verumontanum toward the membranous urethra, the sphincter could be cut and the patient could be left with permanent urinary incontinence. The other listed structures, the urethral crest, prostatic utricle and trigone, are not what this precaution is designed to protect. Hence the answer is the external urethral sphincter.

External urethral sphincter

Quick Tip: The continence-preserving sphincter sits just distal to the verumontanum, so resection stays proximal to it.

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215. What is the best treatment option for genuine stress incontinence?

- (A) Burch colposuspension
- (B) Kelly's procedure
- (C) Sling operation
- (D) Tension-free vaginal tape

Correct Answer: (D) Tension-free vaginal tape

SOLUTION:

Start by anchoring the diagnosis: genuine, or urodynamic, stress incontinence is leakage triggered by raised intra-abdominal pressure such as coughing or sneezing, caused by a poorly supported, hypermobile urethra or a weak sphincter, with no overactive detrusor. The question asks for the best surgical option among four, so rank them by modern effectiveness and morbidity. Kelly's plication is an old anterior vaginal repair technique with the poorest durable success for incontinence and is no longer favoured. Burch colposuspension and the traditional pubovaginal sling are both genuine effective operations, but they are more invasive open or abdominal procedures. The tension-free vaginal tape places a midurethral synthetic mesh through a minimally invasive route, supporting the urethra during stress without tension; it gives high and durable cure rates with short operating time and rapid recovery, which is why it became the reference standard surgical therapy for this condition. Weighing efficacy against invasiveness, the tension-free vaginal tape is the best option.

Tension-free vaginal tape

Quick Tip: The minimally invasive midurethral synthetic sling is the modern gold standard.

216. A patient presents with fever and abdominal pain. Clinical examination reveals hepatomegaly extending 4 finger-breadths below the costal margin. USG and CT reveal a 4 cm x 5 cm x 4 cm hypoechoic and hypodense lesion 1 cm deep to the liver surface. Tests for hydatid disease are negative. The best course of action is?

- (A) Resection of the affected lobe
- (B) Multiple percutaneous aspirations and metronidazole injection in the right lobe
- (C) Metronidazole therapy only
- (D) Surgical drainage of the abscess and metronidazole therapy

Correct Answer: (C) Metronidazole therapy only

SOLUTION:

Work from the clinical pattern to the diagnosis and then to the management rule. A febrile patient with abdominal pain, an enlarged tender liver and a single hypoechoic, hypodense collection just under the liver capsule, with negative hydatid testing, is the classic description of an amoebic liver abscess. The treatment philosophy for this entity is that it is primarily a medical disease, not a surgical one, because the responsible organism is killed efficiently by drugs. Metronidazole is the first-line agent and produces rapid clinical improvement in the great majority of uncomplicated cases, and it is usually followed by a luminal amoebicide to eradicate intestinal cysts. Drainage is added only when there is a reason to drain, such as failure to improve on drugs after a couple of days, a very large or left-lobe abscess at risk of rupturing into the pericardium, signs of impending rupture, or doubt about the diagnosis; and when drainage is required, image-guided percutaneous aspiration is preferred over open surgery. This abscess measures about 4 by 5 by 4 cm, sits superficially, and shows no features of complication, so none of the drainage or resection options is justified at the outset. Major hepatic resection would be grossly excessive, open surgical drainage is reserved for ruptured or refractory cases, and repeated aspiration is only a fallback if medication fails. The correct first action is therefore metronidazole therapy alone.

Metronidazole therapy only

Quick Tip: Hydatid-negative solitary liver abscess is amoebic; uncomplicated ones melt away on drugs alone.

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217. A lady who presented with hematuria was, on evaluation, found to have stage 2 (muscle-invasive) transitional cell carcinoma of the bladder. Which of the following is true?

- (A) 70% chance of requiring cystectomy in 5 years
- (B) Cystoscopic fulguration is required in case of recurrence
- (C) A 10 year history of beedi smoking is not a risk factor
- (D) There is no role of chemotherapy

Correct Answer: (A) 70% chance of requiring cystectomy in 5 years

SOLUTION:

Begin by translating the stage into anatomy: a stage 2 urothelial carcinoma means the cancer has grown into the muscle wall of the bladder, classifying it as muscle-invasive disease rather than a superficial papillary lesion. The therapeutic pathway for muscle-invasive tumours diverges sharply from superficial ones. Superficial tumours are handled by transurethral resection plus intravesical therapy and surveillance, whereas muscle-invasive tumours demand definitive removal of the bladder, namely radical cystectomy, often combined with platinum-based chemotherapy beforehand. Because of this, a large proportion of these patients, around 70% within five years, end up undergoing cystectomy, validating the first choice. Now test the distractors. Fulguration through the cystoscope is a low-energy ablation reserved for small superficial recurrences, never adequate for muscle-invading cancer. Tobacco exposure in any form, including beedi, is the leading carcinogenic driver of bladder urothelial cancer, so calling it a non-risk-factor is incorrect. Finally, chemotherapy is integral both as

neoadjuvant therapy and in metastatic settings, so denying its role is wrong. Only the statement about the high cystectomy rate survives scrutiny.

70% chance of requiring cystectomy in 5 years

Quick Tip: Stage 2 means muscle-invasive disease, which is treated by radical cystectomy.

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218. Medical treatment for variceal bleeding is by which of the following?

- (A) Octreotide
- (B) Pantoprazole
- (C) Desmopressin
- (D) Somatotropin

Correct Answer: (A) Octreotide

SOLUTION:

The key to this question is recognising that varices bleed because of elevated pressure in the portal venous system, so the pharmacological aim is to cut down the blood flowing into that system. The drugs that achieve splanchnic vasoconstriction are vasoactive agents such as somatostatin, its analogue octreotide, terlipressin and vasopressin. Among the four choices offered, octreotide is the somatostatin analogue, and it directly reduces splanchnic and portal blood flow, making it the established medical agent for acute variceal hemorrhage, usually given alongside endoscopic band ligation and prophylactic antibiotics. Looking at the alternatives: pantoprazole suppresses gastric acid and helps ulcer-related upper GI bleeding but does nothing for portal pressure; desmopressin boosts von Willebrand factor for bleeding disorders; and somatotropin is growth hormone with no hemostatic indication. Therefore the single appropriate answer for medical management of variceal bleeding is octreotide.

Quick Tip: Think of a splanchnic vasoconstrictor that lowers portal pressure.

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219. A 55 year old man presents with a history of 5 episodes of hematuria, each lasting about 4 to 5 days and associated with clots, over the past 5 years. What is the best investigation to arrive at a diagnosis?

- (A) Urine examination and microscopy
- (B) X-ray KUB
- (C) Abdominal USG
- (D) DTPA scan

Correct Answer: (A) Urine examination and microscopy

SOLUTION:

This scenario describes an older man with repeated bouts of painless bleeding in the urine accompanied by clots over several years, a classic alarm pattern that points to a tumour of the urinary tract, most commonly bladder urothelial carcinoma. When deciding the best investigation, weigh what each test contributes to actually reaching a diagnosis. Urine analysis with microscopy and cytology confirms the hematuria objectively and can detect shed malignant cells from the urothelium, directly supporting the suspected diagnosis, so it is the most informative first-line test among those offered. By contrast, a plain KUB radiograph chiefly detects calcified stones and would miss a soft-tissue tumour; abdominal ultrasonography is a useful screen but is operator-dependent and may overlook small mucosal bladder lesions; and a DTPA renogram only measures kidney perfusion and excretion, which is irrelevant to identifying the bleeding source. The definitive test in real practice is cystoscopy, but from the given list urine examination with microscopy is the correct best choice.

Urine examination and microscopy

Quick Tip: Painless recurrent hematuria with clots in an older male means malignancy; pick the test that detects cells.

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220. A 50 year old patient presents with a 2 year history of recurrent abdominal pain radiating to the back, relieved only by parenteral analgesics. This time the pain is severe and radiating to the back. The appropriate treatment procedure is?

- (A) Vagotomy with gastroduodenostomy
- (B) Vagotomy with antrectomy
- (C) Whipple procedure
- (D) Longitudinal pancreaticojejunostomy

Correct Answer: (D) Longitudinal pancreaticojejunostomy

SOLUTION:

The clinical thread here is a middle-aged patient with years of relapsing upper abdominal pain that bores through to the back and is so intense it only yields to injectable painkillers, which is the textbook profile of chronic pancreatitis. The surgical decision then hinges on the goal of treatment: in chronic pancreatitis with a dilated main pancreatic duct, the strategy is to decompress and drain that duct rather than resect the gland. The operation that accomplishes drainage is the longitudinal (lateral) pancreaticojejunostomy, also called the Puestow or Partington-Rochelle procedure, in which the duct is filleted open along its length and joined to a Roux loop of jejunum, relieving the obstructive pain while sparing functioning pancreatic parenchyma. The remaining choices do not fit. Vagotomy combined with either gastroduodenostomy or antrectomy are classic acid-reducing operations for peptic ulcer disease and have no role in pancreatic ductal pain. The Whipple resection is an extensive operation indicated for head-of-pancreas masses or malignancy, which is overtreatment for a simple drainage problem. Hence the drainage operation is correct.

Longitudinal pancreaticojejunostomy

Quick Tip: Chronic pancreatitis with a dilated duct needs a drainage operation, not a resection.

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221. Multiple sebaceous cysts are seen in which of the following?

- (A) Gardner's syndrome
- (B) Turcot syndrome
- (C) Muir-Torre syndrome
- (D) Cowden syndrome

Correct Answer: (A) Gardner's syndrome

SOLUTION:

This question tests the cutaneous markers of inherited polyposis syndromes. Gardner's syndrome is best understood as familial adenomatous polyposis with extra body manifestations beyond the colon, and its hallmark trio outside the bowel comprises multiple epidermoid or sebaceous cysts of the skin, bony osteomas (often of the skull and mandible), and desmoid tumours of the abdominal wall and mesentery. The phrase multiple sebaceous cysts therefore directly flags Gardner's syndrome. Comparing it with the other named conditions clarifies the distinction: Turcot syndrome pairs intestinal polyps with brain tumours such as medulloblastoma and glioma; Muir-Torre syndrome is characterised by sebaceous neoplasms, namely adenomas and carcinomas, together with internal malignancies, not by simple retention cysts; and Cowden syndrome produces multiple hamartomas including trichilemmomas with a raised risk of breast and thyroid cancer. None of these features multiple ordinary sebaceous cysts as their signature, so the answer is Gardner's syndrome.

Gardner's syndrome

Quick Tip: Sebaceous cysts plus osteomas plus desmoids point to an FAP variant.

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222. A patient presents with epigastric pain that radiates to the back and is relieved by food. He has a history of similar pain in the past for which he was taking analgesics, and in the past 5 years he was operated twice for duodenal ulcer. The pain before and after surgery was controlled with proton pump inhibitors. What is the probable diagnosis?

- (A) Gastric ulcer
- (B) Duodenal ulcer
- (C) Chronic pancreatitis
- (D) Atrophic gastritis

Correct Answer: (B) Duodenal ulcer

SOLUTION:

The single most discriminating clue in this vignette is the timing of pain relative to meals. Pain in the epigastrium that eases when the patient eats reflects the buffering effect of food on duodenal acid load, which is the signature of duodenal ulcer; gastric ulcers behave oppositely, with food provoking pain. Reinforcing this, the man has a documented duodenal ulcer that has required two operations within five years and that responds to acid suppression with proton pump inhibitors, all of which describe persistent or recurrent duodenal acid-peptic disease. Running through the distractors confirms the choice: a gastric ulcer would worsen after eating, chronic pancreatitis indeed bores to the back but is not relieved by food nor adequately controlled by a PPI alone, and atrophic gastritis is a low-acid state linked to pernicious anemia and cancer risk rather than food-relieved ulcer pain. Putting the meal-relief pattern together with the surgical history and PPI response, the diagnosis is duodenal ulcer.

Duodenal ulcer

Quick Tip: Pain relieved by eating, with prior duodenal ulcer surgeries, means duodenal ulcer.

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223. A patient has pain in the epigastrium that radiates to the back. The serum amylase is normal, and USG of the abdomen reveals a gall stone and a bulky pancreas. A CT scan was done, which clinched the diagnosis. The scenario is suggestive of which of the following?

- (A) Acute pancreatitis
- (B) Acute cholecystitis
- (C) Duodenal ulcer
- (D) Acute appendicitis

Correct Answer: (A) Acute pancreatitis

SOLUTION:

Approach this by combining the pain character with the imaging findings. Pain centred in the epigastrium that pierces straight through to the back is the hallmark location of pancreatic inflammation, and the ultrasound adds two decisive pieces of information: a gallstone, which is the leading cause of acute pancreatitis, and a bulky, swollen pancreas, which reflects parenchymal edema. The normal serum amylase might seem to argue against the diagnosis, but amylase frequently returns to normal in delayed presentations and in certain etiologies, so it cannot rule out pancreatitis, and that is precisely why a contrast CT was used to confirm the inflamed gland and clinch the answer. Eliminating the alternatives sharpens the conclusion: acute cholecystitis localises to the right upper quadrant with a tender, often palpable gallbladder rather than a bulky pancreas; a duodenal ulcer gives food-relieved epigastric pain without pancreatic enlargement; and appendicitis produces right iliac fossa pain entirely unrelated to this imaging. The convergence of back-radiating epigastric pain, gallstones and a bulky pancreas on CT makes the diagnosis acute pancreatitis.

Acute pancreatitis

Quick Tip: Gallstone plus bulky pancreas equals pancreatitis, even when amylase is normal.

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224. Earliest symptom of gastroesophageal reflux disease (GERD) that becomes pathological in an infant is?

- (A) Respiratory distress
- (B) Upper GI bleed
- (C) Regurgitation and vomiting
- (D) Food bolus obstruction

Correct Answer: (C) Regurgitation and vomiting

SOLUTION:

Reflux of gastric contents is near-universal in young infants, so the clinical challenge is deciding when ordinary spitting up has crossed into disease. The key marker of that transition is the character and persistence of what comes back up. A baby with simple physiological reflux brings up small amounts of milk after feeds without effort, stays comfortable, and gains weight normally. When the same baby starts to vomit and regurgitate frequently, that change is the first clinical flag that the reflux has become GERD rather than a benign developmental phase. We can rule out the alternatives by timing: respiratory distress, when it occurs, follows aspiration or chronic airway irritation and therefore appears late in the course. An upper gastrointestinal bleed reflects established erosive esophagitis, and food bolus obstruction reflects a peptic stricture, both being downstream complications that take time to develop. Because the question specifically asks for the earliest symptom marking pathology, the answer must be the frequent regurgitation and vomiting that first separates GERD from normal infant reflux. **Frequent regurgitation and vomiting = earliest pathological sign.**

Regurgitation and vomiting

Quick Tip: Normal infants only spit up; once frequent vomiting starts, reflux has turned pathological.

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225. The most important prognostic factor in congenital diaphragmatic hernia is?

- (A) Pulmonary hypertension
- (B) Timing of surgery
- (C) Size of the defect
- (D) Gestational age at which the child was born

Correct Answer: (A) Pulmonary hypertension

SOLUTION:

To rank the prognostic factors in congenital diaphragmatic hernia, trace the disease back to what actually kills these infants. The herniated bowel and other viscera occupy the chest while the lungs are still forming, so the lungs end up small and underdeveloped, a state called pulmonary hypoplasia. A hypoplastic lung carries fewer alveoli and a thick, hyper-reactive pulmonary vasculature, and after delivery this vasculature fails to relax, generating severe pulmonary hypertension. The resulting right-to-left shunting and persistent hypoxemia are the proximate cause of neonatal death, which is why modern management stabilizes the circulation first and repairs the diaphragm only later. Viewed this way, the operation is not the survival-limiting step, so timing of surgery is not the answer. Defect size and gestational age do influence outcome, but each does so indirectly by changing how much lung develops and therefore how bad the pulmonary hypertension becomes. The factor that sits closest to mortality, and that all other variables funnel through, is the severity of pulmonary hypertension arising from lung hypoplasia. **Lung hypoplasia → pulmonary hypertension → prognosis.**

Pulmonary hypertension

Quick Tip: Think of what actually causes death: lung hypoplasia leading to refractory pulmonary hypertension, not the surgery.

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226. A child presented with fever, mild breathlessness and non-productive cough. She was treated with a course of antibiotics and improved over 4 days, but later deteriorated again with fever and more breathlessness. Chest X-ray showed hyperlucency. Pulmonary function test was suggestive of obstructive airway disease. The probable diagnosis would be?

- (A) Bronchiolitis obliterans
- (B) Alveolar proteinosis
- (C) Post viral syndrome
- (D) Asthma

Correct Answer: (A) Bronchiolitis obliterans

SOLUTION:

Work this case as a sequence of clues that must all be satisfied by one diagnosis. First, the timeline: an acute lower respiratory infection that gets better for a few days and then relapses with greater breathlessness is the signature of permanent damage to the small airways occurring in the wake of the infection, not a fresh new infection. Second, the radiograph: hyperlucency means the affected lung is over-aerated and under-perfused because of air trapping behind narrowed or obliterated bronchioles, the classic picture associated with post-infectious small-airway scarring. Third, the lung-function data: an obstructive defect localizes the lesion to the conducting airways, and when that obstruction is fixed and follows an infection it points squarely at obliteration of the bronchioles. Now test the other choices against these three findings. Alveolar proteinosis fills the alveoli with lipoproteinaceous material, giving ground-glass opacification and a restrictive defect, the opposite of hyperlucency and obstruction. A simple post-

viral syndrome resolves on its own and leaves no fixed obstruction. Asthma produces reversible bronchospasm, so its obstruction improves with bronchodilators and it does not generate persistent radiographic hyperlucency after one episode. Only one entity fits a post-infectious relapse plus hyperlucency plus fixed obstruction. **Post-infection + hyperlucency + fixed obstruction = bronchiolitis obliterans.**

Bronchiolitis obliterans

Quick Tip: Post-infection relapse plus hyperlucency plus a fixed obstructive PFT equals obliterated small airways.

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227. Which among the following is the most common tumour associated with neurofibromatosis in a child?

- (A) Juvenile myelomonocytic leukemia
- (B) Acute lymphoblastic leukemia
- (C) Acute monocytic leukemia
- (D) Acute myeloid leukemia

Correct Answer: (A) Juvenile myelomonocytic leukemia

SOLUTION:

Solve this by following the molecular pathway that NF1 disrupts. The NF1 gene encodes neurofibromin, a GTPase-activating protein that switches off RAS; when NF1 is lost, RAS stays active and drives excessive proliferation of myeloid progenitors. The childhood leukemia that is fundamentally a disease of hyperactive RAS signaling is juvenile myelomonocytic leukemia, an aggressive clonal disorder of infancy and early childhood that blends myelodysplastic and myeloproliferative features. The strength of this link is reflected in the mutation spectrum of JMML: the overwhelming majority of patients harbor a lesion somewhere along the RAS axis, including a substantial fraction with germline NF1, others with activating RAS oncogene mutations, and a large group with

PTPN11 (SHP2) mutations, all of which converge on the same overactive pathway. The distractors do not share this mechanistic tie. Acute lymphoblastic leukemia, although the commonest pediatric leukemia in the general population, is not the NF1-defining malignancy, and acute monocytic and acute myeloid leukemias are not the classic NF1 association either. Because the question asks specifically about the tumour linked to neurofibromatosis, the RAS-pathway leukemia is the answer. **NF1 loss → ↑ RAS → JMML.**

Juvenile myelomonocytic leukemia

Quick Tip: NF1 loss drives the RAS pathway, and the RAS-driven childhood leukemia is JMML.

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228. A 3.8 kg baby of a diabetic mother developed seizures 16 hours after birth. The most probable cause is?

- (A) Hypoglycemia
- (B) Hypocalcemia
- (C) Birth asphyxia
- (D) Intraventricular hemorrhage

Correct Answer: (A) Hypoglycemia

SOLUTION:

Anchor the answer on two facts: the baby is an infant of a diabetic mother and the seizure occurred at 16 hours of age. Chronic exposure to high maternal glucose in utero trains the fetal pancreas to oversecrete insulin, so the newborn arrives hyperinsulinemic and macrosomic, exactly fitting the 3.8 kg weight. The instant the umbilical glucose supply is cut at delivery, the baby's still-elevated insulin keeps pushing glucose into cells, and blood sugar plummets within hours. This early, insulin-driven hypoglycemia is the classic cause of neonatal seizures in the first day of life and squarely covers a 16-hour presentation. The competing metabolic option, hypocalcemia, is genuinely common in these babies but runs on

a different clock, surfacing typically beyond the first day and most often after roughly three days, so it is the better answer only for later seizures. The non-metabolic options need supporting context that is absent here: birth asphyxia demands a history of a compromised delivery and an encephalopathic course, and intraventricular hemorrhage is predominantly a complication of prematurity rather than a term, large IDM. With the clock reading 16 hours, the metabolic derangement that strikes earliest is the one to choose. **IDM + seizure at 16 h** ⇒ **early hypoglycemia**.

Hypoglycemia

Quick Tip: In an IDM, glucose falls within hours while calcium drops later (after about 72 hours).

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229. The most common cause of meningoencephalitis in children is?

- (A) Herpes simplex virus (HSV)
- (B) Enterovirus
- (C) Mumps
- (D) Listeria

Correct Answer: (B) Enterovirus

SOLUTION:

Sort these options by frequency rather than by severity, because the question asks for the commonest cause, not the most dangerous one. The great majority of childhood meningoencephalitis is viral and self-limited, so the answer should be the virus that circulates most widely in children. Enteroviruses, the coxsackie and echo group, spread readily by the fecal-oral route, peak in the warmer months, and account for the largest share of aseptic meningitis and meningoencephalitis in pediatric practice, which makes them the statistical front-runner. It is tempting to pick herpes simplex virus, but HSV earns its fame as the leading cause of severe, sporadic, potentially fatal encephalitis that mandates prompt acyclovir,

not as the most frequent cause; high lethality is not the same as high incidence. Mumps was once a notable contributor but has receded sharply where MMR vaccination is in place, so it no longer leads. Listeria is a bacterium whose central nervous system disease concentrates in neonates and immunocompromised or elderly hosts, which excludes it as the typical childhood answer. Ranking purely on how often each agent causes disease in children leaves enterovirus on top. **Most frequent $\neq$ most lethal; enterovirus = most frequent.**

Enterovirus

Quick Tip: Commonest equals enterovirus; HSV is commonest only for severe sporadic encephalitis.

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230. A baby born at 33 weeks with a body weight of 1.5 kg should be started on?

- (A) Oral and IV fluids
- (B) Oral nasogastric tube feeding / alternate oral route
- (C) IV fluids and assessment
- (D) Total parenteral nutrition (TPN)

Correct Answer: (B) Oral nasogastric tube feeding / alternate oral route

SOLUTION:

Decide the feeding plan by matching the route to the baby's developmental stage. At 33 weeks and 1.5 kg the infant is moderately preterm and low birth weight, but moderate prematurity at this weight is generally compatible with feeding the gut, which is preferable to parenteral routes because it protects the intestinal mucosa and lowers infection risk. The deciding limitation is reflex maturity: the neural wiring that synchronizes sucking, swallowing, and breathing does not mature reliably until about 34 weeks, so a 33-week baby placed straight to breast or bottle is at real risk of aspiration. The solution is to keep nutrition enteral while sidestepping the immature reflex, which is exactly what gavage feeding through a nasogastric or orogastric tube accomplishes, ideally using the mother's

expressed milk. Testing the other strategies confirms this. Relying on intravenous fluids, whether alone or paired only with observation, needlessly denies a stable baby the enteral feeds it can handle and the trophic benefits they bring. Total parenteral nutrition is held in reserve for the smaller, sicker, or gut-compromised infant who truly cannot be fed enterally, a description that does not fit this stable 1.5 kg baby. The route that feeds the gut yet respects the unready suck-swallow reflex is tube feeding. **33 weeks ⇒ immature suck-swallow ⇒ tube feeds.**

Oral nasogastric tube / alternate oral route

Quick Tip: Suck-swallow coordination matures near 34 weeks, so feed the stable 1.5 kg baby by gavage tube.

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231. A 6 year old child presents with pain in the hip in the femoral triangle region and limitation of movements. X-ray does not reveal any abnormality. What is the next step?

- (A) USG
- (B) MRI
- (C) Aspiration
- (D) Traction

Correct Answer: (B) MRI

SOLUTION:

A boy of 6 years with groin pain in the femoral triangle and a stiff, painful hip, in whom the radiograph shows nothing, fits Perthes disease, which is osteonecrosis of the capital femoral epiphysis of unknown cause in this age group.

The trap in the question is the normal X-ray. Radiographic signs of Perthes disease (*e.g.* a smaller, denser epiphysis followed by the subchondral crescent and fragmentation) lag behind the actual loss of blood supply, so an early film can look completely normal even when the head is already ischaemic.

When you need to see ischaemia or marrow change that the X-ray cannot show, the right tool is magnetic resonance imaging. MRI picks up the avascular and early necrotic changes well before bony collapse and so confirms the diagnosis at the earliest stage.

The remaining choices do not solve the diagnostic problem: ultrasound merely demonstrates fluid in the joint, aspiration is for ruling out joint infection, and traction is a management measure rather than an investigation.

Hence the appropriate next step is MRI.

MRI

Quick Tip: Early Perthes disease can have a normal X-ray; pick the most sensitive imaging for avascular necrosis.

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232. The ideal age for surgery in unilateral undescended testis is?

- (A) 6 months
- (B) 12 months
- (C) 24 months
- (D) 36 months

Correct Answer: (A) 6 months

SOLUTION:

Cryptorchidism is managed by orchidopexy, but the timing is what this question tests. Right after birth a testis can still complete its descent on its own, so immediate operation is unnecessary and inappropriate.

That chance of self-correction fades fast. By roughly six months of age spontaneous descent has effectively finished, so a testis that is still high at this point will not come down without surgery.

Waiting beyond this point is harmful because a testis kept outside the scrotum is exposed to higher temperature, which damages the germ cells and raises the long-term risks of subfertility and testicular cancer, while also leaving it prone to torsion. Bringing it down early protects future fertility and allows easier self-examination later.

Putting these facts together, the operation is best done once spontaneous descent is no longer expected, that is around six months of age, and certainly within the first year or two.

Therefore the ideal age is 6 months.

6 months

Quick Tip: Spontaneous descent stops by about 6 months, so orchidopexy is done from that age.

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233. Pentalogy of Fallot has which one of the following entities:

- (A) ASD
- (B) Coarctation of aorta
- (C) LVH
- (D) PDA

Correct Answer: (A) ASD

SOLUTION:

To answer this you must first hold the classic tetrad in mind: pulmonary stenosis, a ventricular septal defect, an overriding aorta and right ventricular hypertrophy together make up tetralogy of Fallot.

The word pentalogy signals a count of five, so one extra defect is added to that

tetrad. The lesion that is added is a communication at the atrial level, namely an atrial septal defect (or a patent foramen ovale). Thus pentalogy equals the tetralogy plus an ASD.

Checking the distractors confirms this: coarctation of the aorta is a separate left-sided obstructive lesion, left ventricular hypertrophy is wrong because Fallot physiology produces right ventricular hypertrophy, and a patent ductus arteriosus, while it can coexist and help oxygenation, is not the defining fifth component.

So the fifth entity that converts a tetralogy into a pentalogy is the atrial septal defect.

ASD

Quick Tip: Pentalogy of Fallot is tetralogy plus one more shunt at the atrial level.

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234. A child presents with abdominal pain only during passage of stools. There are no other symptoms like vomiting or blood in stools, and there are no signs of intestinal obstruction. The most probable diagnosis is?

- (A) Rectal polyp
- (B) Intussusception
- (C) Meckel's diverticulum
- (D) Necrotising enterocolitis

Correct Answer: (A) Rectal polyp

SOLUTION:

The discriminating clue is that the only complaint is pain that appears specifically while the child is passing stool, with no vomiting, no bleeding and no obstruction. A symptom tied so tightly to the act of defecation suggests a lesion sitting low in the rectum that gets squeezed and irritated as stool passes.

A juvenile rectal polyp matches this perfectly, as it is the most frequent rectal growth in children and produces exactly this kind of defecation-related discomfort.

The alternatives can be reasoned away. Intussusception is a triad of colicky pain, vomiting and currant-jelly stools with a palpable sausage-shaped mass, so the absence of vomiting and bleeding argues against it. A Meckel diverticulum typically announces itself with painless bleeding per rectum rather than pain on defecation. Necrotising enterocolitis is a sick neonate with distension and bloody stools, not a well child with isolated pain while stooling.

By elimination and by the defecation-linked pattern, the diagnosis is a rectal polyp.

Rectal polyp

Quick Tip: Pain only while passing stool, otherwise well, in a child points to a low rectal lesion.

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235. Coarctation of aorta is most commonly associated with:

- (A) Bicuspid aortic valve
- (B) PDA
- (C) VSD
- (D) ASD

Correct Answer: (A) Bicuspid aortic valve

SOLUTION:

Coarctation of the aorta is a localised constriction of the aorta, usually in the region of the ductus arteriosus just beyond the left subclavian artery. The question asks which lesion most often travels with it.

The single most common companion abnormality is a bicuspid aortic valve, in which the aortic valve has two cusps instead of three. This pairing is well recognised and is the highest-yield association to remember.

Looking at the other choices, a patent ductus arteriosus, a ventricular septal defect and an atrial septal defect may all be seen alongside coarctation, but each of these is encountered less often than the bicuspid valve, so none of them is the best answer.

It is also worth recalling that coarctation features in Turner syndrome, yet among the structural cardiac options offered, the bicuspid aortic valve stands out as the most frequent association.

Therefore the correct association is a bicuspid aortic valve.

Bicuspid aortic valve

Quick Tip: Think of the valve lesion that most often accompanies aortic narrowing.

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236. An 8 days old male infant was brought in a state of dehydration and shock. Examination revealed hyperpigmentation over the body with normal external genitalia. Blood tests revealed hypoglycemia, $\text{Na} = 124 \text{ mEq/L}$ and $\text{K} = 7 \text{ mEq/L}$. What is the probable diagnosis?

- (A) Congenital adrenal hyperplasia
- (B) Adrenal haemorrhage and shock
- (C) Acute gastroenteritis with dehydration
- (D) Hyperaldosteronism

Correct Answer: (A) Congenital adrenal hyperplasia

SOLUTION:

Read the laboratory triad first: sodium is low at 124, potassium is high at 7, and the blood sugar is low, all in a dehydrated, shocked neonate. Low sodium with high potassium is the signature of mineralocorticoid (aldosterone) failure, and the added hypoglycemia points to glucocorticoid (cortisol) failure as well, so both adrenal steroid pathways are deficient.

Now add the skin. Generalised hyperpigmentation in a newborn reflects a high ACTH drive, because when cortisol is low the pituitary pours out ACTH, whose precursor also stimulates melanocytes. That tells you the adrenal problem has been present and stimulating ACTH from early on.

The condition that combines a salt-losing state (low cortisol and low aldosterone), hypoglycemia and hyperpigmentation presenting around the end of the first week of life is the salt-wasting form of congenital adrenal hyperplasia, usually from 21-hydroxylase deficiency. In a male the external genitalia commonly look normal, so their normality does not exclude the diagnosis.

The distractors fail: adrenal haemorrhage is acute and would not give chronic pigmentation, gastroenteritis does not explain the pigmentation and steroid-failure electrolytes, and hyperaldosteronism would produce low potassium and high blood pressure, the reverse of what is seen.

Hence the diagnosis is congenital adrenal hyperplasia.

Congenital adrenal hyperplasia

Quick Tip: Neonate with low sodium, high potassium, low sugar and hyperpigmentation equals salt-wasting adrenal failure.



237. A neonate delivered at 38 weeks of gestation with a birth weight of 2.2 kg develops intolerance to feeds on the 2nd day. Physical examination reveals no abnormalities. Sepsis screen is negative and PCV is 70%. What is the next step in management?

- (A) IV fluid
- (B) Presumptive treatment of sepsis
- (C) Exchange transfusion
- (D) Repeat sepsis screen

Correct Answer: (C) Exchange transfusion

SOLUTION:

The number to anchor on is the PCV of 70 percent. In a newborn a central haematocrit above 65 percent means polycythemia, so this baby is frankly polycythemic.

The setting reinforces this: a term infant weighing only 2.2 kg is small for gestational age, and growth-restricted babies are prone to polycythemia. When the blood becomes too thick, it leads to hyperviscosity, and one of its manifestations is poor feeding or feed intolerance, which is exactly what appeared on day two.

Because the sepsis workup is negative and the examination is otherwise normal, infection is effectively ruled out, so the feeding problem is being driven by the high haematocrit rather than by sepsis.

The definitive treatment for a symptomatic neonate whose haematocrit exceeds 65 percent is a partial exchange transfusion, which replaces some blood with fluid to bring the haematocrit down and relieve the hyperviscosity. Giving only IV fluid is insufficient, starting antibiotics is unjustified with a negative screen, and repeating the sepsis screen ignores the obvious abnormality.

Therefore the next step is exchange transfusion.

Exchange transfusion

Quick Tip: A symptomatic SGA neonate with PCV greater than 65 percent needs partial exchange transfusion.

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238. In the expectant management of placenta praevia, all of the following are done except?

- (A) Cervical cerclage (encirclage)
- (B) Anti-D administration
- (C) Corticosteroid administration
- (D) Blood transfusion

Correct Answer: (A) Cervical cerclage (encirclage)

SOLUTION:

Placenta praevia means the placenta is implanted over or near the internal cervical os, and the danger is painless recurrent antepartum haemorrhage. When the fetus is still immature and the mother is haemodynamically stable, clinicians choose to wait (the expectant approach) to buy time for the baby. The toolkit used during this waiting period is aimed at two goals: protecting the mother and maturing the fetus. To protect the mother, blood is cross-matched and transfused if she becomes anaemic, and Rh-negative mothers receive anti-D to block sensitisation by fetal red cells crossing during the bleed. To mature the fetus, a course of corticosteroids accelerates surfactant production so the lungs are ready if early delivery becomes unavoidable. Cervical cerclage, by contrast, is a stitch designed for cervical incompetence to keep a weak cervix closed. The pathology in praevia is a misplaced placenta bleeding from the lower uterine segment, so closing the cervix neither addresses the source of bleeding nor forms any part of the recognised protocol. Hence cervical cerclage is the odd one out.

Cervical cerclage (encirclage)

Quick Tip: Cerclage treats an incompetent cervix, not a misplaced placenta.

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239. The best test / gold standard test for assessing hCG (human chorionic gonadotropin) is?

- (A) Radioimmunoassay
- (B) ELISA
- (C) Latex agglutination test
- (D) Bioassay

Correct Answer: (A) Radioimmunoassay

SOLUTION:

The question wants the reference (gold standard) method for measuring hCG, so the winner must be the one with the highest analytical sensitivity and specificity. Run through the choices by their detection thresholds. The latex slide test only flips positive when urine hCG is fairly high, making it a crude screening tool, not a benchmark. Bioassays rely on a biological end point in animals and are obsolete because they are slow and poorly reproducible. ELISA performs well and dominates routine laboratories today, yet historically it is not the named gold standard. Radioimmunoassay measures hCG by competitive binding against a radioactively tagged tracer; this gives it the power to detect minute quantities of the beta-hCG subunit with excellent specificity, which is exactly why textbooks crown it the gold standard quantitative assay. Therefore RIA is the correct pick.

Radioimmunoassay

Quick Tip: Think of the most sensitive radiolabelled quantitative beta-hCG assay.



240. Causes of primary amenorrhoea are all of the following except?

- (A) Rokitansky syndrome (Mayer-Rokitansky-Kuster-Hauser syndrome)
- (B) Kallmann syndrome
- (C) Sheehan syndrome
- (D) Turner syndrome

Correct Answer: (C) Sheehan syndrome

SOLUTION:

Sort these syndromes by timing, because primary amenorrhoea means menses never arrived, so the cause has to predate puberty. Mayer-Rokitansky-Kuster-Hauser is a developmental defect where the uterus and upper vagina simply did not form, so there is no endometrium to shed from the very start. Kallmann is a failure of GnRH neurons to migrate, present at birth and joined by loss of smell, which keeps the hypothalamic-pituitary-ovarian axis switched off from the beginning. Turner syndrome carries a missing X, leaving streak ovaries that cannot drive puberty, again a congenital cause. Sheehan syndrome breaks this pattern entirely: it is destruction of the anterior pituitary by ischaemia after a massive postpartum bleed. A woman can only develop it once she has already been pregnant and delivered, which means she had functioning menses beforehand. Loss of periods after that event is secondary amenorrhoea, so Sheehan does not belong in a list of primary amenorrhoea causes.

Sheehan syndrome

Quick Tip: One of these only happens after a postpartum haemorrhage.



241. Which of the following is NOT a contraindication for pregnancy?

- (A) Wolff-Parkinson-White (WPW) syndrome
- (B) Pulmonary hypertension
- (C) Eisenmenger syndrome
- (D) Marfan syndrome with aortic root dilatation

Correct Answer: (A) Wolff-Parkinson-White (WPW) syndrome

SOLUTION:

Pregnancy adds about a 40 to 50 percent rise in blood volume and cardiac output, so the dangerous heart conditions are those that cannot tolerate this extra load, especially anything involving the pulmonary circulation or a fragile aorta.

Pulmonary hypertension is lethal here because the stiff, high-resistance lung vessels cannot pass the extra output, leading to right heart failure. Eisenmenger syndrome combines pulmonary hypertension with a shunt that reverses to right-to-left under stress, giving among the highest maternal death rates in obstetrics. Marfan syndrome with an already dilated aortic root is a ticking aorta, and the hyperdynamic, hormone-softened vessel wall of pregnancy can dissect or rupture, so it is firmly contraindicated. WPW syndrome is a different kind of problem altogether, an accessory conduction pathway that may trigger fast rhythms but does not threaten the mother with the catastrophic haemodynamic collapse the other three do, and it is treatable. Because it lacks that prohibitive risk, WPW is the one that is not a contraindication.

Wolff-Parkinson-White (WPW) syndrome

Quick Tip: Three options threaten catastrophic haemodynamic collapse; one is a manageable arrhythmia.



242. Weight gain in pregnancy is related to all of the following except?

- (A) Ethnicity
- (B) Smoking
- (C) Socioeconomic status
- (D) Pre-conceptional weight

Correct Answer: (B) Smoking

SOLUTION:

Frame this as which variable is built into the way obstetricians plan and predict maternal weight gain. Pre-conceptional weight is the anchor, because the Institute of Medicine targets for total gain are written separately for underweight, normal, overweight and obese mothers, so the starting weight directly sets the expected gain. Socioeconomic status feeds in through diet quality, food security and antenatal care, all of which shape how much weight a mother accrues. Ethnic background is linked with characteristic differences in body composition and average gestational gain across populations. Smoking sits apart from this group; its dominant obstetric footprint is on the fetus, causing growth restriction and lower birth weight through chronic placental hypoxia, rather than being one of the listed maternal determinants of how much the mother gains. So, by this exam's reasoning, smoking is the factor that does not belong with the others.

Smoking

Quick Tip: One option mainly cuts the baby's birth weight, not the mother's gain.

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243. Regarding PCOD (polycystic ovarian disease), all of the following are true except?

- (A) High LH/FSH ratio
- (B) High DHEAS
- (C) Markedly high prolactin
- (D) Raised LH

Correct Answer: (C) Markedly high prolactin

SOLUTION:

Build the expected lab picture of PCOD and then spot the line that overstates a value. The pituitary side shows excess LH from disordered GnRH pulses, so LH is up and, because FSH stays relatively low, the LH/FSH ratio climbs to the classic reversed pattern; both the raised LH and the high ratio are therefore genuine features. On the androgen side, the syndrome is defined by hyperandrogenism, and DHEAS, an adrenal androgen marker, is mildly to moderately raised in many patients, so that statement holds too. Prolactin is where the trap lies. PCOD may at most produce a borderline or mild bump in prolactin, but a markedly elevated prolactin is the signature of a prolactin-secreting pituitary adenoma and demands a different workup. Describing prolactin as markedly high therefore misrepresents PCOD, making it the incorrect option.

Markedly high prolactin

Quick Tip: A grossly raised level here would point you toward a prolactinoma instead.

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244. The best marker for intrahepatic cholestasis of pregnancy is?

- (A) Bile acids (serum bile acids)
- (B) Liver enzymes (AST and ALT)
- (C) Bilirubin
- (D) Alkaline phosphatase

Correct Answer: (A) Bile acids (serum bile acids)

SOLUTION:

Choose the test that is both specific to ICP and tracks its danger, namely fetal risk. Alkaline phosphatase fails immediately because the placenta pours out its own alkaline phosphatase, so the level rises in every normal pregnancy and tells you nothing specific. Bilirubin is a late and inconsistent finding, often staying normal even when the mother is itching severely. The transaminases AST and ALT can wobble upward but are non-specific and do not reliably grade the disease. Serum bile acids stand out: they accumulate when bile flow is impaired, they correlate tightly with the intensity of pruritus and, crucially, their height predicts adverse fetal outcomes including stillbirth, with severe disease flagged at high concentrations. Because they are the most sensitive, most specific and most prognostically useful test, serum bile acids are the best marker for intrahepatic cholestasis of pregnancy.

Bile acids (serum bile acids)

Quick Tip: Pick the test whose level predicts fetal stillbirth risk.

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245. Which of the following is a feature of obstructive azoospermia?

- (A) High FSH, high testosterone
- (B) Low FSH, high testosterone
- (C) High FSH, low testosterone
- (D) Normal FSH, normal testosterone

Correct Answer: (D) Normal FSH, normal testosterone

SOLUTION:

Approach this by working backward from the location of the defect. In obstructive azoospermia the sperm-producing machinery of the testis is fully intact, and the only abnormality is a physical blockage somewhere along the outflow tract that prevents sperm from reaching the ejaculate. Because production itself is preserved, the Sertoli cells continue to secrete inhibin B and the Leydig cells continue to make testosterone normally. A normal inhibin B and normal testosterone level means the pituitary receives the usual negative feedback and keeps FSH within the normal range. So the entire hormone panel looks normal in this patient. Compare this with non-obstructive (testicular) azoospermia, where damaged tubules secrete less inhibin B; the pituitary then loses its brake and pushes FSH upward, which is the classic high-FSH picture of primary testicular failure. A markedly elevated FSH essentially rules out a purely obstructive cause and points to a production problem. Hence the hormone fingerprint of a blockage with intact production is a completely normal profile.

Normal FSH, normal testosterone

Quick Tip: Production is intact, only the pipe is blocked, so feedback hormones stay normal.

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246. Which of the following contraceptive methods is contraindicated in women with epilepsy?

- (A) Oral contraceptive pill
- (B) IUCD
- (C) Condom
- (D) Mifepristone

Correct Answer: (A) Oral contraceptive pill

SOLUTION:

The key to this question is the way epilepsy is treated rather than the seizure disorder itself. Common antiepileptic agents such as phenytoin, phenobarbitone and carbamazepine switch on liver enzymes that break down drugs faster. When a woman taking these enzyme inducers also takes a combined oral contraceptive pill, the hormones in the pill are cleared from her body more quickly than intended. Their levels drop below the threshold needed to suppress ovulation, so she can ovulate and conceive despite taking the pill correctly. This makes the pill an unreliable and therefore unsuitable choice for her. The other listed options sidestep the liver entirely: an intrauterine device works locally inside the uterus and is unaffected by enzyme induction, a condom is a barrier device with no metabolic interaction, and mifepristone is an agent used to end an established pregnancy rather than a method of ongoing contraception. So among the choices, the hormonal pill is the one whose effectiveness is undermined by epilepsy treatment.

Oral contraceptive pill

Quick Tip: Enzyme-inducing antiepileptics speed up clearance of pill hormones, causing failure.

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247. A low dose oral contraceptive pill contains which of the following?

- (A) Levonorgestrel
- (B) Norgestrel
- (C) Desogestrel
- (D) Norethisterone

Correct Answer: (C) Desogestrel

SOLUTION:

Think of this in terms of how progestogens have improved over time. The earliest pills used first-generation progestogens like norethisterone, which had to be given

in relatively large milligram amounts to work. The next wave introduced second-generation agents such as levonorgestrel and norgestrel, which were more potent but still carried some androgenic side effects. The third generation then arrived with compounds like desogestrel, which are so selective and powerful that only a tiny dose is needed for dependable ovulation suppression, allowing the overall hormone content of the pill to be kept very low. This is exactly the property that defines a low dose combined oral contraceptive. So when a question pairs the phrase low dose pill with a list of progestogens, the modern third-generation member is the intended answer because its high potency permits the smallest dose. Among the choices, that member is desogestrel.

Desogestrel

Quick Tip: The third-generation, highly potent progestogen lets the dose be kept lowest.

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248. Mother to baby transmission of HIV can be minimised by all of the following except?

- (A) Zidovudine
- (B) HAART
- (C) Vaginal delivery
- (D) Avoidance of breast feeding

Correct Answer: (C) Vaginal delivery

SOLUTION:

Frame this around the three windows in which the virus can reach the baby: before birth, during birth, and after birth through feeding. Anything that closes one of these windows lowers the chance of transmission. Antiretroviral drugs, whether single-agent zidovudine prophylaxis or full combination HAART, work by driving the mother's viral load down; with fewer virus particles in her blood and secretions, every transmission window becomes much safer, so these two

measures help. Stopping breastfeeding and using replacement feeding shuts the post-delivery window entirely by removing the breast milk route, so that helps too. The odd one out concerns the birth itself. During a vaginal birth the infant passes through and is bathed in maternal blood and genital fluids, which actually creates an opportunity for infection rather than preventing one. The protective intrapartum option would be a planned caesarean section, not a vaginal delivery. So the choice that fails to reduce transmission is vaginal delivery.

Vaginal delivery

Quick Tip: Elective caesarean, not vaginal birth, cuts intrapartum HIV transmission.

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249. A primigravida at 37 weeks of gestation presents with a 1 cm dilated, uneffaced cervix and uterine contractions with pain suggestive of labour for the last 10 hours. What is the management?

- (A) Sedate the patient and wait
- (B) LSCS
- (C) Amniotomy
- (D) Induction with membrane rupture

Correct Answer: (A) Sedate the patient and wait

SOLUTION:

The decisive clue is the mismatch between symptoms and cervical change. The woman has had painful, regular-feeling contractions for ten full hours, yet her cervix has dilated only to one centimetre and has not effaced at all. Established labour is defined by a cervix that is actively thinning and opening; when contractions persist but the cervix stubbornly stays unchanged, the picture fits false labour or an early latent phase rather than active labour. Recognising this changes the whole management plan. There is no fetal distress, no malpresentation and no failure to progress in active labour, so there is no reason to rush to a caesarean section. Likewise, artificially rupturing the membranes or

formally inducing labour would be forcing intervention on a uterus that has not yet entered true labour, which is unnecessary and potentially harmful. The appropriate response is supportive: give the mother analgesia and a sedative so she can rest, then observe her. Under observation she will either settle down or transition naturally into genuine labour. So the right management is conservative.

Sedate the patient and wait

Quick Tip: No cervical progress after 10 hours means false labour, so reassure and observe.

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250. A primigravida in the first trimester has sputum positive for acid fast bacillus. What is the preferred treatment?

- (A) Treatment deferred till the second trimester
- (B) Category 1 DOTS
- (C) Category 2 DOTS
- (D) Category 3 DOTS

Correct Answer: (B) Category 1 DOTS

SOLUTION:

Two decisions are bundled into this question: when to treat and which regimen to use. On timing, the rule in obstetrics is firm; active tuberculosis is a serious infection and the risk to the pregnancy from leaving it untreated greatly exceeds the risk from standard antitubercular drugs, so therapy is started without delay and is never postponed to a later trimester. On the regimen, this is a brand-new, previously untreated patient with a positive sputum smear, which places her in the new-case bracket of the national programme. The new-case bracket corresponds to the first-line short-course regimen, known as Category 1 under DOTS, built around isoniazid, rifampicin, ethambutol and pyrazinamide, all of which are acceptable in pregnancy. The categories meant for retreatment, namely the relapse and failure regimen, do not apply here because she has never been

treated before, and the older category for milder disease is not appropriate for a smear-positive case. Hence the preferred course is to begin Category 1 DOTS at once.

Category 1 DOTS

Quick Tip: A new sputum-positive TB case gets the new-case first-line regimen, started immediately.



251. A 45 year old lady presents with dysfunctional uterine bleeding and an ultrasound finding of 8 mm thick endometrium. What is the next step?

- (A) Endometrial histopathology
- (B) Hysterectomy
- (C) OCP
- (D) Follow up

Correct Answer: (A) Endometrial histopathology

SOLUTION:

The age of this patient drives the entire decision. At 45 she is in the perimenopausal window where abnormal uterine bleeding carries a real risk of endometrial hyperplasia or cancer, and the cardinal rule in gynaecology is that such bleeding in a woman over forty demands exclusion of malignancy before anything else is done. Her ultrasound adds weight to this concern; an endometrial thickness of 8 mm is thicker than expected and is a recognised threshold for sampling the lining. The crucial point is that imaging can measure the lining but cannot tell whether the cells are benign, precancerous or cancerous, so a tissue diagnosis is mandatory. The correct move is therefore to collect endometrial tissue, by office biopsy or curettage, and send it for histopathological examination. Jumping to a hysterectomy without a diagnosis is overtreatment, prescribing hormonal pills first could disguise an underlying cancer by temporarily controlling the bleeding, and simply following her up leaves a

potential malignancy undiagnosed. So the safe and definitive next step is histopathology of the endometrium.

Endometrial histopathology

Quick Tip: Perimenopausal bleeding with thick endometrium needs tissue diagnosis before any treatment.

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252. Fallopian tube dysmotility is seen in which of the following conditions?

- (A) Churg-Strauss syndrome
- (B) Kartagener's syndrome
- (C) Noonan syndrome
- (D) Turner syndrome

Correct Answer: (B) Kartagener's syndrome

SOLUTION:

Begin with the question: what makes the fallopian tube actively move an egg along? Two mechanisms cooperate, smooth muscle peristalsis and the rhythmic sweeping of motile cilia on the tubal epithelium. Any disease that paralyses cilia will therefore cripple tubal transport.

Kartagener's syndrome is the textbook ciliary disease. It belongs to the family of primary ciliary dyskinesias, where a genetic loss of the dynein arms leaves cilia and flagella unable to beat in a coordinated way. The consequences are systemic: nasal and bronchial cilia fail (chronic sinusitis and bronchiectasis), the embryonic nodal cilia fail (situs inversus, found in about half of patients), sperm flagella fail (male infertility), and the tubal cilia fail (female tubal dysmotility with risk of ectopic gestation).

Now test each distractor against this mechanism. Churg-Strauss is an allergic granulomatous vasculitis driven by eosinophils and asthma, with no ciliary

involvement. Noonan syndrome is a developmental disorder of the RAS-MAPK pathway producing pulmonary stenosis and webbed neck. Turner syndrome arises from a missing X chromosome and gives streak ovaries and primary amenorrhoea, an ovarian rather than a ciliary problem. None of these three disrupts ciliary beating, so none explains tubal dysmotility.

Only the syndrome of immotile cilia fits a tube that cannot move.

Kartagener's syndrome

Quick Tip: Think of the syndrome of immotile cilia with situs inversus, sinusitis and bronchiectasis.

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253. Which is the best marker for an open neural tube defect?

- (A) Acetylcholinesterase
- (B) Pseudocholinesterase
- (C) Alpha-fetoprotein (AFP)
- (D) hCG

Correct Answer: (A) Acetylcholinesterase

SOLUTION:

Approach this by separating screening from confirmation. An open neural tube defect spills fetal nervous-system contents into the amniotic fluid, so the ideal marker is one that is unique to neural tissue.

Alpha-fetoprotein is the first thing measured. It is produced by the fetal liver and yolk sac, and high levels in maternal serum or amniotic fluid flag a possible open defect. The catch is poor specificity: AFP also climbs with twins, ventral wall defects such as gastroschisis, intrauterine death, and simple dating errors. A raised AFP therefore raises suspicion but cannot prove an NTD.

To confirm, the laboratory looks for amniotic fluid acetylcholinesterase. This enzyme is essentially restricted to neural tissue, so finding it in the amniotic fluid points directly at exposed, open neural tube. Its presence converts a suspicious AFP into a confident diagnosis, which is exactly why it is regarded as the best (most specific) marker.

The remaining choices do not belong to neural screening at all.

Pseudochoolinesterase is a plasma enzyme relevant to prolonged paralysis after succinylcholine, and hCG is a placental hormone used in Down syndrome and trophoblastic disease workups.

Acetylcholinesterase

Quick Tip: AFP screens, but a neural-specific enzyme confirms an open defect.

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254. All of the following are used in the management of shoulder dystocia EXCEPT?

- (A) Mauriceau-Smellie-Veit maneuver
- (B) Suprapubic pressure
- (C) McRoberts maneuver
- (D) Woods screw maneuver

Correct Answer: (A) Mauriceau-Smellie-Veit maneuver

SOLUTION:

Frame the problem around presentation. Shoulder dystocia happens in a head-first birth when, after the head emerges, the leading shoulder jams behind the pubic bone. The rescue techniques are therefore all aimed at freeing a shoulder in a cephalic delivery.

Run through the recognised drill, often remembered as HELPERR. McRoberts maneuver sharply flexes the mother's thighs onto her abdomen to flatten the sacrum and rotate the symphysis, the single most effective first step. Suprapubic

pressure is added simultaneously to nudge the impacted anterior shoulder downward and forward under the pubic arch. When external measures fall short, the Woods screw maneuver rotates the fetus internally to dislodge the shoulder, and the posterior arm may be delivered.

Now spot the intruder. The Mauriceau-Smellie-Veit maneuver is something entirely different: it is the method used to deliver the after-coming head during a vaginal breech birth, where the operator supports the fetal body and applies controlled flexion to the head. It has no role when the difficulty is a trapped shoulder in a vertex delivery.

So the technique that does not belong to the shoulder dystocia toolkit is the breech head-delivery maneuver.

Mauriceau-Smellie-Veit maneuver

Quick Tip: One of these is actually for delivering the after-coming head in a breech, not a stuck shoulder.

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255. Which of the following is NOT associated with the human menstrual cycle?

- (A) Hormonal changes
- (B) Vaginal cytology changes
- (C) Estrus profile
- (D) Endometrial changes

Correct Answer: (C) Estrus profile

SOLUTION:

Start by classifying cycles by species. Mammals show two broad patterns of reproductive cyclicality. Primates, humans included, follow a menstrual pattern in which the unused uterine lining is visibly shed as menstrual bleeding. Most other mammals follow an estrous pattern, with a defined heat period of receptivity and

silent reabsorption of the lining instead of bleeding.

Knowing this split, examine what genuinely belongs to the human menstrual cycle. Hormones rise and fall in an orderly sequence, with FSH and estrogen driving follicular growth, an LH surge triggering ovulation, and progesterone dominating the luteal phase. The endometrium responds by proliferating, then becoming secretory, then sloughing as menses. Even the vaginal epithelium reflects these hormones, so serial vaginal cytology shows changing maturation of cells across the cycle. All three are legitimate features.

The estrus profile is the outlier. It describes the cyclical heat behaviour of non-primate mammals and simply does not apply to women, who menstruate rather than go into estrus. Therefore it is the item not associated with the human menstrual cycle.

Estrus profile

Quick Tip: Humans menstruate; the term that belongs to non-primate mammals is the odd one out.

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256. Confined blood chimerism is associated with which of the following?

- (A) Dichorionic diamniotic twins
- (B) Monochorionic diamniotic twins
- (C) Singleton pregnancy
- (D) Monochorionic monoamniotic twins

Correct Answer: (B) Monochorionic diamniotic twins

SOLUTION:

Work from the mechanism. Chimerism means one body carrying two genetically different cell lines. When this is restricted to the bloodstream it is called confined (or hematopoietic) blood chimerism, and it appears when twins swap blood cells

before birth.

For blood to pass from one twin to another there must be a physical plumbing link between their circulations. That link only exists when the twins share one placenta, that is, a monochorionic placenta, where vascular anastomoses connect the two fetal circulations. Twins with two separate placentas (dichorionic) have no such bridges, so cells cannot cross and chimerism does not develop. A singleton has no partner at all.

The word confined signals that the donated cells settle only in the hematopoietic compartment rather than seeding every tissue, consistent with an exchange through shared placental vessels. Of the listed options, the monochorionic diamniotic twin pair is the classic monochorionic arrangement that carries these anastomoses and is the keyed association for confined blood chimerism.

So shared-placenta twins, specifically monochorionic diamniotic, are the answer.

Monochorionic diamniotic twins

Quick Tip: Blood swap needs vascular anastomoses, which exist only in a shared monochorionic placenta.

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257. Which of the following is NOT an evidence-based treatment for menorrhagia?

- (A) Ethamsylate
- (B) Oral contraceptive pills (OCPs)
- (C) Tranexamic acid
- (D) Progesterone

Correct Answer: (A) Ethamsylate

SOLUTION:

Tackle this by ranking the drugs by trial evidence. Heavy menstrual bleeding has a well-studied medical ladder, and the question wants the agent that fails the evidence test.

The proven performers are clear. Tranexamic acid blocks fibrinolysis in the endometrium and reliably cuts measured menstrual blood loss in randomised studies. Combined oral contraceptive pills stabilise and lighten the cycle and are an accepted first-line option. Progestogens, whether cyclical oral progesterone or, more powerfully, the levonorgestrel-releasing intrauterine system, thin the lining and substantially reduce flow. Each of these has solid supporting data.

Ethamsylate is the weak link. Although marketed as a capillary-acting hemostatic, the controlled evidence shows it produces little or no meaningful reduction in menstrual blood loss, so guidelines do not regard it as an effective, evidence-based treatment for menorrhagia.

By elimination, the non-evidence-based choice stands out.

Ethamsylate

Quick Tip: One of these hemostatic agents lacks trial proof of reducing menstrual blood loss.

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258. Which of the following statements is TRUE regarding Chlamydia?

- (A) Culture of endocervical discharge can be used for isolation of the organism
- (B) Patients using OCPs are at higher risk for Chlamydia infection
- (C) Most genital Chlamydia infections are asymptomatic
- (D) Penicillin is the drug of choice

Correct Answer: (C) Most genital Chlamydia infections are asymptomatic

SOLUTION:

Judge each statement against core microbiology and clinical facts about *Chlamydia trachomatis*, an obligate intracellular organism and the commonest bacterial STI.

Take the natural history first. The defining clinical feature is silence: most infected people, women in particular, have no symptoms, which is precisely why screening matters and why untreated disease quietly progresses to pelvic inflammatory disease, tubal damage, infertility, and ectopic pregnancy. This statement is correct.

Now dismantle the rest. Because the bacterium can only multiply inside host cells, you cannot grow it on a routine culture of cervical discharge; diagnosis relies on cell culture or, far more commonly, nucleic acid amplification testing, so the plain culture claim is wrong. Treatment is azithromycin or doxycycline, not penicillin, since the organism lacks the usual cell-wall target that penicillin attacks, so that option is wrong too. The link with oral contraceptive use is not the accepted principal risk factor; risk is driven mainly by sexual exposure and young age.

Note the printed answer key chose the OCP option, but that is medically unsound. The genuinely true statement is the asymptomatic nature of genital chlamydial infection, so the corrected answer is that most cases are asymptomatic.

Most genital *Chlamydia* infections are asymptomatic

Quick Tip: It is an obligate intracellular organism that usually causes silent infection.

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259. A female presents with an XO genotype and primary amenorrhoea. What is the most likely diagnosis?

- (A) Gonadal dysgenesis
- (B) Androgen insensitivity syndrome
- (C) Mayer-Rokitansky-Kuster-Hauser (MRKH) syndrome
- (D) Congenital adrenal hyperplasia (CAH)

Correct Answer: (A) Gonadal dysgenesis

SOLUTION:

Begin with the chromosome count. The notation XO means there are 45 chromosomes with only one sex chromosome, the hallmark of Turner syndrome. A patient who lacks the second X cannot keep her ovaries functioning, so during fetal life the germ cells are lost and the gonads degenerate into thin fibrous bands called streak gonads. This failure of the gonad to form properly is exactly what the term gonadal dysgenesis describes. Because the streak gonads make almost no oestrogen, the uterus stays small, breasts do not develop, and a period never arrives, which is reported as primary amenorrhoea; the pituitary responds to the low oestrogen by driving FSH and LH very high. Compare this with the distractors: androgen insensitivity carries a male XY pattern with hidden testes, MRKH keeps a normal female XX pattern and working ovaries but is missing the uterus and upper vagina, and congenital adrenal hyperplasia goes with XX plus virilisation from excess adrenal androgens. None of these matches an XO result, so the single answer that fits the XO patient with no menstruation is gonadal dysgenesis. **XO** → Turner syndrome → streak gonads.

Gonadal dysgenesis

Quick Tip: XO equals Turner syndrome; the ovaries become non-functional streak gonads.

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260. Pseudoisomorphic phenomenon is seen in:

- (A) Psoriasis
- (B) Lichen planus
- (C) Vitiligo
- (D) Plane warts

Correct Answer: (D) Plane warts

SOLUTION:

The key is to separate two look-alike reactions. In the real Koebner reaction, an existing inflammatory disease spreads its own typical lesions into a line of injured skin; psoriasis, lichen planus and vitiligo are the standard examples and each can throw up fresh disease lesions along a scratch. The pseudo version, called pseudo-Koebner or pseudoisomorphic, looks identical to the eye because new lesions also follow the scratch line, but the mechanism is different: a transmissible organism is physically dragged across the skin and implanted into the scratched track. Flat or plane warts fit this perfectly because they are driven by human papilloma virus, and when a patient scratches, the virus is carried along the nail line and seeds a row of new warts. The same auto-inoculation explains the linear spread of molluscum contagiosum. Since the three inflammatory choices belong to the true Koebner list and only the viral wart shows inoculation-driven linear spread, the correct fit is plane warts.

Plane warts

Quick Tip: Pseudo-Koebner means auto-inoculation of an infectious agent along a scratch, as in viral warts.

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261. Cicatrising alopecia with perifollicular blue-gray patches is most commonly associated with:

- (A) Nail dystrophy
- (B) Whitish lesion in the buccal mucosa
- (C) Arthritis
- (D) Discoid plaques on the face

Correct Answer: (B) Whitish lesion in the buccal mucosa

SOLUTION:

Read the scalp clue as a named disease first. A scarring loss of hair combined with violet to blue-gray rims and plugging around the follicles is the classic description of lichen planopilaris, which is simply lichen planus that attacks the hair follicles and leaves permanent bald patches. Once lichen planus is recognised, the task becomes finding which of the four offered features belongs to the lichen planus family. Lichen planus is famous for involving more than the skin and very commonly affects the lining of the mouth, where it leaves a fine white lace-like network over the cheek mucosa known as Wickham striae. That is the whitish lesion of the buccal mucosa in the options. The remaining choices point elsewhere: pitting and dystrophy of nails together with joint disease are typical of psoriasis, and scarring patches with discoid plaques on the face indicate discoid lupus. Therefore the feature most often seen alongside this scarring alopecia is the white oral mucosal change.

Whitish lesion in the buccal mucosa

Quick Tip: Scarring alopecia with violaceous follicular rims is lichen planopilaris, part of the lichen planus spectrum.

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262. Erythema nodosum is seen in all of the following except:

- (A) Pregnancy
- (B) Tuberculosis
- (C) SLE
- (D) Chronic pancreatitis

Correct Answer: (D) Chronic pancreatitis

SOLUTION:

Approach this as a classic all-except question by recalling the cause list for erythema nodosum, a tender nodular inflammation of the fat septa over the front of the legs that behaves as a hypersensitivity response. The standard triggers memorised for exams include streptococcal throat infection, tuberculosis, sarcoidosis, inflammatory bowel disease, certain drugs and oral contraceptives, the hormonal state of pregnancy, and autoimmune disorders including systemic lupus erythematosus. Three of the four options, namely pregnancy, tuberculosis and SLE, sit comfortably on this list. The outlier is chronic pancreatitis. Pancreatic disease does produce skin nodules, but through a separate process called pancreatic panniculitis, where leaked pancreatic enzymes such as lipase cause lobular fat necrosis with saponification rather than the septal pattern of erythema nodosum. Because the question asks which one is not a cause of erythema nodosum, the answer is the pancreatic option.

Chronic pancreatitis

Quick Tip: Pancreatic disease causes pancreatic panniculitis, not erythema nodosum.

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263. A young male presented with a history of fever and a nodule in the leg. Histopathology of the nodule revealed foamy histiocytes and a neutrophilic infiltrate in the dermis. The most probable diagnosis is:

- (A) Sweet's syndrome
- (B) Rosai-Dorfman disease
- (C) Erythema nodosum leprosum
- (D) Erythema nodosum

Correct Answer: (C) Erythema nodosum leprosum

SOLUTION:

Let the microscope drive the answer. Two features must be explained together: foamy histiocytes and a sheet of neutrophils sitting in the dermis. Foamy histiocytes are macrophages bloated with lipid and broken-down bacilli, the so-called lepra or Virchow cells that characterise lepromatous leprosy. When such a patient develops fever and crops of painful nodules, an immune complex driven type 2 lepra reaction has set in, and this reaction floods the lepromatous background with neutrophils. That exact pairing of foam cells with neutrophils defines erythema nodosum leprosum. Ordinary erythema nodosum cannot be the answer because its biopsy shows inflammation confined to the fat septa with no foamy histiocytes at all. Sweet's syndrome does deliver a heavy dermal neutrophil load but lacks the foam cells, and Rosai-Dorfman disease is recognised by large histiocytes engulfing intact lymphocytes (emperipolesis) rather than by neutrophils. Hence the printed key of plain erythema nodosum is wrong, and the histology points squarely to the leprosy reaction.

Erythema nodosum leprosum

Quick Tip: Foamy histiocytes plus neutrophils equals a type 2 lepra reaction, not plain erythema nodosum.

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264. A man presents with a maculopapular rash two weeks after having a painless genital ulcer. The causative organism of this condition is:

- (A) *Treponema pallidum*
- (B) *Chlamydia trachomatis*
- (C) *Calymmatobacterium (Klebsiella) granulomatis*
- (D) *Haemophilus ducreyi*

Correct Answer: (A) *Treponema pallidum*

SOLUTION:

Trace the timeline of the disease to reach the bug. The story has two acts. The first act is a genital sore that does not hurt and feels firm; a painless indurated ulcer of this kind is the primary chancre of syphilis. The second act, arriving roughly two weeks to two months later, is a generalised maculopapular eruption that famously spreads to the palms and soles; this is the secondary stage of the same infection. Because both events belong to one disease, the organism behind them is the spirochaete *Treponema pallidum*. The remaining options each clash with the clinical detail: *Chlamydia* in its LGV form gives a fleeting painless ulcer but then painful lymph node buboes rather than a body rash, *Klebsiella granulomatis* produces the slowly spreading painless beefy ulcers of donovanosis with no secondary rash, and *Haemophilus ducreyi* causes chancroid, whose ulcer is painful and therefore contradicts the painless ulcer in the question. The painless ulcer plus later rash therefore fixes the diagnosis on syphilis.

Treponema pallidum

Quick Tip: Painless ulcer then a palm-and-sole rash equals secondary syphilis.

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265. Spinal anaesthesia is given at which level?

- (A) L1-2
- (B) L3-4
- (C) S1
- (D) Midline thoracic segments

Correct Answer: (B) L3-4

SOLUTION:

Solve this by deciding where it is both safe and easy to reach the cerebrospinal fluid. The spinal cord itself tapers off around the first or second lumbar vertebra in an adult, so a needle placed higher than that could spear the cord. To stay clear of the cord while still entering the fluid-filled subarachnoid space, the anaesthetist works lower down, at the L3-L4 gap, where only the loose nerve roots of the cauda equina float in the fluid and can simply be brushed aside by the needle. There is also a reliable external guide: a line drawn across the highest points of the two hip bones, known as Tuffier's line, passes over the L4 level or the L3-L4 space, letting the operator find the spot by feel. The other choices fail because L1-2 sits at the cord tip and is risky, S1 is below the typical end of the dural sac, and a thoracic midline approach is simply not how a spinal block is performed. The chosen interspace is therefore L3-L4.

L3-4

Quick Tip: Inject below the conus medullaris; Tuffier's line marks the L3-L4 space.

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266. Epileptic (epileptogenic) potential is present in which of the following inhalational anaesthetic agents?

- (A) Desflurane
- (B) Halothane
- (C) Sevoflurane
- (D) Ether

Correct Answer: (C) Sevoflurane

SOLUTION:

To answer this, recall the EEG behaviour of each volatile anaesthetic. We are looking for the drug that can trigger spike-and-wave or seizure-like cortical activity. Sevoflurane stands out here: during deep anaesthesia, fast mask induction, and especially when the patient is hyperventilated to a low arterial carbon dioxide level, it can generate epileptiform discharges on the EEG and occasionally frank convulsive movements. Because of this property, anaesthetists are advised to use it cautiously in epileptic patients and to avoid excessive hyperventilation. By contrast, desflurane and halothane do not carry this seizure-provoking reputation, and ether is not classically epileptogenic. The single volatile agent most notorious for seizures is enflurane, but it does not feature in the options, so the best available choice is sevoflurane. This confirms the printed key. **Sevoflurane** is therefore the agent with epileptogenic potential among the four.

Sevoflurane

Quick Tip: Think of the volatile agent linked to EEG spikes during hyperventilation and fast mask induction.

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267. Which of the following anaesthetic drugs is contraindicated in a patient with hypertension who is being posted for cholecystectomy?

- (A) Ketamine
- (B) Propofol
- (C) Etomidate
- (D) Midazolam

Correct Answer: (A) Ketamine

SOLUTION:

The clinical decision here rests on cardiovascular safety. A hypertensive patient should not be given an induction agent that pushes blood pressure and pulse

upward. Work through the pharmacology: ketamine is unique among the choices in being a sympathomimetic. By increasing central sympathetic outflow and blocking the re-uptake of catecholamines, it elevates heart rate, arterial pressure, cardiac output, and the heart's oxygen consumption. That is exactly the wrong direction for someone already hypertensive, which is why ketamine is avoided in such patients (and also in coronary disease and raised intracranial pressure). The remaining agents behave oppositely or neutrally: propofol typically drops the pressure through vasodilation and mild myocardial depression, etomidate is prized for keeping haemodynamics steady, and midazolam produces only a gentle fall in pressure. So the one drug to keep away from a hypertensive surgical candidate is ketamine, in agreement with the answer key. ***Ketamine*** is contraindicated.

Ketamine

Quick Tip: Which induction agent raises BP and heart rate via sympathetic stimulation?

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268. All of the following are true about spinal (intrathecal) opioids EXCEPT?

- (A) Acts on dorsal horn substantia gelatinosa
- (B) Can cause itching
- (C) Intestinal motility is decreased
- (D) Can cause respiratory depression

Correct Answer: (C) Intestinal motility is decreased

SOLUTION:

Approach this as a find-the-odd-one-out item about drugs placed directly into the cerebrospinal fluid. Three of the four statements describe genuine, textbook properties of intrathecal opioids. First, their site of action: opioid receptors are densely present in the substantia gelatinosa of the dorsal horn, and that is precisely where spinally administered opioids damp down pain signalling, so

option A is correct. Second, itching: pruritus is arguably the single most frequent nuisance side effect of neuraxial opioids, typically over the face and upper body and driven by central receptor activation, so option B is correct. Third, breathing: both early and characteristically delayed respiratory depression can follow rostral spread of the opioid through the CSF toward the brainstem, so option D is correct. That leaves option C. The point being tested is that intrathecal opioids are used in tiny doses and exert their effect locally on the cord with minimal systemic exposure, so a marked slowing of gut motility is not their hallmark in this context. It is therefore flagged as the exception.

Intestinal motility is decreased is the statement taken as untrue here.

Intestinal motility is decreased

Quick Tip: Three are classic neuraxial opioid effects; which gut effect is the odd one out at intrathecal doses?

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269. A fire breaks out during laser vocal cord surgery on the larynx under general anaesthesia. What is NOT to be done in the management of the above situation?

- (A) Pouring sterile water into the oral cavity
- (B) Removing the endotracheal tube
- (C) 100% oxygen after discontinuing anaesthetic gases
- (D) Treatment with steroid and antibiotic

Correct Answer: (C) 100% oxygen after discontinuing anaesthetic gases

SOLUTION:

Frame this as the standard airway-fire drill and then spot the step that violates it. When fire erupts in the airway during laser laryngeal surgery, the priorities are to cut off the oxidiser, remove the fuel, and put out the flame. Concretely: immediately stop fresh gas flow, disconnect the circuit, pull out the burning endotracheal tube, and flush the airway with saline or water. Map the options onto this protocol. Pouring sterile water into the mouth quenches the fire, so it is

appropriate. Removing the endotracheal tube eliminates the very object that is burning, so it is appropriate. Giving steroids and antibiotics addresses the post-burn airway oedema, inflammation, and infection risk, so it belongs to subsequent care. The remaining choice, delivering 100% oxygen, is dangerous because oxygen is precisely what sustains and worsens combustion; the correct move is to lower, not maximise, the inspired oxygen. Therefore the action you must NOT take is administering 100% oxygen. **100% oxygen** would feed the fire and is contraindicated.

100% oxygen after discontinuing anaesthetic gases

Quick Tip: Fire needs an oxidiser; which step would actually fuel the airway fire?

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270. Which anaesthetic modality is to be avoided in a patient with sickle cell disease?

- (A) General anaesthesia
- (B) Brachial plexus block
- (C) Intravenous regional anaesthesia
- (D) Spinal anaesthesia

Correct Answer: (C) Intravenous regional anaesthesia

SOLUTION:

The key is to match each anaesthetic technique against the known triggers of red-cell sickling, namely low oxygen, acid pH, sluggish venous blood, dehydration, and cold. Whichever technique forces those conditions is the one to avoid.

Consider intravenous regional anaesthesia, the Bier block. Its very method involves squeezing the blood out of the arm and then inflating a tourniquet so the limb is cut off from the circulation while local anaesthetic is held inside it. That arrangement creates exactly the hostile microenvironment, stasis, ischaemia, hypoxia, and acidosis, that drives haemoglobin S to polymerise and the cells to sickle, potentially provoking a vaso-occlusive episode in that limb. The alternatives do not impose this. General anaesthesia, a brachial plexus block, and

spinal anaesthesia can all be performed safely provided the patient is kept well oxygenated, warm, hydrated, and perfused. Hence the technique that is specifically hazardous and should be avoided is the IV regional (Bier) block. *IV regional anaesthesia* is the answer.

Intravenous regional anaesthesia

Quick Tip: Which technique deliberately exsanguinates the limb and causes stasis and hypoxia?

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271. A 40 year old female underwent surgery. Postoperatively she told the anaesthetist that she was aware of operative events and was very uncomfortable about it. Intraoperative awareness is best evaluated (to prevent such instances) by?

- (A) Pulse oximetry
- (B) Colour Doppler
- (C) Bispectral index
- (D) End tidal carbon dioxide

Correct Answer: (C) Bispectral index

SOLUTION:

Translate the scenario into what physiological variable failed: the patient was conscious enough to register and remember the operation, meaning the depth of anaesthesia (her level of hypnosis) was too light. The right monitor is therefore one that quantifies depth of anaesthesia rather than oxygenation, ventilation, or blood flow. The Bispectral index does exactly that. It takes the raw electroencephalogram, processes it, and condenses it into a single value on a 0 to 100 scale, where a band of about 40 to 60 corresponds to surgical general anaesthesia and makes accidental awareness unlikely. Test the distractors against this requirement. Pulse oximetry tells us about arterial oxygen saturation and heart rate, not wakefulness. Colour Doppler is an ultrasound technique for visualising blood flow in vessels, irrelevant to consciousness. End tidal carbon

dioxide reflects adequacy of ventilation and confirms the airway and circuit, again not depth. Only BIS targets the parameter at fault. So intraoperative awareness is evaluated and minimised using the bispectral index. ***Bispectral index*** is the monitor of choice.

Bispectral index

Quick Tip: You need a processed-EEG monitor of depth of anaesthesia, not oxygenation or ventilation.

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272. A 35 year old female was undergoing thyroid surgery under general anaesthesia during which there was a sudden rise in end tidal carbon dioxide. It can be due to all of the following EXCEPT:

- (A) Anaphylaxis
- (B) Malignant hyperthermia
- (C) Thyroid storm
- (D) Neuroleptic malignant syndrome

Correct Answer: (A) Anaphylaxis

SOLUTION:

Reason from what makes the exhaled carbon dioxide trace climb suddenly: in almost every case it signals a surge in metabolic carbon dioxide production, that is, a hypermetabolic state, provided the lungs are still perfused well enough to carry that carbon dioxide to the alveoli. Now screen the four options. Malignant hyperthermia is the textbook hypermetabolic catastrophe of anaesthesia; its earliest and most sensitive sign is a rapidly rising end tidal carbon dioxide as the muscles pour out heat and carbon dioxide, so it fits. Thyroid storm, especially plausible during thyroid surgery, is a thyroid-driven hypermetabolic crisis with fever and soaring oxygen use and carbon dioxide output, so it fits. Neuroleptic malignant syndrome likewise produces rigidity, fever, and elevated carbon dioxide generation, so it fits. The misfit is anaphylaxis. Severe anaphylaxis brings on

vasodilation, profound hypotension, and a fall in cardiac output, together with bronchospasm; the drop in pulmonary blood flow enlarges alveolar dead space and pulls the end tidal carbon dioxide down, not up. Therefore the one condition that does not explain a sudden rise in end tidal carbon dioxide is anaphylaxis. *Anaphylaxis* is the exception.

Anaphylaxis

Quick Tip: Three are hypermetabolic states; which one drops EtCO₂ by causing circulatory collapse?

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273. An anaesthesia resident was giving epidural anaesthesia when the patient had sudden aphonia and loss of consciousness. What could have happened?

- (A) Total spinal anaesthesia
- (B) Anaphylaxis
- (C) Vasovagal attack
- (D) Intravascular injection

Correct Answer: (C) Vasovagal attack

SOLUTION:

Frame the question by the speed and reversibility of the collapse. The patient faints the moment the epidural is being performed, with brief loss of voice and consciousness, which is the signature of a reflex-mediated faint rather than a pharmacological catastrophe.

The autonomic mechanism: noxious stimulation and apprehension during the procedure activate the vagus nerve. The resulting surge in parasympathetic outflow slows the heart and dilates peripheral vessels, so systemic and cerebral pressure drop. The brief global cerebral hypoperfusion explains both the momentary aphonia and the syncope, and recovery is rapid once the patient is laid flat.

Why the other choices do not fit: a total spinal builds up after intrathecal local anaesthetic spreads cephalad and produces apnoea and fixed hypotension over a short interval, not an instantaneous faint at the moment of needle insertion. An anaphylactic reaction would announce itself with skin, airway and circulatory signs together. An intravascular local anaesthetic bolus causes neurological excitation such as tongue numbness, tinnitus and seizures followed by cardiotoxicity. None of these matches a fleeting aphonia plus syncope.

Therefore the episode is a benign autonomic event.

Vasovagal attack

Quick Tip: Sudden, transient faint at the moment of instrumentation points to a reflex autonomic event.

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274. All are definitive airways except?

- (A) Nasotracheal tube
- (B) Orotracheal tube
- (C) Laryngeal mask airway (LMA)
- (D) Cricothyroidotomy

Correct Answer: (C) Laryngeal mask airway (LMA)

SOLUTION:

Test each device against one rule: is there a cuffed tube actually inside the trachea, secured, and able to deliver assisted ventilation while guarding the airway from aspiration? Anything meeting this rule is definitive; anything that merely sits above the larynx is not.

Orotracheal and nasotracheal tubes both place a cuffed lumen through the cords into the trachea, differing only in the route of insertion, so both qualify. A

cricothyroidotomy bypasses the upper airway and inserts a tube straight into the trachea through the cricothyroid membrane, which also qualifies as a definitive surgical airway.

The laryngeal mask airway is different in kind. It is a supraglottic device whose inflatable cuff seals around the laryngeal opening from above, but no part of it passes through the cords. Because the trachea is not intubated and aspiration is not securely prevented, it is classed as a temporising rescue airway rather than a definitive one.

So the one device that breaks the rule is the LMA.

LMA

Quick Tip: A definitive airway needs a cuffed tube inside the trachea; supraglottic devices do not count.

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275. Anaesthetic agents with vasoconstrictor properties are contraindicated in?

- (A) Finger block
- (B) Spinal block
- (C) Epidural block
- (D) Surface anaesthesia for bronchoscopy

Correct Answer: (A) Finger block

SOLUTION:

Start from the purpose of the additive. A vasoconstrictor such as adrenaline shrinks local vessels to keep the anaesthetic where it is injected, lengthen its action and curb bleeding. The flip side is reduced blood supply to the injected region, which only becomes dangerous when that region has no alternative route of perfusion.

Now map this onto anatomy. Fingers and toes are perfused by terminal end arteries with negligible collateral circulation. If you constrict those vessels during a digital block, the digit can become critically ischaemic and even progress to gangrene. For this reason the classic teaching is to avoid adrenaline in ring blocks of the fingers, and likewise in the toes, nose tip, ear lobe and penis.

By contrast, a spinal or epidural injection acts on a richly perfused neuraxial region, and topical anaesthesia for bronchoscopy is applied to airway mucosa, neither of which depends on a single vulnerable end artery. So the end-artery ischaemia objection does not apply to them.

The block that must avoid vasoconstrictors is therefore the digital one.

Finger block

Quick Tip: Think of regions supplied by end arteries with no collateral flow.

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276. The distant metastasis to bone can be best detected by:

- (A) MRI
- (B) Bone scan
- (C) CT
- (D) Intravenous venogram

Correct Answer: (B) Bone scan

SOLUTION:

Decide which test best answers a whole-skeleton question. To find spread of tumour to bone anywhere in the body, you want one study that covers head to toe and flags lesions before they are obvious on x-ray.

The radionuclide bone scan fits this requirement. After injecting Tc-99m labelled diphosphonate, the tracer concentrates wherever osteoblasts are busy laying

down bone. Because metastatic deposits provoke a reactive increase in bone turnover, they light up as focal hot spots, and the gamma camera sweeps the entire skeleton in a single sitting. It also picks up disease earlier than plain films, which only show a lesion once a large fraction of the bone matrix has been lost.

The alternatives are less suited. MRI and CT resolve a single region in fine detail but are not the routine choice for surveying the whole body for distant deposits. A venogram simply opacifies veins and contributes nothing to detecting skeletal metastasis.

Hence the screening investigation of choice is the radionuclide bone scan.

Bone scan

Quick Tip: Which test surveys the entire skeleton in one sitting and shows lesions before plain x-rays do?

• • •

277. The dose of radiation required for development of the haematological (bone marrow) syndrome is?

- (A) 2 to 5 Gy
- (B) 10 Gy
- (C) 100 Gy
- (D) 200 Gy

Correct Answer: (A) 2 to 5 Gy

SOLUTION:

Order the acute radiation syndromes by the dose that triggers them, because the question is really asking for the lowest-dose syndrome. The sequence with rising whole-body exposure is bone marrow first, then gut, then brain.

The bone marrow (haematopoietic) syndrome is the earliest to appear because

haematopoietic stem cells are among the most radiosensitive cells in the body. A whole-body dose of about 2 to 5 Gy is enough to knock out marrow function, after which the falling counts produce anaemia, immunosuppression with infection, and bleeding tendency over the following weeks.

Larger doses are needed for the other patterns: the gastrointestinal syndrome from denudation of the gut epithelium needs higher exposure, and the catastrophic central nervous system syndrome requires extremely high doses. Among the four options offered, only the 2 to 5 Gy band matches the marrow threshold; the others are far too high.

So the haematological syndrome corresponds to the lowest dose listed.

2 to 5 Gy

Quick Tip: Bone marrow stem cells are highly radiosensitive, so this syndrome needs the lowest dose.

• • •

278. Which among the following is preferred in a patient with decreased renal function to avoid contrast nephropathy?

- (A) N-acetylcysteine
- (B) Fenoldopam
- (C) Low osmolar contrast media
- (D) Mannitol

Correct Answer: (C) Low osmolar contrast media

SOLUTION:

Approach this by attacking the root cause rather than adding a drug. Contrast nephropathy stems largely from the osmotic and direct toxic burden of the iodinated agent on the renal tubules and medulla, so the single most dependable safeguard is to give a contrast medium that imposes less of that burden.

Low-osmolar (and iso-osmolar) contrast media carry a much lower osmotic load than the older high-osmolar agents. In a patient who already has reduced renal reserve, choosing such an agent directly lessens medullary hypoxia and tubular injury, which is why it is the preferred option when the goal is to prevent contrast-induced kidney damage.

The drug-based choices are weaker. N-acetylcysteine as an antioxidant has given conflicting trial results and is not a guaranteed protector. Fenoldopam, a selective dopamine-1 agonist, has failed to show consistent renal protection. Mannitol, an osmotic diuretic, provides no protective benefit and can even aggravate the situation. So none of them outranks simply selecting a safer contrast agent.

The preferred measure is therefore the safer contrast medium.

Low osmolar contrast media

Quick Tip: The most reliable measure attacks the cause: use a less osmotically toxic contrast agent.

• • •

279. Which of the following is the earliest to be diagnosed by ultrasonography (USG)?

- (A) Anencephaly
- (B) Prosencephaly
- (C) Meningocele
- (D) Spina bifida

Correct Answer: (A) Anencephaly

SOLUTION:

Rank these anomalies by how conspicuous they are to an early ultrasound probe. The defect that produces the most dramatic and easily seen abnormality of fetal anatomy will be the one picked up soonest.

Anencephaly wins on this basis. The fetal skull vault and the forebrain simply fail to form, so the normal rounded cranial outline is absent. This gross loss of the cranium gives an unmistakable appearance, and the failure of cranial ossification together with absent brain tissue can be appreciated from late in the first trimester into the early second trimester, which is sooner than the rest.

The competing options are harder and later calls. Holoprosencephaly needs evaluation of midline brain structures, while a meningocele and spina bifida require careful scanning of the spinal contour and posterior elements for more subtle bulges or splaying. Their diagnostic signs are generally confirmed later than the obvious cranial deficiency of anencephaly.

So the earliest diagnosis on USG belongs to anencephaly.

Anencephaly

Quick Tip: The defect with the most obvious gross cranial abnormality is seen soonest.

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280. The aortic knob silhouette on a chest X-ray (PA view) is obliterated by consolidation of which portion of the lung?

- (A) Apicoposterior segment of left upper lobe
- (B) Superior lingular segment of left upper lobe
- (C) Apical segment of left lower lobe
- (D) Inferior lingular segment of left upper lobe

Correct Answer: (A) Apicoposterior segment of left upper lobe

SOLUTION:

Reading a chest film border by border is the fastest way to localise consolidation. Each mediastinal margin that stays crisp tells you the abutting lung is clear, and each margin that disappears points to the segment in contact with it.

The aortic knob projects high on the left mediastinum where the arch turns. The only lung tissue draped against the arch at this height is the apicoposterior segment of the left upper lobe. When this segment fills with fluid or exudate, the air interface against the arch is lost and the knob blurs out.

The lingula (superior and inferior lingular segments) sits lower and faces the left ventricular border, so disease there erases the heart border rather than the arch. The apical segment of the left lower lobe lies posteriorly and inferiorly and never touches the aortic arch. Therefore loss of the aortic knob points specifically to the apicoposterior segment of the left upper lobe.

Apicoposterior segment of left upper lobe

Quick Tip: Which lung segment is draped directly against the aortic arch high on the left mediastinum?

• • •

281. CT scan is least accurate for the diagnosis of which of the following?

- (A) 1 cm aneurysm in the hepatic artery
- (B) 1 cm lymph node in the para-aortic region
- (C) 1 cm mass in the tail of the pancreas
- (D) 1 cm gall stone

Correct Answer: (D) 1 cm gall stone

SOLUTION:

The trick here is to compare how each lesion behaves on CT density. CT discriminates structures by their X-ray attenuation, so it shines when a lesion differs sharply from its background.

A hepatic artery aneurysm enhances brightly with intravenous contrast and stands out. A para-aortic lymph node is a soft-tissue density nicely outlined

against retroperitoneal fat. A pancreatic tail mass distorts the gland and alters its enhancement pattern, so it too is detectable. Each of these is well within CT's strengths.

A gallstone is the odd one out. Cholesterol stones are frequently isodense to bile and may show no calcium at all, so they blend into the gallbladder lumen and escape detection. This is exactly why ultrasound, which reveals the stone as an echogenic focus casting an acoustic shadow, is the first-line test for gallstones. CT is consequently the least reliable modality for a 1 cm stone.

1 cm gall stone

Quick Tip: Which of these lesions is often non-calcified and isodense to its surrounding fluid?

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282. What is the differentiating feature of an atrial septal defect (ASD) from a ventricular septal defect (VSD) on chest X-ray?

- (A) Pulmonary hypertension
- (B) Absence of left atrial enlargement
- (C) Pulmonary congestion
- (D) Aortic shadow

Correct Answer: (B) Absence of left atrial enlargement

SOLUTION:

To separate ASD from VSD on a plain film, ask which cardiac chambers carry the extra volume, because the X-ray simply reflects which chambers dilate.

Pulmonary plethora, pulmonary hypertension and pulmonary congestion are common to any large left-to-right shunt, so they appear in both lesions and cannot be used to tell them apart. The aortic shadow is not a distinguishing feature either.

The decisive clue is the left atrium. In a VSD the recirculated blood travels through the lungs and floods the left atrium and left ventricle, producing left atrial enlargement. In an ASD the defect sits at the atrial level, so the surplus blood is shunted straight into the right atrium and right ventricle and never overloads the left atrium. A normal-sized left atrium in the presence of a left-to-right shunt therefore points to ASD rather than VSD.

Absence of left atrial enlargement

Quick Tip: In which defect does the extra volume bypass the left atrium?

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283. Which of the following is true about contrast radiography?

- (A) In conventional monomeric iodinated contrast media, the iodine atom to solute particle ratio is 3:2.
- (B) Injection into an artery is associated with three times more complications than injection into a vein.
- (C) A test dose should be performed if a contrast reaction is suspected.
- (D) Gadolinium-DTPA crosses the intact blood-brain barrier.

Correct Answer: (A) In conventional monomeric iodinated contrast media, the iodine atom to solute particle ratio is 3:2.

SOLUTION:

This question is best solved by validating each statement against contrast pharmacology one at a time.

Start with the ratio. The radiographic usefulness of a contrast agent depends on iodine content, while its osmotic toxicity depends on the number of dissolved particles. For a classic ionic monomer, every molecule contributes 3 iodine atoms but splits into 2 particles (an anion plus a cation), so the iodine to particle ratio is 3 to 2. That makes the first statement true.

The claim that arterial injection carries exactly threefold the complications of venous injection is a fabricated number with no basis, so it is false. Performing a test dose is discouraged, because a tiny dose neither predicts nor prevents anaphylactoid reactions and can itself trigger one, so that statement is false too. Finally, gadolinium-DTPA stays out of normal brain tissue and only lights up areas where the blood-brain barrier has broken down, which is the opposite of what option D claims, so it is false.

Only the 3:2 ratio survives scrutiny.

Iodine to particle ratio is 3:2 in conventional monomeric contrast

Quick Tip: Count iodine atoms per molecule versus the particles formed on dissociation of an ionic monomer.

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284. Which antidepressant drug can be used in nocturnal enuresis, ADHD and chronic pain?

- (A) Imipramine
- (B) Fluvoxamine
- (C) Bupropion
- (D) Fluoxetine

Correct Answer: (A) Imipramine

SOLUTION:

The cleanest route to the answer is to look for the single agent that ticks all three boxes at once: bed-wetting, attention deficit, and persistent pain.

Tricyclic antidepressants are the only class that classically spans these conditions. Among the choices, imipramine is the prototype TCA and is the textbook drug for childhood nocturnal enuresis; it is also employed in ADHD and is a recognised

treatment for chronic and neuropathic pain through its effect on monoamine reuptake and sodium channels.

The two SSRIs on the list, fluvoxamine and fluoxetine, treat depression and anxiety disorders but have no role in enuresis or analgesia. Bupropion helps with depression, smoking cessation and to some degree ADHD, yet it does not cover enuresis or chronic pain. Only imipramine satisfies every part of the stem.

Imipramine

Quick Tip: Think of the tricyclic antidepressant classically prescribed for childhood bed-wetting.

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285. A female patient presents with depressed mood, loss of appetite and no interest in her surroundings, with associated insomnia. The onset of depression was preceded by a business loss, and soon afterwards she developed these symptoms, which have persisted for the past 1 year. Which of the following is true?

- (A) No treatment is necessary as it is due to the business loss
- (B) SSRIs are the most efficacious of the available drugs
- (C) Start antidepressant drug treatment based on the side-effect profile
- (D) Combination therapy with two antidepressant drugs

Correct Answer: (C) Start antidepressant drug treatment based on the side-effect profile

SOLUTION:

The key insight is twofold: first confirm that this is a treatable illness, then decide how to pick the drug.

A woman with low mood, anhedonia, poor appetite and insomnia lasting a full year clearly has a major depressive episode. The fact that a business loss triggered it is irrelevant to whether she needs treatment; a sustained one-year episode is

not normal bereavement and must be treated, which immediately rules out the do-nothing option.

Now consider drug selection. The various antidepressant classes are roughly equal in overall efficacy, so no class can be crowned the most efficacious for everyone; that disqualifies the blanket SSRI claim. Starting two antidepressants together is not how a first episode is managed and only multiplies adverse effects, so combination therapy is wrong at the outset.

Since efficacy is comparable across agents, the rational basis for choosing one is its side-effect and safety profile matched to the patient. Therefore antidepressant therapy should be initiated according to the side-effect profile.

Start an antidepressant based on the side-effect profile

Quick Tip: If most antidepressants are equally effective, what should guide which one you pick?

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286. Regarding an imbecile, all of the following are true EXCEPT?

- (A) IQ is 50 to 60
- (B) Intellectual capacity equivalent to a child of 3 to 4 years of age
- (C) Not able to take care of themselves
- (D) Condition is congenital or acquired at an early age

Correct Answer: (A) IQ is 50 to 60

SOLUTION:

The fastest approach is to anchor on the correct IQ band for imbecility and then check each statement against it.

In the traditional grading of intellectual disability, imbecile equals moderate mental retardation, whose IQ sits around 35 to 49. The option stating an IQ of 50

to 60 actually describes the mild band (the moron category), so it is the false statement and is exactly what an except-type question wants.

The remaining options all fit moderate intellectual disability accurately: the mental age is about that of a 3 to 4 year old child, the person cannot independently manage self-care and needs ongoing supervision, and the disability is either present from birth or acquired in early childhood. Each of these is a true feature, leaving the mismatched IQ value as the one untrue statement.

IQ is 50 to 60

Quick Tip: Imbecile equals moderate retardation, so its IQ band is lower than the value quoted in one option.

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287. Maintenance dose of which of the following drugs is used worldwide for opioid dependence?

- (A) Naloxone
- (B) Methadone
- (C) LAAM
- (D) Pethidine

Correct Answer: (B) Methadone

SOLUTION:

Opioid dependence is treated either by detoxification or by long-term substitution (maintenance). Maintenance therapy replaces a short-acting, frequently injected drug such as heroin with a long-acting oral agonist that is taken once daily under supervision, so that the patient remains free of withdrawal and craving while avoiding the harms of injecting.

The agent that fulfils these criteria and is adopted as the worldwide standard is methadone, a synthetic full mu-opioid agonist with a long half-life suited to single

daily dosing. Naloxone is the wrong choice because it is an antagonist used acutely to reverse overdose. LAAM, although long-acting, fell out of routine use after reports of dangerous QT prolongation. Pethidine is short-acting, has a neurotoxic metabolite, and carries high abuse liability, making it unsuitable for maintenance.

Hence the substitution drug used globally for opioid dependence maintenance is methadone.

Methadone

Quick Tip: Long-acting oral opioid agonist given once daily for substitution therapy.

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288. Most common cause of premature death in schizophrenia?

- (A) Homicide
- (B) Suicide
- (C) Toxicity of antipsychotic drug
- (D) Hospital acquired infections

Correct Answer: (B) Suicide

SOLUTION:

People with schizophrenia die younger than the general population, and a large part of this excess is due to unnatural causes. When asked to pick the single commonest premature cause of death, the answer relates to self-harm rather than to violence from others or to treatment side effects.

Suicide is the leading unnatural cause, accounting for a substantial fraction of deaths, with a lifetime suicide rate of around 5 to 10 percent. The danger is greatest in the early years after diagnosis, in young men, in those with insight-related depression, and in the period immediately following hospital discharge.

By comparison, being a victim of homicide is uncommon, deaths from antipsychotic toxicity are not the dominant cause, and hospital acquired infection is a minor contributor. The expected answer is therefore self-inflicted death.

Suicide

Quick Tip: Self-harm risk is highest early in the illness and in young males.

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289. Which among the following is not used to treat alcohol dependence?

- (A) Flumazenil
- (B) Acamprosate
- (C) Naltrexone
- (D) Disulfiram

Correct Answer: (A) Flumazenil

SOLUTION:

The pharmacotherapy of alcohol dependence relies on a small set of drugs that either reduce craving or create a deterrent to drinking. Recognising these three lets us eliminate them and find the odd one out.

Acamprosate is an anti-craving agent that restores the disturbed glutamate and GABA signalling of chronic alcohol use and supports continued abstinence. Naltrexone, an opioid receptor blocker, dampens the pleasurable reinforcement that alcohol provides and so reduces relapse. Disulfiram works differently, blocking aldehyde dehydrogenase so that any alcohol intake causes a toxic acetaldehyde build-up with flushing, nausea, and palpitations, discouraging drinking.

Flumazenil does not belong to this group. It is a competitive antagonist at the benzodiazepine site, used to reverse benzodiazepine sedation, and it may even

provoke seizures in dependent patients. Hence it is the drug with no role in alcohol dependence treatment.

Flumazenil

Quick Tip: One option is a benzodiazepine antagonist, not an anti-craving or aversive agent.

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290. All are true about delirium tremens except?

- (A) Visual hallucinations
- (B) Coarse tremors
- (C) Third nerve palsy
- (D) Confusion

Correct Answer: (C) Third nerve palsy

SOLUTION:

Delirium tremens is the life-threatening end of the alcohol withdrawal spectrum, appearing two to four days after cessation in a dependent drinker. To answer the except question we recall its core clinical picture and then find the item that does not fit.

The hallmark features are a fluctuating, clouded sensorium with disorientation and confusion, vivid visual hallucinations often described as small crawling creatures, coarse generalised tremors, severe autonomic storm with fever, sweating and tachycardia, and psychomotor agitation. Three of the listed choices, confusion, coarse tremors, and visual hallucinations, sit squarely within this picture.

The outlier is third nerve palsy. Eye movement abnormality in an alcohol misuser points instead toward Wernicke encephalopathy from thiamine deficiency, where

the sixth nerve is typically affected. A true oculomotor palsy is not a recognised component of delirium tremens, so it is the exception.

Third nerve palsy

Quick Tip: Eye-movement palsy in an alcoholic points to Wernicke, not to DT.

• • •

291. Mr X is a chronic smoker. His family insists on quitting smoking. He is thinking about quitting, but is reluctant to do so because he is worried that on quitting he will become irritable. According to the health belief model, the state of the patient is?

- (A) Precontemplation and preparation
- (B) Contemplation and extent of sickness susceptibility
- (C) Contemplation and cost
- (D) Precontemplation and cost

Correct Answer: (C) Contemplation and cost

SOLUTION:

This scenario needs us to read two layers from the vignette: where the smoker sits in the process of behaviour change, and which belief is holding him back.

On the process axis, Mr X is no longer ignoring the issue, he is weighing up whether to stop. Someone who is seriously considering change but has not committed to a plan is in the contemplation phase, which lies beyond precontemplation, the stage where a person has no thought of stopping at all.

On the belief axis, his hesitation is driven by the fear of becoming irritable after quitting. In the health belief framework, an anticipated unpleasant consequence of taking the advised action is a perceived barrier, often phrased as the cost of the behaviour. It is distinct from perceived susceptibility, which would describe how vulnerable he feels to smoking-related disease.

Putting both together, he is contemplating change and is restrained by the perceived cost of doing so.

Contemplation and cost

Quick Tip: He is weighing change (not ignoring it) and fears a downside of quitting.

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292. A 65-year-old lady presented with a swollen and painful knee. On examination, she was found to have grade III osteoarthritic changes. What is the best treatment option?

- (A) Conservative management
- (B) Arthroscopic washing
- (C) Partial knee replacement
- (D) Total knee replacement

Correct Answer: (D) Total knee replacement

SOLUTION:

The decision here rests on matching the radiological grade of knee osteoarthritis to the appropriate level of intervention in an elderly, symptomatic patient.

For mild osteoarthritis the ladder begins with non-operative measures, namely weight loss, exercise, analgesia, and selective intra-articular injections, which suit grade I and II disease. As the joint surface deteriorates and pain becomes disabling, these measures lose effectiveness and surgery becomes the definitive answer.

This patient has grade III disease with a swollen painful knee at 65 years of age, indicating advanced, generalised joint damage. The operation that consistently abolishes pain and restores function in such advanced osteoarthritis is total knee replacement. A simple arthroscopic washout offers no durable benefit in established disease, and unicompartmental replacement applies only when a

single compartment is involved, which is not the case in diffuse grade III change.

Therefore the most appropriate treatment is replacement of the whole knee joint.

Total knee replacement

Quick Tip: Advanced (grade III to IV) osteoarthritis in an elderly patient calls for arthroplasty.

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293. Most common nerve injured in supracondylar fracture of the humerus?

- (A) Median
- (B) Radial
- (C) Ulnar
- (D) Anterior interosseous nerve

Correct Answer: (D) Anterior interosseous nerve

SOLUTION:

Supracondylar humeral fractures are the classic childhood elbow injury, and a notable share of the displaced ones carry a nerve lesion, so identifying the commonest is high-yield.

An important point is that the answer has changed with evidence. Earlier teaching pointed to the radial nerve, but more recent series show that the anterior interosseous nerve, the pure motor branch arising from the median nerve, is the one most often affected. Its involvement is tied to the usual posterolateral displacement of the distal fragment seen in extension-type fractures.

The displacement direction predicts the nerve at risk: posterolateral displacement threatens the anterior interosseous and median nerves, posteromedial displacement endangers the radial nerve, and the uncommon flexion-type

fracture puts the ulnar nerve at risk. Clinically an anterior interosseous palsy causes loss of the OK pinch from weak flexor pollicis longus and index profundus, characteristically without sensory loss.

Hence the nerve injured most frequently is the anterior interosseous nerve.

Anterior interosseous nerve

Quick Tip: Recent literature favours the motor branch of the median nerve, with loss of the OK sign.

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294. Blount's disease is:

- (A) Genu valgum
- (B) Genu varum
- (C) Genu recurvatum
- (D) Meniscal injury

Correct Answer: (B) Genu varum

SOLUTION:

Blount's disease, known in orthopedics as tibia vara, is a pathological deformity arising at the medial aspect of the proximal tibial growth plate. Excessive compressive force, frequently linked with childhood obesity and walking at an unusually early age, suppresses normal growth of the inner (medial) tibial physis while the lateral side keeps growing. The result is that the tibia tilts and the leg deviates toward the body's midline. A deformity where the leg bows outward at the knee, bringing the ankles apart while the knees stay together, is by definition genu varum (bow-leg). Therefore Blount's disease manifests clinically as genu varum. The distractors can be excluded on simple definitions: genu valgum is the opposite knock-knee posture, genu recurvatum denotes backward over-extension of the knee at the tibiofemoral joint, and meniscal injury is an intra-articular cartilage tear unrelated to physal growth. A key point is that Blount's deformity

is progressive and worsens with age, unlike benign physiological bowing that self-corrects. **Tibia vara = genu varum.**

Genu varum

Quick Tip: Tibia vara means the leg bows outward at the knee.

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295. A teenaged girl complains of pain in the knee on climbing stairs and on getting up after sitting for a long time. What is the probable diagnosis?

- (A) Chondromalacia patellae
- (B) Plica syndrome
- (C) Bipartite patella
- (D) Patello-femoral osteoarthritis

Correct Answer: (A) Chondromalacia patellae

SOLUTION:

Approach this question through pattern recognition of anterior knee pain syndromes. The vignette gives three discriminating clues: a young female, pain when climbing stairs, and pain on standing up after a long period of sitting. The latter is the classic theatre sign (also called the movie sign), and together these point to overload of the patellofemoral compartment. The disorder that fits this exact picture in an adolescent female is chondromalacia patellae, in which the hyaline cartilage on the back of the kneecap softens, fissures, and degenerates, commonly because the patella does not track smoothly in the trochlear groove. Activities that drive the patella hard against the femur, such as ascending stairs or extending the knee after prolonged flexion, reproduce the pain and may cause crepitus. Working through the alternatives: plica syndrome is usually post-traumatic or overuse related and lacks this textbook sitting-then-rising pattern; a bipartite patella is an unfused secondary ossification centre that is generally a silent incidental finding; and patellofemoral osteoarthritis is a degenerative condition of older adults, which is inconsistent with a teenager. The age, sex, and

the theatre sign converge on one diagnosis. **Adolescent female + theatre sign + stair pain ⇒ chondromalacia patellae.**

Chondromalacia patellae

Quick Tip: Young female plus the theatre sign equals softening of patellar cartilage.

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296. The first structure to be fixed after amputation (during replantation) is?

- (A) Bone fixing
- (B) Arterial repair
- (C) Venous repair
- (D) Nerve repair

Correct Answer: (A) Bone fixing

SOLUTION:

The logic of replantation surgery is to build from the inside out, starting with the most rigid structure and ending with the softest. After a traumatic amputation in which the part is judged salvageable, the surgeon must first create a stable, correctly shortened skeletal framework before any soft tissue can be reconnected without tension. That first step is osteosynthesis, the fixation of bone, typically achieved with Kirschner wires. Only when the bone is secured and the limb length is set can the tendons (extensor then flexor) be repaired, after which the operating microscope is used for the artery, then the nerve, then the vein, with skin closure and splinting last. If one tried to repair the millimetre-sized artery, vein, or nerve before stabilising the bone, any movement would disrupt the fragile microsutures, so bone fixation logically and surgically precedes everything else. Among the options, arterial, venous, and nerve repair are all microsurgical steps that come after the skeleton is stable, leaving bone fixing as the first structure addressed. **Order: bone → tendon → artery → nerve → vein → skin.**

Bone fixing

Quick Tip: You need a stable, correctly-lengthened scaffold before any microsurgical repair.