FMGE July 2023 Question Paper

145 recall questions with answers and explanations.

Recall honesty note: NBEMS does not release official papers, so these are memory-based recall questions, not official papers. Image-based questions are excluded for now because the bank's images are currently unavailable.

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Question 1. and apnea (or shallow breathing). It is triggered by the stimulation of chemoreceptors and mechanoreceptors (C-fibers) located in the ventricular walls of the heart. Chemical irritants, certain drugs, or myocardial ischemia can activate these receptors, leading to an increase in parasympathetic (vagal) outflow and a decrease in sympathetic tone.
The Bainbridge reflex (Option B) is the opposite; it causes an increase in heart rate in response to increased venous return and atrial stretch. The Cushing reflex (Option C) is a physiological response to increased intracranial pressure, characterized by hypertension, irregular breathing, and bradycardia. While both Cushing and Bezold-Jarisch involve bradycardia, the specific combination of hypotension and apnea following IV irritant administration is diagnostic for the Bezold-Jarisch reflex. This reflex can be particularly significant during anesthesia or in the early stages of a myocardial infarction.

A 35-year-old patient presents to the emergency department with severe abdominal pain and vomiting. During evaluation, the physician reviews the functional roles of the intestinal epithelium. Which of the following functions is NOT a primary function of the intestinal epithelium?

A. Absorption of the ions

B. Bile salts secretion

C. Mucous secretion

D. Formation of digestive enzyme

Correct answer: B

The secretion of bile salts is a primary function of the liver (hepatocytes), not the intestinal epithelium. Bile is synthesized in the liver, stored in the gallbladder, and released into the duodenum to aid in the emulsification and absorption of fats.

The other functions listed are key roles of the intestinal epithelium. The epithelium is highly specialized for the absorption of ions (Option A), water, and nutrients via various transporters. Mucous secretion (Option C) is performed by goblet cells interspersed within the epithelium to protect the mucosal surface and facilitate the passage of contents. The formation of digestive enzymes (Option D), such as disaccharidases and peptidases, occurs at the brush border of the enterocytes, allowing for the final stages of carbohydrate and protein digestion. While the intestine is vital for the reabsorption of bile salts in the terminal ileum (enterohepatic circulation), their initial secretion is exclusively a hepatic process.

In the adjacent graph, plateau phase represents which one of the following properties?

(A)

Elasticity

(B)

Plasticity

(C)

Contractility

(D)

Automaticity

Question 2. A 35-year-old carpenter presents with sudden anterior shoulder pain after lifting a heavy object

overhead. He reports hearing a “pop” at the time of injury, followed by immediate swelling and bruising. Examination reveals a bulge in the mid–upper arm, and he has marked weakness in elbow flexion and forearm supination. What is the most likely diagnosis?

A. Biceps tendon rupture

B. Triceps muscle rupture

C. Humerus Fracture

D. Tennis elbow

Correct answer: A

The clinical presentation described is a classic case of a long head of the biceps tendon rupture. The patient’s sudden "pop" sound during heavy overhead lifting and the subsequent formation of a visible bulge in the mid-upper arm—commonly referred to as the "Popeye deformity"—are pathognomonic. This muscle bulge occurs because the detached muscle belly retracts distally toward the elbow. The long head of the biceps is essential for elbow flexion and forearm supination, which explains the significant weakness the patient experiences.

Triceps muscle rupture (Option B) would present with a bulge on the posterior aspect of the arm and weakness in elbow extension. A humerus fracture (Option C) would cause severe localized bone pain, instability, and usually a different radiographic appearance rather than an isolated muscle bulge. Tennis elbow (Option D), or lateral epicondylitis, involves chronic overuse pain at the lateral epicondyle rather than acute muscle deformity or flexion weakness.

Question 3. A 14-year-old patient presents with a congenital deformity of the neck and upper back. Examination shows an elevated, medially rotated scapula with an equilateral triangle appearance and restricted neck movements. The deformity has been present since birth with no improvement over time. What is the most likely diagnosis?

A. Separated shoulder deformity

B. Torticollis

C. Klippel Feil deformity

D. Sprengel's deformity

Correct answer: C

Klippel-Feil deformity is a congenital condition characterized by the fusion of two or more cervical vertebrae. This leads to a short neck, restricted neck movements, and a low hairline. A

distinctive feature is the triangular appearance of the neck, which occurs due to elevation and medial rotation of the scapula.

Why other options are incorrect:

1.

Separated Shoulder Deformity : This refers to a traumatic separation of the clavicle from the acromion. It is not a congenital condition and does not present with a short neck or limited neck mobility.

2.

Torticollis (Wry Neck) : In this condition, the head tilts to one side and the chin rotates to the opposite side. Although it may be congenital, it primarily affects head posture rather than causing a short neck or vertebral fusion.

3.

Sprengel’s Deformity : This is a congenital condition involving an elevated and medially rotated scapula, leading to shoulder asymmetry. However, it typically does not cause marked restriction of neck movement or vertebral fusion, which are key features of Klippel-Feil deformity.

Question 4. A 42-year-old patient presents to the emergency department after a road traffic accident and is diagnosed with an extradural (epidural) hematoma caused by injury to the middle meningeal artery. At which site of the skull is the impact of collision most likely to have occurred?

A. Angle of mandible (B) Lambdoid suture

C. Nasion

D. Pterion

Correct answer: D

In cases of extradural hematoma (EDH) resulting from a road traffic accident, the site of impact is characteristically the Pterion. The Pterion is an H-shaped junction where the frontal, parietal, temporal, and greater wing of the sphenoid bones meet. This anatomical region is clinically significant because the bone is notably thin here and lies directly over the anterior branch of the middle meningeal artery. Trauma to this area often results in a fracture that ruptures the artery, causing blood to collect between the skull and the dura mater.

The angle of the mandible (Option A) is located much lower and is not associated with the middle meningeal artery. The lambdoid suture (Option B) is at the posterior of the skull, while the nasion (Option C) is the midline depression at the bridge of the nose. Neither site typically underlies the specific arterial branches involved in the classic presentation of a temporal-region EDH.

Question 5. During intrauterine development, the talus, a tarsal bone of the foot, begins ossification at a specific gestational age. At what time during fetal life does ossification of the talus occur?

A. 3 months

B. 7 months

C. 9 months

D. 2 months

Correct answer: B

The ossification of the tarsal bones follows a specific chronological sequence during intrauterine development. The talus typically begins to ossify at 7 months of intrauterine life. It is the second tarsal bone to ossify, following the calcaneus, which begins ossification at approximately 5 to 6 months of gestation. The cuboid bone is usually the third, ossifying shortly before birth, often at 9 months.

Options A (3 months), C (9 months), and D (2 months) are incorrect for the talus. While the primary centers for long bones appear much earlier (around the 8th week or 2nd month), the tarsal bones are mostly cartilaginous at birth, except for the calcaneus, talus, and sometimes the cuboid. Identifying the presence of these ossification centers on fetal radiographs or ultrasounds can be a useful clinical indicator for assessing gestational age and skeletal maturity in a developing fetus.

Question 6. Cholera causes diarrhea by binding to specific receptors on intestinal cells. Which factor facilitates the entry of cholera toxin through the intestinal mucosa?

A. GLUT 1

B. GM2 ganglioside

C. Cephalin

D. GM1 ganglioside

Correct answer: D

The cholera toxin, produced by Vibrio cholerae, consists of an A subunit and five B subunits. The B subunits are responsible for binding to the host cell. The specific receptor on the intestinal epithelial cell surface that the cholera toxin binds to is the GM1 ganglioside. This binding facilitates the entry of the active A subunit into the cell.

GLUT 1 (Option A) is a glucose transporter and is not involved in toxin binding. GM2 ganglioside (Option B) is a related molecule but is not the primary receptor for cholera toxin. Cephalin (Option C, phosphatidylethanolamine) is a common membrane phospholipid but lacks the specific carbohydrate structure required for toxin recognition. Once inside, the A subunit

constitutively activates the Gs protein, leading to a massive increase in intracellular cAMP. This causes the hypersecretion of chloride ions and water into the intestinal lumen, resulting in the characteristic profuse "rice-water" diarrhea of cholera.

Question 7. 12. (B) 81 times
According to Poiseuille’s law, the resistance to fluid flow through a vessel is inversely proportional to the fourth power of the radius or diameter . This mathematical relationship is expressed as . If the diameter of an artery is reduced to one-third of its original size, the new resistance can be calculated by substituting the change into the proportionality formula. Since the diameter becomes , the resistance increases by a factor of . Calculating results in 81. Therefore, a three-fold reduction in diameter leads to an 81-fold increase in vascular resistance. Options A (9 times), C (27 times), and D (18 times) do not follow the inverse fourth-power relationship defined by vascular physiology. This principle explains why even small changes in vessel caliber, such as in atherosclerosis or vasospasm, can significantly impact blood pressure and organ perfusion.
How does the affinity of carbon monoxide for hemoglobin compare with that of oxygen?
A. 100
B. 400
C. 250
D. 150
Correct answer: C
Hemoglobin is the primary protein in red blood cells responsible for transporting gases throughout the body. While it is designed to bind oxygen, it has a remarkably higher affinity

Question 8. serosa. Most other abdominal digestive organs are covered by a serous membrane (visceral peritoneum). Instead, the outermost layer of

the esophagus is the adventitia, which consists of loose connective tissue that anchors the esophagus to surrounding structures in the mediastinum.

The other listed layers are standard components of the esophageal wall: the mucosa (Option A), which is the innermost lining; the submucosa (Option B), which contains glands and blood vessels; and the muscularis externa (Option D), which consists of both skeletal and smooth muscle layers to facilitate peristalsis.

The absence of a serosa is clinically important because

it

allows

esophageal

infections

and tumors to spread more easily into the surrounding mediastinal space, often leading to more rapid complications compared to organs with a protective serous layer.

DNA is present in which one of the organelle?

A. Mitochondria

B. Lysosome

C. Endoplasmic reticulum

D. Cytoplasm

Correct answer: A

In animal cells, while the vast majority of genetic material is located within the nucleus, mitochondria are unique organelles that possess their own independent DNA. This mitochondrial DNA (mtDNA) is typically circular and is inherited maternally. It encodes for essential proteins required for the electron transport chain and oxidative phosphorylation, which are the primary processes used to generate ATP for cellular energy.

Lysosomes (Option B) are involved in

intracellular digestion and waste removal but do not contain DNA. The endoplasmic reticulum (Option C) is responsible for protein and lipid synthesis but lacks its own genome. The cytoplasm (Option D) is the fluid environment of the cell where translation and glycolysis occur; while viral DNA might temporarily be present there during infection, it is not a normal site for cellular DNA storage. Mitochondrial DNA is essential for the organelle's function, and mutations in it can lead to various mitochondrial diseases affecting energy-hungry tissues like muscle and brain.

In the male reproductive system, the testes contain specialized cells with distinct hormonal functions. Which hormones are secreted by Sertoli cells and Leydig cells, respectively?

(A)

DHA and testosterone

(B)

Testosterone and inhibin

(C)

Testosterone and DHA

(D)

Inhibin and testosterone

Question 9. 14. (A) Mitochondria

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Lysosomes (Option B) are involved in intracellular digestion and waste removal but do not contain DNA. The endoplasmic reticulum

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A. DHA and testosterone

B. Testosterone and inhibin

C. Testosterone and DHA

D. Inhibin and testosterone

Correct answer: D

The testes contain two primary types of endocrine cells with distinct functions. Sertoli

Question 10. cells, located within the seminiferous tubules, provide support for developing sperm and secrete inhibin. Inhibin serves as a negative feedback signal to the pituitary gland to regulate the secretion of Follicle-Stimulating Hormone (FSH). Leydig cells (interstitial cells), located between the tubules, are responsible for secreting testosterone under the influence of Luteinizing Hormone (LH).

Option B is incorrect because it reverses the order. Options A and C include DHA (dehydroepiandrosterone), which is primarily an adrenal androgen rather than a major direct secretion of these specific testicular cells. This hormonal interplay is essential for

the
maintenance
of
spermatogenesis
and the development of male secondary
sexual characteristics. Understanding these
cell-specific secretions is fundamental to
diagnosing various forms of male infertility and
hypogonadism.

During a trip to a high-altitude mountainous region, a group of individuals experiences several physiological changes related to altitude exposure. Which of the following conditions is least likely to occur under high-altitude conditions?

A. Increase PO2

B. Increase in RBC & Hb

C. Increase in myoglobin

D. Hyperventilation

Correct answer: A

At high altitudes, the barometric pressure decreases, which directly reduces the partial pressure of inspired oxygen (O2). This leads to arterial hypoxia. Therefore, an increase in partial pressure of oxygen (PO2) in the blood is least likely to occur; in fact, blood levels characteristically drop.

The other options represent standard compensatory mechanisms of high-altitude acclimatization.

Hyperventilation (Option D) is the immediate response triggered by peripheral chemoreceptors to maximize oxygen intake. Over longer periods, the kidneys secrete erythropoietin, which stimulates an increase in Red Blood Cell (RBC) count and Hemoglobin (Hb) levels (Option B) to improve

oxygen-carrying capacity. Additionally, muscle tissues adapt by increasing myoglobin content (Option C) to facilitate oxygen diffusion into the mitochondria. These physiological adjustments allow the body to function in an oxygen-deprived environment, but the primary challenge remains the inherently low atmospheric and arterial .

A patient develops bradycardia, hypotension, and apnea after receiving intravenous irritant substances. These clinical features are mediated by a specific reflex mechanism. Which reflex is primarily responsible for these physiological responses?

(A)

Bezold jarisch reflex

(B)

Bainbridge reflex

(C)

Cushing reflex

(D)

None of them

Question 11. 16. (A) Increase PO2

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A. Bezold jarisch reflex

B. Bainbridge reflex

C. Cushing reflex

D. None of them

Correct answer: A

The Bezold-Jarisch reflex is characterized by the clinical triad of bradycardia, hypotension,

Question 12. 18. (B) Bile salts secretion

The secretion of bile salts is a primary function of the liver (hepatocytes), not the intestinal epithelium. Bile is synthesized in the liver, stored in the gallbladder, and released into the duodenum to aid in the emulsification and absorption of fats.

The other functions listed are key roles of the intestinal epithelium. The epithelium is highly specialized for the absorption of ions (Option A), water, and nutrients via various transporters. Mucous secretion (Option C) is performed by goblet cells interspersed within the epithelium to protect the mucosal surface and facilitate the passage of contents. The formation of digestive enzymes (Option D), such as disaccharidases and peptidases, occurs at the brush border of

the enterocytes, allowing for the final stages of carbohydrate and protein digestion. While the intestine is vital for the reabsorption of bile salts in the terminal ileum (enterohepatic circulation), their initial secretion is exclusively a hepatic process.

In the adjacent graph, plateau phase represents which one of the following properties?

A. Elasticity

B. Plasticity

C. Contractility

D. Automaticity

Correct answer: B

The provided graph is a cystometrogram, which plots intravesical pressure against volume

Question 13. during bladder filling. The plateau phase (Phase II) of this curve represents the property of plasticity (also known as accommodation). During this phase, the bladder volume increases significantly with only a minimal rise in pressure. This is due to the inherent ability of the smooth muscle (detrusor) to relax and reorganize its fibers as it stretches, allowing the bladder to store large amounts of urine without reaching the micturition threshold prematurely. Elasticity (Option A) refers to the immediate return to original shape after stretching, but plasticity describes the sustained adaptation to new volumes. Contractility (Option C) is the active phase (Phase III) where the muscle shortens to expel urine, resulting in a sharp pressure rise. Automaticity (Option D) refers to self-initiated contraction, which is generally not a feature of a normal bladder under this filling test. Thus, plasticity is the specific physiological property illustrated by the long plateau.

A 30-year-old man presents to the emergency department following a road traffic

accident with complaints of intense superficial pain in his hand due to the injury. Considering the nature of this pain, which type of nerve fiber is primarily responsible for transmitting superficial pain and would be the appropriate target for selective pain relief?

A. A delta

B. A gamma

C. A alpha

D. C fiber

Correct answer: A

Pain sensation is transmitted by two main types of nerve fibers: A delta and C fibers. A delta fibers are small, myelinated fibers that transmit "fast pain". This is characterized as sharp, localized, and immediate pain, such as the acute superficial pain resulting from trauma in a road traffic accident. Targeting these fibers is the priority for alleviating the initial sharp discomfort.

C fibers (Option D) are unmyelinated and transmit "slow pain," which is described as dull, aching, and poorly localized, typically arriving after the initial sharp sensation. A alpha fibers (Option C) are large and myelinated, primarily carrying proprioceptive information. A gamma fibers (Option B) are motor fibers involved in regulating muscle spindle sensitivity. Therefore, for the specific complaint of "severe superficial" sharp pain immediately following trauma, the A delta fibers are the primary neuroanatomical pathway involved in the transmission of the signal.

A patient undergoing evaluation for suspected mitochondrial dysfunction has various mitochondrial structures assessed. Cardiolipin is a characteristic phospholipid of which mitochondrial location?

(A)

Outer mitochondrial membrane

(B)

Inner mitochondrial membrane

(C)
Cytosol
(D)
Mitochondrial matrix

Question 14. A patient undergoing evaluation for suspected mitochondrial dysfunction has various mitochondrial structures assessed. Cardiolipin is a characteristic phospholipid of which mitochondrial location?

A. Outer mitochondrial membrane
B. Inner mitochondrial membrane
C. Cytosol
D. Mitochondrial matrix

Correct answer: B

Cardiolipin is a unique phospholipid that is found almost exclusively in the inner mitochondrial membrane. It accounts for approximately 20% of the total lipid composition in this membrane. Cardiolipin is essential for the structural integrity and optimal function of various mitochondrial proteins, including those involved in the electron transport chain (such as Complex IV) and the ATP synthase complex.

It is not a significant component of the outer mitochondrial membrane (Option A), the cytosol (Option B), or the mitochondrial matrix (Option D). Because of its specific location and role in bioenergetics, cardiolipin is often a target of investigation in cases of mitochondrial dysfunction. For example, abnormalities in cardiolipin metabolism are associated with Barth syndrome, a rare X-linked disorder characterized by cardiomyopathy and skeletal muscle weakness. Its unique structure, consisting of four fatty acid tails, allows the inner membrane to maintain the tight curvature necessary for forming cristae.

BIOCHEMISTRY

Question 15. A 62-year-old man with a long history of chronic alcohol use presents with confusion, visual disturbances, gait instability, and impaired short-term memory. These findings are suggestive of a nutritional deficiency. Deficiency of which vitamin is most likely responsible for this clinical picture?

A. Ascorbic acid

B. Thiamine

C. Retinol

D. Folate

Correct answer: B

The clinical triad of confusion, vision disturbances (ophthalmoplegia/nystagmus), and unsteady gait (ataxia) in a chronic alcoholic is diagnostic for Wernicke encephalopathy. When accompanied by short-term memory loss and confabulation, it is termed Wernicke-Korsakoff syndrome. This condition is caused by a severe deficiency of Thiamine (Vitamin B1). Thiamine is a vital cofactor for key enzymes in glucose metabolism, particularly in the brain.

Ascorbic acid (Option A, Vitamin C) deficiency causes scurvy. Retinol (Option C, Vitamin A) deficiency leads to night blindness and xerophthalmia. Folate (Option D, Vitamin B9) deficiency causes megaloblastic anemia and can contribute to cognitive issues, but it does not produce the specific oculomotor and gait disturbances seen in Wernicke's. Chronic alcohol use impairs thiamine absorption and storage, making these patients highly susceptible. It is a medical emergency; administering glucose before thiamine can worsen the condition by further depleting the remaining thiamine stores.

Question 16. A patient presents with delayed wound healing, dermatitis, recurrent diarrhea, and alopecia. This combination of symptoms indicates a deficiency of an essential dietary mineral involved in skin maintenance, immune function, and gastrointestinal health. Which mineral deficiency is most likely responsible for these findings?

A. Iron

B. Calcium

C. Magnesium

D. Zinc

Correct answer: D

The symptoms of alopecia, dermatitis (often perioral and acral), diarrhea, and impaired wound healing are the classic presentation of Zinc deficiency. Zinc is a critical trace mineral that serves as a cofactor for over 300 enzymes, including those involved in DNA synthesis, protein

metabolism, and immune function. Severe congenital zinc deficiency is known as acrodermatitis enteropathica.

Iron deficiency (Option A) primarily results in microcytic anemia, fatigue, and pica. Calcium deficiency (Option B) leads to muscle cramps, tetany, and osteoporosis. Magnesium deficiency (Option C) can cause neuromuscular irritability, tremors, and cardiac arrhythmias. Zinc's role in epithelial health and cell division explains why its lack so profoundly affects the skin and gastrointestinal tract. Supplementation typically leads to a rapid improvement in symptoms. Clinicians should consider zinc deficiency in patients with malabsorption syndromes, chronic alcoholism, or those on long-term parenteral nutrition without adequate mineral replacement.

Question 17. A farmer adds a chemical to a water pool that acts by inhibiting cellular respiration. The substance specifically targets Complex III of the electron transport chain, disrupting electron transfer and proton gradient formation required for ATP synthesis. Which chemical produces this effect by inhibiting Complex III?

A. Rotenone

B. TTFA

C. Antimycin

D. Cyanide

Correct answer: C

Antimycin A is a well-known antibiotic and piscicide (fish poison) that specifically inhibits Complex III (ubiquinone-cytochrome c oxidoreductase) of the mitochondrial electron transport chain. By binding to the Qi site, it blocks the transfer of electrons from cytochrome b to cytochrome c1, effectively halting the generation of the proton gradient necessary for ATP synthesis.

Rotenone (Option A) is an insecticide that inhibits Complex I. TTFA (Option B, thenoyltrifluoroacetone) is a specific inhibitor of Complex II. Cyanide (Option D) is a lethal poison that inhibits Complex IV (cytochrome c oxidase) by binding to the heme iron. Understanding these specific inhibitors is fundamental for biochemistry and toxicology. Antimycin is often used in laboratory research to isolate the functions of different segments of the respiratory chain. For the farmer's use in a "water pool" as a piscicide, Antimycin's mechanism of action is the defining characteristic.

Question 18. Production of oxaloacetate is from which of the following amino acid?

A. Alanine

B. Lysine

C. Leucine

D. Aspartate

Correct answer: D

In amino acid metabolism, certain amino acids are classified as glucogenic because they can be converted into intermediates of the TCA cycle or gluconeogenesis. Aspartate is directly converted into oxaloacetate via a transamination reaction. In this reaction, catalyzed by aspartate aminotransferase (AST), the amino group of aspartate is transferred to alpha-ketoglutarate, producing oxaloacetate and glutamate.

Alanine (Option A) is transaminated to produce pyruvate. Lysine (Option B) and Leucine (Option C) are strictly ketogenic amino acids; they are broken down into acetyl-CoA or acetoacetate and cannot be used for the net production of glucose or TCA cycle intermediates like oxaloacetate. Oxaloacetate is a critical four-carbon intermediate that condenses with acetyl-CoA to initiate the TCA cycle and is also the starting material for gluconeogenesis in the liver. Thus, aspartate serves as a vital nitrogen and carbon source for these central metabolic pathways.

Question 19. Name the mineral which is best known for insulin secretion stabilization?

A. Cadmium

B. Copper

C. Iron

D. Zinc

Correct answer: D

Zinc is the mineral most closely associated with the stabilization and storage of insulin within the pancreatic beta cells. Within the secretory granules, insulin molecules form hexamers that are coordinated around two zinc ions. this crystalline structure stabilizes the hormone and protects it from degradation, ensuring it is ready for rapid release into the bloodstream in response to glucose.

Cadmium (Option A) is a toxic heavy metal that can actually damage pancreatic tissue. Copper (Option B) is essential for many enzymes (like cytochrome c oxidase) but is not involved in insulin stabilization. Iron (Option C) is vital for hemoglobin and oxygen transport, and while excess iron can cause "bronze diabetes" by damaging the pancreas, it does not stabilize insulin secretion. Zinc's unique role in insulin biochemistry makes it a key focus in nutritional studies related to glucose tolerance and diabetes management.

Question 20. All of the following can activate Hormone-sensitive lipase. Except?

A. Glucagon

B. Epinephrine

C. ACTH

D. Insulin

Correct answer: D

Hormone-sensitive lipase (HSL) is a key enzyme in adipocytes responsible for the breakdown of stored triacylglycerols into free fatty acids and glycerol (lipolysis). It is activated by phosphorylation in response to hormones that signal a need for energy. Glucagon (Option A), Epinephrine (Option B), and ACTH (Option C) all bind to G-protein coupled receptors that increase intracellular cAMP, thereby activating HSL.

Insulin, conversely, is the primary inhibitor of HSL. When blood glucose is high, insulin is secreted to promote fat storage (lipogenesis) and inhibit the breakdown of fat. It acts by activating a phosphatase that dephosphorylates and inactivates HSL, effectively shutting down lipolysis. This regulatory mechanism ensures that fat stores are mobilized only when other energy sources are low. Therefore, insulin is the exception among the hormones listed, as its role is to suppress rather than activate this enzyme.

Question 21. Which enzyme serves as the rate-limiting step in the heme synthesis pathway?

A. HMB synthase

B. d Amino-Levulinic Acid dehydratase

C. d Amino-Levulinic Acid synthase

D. Ferrochelatase

Correct answer: C

The synthesis of heme is a complex pathway occurring partly in the mitochondria and partly in the cytosol. The rate-limiting and primary regulatory step of the entire pathway is the first step: the condensation of succinyl-CoA and glycine to form delta-aminolevulinic acid. This reaction is catalyzed by the enzyme delta-aminolevulinic acid (ALA) synthase. This enzyme requires pyridoxal phosphate (Vitamin B6) as a cofactor and is inhibited by the end-product, heme (feedback inhibition).

HMB synthase (Option A) is the enzyme deficient in acute intermittent porphyria. ALA dehydratase (Option B) and Ferrochelatase (Option D) are enzymes later in the pathway that are highly sensitive to lead inhibition but are not the primary rate-limiting steps under normal physiological conditions. Proper regulation of ALA synthase is essential to ensure that heme production matches the body's requirements for hemoglobin and other hemoproteins while preventing the accumulation of toxic porphyrin intermediates.

Question 22. A 25-year-old woman presents with easy bruising, prolonged bleeding, and dental caries and is found to have a vitamin deficiency. Which vitamin supplementation would be most appropriate for treating her condition?

A. Vitamin B1

B. Vitamin B9

C. Vitamin D

D. Vitamin K

Correct answer: D

The combination of easy bruising and prolonged bleeding is highly suggestive of a coagulopathy resulting from a Vitamin K deficiency. Vitamin K is an essential cofactor for the gamma-carboxylation of clotting factors II (prothrombin), VII, IX, and X, as well as proteins C and S. Without Vitamin K, these factors are produced in an inactive form, leading to a significantly increased risk of bleeding.

Vitamin B1 (Option A) deficiency causes Wernicke-Korsakoff syndrome. Vitamin B9 (Option B, folate) deficiency results in megaloblastic anemia but not primary bleeding issues. Vitamin D (Option C) is essential for bone health and its deficiency causes rickets or osteomalacia; while the question mentions "dental caries" (which can be seen in Vitamin D or C lack), the primary acute presentation of "prolonged bleeding" points decisively to Vitamin K. Supplementation with Vitamin K is the most appropriate treatment to restore normal clotting function and prevent life-threatening hemorrhage.

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ANATOMY

Question 23. Galactokinesis is governed by:

A. Prolactin

B. Estrogen

C. Oxytocin

D. Progesterone

Correct answer: C

Galactokinesis, which refers to the ejection of milk from the mammary glands, is primarily governed by the hormone oxytocin. This occurs through the "milk-ejection reflex" or "let-down reflex." When an infant suckles, sensory signals are sent to the hypothalamus, triggering the posterior pituitary to release oxytocin into the bloodstream. Oxytocin then causes the contraction of myoepithelial cells surrounding the alveoli, forcing milk into the ducts.

Prolactin (Option A) is responsible for lactogenesis (milk production) and galactopoiesis (maintenance of secretion) but not the actual ejection. Estrogen (Option B) and Progesterone (Option D) are involved in mamogenesis (development of the breast tissue) during pregnancy but actually inhibit the stimulatory effects of prolactin until their levels drop after delivery. Understanding these specific roles is critical for managing lactation issues; oxytocin's role in ejection means that emotional stress or pain can inhibit the let-down reflex by interfering with

oxytocin release.

Question 24. In the management of celiac sprue, patients are advised to adhere strictly to a gluten-free diet to prevent symptom exacerbation and intestinal injury. Which of the following food items should be avoided by individuals with celiac disease?

A. Rice

B. Wheat

C. Dhal

D. Ragi

Correct answer: B

Celiac disease is an autoimmune-mediated enteropathy triggered by the ingestion of gluten, a protein complex found in certain grains. Wheat (Option B) is the most common source of gluten and must be strictly avoided by individuals with this condition. Other grains to avoid include barley and rye (often remembered by the acronym "BROW": Barley, Rye, Oats, Wheat). Ingestion of even small amounts of gluten leads to villous atrophy in the small intestine, resulting in malabsorption and symptoms like diarrhea and weight loss.

Rice (Option A), Dhal (Option C, lentils), and Ragi (Option D, finger millet) are naturally gluten-free and are safe, recommended alternatives for a celiac-friendly diet. Patients must be educated about hidden sources of gluten in processed foods and medications. Adhering to a lifelong gluten-free diet is the only effective treatment to prevent long-term complications such as osteoporosis and intestinal lymphoma.

Question 25. What is the recommended daily protein intake for a 30-year-old woman weighing 55 kg?

A. 45gm

B. 55gm

C. 60gm

D. 70gm

Correct answer: A

The recommended daily protein intake for a healthy adult is commonly based on body weight. According to standard nutritional guidelines such as ICMR, the average requirement is approximately 0.8 grams of protein per kilogram of body weight per day.

For a 30-year-old woman weighing 55 kg:

Protein requirement = 0.8 × 55 = 44 grams/day, which is rounded off to 45 grams/day

This intake is adequate to maintain nitrogen balance, support tissue repair, enzyme and hormone production, and overall metabolic functions in a healthy adult with normal activity levels.

Although some sources mention 1 g/kg/day, especially for easier calculation, the standard recommended dietary allowance (RDA) for adults remains closer to 0.8 g/kg/day, particularly in exam-based contexts like FMGE.

Why Other Options Are Incorrect

(B)

55 gm: Based on 1 g/kg, slightly higher than standard

(C)

60 gm: More than required

(D)

70 gm: Excess unless increased demand (pregnancy, illness)

Question 26. A 35-year-old woman presents with abdominal pain, constipation, and fatigue and is subsequently diagnosed with lead poisoning. Which enzyme defect is most likely responsible for the manifestations of lead toxicity in this patient?

A. ALA synthase

B. ALA dehydratase

C. Heme synthase

D. Coproporphyrinogen oxidase

Correct answer: B

Lead poisoning interferes with several enzymes in the heme biosynthetic pathway, but its most characteristic and potent effect is the inhibition of delta-aminolevulinic acid (ALA) dehydratase. This enzyme (also known as porphobilinogen synthase) catalyzes the second step of the pathway, converting two molecules of ALA into one molecule of porphobilinogen. Lead also inhibits ferrochelatase (Heme synthase, Option C), which is responsible for the final step of inserting iron into protoporphyrin IX.

Inhibition of ALA dehydratase leads to an accumulation of ALA in the blood and urine, which is thought to contribute to the neurological symptoms and abdominal pain seen in lead toxicity. ALA synthase (Option A) is the rate-limiting enzyme but is not the primary target of lead. Coproporphyrinogen oxidase (Option D) is another pathway enzyme but is less sensitive to lead than ALA dehydratase. Clinically, lead poisoning is often identified by "basophilic stippling" on a

blood smear and elevated blood lead levels. Management focuses on removing the source of lead and using chelation therapy in severe cases.

Question 27. In a 30-year-old man presenting with bleeding gums and iron deficiency anemia, deficiency of which vitamin is most likely to be present?

A. Vitamin A

B. Vitamin B1

C. Vitamin C

D. Vitamin D

Correct answer: C

The clinical presentation of a sexually active young female with lower abdominal pain, high-grade fever (103°F), tachycardia (109/min), vomiting, and foul-smelling vaginal discharge strongly suggests an acute ascending genital tract infection. The most significant diagnostic finding in this case is cervical motion tenderness, also known as the Chandelier sign, which is a hallmark clinical feature of Pelvic Inflammatory Disease (PID).

PID results from the ascending spread of microorganisms from the lower genital tract to the uterus, fallopian tubes, and adjacent pelvic structures. It is commonly polymicrobial, with Chlamydia trachomatis and Neisseria gonorrhoeae being frequent causative agents. The presence of systemic signs such as fever and tachycardia indicates active infection and inflammation.

Endometriosis (Option B) and adenomyosis (Option C) typically present with chronic pelvic pain and dysmenorrhea, not acute fever or purulent discharge. Appendicitis (Option D) may cause fever and abdominal tenderness but does not produce cervical motion tenderness or vaginal discharge.

Prompt diagnosis and early antibiotic therapy are crucial in PID to prevent long-term complications such as infertility, chronic pelvic pain, and ectopic pregnancy.

Question 28. In a 40-kg female with a reduced serum sodium level, how much sodium deficit must be corrected to raise her serum sodium to the desired target concentration?

A. 400 mEq

B. 300 mEq

C. 200 mEq

D. 100 mEq

Correct answer: A

The total sodium deficit is calculated using the formula: Sodium Deficit = Total Body Water (TBW) (Desired – Current).

1.

For a female, TBW is approximately 50% of body weight. So, TBW = .

2.

The difference in sodium concentration = .

3.

Calculation: .

Option B (300 mEq), C (200 mEq), and D (100 mEq) are incorrect results of the formula. Clinically, hyponatremia must be corrected cautiously to avoid osmotic demyelination syndrome. The rate of correction is generally limited to no more than 8–10 mEq/L in a 24-hour period for chronic cases. This calculation helps determine the total amount of sodium required, but the actual infusion strategy must consider the concentration of the saline used (e.g., 3% hypertonic saline) and the patient's fluid status.

PATHOLOGY

Question 29. During a routine thyroid examination, a 45-year-old woman is found to have a palpable thyroid nodule, and fine-needle aspiration cytology confirms papillary thyroid carcinoma. Which of the following statements regarding papillary thyroid cancer is NOT true?

A. It often presents with cervical lymph node metastases

B. It is the most common type of thyroid cancer.

C. It arises from parafollicular C-cells

D. It is TSH dependent

Correct answer: C

Papillary thyroid cancer is derived from the follicular cells of the thyroid, not the parafollicular C-cells. Parafollicular C-cells give rise to medullary thyroid cancer, which secretes calcitonin.

The other statements are correct: it is indeed the most common type of thyroid cancer (Option B), accounting for over 80% of cases. It is known for its slow growth and frequent spread to cervical lymph nodes (Option A), although this does not significantly worsen the generally excellent prognosis. Most well-differentiated thyroid cancers, including papillary, are TSH dependent (Option D), meaning that suppressing TSH levels with levothyroxine is a key part of post-operative management to prevent recurrence. Histologically, it is recognized by characteristic features such as "Orphan Annie eye" nuclei and psammoma bodies. Understanding these distinctions is vital for the correct diagnosis and staging of thyroid malignancies.

Question 30. A patient develops immune-mediated hemolytic anemia following administration of penicillin, indicating an adverse drug reaction. This immune response represents which type of hypersensitivity reaction?

A. Type 1

B. Type 2

C. Type 3

D. Type 4

Correct answer: B

Drug-induced immune hemolytic anemia caused by penicillin is a classic example of a Type 2 (cytotoxic) hypersensitivity reaction. In this mechanism, penicillin acts as a hapten and binds to the surface of red blood cells. The immune system then produces antibodies (usually IgG or IgM) that specifically target the penicillin-coated RBCs. This leads to the destruction of the cells via the complement system or phagocytosis by splenic macrophages.

Type 1 (Option A) is IgE-mediated and results in immediate anaphylaxis or hives. Type 3 (Option C) involves the deposition of circulating immune complexes in tissues, leading to conditions like serum sickness. Type 4 (Option D) is a cell-mediated (delayed) response, such as contact dermatitis. While penicillin can cause any of these reactions, the specific destruction of blood cells mediated by surface-bound antibodies is uniquely categorized as Type 2. Clinically, this is confirmed by a positive Direct Antiglobulin (Coombs) test.

Question 31. A 50-year-old man presents with a movement disorder marked by hand tremors, along with cognitive decline and emotional disturbances. Given the age of onset and the combination of motor and neuropsychiatric features, which diagnosis best fits this clinical presentation?

A. Parkinson disease

B. Friedreich Ataxia

C. Alzheimer's disease

D. Huntington chorea/CAG repeats

Correct answer: D

The triad of an adult-onset movement disorder (tremors/chorea), cognitive decline (dementia), and emotional/psychiatric symptoms is diagnostic for Huntington's disease. This is an

autosomal dominant neurodegenerative disorder caused by an unstable expansion of CAG repeats in the huntingtin gene. Imaging characteristically shows atrophy of the caudate nucleus and putamen.

Parkinson’s disease (Option A) primarily presents with resting tremors and bradykinesia, while cognitive decline usually occurs much later in the disease course. Friedreich Ataxia (Option B) typically presents in childhood or adolescence with cerebellar signs and limb weakness. Alzheimer’s disease (Option C) is primarily a disorder of memory and cognition, and while motor symptoms can occur, they are not the presenting feature in a 50-year-old. The progressive nature and the specific combination of "choreiform" movements and psychiatric changes are the defining features of Huntington's, making genetic testing for CAG repeats the confirmatory step.

Question 32. A 62-year-old man with a history of coronary artery disease presents for routine follow-up. His blood glucose and lipid profile are normal, but laboratory testing reveals an elevated homocysteine level above the normal range. Based on these findings, deficiency of which enzyme is most likely responsible?

A. Homogentisate oxidase

Examination Paper July 2023 Question

D. Acal

Correct answer: A

Alzheimer's disease is the most common cause of dementia in the elderly and is pathologically characterized by the extracellular deposition of amyloid plaques and intracellular neurofibrillary tangles. The primary protein component responsible for these amyloid plaques is the Amyloid-beta (Aβ) protein. Aβ is derived from the proteolytic cleavage of the larger Amyloid Precursor Protein (APP) by β-secretase and γ-secretase. In contrast, ATTR (Option B) refers to transthyretin amyloidosis, which typically affects the heart and nerves in familial or senile systemic amyloidosis. Amyloid beta-2 (Option C, -microglobulin) is associated with dialysis-related amyloidosis. Acal (Option D, Procalcitonin-derived) is found in medullary thyroid carcinoma. The accumulation of Aβ is thought to trigger a cascade of neurotoxicity, leading to the formation of tangles (composed of hyperphosphorylated tau protein) and subsequent neuronal death and cognitive decline. Understanding the specific Aβ protein is the target of modern research, including monoclonal antibody therapies designed to clear these plaques from the brain to slow disease progression.

Question 33. TSH suppression therapy. The combination of

patient age, ultrasound findings, and specific nuclear histology is diagnostic.

A 70-year-old man presents with low back pain and progressive pallor. Investigations show abnormal kidney function tests, normal liver function with preserved albumin levels, markedly increased gamma globulins, and multiple lytic lesions on spinal X-ray. Which diagnosis is most consistent with these findings?

A. Multiple myeloma

B. MGUS

C. Immunoglobulin light chain amyloidosis (AL)

D. Solitary plasmacytoma

Correct answer: A

This question provides the classic clinical and laboratory constellation for Multiple Myeloma. The "CRAB" criteria are all present: Calcium elevation (implied by lytic lesions), Renal insufficiency (abnormal KFT), Anemia (progressive pallor), and Bone lesions (multiple lytic lesions on spine X-ray). The biochemical hallmark—disproportionately increased gamma globulins (the M-spike) in the presence of a normal liver profile—is definitive for a monoclonal gammopathy.

MGUS (Option B, monoclonal gammopathy of undetermined significance) lacks end-organ damage like renal failure or bone lesions. AL amyloidosis (Option C) involves systemic organ deposition and often presents with nephrotic syndrome or cardiomyopathy, but not characteristically multiple lytic bone lesions. A solitary plasmacytoma (Option D) would present as a single bone lesion without the systemic features and widespread bone involvement seen here. Multiple myeloma is a malignancy of plasma cells that necessitates intensive chemotherapy and potentially bone marrow transplantation.

A 45-year-old patient presents with severe headaches, seizures, and progressive neurological

deficits. Neuroimaging reveals a large brain mass with irregular margins and areas of necrosis, and biopsy confirms a malignant tumor. What is the most common primary brain tumor in adults suggested by this presentation?

(A)

Medulloblastoma

(B)

Meningioma

(C)

Retinoblastoma

(D)

Glioblastoma

Question 34. A 45-year-old patient presents with fatigue, nausea, and jaundice lasting for more than 15 days, with liver enzyme findings consistent with hepatitis A infection. Which term best describes the stage of hepatitis A in this patient?

A. Early Acute

B. Acute

C. Chronic

D. Severe

Correct answer: B

A Virus (HAV) infection is characteristically an acute, self-limiting illness. It is transmitted through the fecal-oral route and presents with symptoms of fever, nausea, and jaundice once the incubation period has passed. The patient's presentation of jaundice persisting for 15 days along with elevated enzymes fits the clinical definition of an acute stage infection. Crucially, HAV never causes chronic infection (Option C), unlike Hepatitis B or C; there is no carrier state or long-term viral persistence. "Early Acute" (Option A) would describe the prodromal phase before the onset of jaundice. While some cases can be "Severe" (Option D) or fulminant, leading to acute liver failure, the standard term for the symptomatic phase described is simply acute hepatitis. Diagnosis is confirmed by the presence of anti-HAV IgM antibodies in the serum, which indicate a current or recent infection. Treatment is purely supportive, focusing on hydration and monitoring for rare complications, as the vast majority of patients recover completely with lifelong immunity provided by anti-HAV IgG antibodies.

Question 35. In a patient presenting with weight gain, fatigue, and cold intolerance suggestive of hypothyroidism, thyroid hormones primarily exert their effects through which type of

receptor?

A. Cytoplasmic receptors

B. Nuclear receptors

C. Tyrosine kinase

D. GPCR

Correct answer: B

The patient's symptoms of weight gain, fatigue, and cold intolerance are classic indicators of hypothyroidism. Thyroid hormones (and) exert their primary physiological effects by binding to Nuclear receptors. These receptors act as ligand-regulated transcription factors. Once enters the nucleus, it binds to the thyroid hormone receptor (TR), which is often pre-bound to thyroid response elements (TREs) on the DNA. This binding triggers the recruitment of coactivators and the initiation of gene transcription, leading to the synthesis of various proteins that regulate basal metabolic rate, thermogenesis, and heart rate. Cytoplasmic receptors (Option A) are used by steroid hormones but they eventually translocate to the nucleus. Tyrosine kinase receptors (Option C) are used by insulin and growth factors. G-protein coupled receptors (GPCR, Option D) are used by peptide hormones and TSH (the hormone that stimulates the thyroid). Understanding the nuclear mechanism is fundamental for explaining why thyroid hormone effects have a slow onset and long duration, as they require changes in protein synthesis.

Question 36. A 35-year-old patient undergoes endoscopic evaluation for recurrent abdominal discomfort and altered bowel habits. Which anatomical structure is indicated by the arrow in the provided image?

A. Brunner gland

B. Intestinal cell of kajal

C. Crypts of lieberkuhn

D. Peyer's patch

Correct answer: A

The given histological image represents a section of the duodenum, which can be identified by the presence of finger-like villi in the mucosa and prominent glandular structures in the submucosa. The arrow is pointing to clusters of mucous-secreting glands located beneath the mucosal layer. These are Brunner’s glands, a distinctive feature of the duodenum.

Brunner’s glands secrete an alkaline mucus rich in bicarbonate ions, which plays a crucial role in neutralizing the acidic chyme entering from the stomach. This protective mechanism helps prevent damage to the intestinal lining and provides an optimal pH for pancreatic enzyme activity.

Why Other Options Are Incorrect

(B)

Interstitial cells of Cajal: These are microscopic pacemaker cells and are not visible as large glandular clusters

(C)

Crypts of Lieberkühn: Present in the mucosa, not in the submucosa

(D)

Peyer’s patches: Lymphoid aggregates found in the ileum, not in the duodenum

Question 37. A 40-year-old patient is diagnosed with a tumor in the hypothalamic region that compresses the supraoptic nucleus. Which hormonal imbalance is most likely to result from this condition?

A. ACTH

B. GH

C. ADH

D. TSH

Correct answer: C

The Supraoptic nucleus of the hypothalamus is the primary site for the synthesis of Antidiuretic Hormone (ADH), also known as vasopressin. Once synthesized, ADH travels down the axons to be stored and released from the posterior pituitary gland. A tumor exerting pressure on or destroying the supraoptic nucleus will lead to a deficiency in ADH. This results in Central Diabetes Insipidus, a condition characterized by the inability of the kidneys to concentrate urine, leading to polyuria (excessive urination) and polydipsia (excessive thirst). ACTH (Option A), Growth Hormone (Option B), and TSH (Option D) are synthesized in the anterior pituitary gland. While their release is controlled by hypothalamic releasing hormones, the supraoptic nucleus specifically produces ADH (and some oxytocin). Clinically, this patient would require lifelong replacement therapy with desmopressin, a synthetic ADH analog, to manage fluid balance. Diagnosis of central DI is confirmed by a water deprivation test followed by a positive response to desmopressin.

Question 38. Among the conditions listed, the one that does not result from exotoxins is:

A. Meningitis

B. HUS

C. Toxic shock syndrome

D. Pseudomembranous colitis

Correct answer: A

Exotoxins are potent proteins secreted by bacteria that cause specific systemic or local damage. Meningitis (Option A) is an inflammation of the protective membranes covering the

brain and spinal cord, typically caused by direct bacterial invasion (e.g., N. meningitidis or S. pneumoniae) and the resulting inflammatory response to endotoxins (LPS) released upon bacterial death, rather than a secreted exotoxin. In contrast, Hemolytic Uremic Syndrome (Option B) is caused by the Shiga toxin (an exotoxin) produced by E. coli O157:H7. Toxic Shock Syndrome (Option C) results from the TSST-1 superantigen exotoxin of S. aureus. Pseudomembranous colitis (Option D) is caused by Toxins A and B secreted by Clostridioides difficile. These exotoxins act directly on target cells to induce the specific clinical syndromes. Meningitis pathogenesis is complex and primarily driven by the host's massive cytokine response to bacterial cell wall components in the subarachnoid space. Differentiating toxin-mediated diseases from direct invasive infections is critical for determining appropriate therapeutic interventions like antitoxins versus standard antibiotics.

Question 39. Which substance serves as a mediator in chronic inflammation?

A. IL-1

B. TNF alpha

C. TGF-beta

D. None

Correct answer: C

Chronic inflammation is characterized by a long duration, tissue destruction, and attempts at healing through fibrosis. TGF-beta (Transforming Growth Factor-beta) is a critical anti-inflammatory cytokine and a central mediator in chronic inflammation. It plays a dual role: it suppresses the inflammatory response by inhibiting lymphocyte activity, while simultaneously acting as the most potent inducer of fibrosis by stimulating fibroblast migration and collagen synthesis. IL-1 (Option A) and TNF-alpha (Option B) are classic mediators of acute inflammation, responsible for initiating the vascular response, fever, and acute-phase reactant production. While they can be present in chronic inflammation (as in autoimmune diseases), TGF-beta is specifically characteristic of the chronic phase's reparative and fibrotic processes. The persistence of TGF-beta can lead to pathological scarring in organs, such as liver cirrhosis or pulmonary fibrosis. Understanding these mediators is essential for developing therapies to control chronic inflammatory diseases and prevent permanent organ damage resulting from excessive fibrotic remodeling.

Question 40. may require repeated doses or an infusion if "re-sedation" occurs once the flumazenil wears off. It is primarily used for acute poisoning or to reverse conscious sedation post-procedure.

A 54-year-old patient receiving chemotherapy with cisplatin develops notable adverse effects. Which side effect is most commonly associated with cisplatin

therapy?

A. GI symptoms

B. Neuropathy

C. Cardiotoxicity

D. Myopathy

Correct answer: A

Cisplatin is a potent platinum-based alkylating agent used for various solid tumors, but it has a very high "emetic potential". The most common and immediate side effects of cisplatin are severe GI symptoms, specifically nausea and intractable vomiting. These symptoms are so prevalent that almost all patients require aggressive pre-treatment with anti-emetics like 5-HT3 antagonists (e.g., ondansetron) and dexamethasone. While Neuropathy (Option B, specifically sensory peripheral neuropathy) and Nephrotoxicity (damage to renal tubules) are significant dose-limiting toxicities, they are typically cumulative rather than immediate. Cardiotoxicity (Option C) and Myopathy (Option D) are rare side effects compared to the near-universal GI distress. Clinicians must also vigilantly monitor renal function and hearing (ototoxicity), as cisplatin can cause permanent damage to the hair cells in the cochlea. Aggressive hydration is a standard preventive measure used during administration to minimize the risk of acute kidney injury.

Which cellular process does Bedaquiline primarily target to exert its therapeutic effect?

(A)

ATP synthesis inhibition

(B)

Mycolic acid synthesis inhibition

(C)

Protein inhibition

(D)

Inhibiting reverse transcriptase enzyme

Question 41. Which cellular process does Bedaquiline primarily target to exert its therapeutic effect?

A. ATP synthesis inhibition

B. Mycolic acid synthesis inhibition

C. Protein inhibition

D. Inhibiting reverse transcriptase enzyme

Correct answer: A

Bedaquiline is a novel, breakthrough diarylquinoline antibiotic used specifically for the treatment of multidrug-resistant tuberculosis (MDR-TB). Its unique mechanism of action involves the inhibition of ATP synthesis within the Mycobacterium tuberculosis bacterium. It specifically binds to the C-subunit of the mycobacterial ATP synthase enzyme, which is the rotary engine that generates ATP through the proton gradient. By cutting off the energy supply, bedaquiline effectively kills both active and dormant bacilli, as even non-replicating bacteria require ATP for survival. Mycolic acid synthesis inhibition (Option B) is the mechanism of isoniazid and ethionamide. Protein synthesis inhibition (Option C) is how aminoglycosides or linezolid work. Inhibiting reverse transcriptase (Option D) is the mechanism for antiretroviral drugs used in HIV. Clinically, bedaquiline is reserved for complex cases due to its risk of QT interval prolongation, but its targeted action on bioenergetics makes it a cornerstone of modern MDR-TB regimens.

Question 42. Which drug is routinely administered preoperatively in patients with pheochromocytoma to control blood pressure and prevent hypertensive crises?

A. Captopril

B. Propranolol

C. Nifedipine

D. Phenoxybenzamine

Correct answer: D

Pheochromocytoma is a catecholamine-secreting tumor of the adrenal medulla that causes severe paroxysmal hypertension. The gold-standard medication for preoperative management

is Phenoxybenzamine. It is an irreversible, long-acting non-selective alpha-adrenergic blocker that prevents the surge of blood pressure during tumor handling by binding to and receptors. Captopril (Option A, ACE inhibitor) and Nifedipine (Option C, CCB) can be used as adjuncts but are not the primary agents. Crucially, Propranolol (Option B, beta-blocker) must never be given alone before alpha-blockade is established. Blocking -mediated vasodilation while leaving alpha-mediated vasoconstriction unopposed can lead to a catastrophic, life-threatening hypertensive crisis. The standard "alpha-first" rule requires alpha-blockade for at least 10–14 days pre-surgery to allow for volume expansion. Beta-blockers are only added once alpha-blockade is effective, specifically to manage catecholamine-induced tachycardia. Proper preoperative preparation is essential for a safe surgical outcome.

Question 43. In managing a case of facial nerve palsy, what is the preferred drug for the treatment?

A. Acyclovir

B. Prednisolone

C. Ceftriaxone

D. Naproxen

Correct answer: B

For the treatment of acute idiopathic facial nerve palsy (Bell's palsy), Prednisolone (an oral corticosteroid) is the preferred drug and the cornerstone of therapy. Extensive clinical evidence shows that starting high-dose prednisolone within 72 hours of symptom onset significantly increases the likelihood of complete recovery by reducing inflammation and edema of the facial nerve within the narrow bony facial canal. Acyclovir (Option A) is an antiviral that may be added to steroids in severe cases where a viral etiology (like HSV-1) is suspected, but it is not recommended as monotherapy. Ceftriaxone (Option C) is an antibiotic with no role in Bell's palsy management unless there is an associated Lyme disease infection. Naproxen (Option D) is an NSAID that provides analgesia but lacks the potent anti-inflammatory effects of steroids needed for nerve recovery. Management also includes eye protection (lubricants and nocturnal taping) to prevent exposure keratopathy due to impaired eyelid closure. Early steroid intervention remains the most vital factor for improving long-term neurological outcomes.

Question 44. In the treatment of Thalamic Dejerine syndrome, which of the following drugs is least effective or least useful in its management?

A. Pregabalin

B. Carbamazepine

C. Gabapentin

D. NSAID analgesic

Correct answer: D

Thalamic Dejerine Syndrome (or Dejerine-Roussy syndrome) is a condition of central post-stroke pain resulting from a lesion in the sensory nuclei of the thalamus. It is characterized by severe, often burning, paroxysmal pain and allodynia on the contralateral side of the body. Because the pain is neuropathic (central) in origin, NSAID analgesics (Option D) like ibuprofen are least useful and generally ineffective as they target peripheral inflammatory pathways rather than central neurotransmission. In contrast, medications that modulate neurotransmitters in the CNS are the mainstay of treatment. Pregabalin (Option A) and Gabapentin (Option C) are first-line agents that bind to calcium channels to reduce neuronal hyperexcitability. Carbamazepine (Option B), an anticonvulsant, is also effective for shooting or paroxysmal components of central pain. Other useful classes include TCAs or SNRIs. This syndrome is notorious for being difficult to treat and often requires a multimodal approach combining pharmacological therapy with psychological support and physical rehabilitation.

Question 45. Which of the following drugs is NOT classified as a selective serotonin reuptake inhibitor (SSRI) used in the treatment of depression?

A. Fluoxetine

B. Sertraline

C. Trazodone

D. Escitalopram

Correct answer: C

Trazodone (Option C) is an antidepressant, but it is not classified as an SSRI. Instead, it belongs to the class of Serotonin Antagonist and Reuptake Inhibitors (SARIs). It works primarily by blocking receptors and moderately inhibiting serotonin reuptake. Due to its potent and blocking effects, it is highly sedative and is often used off-label at low doses as a sleep aid for patients with insomnia. A classic, rare, but serious side effect of trazodone is priapism ("Trazobone"). Fluoxetine (Option A), Sertraline (Option B), and Escitalopram (Option D) are all classic SSRIs, which are the standard first-line treatments for major depressive disorder and various anxiety disorders due to their favorable safety profile and lack of significant sedation compared to older antidepressants. Accurate classification of psychiatric medications is essential for predicting side-effect profiles (like the weight gain of mirtazapine versus the sexual dysfunction of SSRIs) and tailoring treatment to the patient's specific symptoms.

Question 46. A 55-year-old patient with colorectal cancer is receiving chemotherapy. Which drug acts primarily by inhibiting the availability of thymidylate during DNA synthesis?

A. Rituximab

B. Cisplatin

C. 5-fluorouracil

D. Methotrexate

Correct answer: C

In the treatment of colorectal cancer, 5-fluorouracil (5-FU) is a fundamental antimetabolite drug. Its primary mechanism of action is the inhibition of thymidylate synthase, the enzyme responsible for converting dUMP to dTMP (thymidylate). By irreversibly binding to the enzyme along with a folate cofactor, 5-FU creates a "thymineless death" for rapidly dividing cancer cells by halting DNA synthesis. Methotrexate (Option D) also affects thymidylate but it works upstream by inhibiting dihydrofolate reductase, thereby depleting the folate cofactor rather than primarily the enzyme itself. Cisplatin (Option B) is an alkylating-like agent that causes DNA cross-links. Rituximab (Option A) is a monoclonal antibody against CD20 used for lymphomas. 5-FU is often administered with leucovorin, which actually potentiates 5-FU's inhibition of thymidylate synthase by increasing the formation of the stable ternary complex. Clinically, 5-FU is associated with side effects like myelosuppression, diarrhea, and the characteristic hand-foot syndrome.

Question 47. A 35-year-old woman with sickle cell disease presents with painful episodes involving the extremities and trunk, suggestive of vaso-occlusive and thromboembolic events. Which medication is used initially for prophylaxis in this condition?

A. LMWH

B. Warfarin

C. Aspirin

D. Dabigatran

Correct answer: A

Patients with sickle cell disease (SCD) are in a chronic hypercoagulable state and are at high risk for venous thromboembolism (VTE), especially during an acute vaso-occlusive crisis. For a patient hospitalized with a crisis where thromboembolism is suspected, the initial medication for prophylaxis or treatment is Low-Molecular-Weight Heparin (LMWH), such as enoxaparin. LMWH provides rapid anticoagulation by inactivating Factor Xa and has a more predictable response than unfractionated heparin. Warfarin (Option B) is an oral vitamin K antagonist used for long-term maintenance but takes several days to become therapeutic and requires initial "bridging" with heparin. Aspirin (Option C) is an antiplatelet agent and is generally insufficient for preventing or treating venous clots like DVT or PE. Dabigatran (Option D) is a direct thrombin inhibitor not typically used as the initial inpatient prophylactic choice in SCD. Early use of LMWH, along with aggressive hydration and pain management, is critical for reducing the

high morbidity and mortality associated with thromboembolic complications in sickle cell patients.

Question 48. A 30-year-old man develops chest tightness, shortness of breath, and altered consciousness while undertaking a high-altitude mountain pilgrimage. Which intervention would provide symptomatic relief in this situation?

A. Mannitol

B. Digoxin

C. Diltiazem

D. Acetazolamide

Correct answer: D

The patient is likely suffering from High-Altitude Cerebral Edema (HACE) or severe Acute Mountain Sickness (AMS). The primary intervention for providing relief and facilitating acclimatization is Acetazolamide. It is a carbonic anhydrase inhibitor that induces a mild metabolic acidosis by increasing renal bicarbonate excretion. This acidosis stimulates the respiratory centers in the medulla to increase ventilation, thereby counteracting the low atmospheric oxygen levels. Mannitol (Option A) is an osmotic diuretic used for cerebral edema in other contexts but is not the standard for high-altitude illness. Digoxin (Option B) and Diltiazem (Option C) are cardiac medications with no role in high-altitude relief. For patients with severe HACE or High-Altitude Pulmonary Edema (HAPE), the absolute most critical intervention is immediate descent to a lower altitude and supplemental oxygen. Dexamethasone is often added to acetazolamide for HACE to reduce brain swelling. Acetazolamide remains the foundational pharmacological tool for both preventing and treating high-altitude sickness in trekkers and pilgrims.

Question 49. Which chemotherapeutic drug is most likely to cause extrapyramidal symptoms such as acute dystonia, bradykinesia, and tremors in a patient receiving chemotherapy?

A. Ondansetron

B. Metoclopramide

C. Meclizine

D. Scopolamine

Correct answer: B

Metoclopramide is a commonly used anti-emetic, particularly in patients undergoing chemotherapy. It acts primarily as a dopamine D_2-receptor antagonist. Because it readily crosses the blood–brain barrier, metoclopramide blocks dopamine receptors in the basal

ganglia, which can lead to extrapyramidal side effects (EPS). These include acute dystonia, parkinsonism (bradykinesia, rigidity, tremors), and akathisia, and they occur more frequently in children and young adults.

Ondansetron (Option A) is a 5-HT_3 (serotonin) receptor antagonist and does not interfere with dopaminergic pathways; therefore, it does not cause EPS. Meclizine (Option C) and scopolamine (Option D) are antihistaminic and anticholinergic agents, respectively, used mainly for motion sickness and vestibular disorders, and they are not associated with dystonic reactions.

Acute dystonic reactions due to metoclopramide can be rapidly reversed with anticholinergic agents such as diphenhydramine or benztropine. With prolonged or high-dose use, metoclopramide carries a risk of tardive dyskinesia, which may be irreversible, hence the drug carries a black-box warning.

Question 50. How should steroid therapy be administered for a 55-year-old male diagnosed with Addison's disease?

A. Bolus dose of 100mg

B. Bolus of 100mg, followed by 200mg over 24 hours

C. Bolus of 200 mg, followed by 500 mg over 24 hours

D. Infusion of 500 mg over 24 hours

Correct answer: B

In the management of an Addisonian crisis (acute adrenal insufficiency), rapid replacement of glucocorticoids is life-saving. The standard protocol involves an immediate intravenous bolus of 100 mg of hydrocortisone. This is followed by either continuous infusion or intermittent doses totaling 200 mg over the subsequent 24 hours. Options C and D (500 mg) represent excessively high doses that are generally not required and increase the risk of side effects. Hydrocortisone is preferred because it has both glucocorticoid and mineralocorticoid activity, though aggressive fluid resuscitation with normal saline is also mandatory to correct the associated hypotension and electrolyte imbalances (hyponatremia/hyperkalemia). Once the patient is stabilized and can tolerate oral intake, the dose is gradually tapered to a maintenance level (typically 15–25 mg daily). Identifying the trigger for the crisis, such as infection or stress, is also a critical part of management to prevent future life-threatening episodes.

84. Which neuromuscular blocking agent undergoes Hofmann elimination?

(A) Pancuronium

(B) Rocuronium

Question 51. 83. (B) Bolus of 100mg, followed by 200mg over 24 hours

In the management of an Addisonian crisis (acute adrenal insufficiency), rapid replacement of glucocorticoids is life-saving. The standard protocol involves an immediate intravenous bolus of 100 mg of hydrocortisone. This is followed by either continuous infusion or intermittent doses totaling 200 mg over the subsequent 24 hours. Options C and D (500 mg) represent excessively high doses that are generally not required and increase the risk of side effects. Hydrocortisone is preferred because it has both glucocorticoid and mineralocorticoid activity, though aggressive fluid resuscitation with normal saline is also mandatory to correct the associated hypotension and electrolyte imbalances (hyponatremia/hyperkalemia).

Once the patient is stabilized and can tolerate oral intake, the dose is gradually tapered to a maintenance level (typically 15–25 mg daily). Identifying the trigger for the crisis, such as infection or stress, is also a critical part of management to prevent future life-threatening episodes.

Which neuromuscular blocking agent undergoes Hofmann elimination?

A. Pancuronium

B. Rocuronium

C. Vecuronium

D. Atracurium

Correct answer: D

Atracurium is a non-depolarizing

neuromuscular blocking agent that is unique because it undergoes Hofmann elimination. Hofmann elimination is a spontaneous, non-enzymatic chemical degradation that occurs

Question 52. lead to hyperkalemia and various heart blocks or bradyarrhythmias. The plant description (long, narrow leaves) and the clinical picture of cardiotoxicity are classic for Oleander. Ricinus communis (Option B) contains ricin, which causes severe hemorrhagic gastroenteritis but not primary cardiac arrhythmias. Datura (Option C) presents with anticholinergic symptoms—the "dry as a bone, red as a beet, mad as a hatter" triad—including dilated pupils and tachycardia, rather than the gastrointestinal-cardiac mix seen here. Papaver somniferum (Option D), the opium poppy, causes CNS depression, pinpoint pupils, and respiratory depression. Given the presence of gastrointestinal distress coupled with life-threatening cardiac irregularities, Yellow Oleander is the most probable toxicological culprit.

During the autopsy of a 30-year-old man who died due to drowning, the pathologist observes several cut-like marks on the arms. In the context of drowning, these findings raise questions about their origin. What is the most likely explanation for these marks on the victim’s arms?

A. Defense wound

B. Self inflicted injury

C. Accidental cut wound from falling

D. Washer-women hands

Correct answer: A

The image shows multiple irregular cut-like wounds on the palm and fingers, which are characteristic of defense wounds. These injuries occur when a person actively tries to protect themselves from an assault, typically by raising their hands to block or grab a weapon. As a

result, cuts are commonly seen on the palms, fingers, and forearms.
In the context of drowning, the presence of such injuries suggests that the victim may have been attacked before or during entry into water, rather than accidental drowning alone. Defense wounds indicate struggle and possible homicidal involvement.
Why Other Options Are Wrong
(B) Self-inflicted injury: Usually more superficial, accessible, and patterned
(C) Accidental cuts: Random and less localized to defensive areas
(D) Washer-women hands: Refers to wrinkling of skin after prolonged immersion, not cuts
A 35-year-old patient presents to the outpatient department with a history of prolonged topical steroid use for a skin disorder. The patient reports an enlarging rash that has become less itchy and less erythematous after steroid application. On examination, well-defined, mildly raised plaques with central clearing and a scaly margin are seen over multiple body sites. What is the most likely diagnosis in this case?
(A) Tinea incognito
(B) Tinea corporis
(C) Tinea cruris
(D) Tinea pedis

Question 53. A 35-year-old patient presents to the outpatient department with a history of prolonged topical steroid use for a skin disorder. The patient reports an enlarging rash that has become less itchy and less erythematous after steroid application. On examination, well-defined,

mildly raised plaques with central clearing and a scaly margin are seen over multiple body sites. What is the most likely diagnosis in this case?

A. Tinea incognito

B. Tinea corporis

C. Tinea cruris

D. Tinea pedis

Correct answer: A

Tinea incognito is a fungal infection (dermatophytosis) that has had its classic clinical appearance altered by the inappropriate application of topical or systemic corticosteroids. Ordinarily, tinea presents with highly inflammatory, itchy, and well-defined scaly borders. Steroids suppress this local inflammation, making the rash appear "less red and itchy," but they simultaneously impair the local immune response, allowing the fungus to proliferate more extensively into deeper layers of the skin. This often results in a less well-defined, widespread, and "bizarre" looking rash. Tinea corporis (Option B) refers to a standard ringworm infection of the body without steroid modification. Tinea cruris (Option C) is specific to the groin area, and tinea pedis (Option D) is athlete's foot. The patient’s specific history of using steroids followed by an "expanding" but less symptomatic rash is the hallmark of tinea incognito, requiring cessation of steroids and initiation of proper antifungal therapy for resolution.

Question 54. A 45-year-old man from a tropical region presents with a history of recurrent episodes of fever and chills along with progressive swelling of the lower limbs over several months. Examination reveals marked non-pitting edema of both legs extending to the scrotum, with thickened, mildly erythematous skin. He reports similar episodic symptoms over the past few years, and laboratory investigations show eosinophilia. Involvement of which structure is responsible for the development of this condition?

A. Arteries

B. Veins

C. Lymphatics

D. DVT

Correct answer: C

The clinical presentation of recurrent fever, chills, and massive, thickened, non-pitting edema of the lower extremities and scrotum (elephantiasis) in a tropical resident is classic for Lymphatic

Filariasis, caused by parasites like Wuchereria bancrofti. These filarial worms reside in and damage the lymphatic vessels, leading to chronic lymphatic obstruction and stasis. Unlike venous edema, lymphatic edema is "non-pitting" because of the accumulation of protein-rich fluid and subsequent subcutaneous fibrosis and skin thickening (hyperkeratosis). Eosinophilia is a common laboratory finding in parasitic infections. Arteries (Option A) and veins (Option B) are not the primary sites of filarial worm residence or the cause of this specific type of hard, fibrotic swelling. Deep Vein Thrombosis (DVT, Option D) causes acute, painful, pitting edema, usually in one leg, and does not lead to the chronic, massive skin changes or scrotal involvement characteristic of filarial elephantiasis. Therefore, the involvement of the lymphatic system is the definitive cause of this condition.

Question 55. A 28-year-old woman presents with continuous diarrhea, abdominal discomfort, bloating, and weight loss over the past two weeks. She reports recent camping in a rural area and consumption of untreated stream water. On examination, her temperature is normal, and mild tenderness is noted in the right upper quadrant. Stool analysis reveals trophozoites and cysts, with microscopic observation showing the characteristic “falling leaf” motility. Which organism is most likely responsible for her symptoms?

A. Salmonella typhi

B. Entamoeba histolytica

C. Giardia lamblia

D. Cryptosporidium parvum

Correct answer: C

The history of drinking untreated stream water during a camping trip, followed by bloating, flatulence, and "greasy" or continuous diarrhea, is the classic presentation for Giardiasis. The pathognomonic laboratory finding for Giardia lamblia is the observation of pear-shaped trophozoites with a "falling leaf" motility on a wet mount of fresh stool. Giardia trophozoites use their ventral sucking discs to attach to the intestinal mucosa, leading to malabsorption and weight loss. Salmonella typhi (Option A) causes enteric fever, characterized by high fever and "pea soup" diarrhea, which is inconsistent with the patient's normal temperature. Entamoeba histolytica (Option B) causes amoebic dysentery, typically presenting with bloody stools and trophozoites that may contain ingested RBCs, rather than "falling leaf" motility. Cryptosporidium parvum (Option D) also causes waterborne diarrhea, especially in immunocompromised individuals, but is identified by acid-fast staining of oocysts, not by the

distinctive flagellated motility of Giardia. Thus, Giardia lamblia is the only diagnosis fitting all clinical and microscopic clues.

Question 56. A 54-year-old woman with a history of rheumatic heart disease and prosthetic valve replacement six months ago presents with fever, fatigue, and progressively worsening shortness of breath. Examination reveals a new heart murmur and splinter hemorrhages on the nail beds, suggestive of infective endocarditis. Considering her prosthetic valve and current presentation, which organism is most likely responsible for her infective endocarditis?

C. Vecuronium

D. Atracurium

Correct answer: D

Atracurium is a non-depolarizing neuromuscular blocking agent that is unique because it undergoes Hofmann elimination. Hofmann elimination is a spontaneous, non-enzymatic chemical degradation that occurs at physiological temperature and pH. Because this process is independent of kidney and liver function, atracurium (and its isomer cisatracurium) is the drug of choice for inducing muscle relaxation in patients with renal or hepatic failure. Pancuronium (Option A), Rocuronium (Option B), and Vecuronium (Option C) are primarily cleared by the liver or kidneys; their duration of action is significantly prolonged in patients with organ dysfunction, increasing the risk of prolonged paralysis. A byproduct of atracurium's degradation is laudanosine, which can theoretically cross the blood-brain barrier and cause seizures at very high concentrations. Cisatracurium is often preferred as it produces less laudanosine and does not cause histamine release. Understanding these specific metabolic pathways is fundamental for choosing safe anesthetic agents for medically complex surgical patients.

FORENSIC MEDICINE

Question 57. A 55-year-old man presents with fever, night sweats, and pleural effusion, and is subsequently diagnosed with Primary Effusion Lymphoma. Which infectious agent is most likely responsible for this condition?

A. HHV-8

B. EBV

C. HPV

D. HIV

Correct answer: A

Primary Effusion Lymphoma (PEL) is a rare B-cell non-Hodgkin lymphoma that characteristically presents as malignant effusions in body cavities without a detectable solid tumor mass. It is most commonly seen in patients with advanced HIV/AIDS. The pathognomonic causative agent is Human Herpesvirus-8 (HHV-8), also known as Kaposi Sarcoma-associated Herpesvirus. Epstein-Barr Virus (EBV) (Option B) is often a co-infectant in these malignant cells but is not the primary driver like HHV-8. HPV (Option C) is associated with cervical and oropharyngeal cancers. HIV (Option D) creates the underlying immunosuppression that allows HHV-8 to trigger lymphoproliferation, but it is not the direct viral cause of the lymphoma itself. PEL typically presents with pleural, pericardial, or peritoneal effusions in immunocompromised individuals. Diagnosis is confirmed by cytological examination of the effusion fluid showing large pleomorphic cells that are universally positive for HHV-8. The prognosis is generally poor, requiring intensive chemotherapy and optimized antiretroviral therapy.

Question 58. A 30-year-old patient presents with persistent itching, redness, and scaling of the skin. Skin scraping is performed for microscopic examination, revealing a pathogen with a characteristic pencil-shaped morphology. Which pathogen is most likely responsible for the patient’s dermatological symptoms?

A. Trichophyton

B. Microsporum

C. Epidermophyton

D. None of the above

Correct answer: A

Dermatophytosis, or fungal skin infection, is diagnosed by the microscopic appearance of macroconidia in skin scrapings. Trichophyton species are characterized by their "pencil-shaped" or cigar-shaped, thin-walled, multi-septate macroconidia. They are the most common genus of dermatophytes causing infections of the skin, hair, and nails (tinea). Microsporum (Option B) produces spindle-shaped macroconidia with thick, rough walls, which look very different from the smooth "pencil" shape of Trichophyton. Epidermophyton (Option C) produces club-shaped or "snowshoe-shaped" macroconidia, often occurring in clusters of two or three. The patient's symptoms of itching, redness, and scaling are the standard clinical manifestations of tinea. Since the microscopic evidence specifically identifies a pencil-shaped morphology, Trichophyton is the correct genus. Identifying these microscopic features is essential for differentiating

between the three main genera of dermatophytes that cause clinically similar skin lesions.

Question 59. A 46-year-old farmer presents with a painful eye lesion following an occupational injury. Examination reveals an ulcerative corneal lesion, and microscopic analysis of a sample from the lesion shows septate hyphae with acute-angle branching. Which organism is most likely responsible for this ocular infection?

A. Mucor

B. Aspergillosis

C. Candida

D. Rhizopus

Correct answer: B

The history of ocular trauma involving vegetative material (common in farmers) followed by a painful corneal ulcer is classic for fungal keratitis. The microscopic description of "septate hyphae branching at acute angles" (approximately 45 degrees) is the hallmark of Aspergillus species. Aspergillus is a ubiquitous filamentous fungus that commonly causes keratomycosis after agricultural injuries. Mucor (Option A) and Rhizopus (Option D) belong to the Zygomycetes family, which are characterized by broad, non-septate (coenocytic) hyphae that branch at wide, right angles (90 degrees). Candida (Option C) is a yeast that typically presents with pseudohyphae and budding yeast cells, rather than true septate hyphae. Therefore, the combination of the occupational risk factor, the clinical presentation of a corneal ulcer, and the specific microscopic finding of acute-angle branching septate hyphae makes Aspergillus (Aspergillosis) the most definitive and probable diagnosis for this patient's eye condition.

Question 60. A 28-year-old patient develops watery diarrhea and dysentery after consuming oysters during a recent trip. Based on this history, which pathogen is most likely responsible for his gastrointestinal symptoms?

A. Vibrio Parahaemolyticus

B. Staph aureus

C. E. coli

D. Vibrio Cholerae

Correct answer: A

Vibrio parahaemolyticus is a halophilic (salt-loving) bacterium commonly found in marine environments. It is the leading cause of seafood-associated gastroenteritis worldwide, specifically linked to the consumption of raw or undercooked shellfish such as oysters. The

clinical presentation can range from self-limiting watery diarrhea to more severe dysentery (bloody stools) caused by its Kanagawa-positive thermostable direct hemolysin. Staphylococcus aureus (Option B) causes food poisoning via a preformed enterotoxin, typically within 1-6 hours of eating contaminated creamy or salty foods, and does not cause dysentery. E. coli (Option C) has various strains (like ETEC or EHEC) that cause diarrhea, but they are not specifically associated with marine oysters. Vibrio cholerae (Option D) causes "rice-water" stools and massive dehydration through a potent exotoxin but does not typically cause the inflammatory dysentery or oyster-specific outbreaks as characteristically as V. parahaemolyticus. Thus, given the oyster ingestion and the resulting dysentery, V. parahaemolyticus is the most likely pathogen.

Question 61. A 25-year-old patient is admitted with symptoms suggestive of hydrophobia, raising suspicion for rabies infection. To confirm the diagnosis, the clinician plans to perform tests on a corneal scraping. Which diagnostic test is most appropriate and accurate for confirming rabies in this patient?

A. RT-PCR

B. Viral culture

C. Antibody detection by ELISA

D. Direct fluorescent antibody test

Correct answer: A

Rabies is a fatal viral encephalitis, and early diagnosis in a living patient is crucial. In suspected rabies (e.g., hydrophobia), samples such as saliva, CSF, nuchal skin biopsy, and corneal scrapings can be used for diagnosis.

RT-PCR (Reverse Transcriptase Polymerase Chain Reaction) is the most sensitive and specific test for detecting rabies viral RNA in these samples. It allows early detection, even before antibody formation, and is highly accurate. Because it directly identifies viral genetic material, it is considered the best confirmatory test in modern practice, including for corneal scrapings.

Why Other Options Are Wrong

(B)

Viral culture: Rarely used due to slow growth and biohazard risk

(C)

ELISA: Detects antibodies, which appear late → not useful early

(D)

DFA test: Commonly used but less sensitive than RT-PCR, especially in corneal samples

Question 62. A 23-year-old patient presents with persistent flank pain, fatigue, and episodes of red-colored urine, with no prior history of urinary or renal disease. Laboratory tests show more than 20 red blood cells per high-power field in the urine, and microscopic examination reveals these RBCs to be dysmorphic. What is the most likely diagnosis in this patient?

A. Minimal change disease

B. PSGN

C. UTI

D. Bladder calculi

Correct answer: B

The presence of "dysmorphic RBCs" (such as acanthocytes) in the urine is a critical diagnostic clue indicating that the hematuria is of glomerular origin. As RBCs pass through the damaged glomerular basement membrane and navigate the osmotic changes of the renal tubules, they become distorted. Post-Streptococcal Glomerulonephritis (PSGN) is a classic cause of nephritic syndrome presenting with hematuria, flank pain, and systemic symptoms like fatigue. Minimal Change Disease (Option A) is a nephrotic syndrome characterized by massive proteinuria rather than significant hematuria or dysmorphic RBCs. Urinary Tract Infections (UTI, Option C) and Bladder Calculi (Option D) are causes of "extra-glomerular" or post-renal hematuria. In these cases, the RBCs do not pass through the glomerulus and therefore maintain their normal, uniform, biconcave shape. Since this patient's RBCs are specifically described as dysmorphic, a glomerular disease like PSGN is the only plausible diagnosis among the choices provided.

Question 63. A 40-year-old man living with HIV is noted to have a CD4 count below a critical threshold, indicating severe immunosuppression. Which opportunistic infection is he most likely to develop given his compromised immune status?

A. Candida

B. Staph. aureus

C. Disseminated MAC Infection

D. Pneumocystis jirovecii

Correct answer: C

In the natural progression of HIV, specific opportunistic infections occur at predictable CD4 thresholds. A CD4 count below puts the patient at highest risk for Disseminated Mycobacterium avium complex (MAC) infection. At this extremely low count, prophylaxis with azithromycin was historically standard. Pneumocystis jirovecii (Option D) typically occurs when the CD4 count drops below 200. Oropharyngeal Candida (Option A) is common at counts between 200 and 500. Staphylococcus aureus (Option B) is a common pyogenic pathogen but is not specifically classified as an opportunistic indicator linked to the sub-50 CD4 threshold. Disseminated MAC presents with systemic symptoms like high fever, drenching night sweats, weight loss, and severe anemia. Diagnosis involves blood cultures or bone marrow biopsy to identify the acid-fast bacilli. Management requires a multi-drug regimen, typically including clarithromycin and ethambutol. Immediate initiation of antiretroviral therapy is essential to facilitate immune reconstitution and reduce the risk of further life-threatening infections in these patients.

Question 64. A 25-year-old man presents with fever, and his viral serology shows HBsAg positive and IgM anti-HBc antibody positive. What is the most likely diagnosis based on these results?

A. Acute hepatitis

B. Chronic hepatitis

C. Window period

D. Persistent infection

Correct answer: A

The combination of HBsAg positive and IgM anti-HBc positive is diagnostic for Acute Hepatitis B infection. HBsAg indicates the presence of the virus, while the IgM class of antibodies against the core antigen (anti-HBc) is a definitive marker for a primary, recent infection within the last six months. In Chronic Hepatitis B (Option B) or persistent infection (Option D), HBsAg remains positive for more than six months, but the core antibody shifts from the IgM to the IgG class. The Window Period (Option C) occurs when HBsAg has disappeared but the anti-HBs antibody has not yet appeared; during this specific time, IgM anti-HBc might be the only detectable marker of a recent infection. Clinically, acute hepatitis B presents with fever, jaundice, and significantly elevated transaminases. Most adults clear the virus spontaneously. Monitoring markers is essential to differentiate acute from chronic states, as chronic infection carries risks of cirrhosis and hepatocellular carcinoma.

Question 65. A 26-year-old man presents with fever, abdominal pain, and diarrhea for three days, following consumption of raw fish. He is otherwise stable, and physical examination is

unremarkable. Stool analysis shows no pus, and culture grows on Wagatsuma agar. Which causative agent is most likely responsible for his illness?

A. Vibrio cholera

B. Salmonella typhi

C. Shigella sonnei

D. Vibrio parahaemolyticus

Correct answer: D

The history of consuming raw fish followed by diarrhea and abdominal pain is highly suggestive of Vibrio parahaemolyticus infection. This halophilic organism is a leading cause of seafood-borne gastroenteritis. The definitive laboratory clue is the growth on Wagatsuma agar, which is used to detect the Kanagawa phenomenon (hemolysis), a marker of virulent strains. Vibrio cholerae (Option A) causes profuse "rice-water" diarrhea and characteristically grows yellow colonies on TCBS agar. Salmonella typhi (Option B) presents with high-grade fever (step-ladder pattern) and bradycardia rather than acute raw-fish-linked diarrhea. Shigella sonnei (Option C) typically causes inflammatory diarrhea with pus and blood in the stool. V. parahaemolyticus gastroenteritis is usually self-limiting, requiring only oral rehydration therapy. It is common in coastal regions where raw or undercooked shellfish and fish are consumed. Prevention focuses on proper cooking and avoiding cross-contamination of seafood products.

PSM

Question 66. Which of the following biomedical waste management methods is correct for the disposal of an expired tablet?

A. Red bag hydroclaving

B. Blue bag-incineration

C. Yellow bag- burial

D. Yellow bag- incineration

Correct answer: D

Under the Biomedical Waste Management Rules, expired or discarded medicines (including tablets) are classified as pharmaceutical waste. These must be segregated into the Yellow bag. The mandated final disposal method for this category is incineration at temperatures exceeding to ensure complete chemical destruction. The Red bag (Option A) is for recyclable plastic waste like IV sets and catheters, usually disposed of via autoclaving. The Blue bag (Option B) is for glassware and metallic implants, treated by disinfection or recycling. Deep burial (Option C) in yellow bags is reserved for human anatomical waste in rural or remote areas without access to incinerators, but it is not the standard for chemical/pharmaceutical waste. Improper disposal of

expired drugs can lead to environmental contamination and antibiotic resistance. Correct segregation ensures that toxic pharmaceutical components do not enter the general waste stream or water supply.

Question 67. According to the Sustainable Development Goals (SDGs) set for 2030, what is the target for reducing the maternal mortality rate?

A. <60/100000

B. <70/100000

C. <50/100000

D. <80/100000

Correct answer: B

The United Nations Sustainable Development Goal (SDG) 3.1 sets a global target to reduce the Maternal Mortality Ratio (MMR) to less than 70 per 100,000 live births by the year 2030. This goal aims to eliminate preventable maternal deaths worldwide and improve maternal health outcomes.

Options A, C, and D represent other numerical thresholds but do not correspond to the officially adopted SDG target. MMR is defined as the number of maternal deaths per 100,000 live births resulting from complications related to pregnancy, childbirth, or its management, excluding accidental or incidental causes.

India has made notable progress in reducing MMR through initiatives such as Janani Suraksha Yojana, promotion of institutional deliveries, improved access to antenatal and postnatal care, and strengthening of emergency obstetric services. Monitoring of progress is carried out through national data sources such as the Sample Registration System (SRS) and National Family Health Surveys (NFHS).

Achieving the SDG 3.1 target requires universal access to quality maternal healthcare, skilled birth attendance, and timely referral services. Reducing MMR is a key indicator of health system performance, women’s health, and gender equality.

Question 68. Which of the following statements is correct about triage?

A. Red-ambulatory

B. Yellow-stable need observation

C. Black-minor injuries

D. Green-life threatening

Correct answer: B

Triage is the process of prioritizing patients based on the severity of their condition during mass casualty incidents. The Yellow category is for "delayed" priority, representing patients who are stable but require medical care and observation; their treatment can be safely postponed for a

short time. The Red category (Option A) is for "immediate" priority—patients with life-threatening but treatable injuries, such as airway obstruction or tension pneumothorax. The Green category (Option D) is for the "walking wounded" or ambulatory patients with minor injuries. The Black category (Option C) is for the deceased or those whose injuries are so extensive that survival is unlikely even with maximal care. Efficient triage ensures the greatest good for the greatest number of people when resources are overwhelmed. Correct color-coding allows rapid visual identification of priority by responding medical teams. Knowledge of these categories is a fundamental skill in emergency and disaster medicine.

Question 69. True statement regarding Ayushman Bharat scheme?

A. Rs 5 lakh/per family per year is given

B. Rs 10 lakh/per family per year is given

C. Rs 6 lakh/per family per year is given

D. Rs 2 lakh/per family per year is given

Correct answer: A

The Ayushman Bharat Pradhan Mantri Jan Arogya Yojana (AB-PMJAY) is the world's largest government-funded healthcare program. Its primary feature is providing a health cover of Rs 5 lakh per family per year for secondary and tertiary care hospitalization. This benefit is available to over 12 crore poor and vulnerable families based on Socio-Economic Caste Census (SECC) data. Options B (10 lakh), C (6 lakh), and D (2 lakh) are incorrect amounts for the standard annual coverage. The scheme is "portable," meaning a beneficiary can receive treatment in any empaneled public or private hospital across India. It covers pre-hospitalization, medicines, and post-hospitalization expenses. The program aims to reduce catastrophic out-of-pocket expenditure that often pushes families into poverty. By providing cashless and paperless access to services, Ayushman Bharat is a critical step toward achieving Universal Health Coverage in India, specifically targeting the bottom 40% of the population.

Question 70. Which of the following is NOT considered a component of the urban health care delivery system?

A. PHC

B. CHC

C. Dist. Hospital

D. Subcenter

Correct answer: D

The Subcenter is the peripheral-most unit of the rural health care delivery system in India, serving a population of 3,000 to 5,000. It is not a standard structural component of the Urban health care delivery system. Under the National Urban Health Mission (NUHM), the primary tier

in cities is the Urban Primary Health Centre (U-PHC) (Option A), which serves approximately 50,000 people. Secondary care is provided by Urban Community Health Centres (U-CHC) (Option B) or small hospitals. District Hospitals (Option C) serve as the tertiary referral centers for both urban and rural populations within the district. Urban health systems also rely on community-level workers like ASHAs and Mahila Arogya Samitis, but they lack the physical "Subcenter" building found in the rural three-tier model. Recognizing these structural differences is essential for public health administration and ensuring that healthcare services are tailored to the specific demographic needs of urban dwellers.

Question 71. In the management of bacterial vaginosis (BV), certain antibiotics are not advised according to CDC guidelines. Which antibiotic is specifically not recommended for treating BV?

A. Metronidazole

B. Tinidazole

C. Clindamycin

D. Erythromycin

Correct answer: D

Bacterial Vaginosis (BV) results from a shift in vaginal flora where lactobacilli are replaced by anaerobes like Gardnerella vaginalis. According to CDC guidelines, Erythromycin (Option D) is not recommended for the treatment of BV as it has poor activity against the causative organisms. The first-line recommended treatments include Metronidazole (Option A) (either oral or vaginal gel) and Clindamycin (Option C) (cream or oral). Tinidazole (Option B) is an alternative oral regimen recommended by the CDC. BV is diagnosed clinically using Amsel's criteria: thin white discharge, vaginal pH , positive "whiff" test, and "clue cells" on microscopy. Treatment is indicated for symptomatic women and all pregnant women to reduce the risk of preterm birth. Partners are generally not treated as it does not prevent recurrence. It is important to advise patients on Metronidazole to avoid alcohol to prevent a disulfiram-like reaction.

Question 72. Which international agency supports the construction of sanitary latrines (toilets) in India?

A. USAID

B. CURE

C. Redcross

D. FORD

Correct answer: A

The United States Agency for International Development (USAID) has been actively involved in

supporting water, sanitation, and hygiene (WASH) programs in India. One of its key contributions includes promoting the construction of sanitary latrines, improving access to safe sanitation, and reducing open defecation.

USAID collaborates with the Government of India and various NGOs under initiatives such as the Swachh Bharat Mission, aiming to improve public health by enhancing sanitation infrastructure and hygiene practices. These efforts help in preventing waterborne diseases and improving overall community health.

Why Other Options Are Wrong

(B) CURE: Not a major international agency involved in sanitation programs in India

(C) Red Cross: Focuses more on disaster relief and emergency health services

(D) Ford Foundation: Works in development sectors but not specifically known for latrine construction programs

Question 73. In a hospital pharmacy, a total budget of ₹50,000 is allocated for purchasing three types of drugs: ₹35,000 for A drugs, ₹10,000 for B drugs, and the remaining amount for C drugs. Which type of analysis is being applied in this budgeting scenario?

A. Network Analysis

B. ABC Analysis

Examination Paper July 2023 Question

C. RIO and LIR

D. LIO and RIR

Correct answer: B

Levo depression means depression of both eyes when looking to the left (levoversion). In left gaze, the left eye is abducted and the right eye is adducted.

1.

The left eye (abducted) is depressed mainly by the Left Inferior Rectus (LIR).

2.

The right eye (adducted) is depressed mainly by the Right Superior Oblique (RSO).

Thus, the correct muscle pair is RSO (right superior oblique) and LIR (left inferior rectus).

Why other options are wrong:

(A)

LSO and RIR: These muscles produce depression in the opposite gaze combination (not levo depression).

(C)

RIO and LIR: Inferior oblique elevates the eye, not depresses it.

(D)

LIO and RIR: Inferior oblique again causes elevation, and the pairing does not match left gaze depression.

Question 74. A man is using nasal drops continuously for long period of time. What can be the possible adverse effect from its use?

A. Mulberry turbinate

B. Allergic rhinitis

C. Vasomotor rhinitis

D. Rhinitis Medicamentosa

Correct answer: D

Rhinitis Medicamentosa is a condition of rebound nasal congestion specifically caused by the prolonged and continuous use of topical decongestants (such as oxymetazoline or xylometazoline). These drops work by causing intense vasoconstriction. With overuse (typically more than 5–7 days), the nasal mucosa loses its sensitivity and develops secondary hyperemia and edema once the drug wears off, leading to a vicious cycle of dependency. Mulberry turbinate (Option A) describes the pitted appearance of the inferior turbinate in chronic hypertrophic rhinitis. Allergic rhinitis (Option B) is an IgE-mediated response to allergens. Vasomotor rhinitis (Option C) is a non-allergic condition triggered by physical factors like temperature or odors. Rhinitis medicamentosa is characterized by a "red, beefy" appearance of the mucosa on examination. Management involves immediate cessation of the decongestant drops, often supplemented with topical nasal corticosteroids or a short course of oral steroids to manage the rebound swelling during withdrawal.

(B) Janani suraksha yojana

(C) Mid day meal

(D) Navjat Shishu Karyakram yojana

AAns

(A) Rashtriya bal swasthya karyakram

The Rashtriya Bal Swasthya Karyakram (RBSK) is a comprehensive child health initiative of the Government of India aimed at the early identification and management of the “4 Ds”: Defects at birth, Diseases, Deficiencies, and Developmental delays (including disabilities). The program covers all children from birth to 18 years of age, including out-of-school children, making it especially relevant for vulnerable populations.

In this case, the 10-year-old girl with anemia falls under the category of “Deficiencies”, one of

the core components of RBSK. Therefore, she would be screened and managed by RBSK mobile health teams, with referral to District Early Intervention Centres (DEICs) when required, ensuring free treatment and follow-up care.

Janani Suraksha Yojana (Option B) focuses on maternal health and institutional deliveries. The Mid-Day Meal Scheme (Option C) benefits only school-going children and does not cover out-of-school children. Navjat Shishu Suraksha Karyakram (Option D) is limited to newborn care and resuscitation.

Thus, RBSK is the most appropriate program, as it ensures universal child health screening and management, particularly for nutritional deficiencies like anemia, regardless of school enrollment status.

Question 75. A 60-year-old man presents with difficulty seeing from the left side in both eyes, while central vision remains intact, and there is no history of recent trauma. Which condition best explains his visual field disturbances?

A. Quadrantanopia

B. Homonymous hemianopia

C. Heteronymous hemianopia

D. Homonymous hemianopia with macular sparing

Correct answer: D

A patient with difficulty seeing from the left side in both eyes has a left-sided homonymous hemianopia, indicating a lesion in the right visual pathway posterior to the optic chiasma. The fact that central vision remains clear is the defining feature of macular sparing. This specific pattern strongly suggests a lesion in the occipital cortex, most commonly due to a stroke involving the posterior cerebral artery (PCA). The macula is spared because the macular representation in the visual cortex has a dual blood supply from both the PCA and the middle cerebral artery. A standard homonymous hemianopia (Option B) would include the loss of central vision if the lesion was in the optic tract. Quadrantanopia (Option A) involves only one-fourth of the visual field. Heteronymous hemianopia (Option C) affects opposite sides in both eyes (e.g., bitemporal), characteristically seen in chiasmal lesions. Accurate field testing is vital for localizing neurological lesions.

Question 76. A 40-year-old man working in an iron factory presents with progressively worsening vision and changes in color perception. Ophthalmologic examination reveals iron deposits in the eyes. What is the most likely ocular condition in this

patient?

A. Siderosis bulbi

B. Hemochromatosis

C. Retinitis pigmentosa

D. Age-related macular degeneration

Correct answer: A

Siderosis bulbi is a vision-threatening condition caused by the chronic retention of an intraocular iron-containing foreign body. The patient's employment in an iron factory provides a significant clinical clue for accidental trauma. As the iron oxidizes, it releases toxic ions that deposit throughout the ocular tissues, including the iris (causing heterochromia), lens (causing cataract), and most importantly, the retina. Retinal toxicity leads to progressive vision loss, night blindness, and altered color perception. Hemochromatosis (Option B) is a systemic iron-overload disorder that rarely causes primary ocular iron deposits. Retinitis pigmentosa (Option C) is a genetic dystrophy that presents with similar symptoms but lacks the history of industrial exposure and specific iron deposits. Age-related macular degeneration (Option D) causes gradual central vision loss in elderly patients without iron involvement. Management involves the urgent surgical removal of the metallic foreign body. Even with removal, the electroretinogram (ERG) may show permanent damage if the condition was long-standing.

Question 77. In which type of cataract surgery is suturing with 10-0 nylon commonly performed?

A. Phacoemulsification

B. Extracapsular cataract extraction (ECCE)

C. Intracapsular cataract extraction (ICCE)

D. Manual small incision cataract surgery (MSICS)

Correct answer: B

In Extracapsular Cataract Extraction (ECCE), a relatively large limbal incision (approximately 8–10 mm) is made to remove the lens nucleus in one piece. Because of the size of this incision, multiple interrupted or continuous sutures—typically using fine 10-0 nylon—are mandatory to ensure a watertight closure and prevent complications like iris prolapse or endophthalmitis. Phacoemulsification (Option A) utilizes a very small incision (2.2–3.0 mm) that is typically "self-sealing" and requires no sutures. Manual Small Incision Cataract Surgery (MSICS) (Option D) also uses a self-sealing tunnel incision (usually 6 mm) that generally does not require suturing. ICCE (Option C) is an older technique where the entire lens and capsule are removed through a large incision, also requiring sutures, but it is rarely performed today compared to ECCE. While Phaco is the global gold standard, ECCE remains an important technique for extremely hard (black or brown) cataracts where ultrasound energy may be insufficient or

unsafe.

Question 78. A 60-year-old woman presents with persistent tearing, ocular discharge, and swelling at the inner corner of her eye, and is diagnosed with chronic dacryocystitis. What is the treatment of choice for this condition?

A. Lacrimal sac massage

B. Dacryocystorhinostomy

C. Syringing

D. Probing

Correct answer: B

Chronic dacryocystitis in an adult is primarily caused by an irreversible obstruction of the nasolacrimal duct, leading to the accumulation of tears and subsequent infection within the lacrimal sac. The definitive treatment of choice is Dacryocystorhinostomy (DCR). This surgical procedure creates a new, permanent bypass track between the lacrimal sac and the middle meatus of the nasal cavity, effectively restoring tear drainage. Lacrimal sac massage (Option A) and Probing (Option D) are first-line treatments for congenital nasolacrimal duct obstruction in infants, but they have a very high failure rate in adults with established chronic inflammation. Syringing (Option C) is a diagnostic tool used to confirm the site of obstruction but is not a curative treatment. DCR can be performed via an external approach (with a skin incision) or endoscopically through the nose. Preoperative evaluation includes syringing and sometimes dacryocystography. Successful DCR provides immediate and long-term relief from epiphora and recurrent bouts of painful infection.

Question 79. A 45-year-old man presents with severe eye pain following an injury involving vegetative material. Examination and microscopy reveal septate hyphae with acute-angle branching. Which organism is most likely responsible for this ocular infection?

A. Fungal corneal ulcer

B. Viral corneal ulcer

C. Bacterial corneal ulcer

D. Acanthamoeba corneal ulcer

Correct answer: A

A history of ocular trauma with vegetative matter (such as a leaf, twig, or branch) is a classic red-flag history for fungal corneal ulcer (mycotic keratitis). The definitive laboratory finding of septate hyphae branching at acute angles (≈45°) is characteristic of filamentous fungi, most

commonly Aspergillus or Fusarium species.

Bacterial corneal ulcers (Option C) usually present with an acute onset, marked purulent discharge, and a wet-looking infiltrate. Viral keratitis (Option B), most commonly due to herpes simplex virus, typically shows dendritic or geographic ulcers on fluorescein staining. Acanthamoeba keratitis (Option D) is strongly associated with contact lens use, severe pain out of proportion to clinical findings, and a characteristic ring-shaped stromal infiltrate.

Fungal corneal ulcers classically have feathery margins, satellite lesions, and a dry, grayish-white infiltrate. Management is an ophthalmic emergency and requires prompt initiation of topical antifungal therapy, most commonly natamycin 5%. In cases with deep stromal involvement or poor response to medical treatment, therapeutic penetrating keratoplasty may be required to prevent corneal perforation and preserve vision.

Question 80. In ophthalmic procedures, a specific dye is used to enhance the visualization of structures within the anterior chamber of the eye. Which dye is employed for staining the anterior chamber?

A. Trypan blue

B. Brilliant blue

C. Fluorescent green

D. Lissamine green

Correct answer: A

In modern ophthalmic microsurgery, Trypan blue is the standard dye used to stain the anterior capsule of the lens during cataract surgery (specifically for continuous curvilinear capsulorhexis). By providing a sharp contrast, it allows the surgeon to clearly see the edges of the capsule, which is especially vital in cases of dense ("white") cataracts where the red reflex is absent. It is also used to stain the donor corneal tissue in endothelial keratoplasty. Brilliant blue (Option B) is primarily used to stain the internal limiting membrane during vitreoretinal surgery. Fluorescein (Option C, often greenish when viewed with cobalt blue light) is used for assessing corneal ulcers and tear film. Lissamine green (Option D) is used to stain devitalized conjunctival cells in dry eye diagnostics. Trypan blue is non-toxic to the corneal endothelium when used appropriately. Its introduction has significantly improved the safety and predictability of complex cataract procedures by providing superior intraoperative visualization of clear ocular structures.

Question 81. A 55-year-old hypertensive patient presents with blurred vision and headaches. Retinal examination reveals flame-shaped hemorrhages, cotton wool spots, and disc edema. According to the Keith-Wagener classification, which grade of

hypertensive retinopathy does this patient have?

A. Grade 1

B. Grade II

C. Grade III

D. Grade IV

Correct answer: D

The Keith-Wagener-Barker classification is used to grade the severity of hypertensive retinopathy based on ophthalmoscopic findings. The presence of disc edema (papilledema), along with the signs of severe retinal damage like flame-shaped hemorrhages and cotton wool spots, is the defining feature of Grade IV retinopathy. This grade signifies malignant hypertension and is a medical emergency, as it indicates significant end-organ damage and a high risk of cardiovascular or neurological events. Grade III (Option C) includes hemorrhages, cotton wool spots, and hard exudates (often in a "macular star" pattern) but lacks disc edema. Grade II (Option B) is characterized by more pronounced arteriolar narrowing and AV nipping. Grade 1 (Option A) involves simple generalized arteriolar narrowing and "silver-wiring". Management of Grade IV retinopathy requires immediate but controlled reduction of blood pressure, usually in an intensive care setting, and urgent neurological evaluation to rule out hypertensive encephalopathy. Retinal findings often improve significantly once blood pressure is stabilized.

Question 82. In the management of cytomegalovirus (CMV) retinitis, especially in immunocompromised patients like those with AIDS, which drug is considered the treatment of choice?

A. Cotrimoxazole

B. Valacyclovir

C. Tenofovir

D. Ganciclovir

Correct answer: D

Cytomegalovirus (CMV) retinitis is a major opportunistic infection and a leading cause of blindness in patients with advanced AIDS (typically when CD4 count is). The drug of choice for both initial induction and long-term maintenance therapy is Ganciclovir. It can be administered intravenously, orally (as valganciclovir), or as an intravitreal injection. Ganciclovir works by inhibiting the viral DNA polymerase. Cotrimoxazole (Option A) is used for the prophylaxis and treatment of Pneumocystis pneumonia. Valacyclovir (Option B) is highly effective against HSV and VZV but has poor activity against CMV. Tenofovir (Option C) is a foundational drug in antiretroviral therapy (ART) for HIV itself, not an anti-CMV agent. CMV retinitis characteristically presents with a "pizza-pie" appearance (hemorrhage and necrosis) on the retina. Management

must also focus on immune reconstitution through ART, as the retinitis will inevitably relapse if the CD4 count remains profoundly low despite antiviral therapy.

Question 83. A 34-year-old woman presents with chronic sinusitis, recurrent respiratory infections, and infertility. Examination reveals situs inversus. Which condition is most likely responsible for this combination of findings?

A. Primary ciliary dyskinesia

B. Akinesia

C. Tardive dyskinesia

D. Athetosis

Correct answer: A

The clinical triad of chronic sinusitis, recurrent respiratory infections (bronchiectasis), and infertility in a patient with situs inversus is diagnostic for Kartagener syndrome, which is a classic form of Primary Ciliary Dyskinesia (PCD). This autosomal recessive condition involves a structural defect in the ciliary dynein arms, rendering cilia and sperm flagella immobile. The lack of ciliary clearance leads to chronic airway infections, while the immobile flagella cause female (due to impaired fallopian tube cilia) and male infertility. Akinesia (Option B), Tardive dyskinesia (Option C), and Athetosis (Option D) are various types of motor movement disorders associated with basal ganglia dysfunction or drug side effects, entirely unrelated to ciliary or organ-positioning pathologies. Diagnosis of PCD is supported by low nasal nitric oxide and confirmed by electron microscopy of ciliary biopsies. Management centers on aggressive respiratory hygiene, prompt treatment of infections, and assisted reproductive techniques for infertility. The presence of situs inversus is the definitive clinical anchor for this diagnosis.

Question 84. Hypokalemia is shown by all. Except?

A. RTA1

B. RTA2

C. RTA4

D. Ureterosigmoidostomy

Correct answer: C

Renal Tubular Acidosis (RTA) is a group of disorders characterized by metabolic acidosis due to renal impairment. RTA Type 4 (Hyperkalemic RTA) is unique because it is characteristically associated with hyperkalemia (high potassium) rather than hypokalemia. This is usually caused by hypoaldosteronism or resistance to aldosterone. RTA Type 1 (distal, Option A) and RTA Type 2 (proximal, Option B) both typically lead to hypokalemia due to increased distal delivery of sodium or defective bicarbonate reabsorption, respectively. Ureterosigmoidostomy (Option D), a surgical procedure where ureters are diverted to the sigmoid colon, also causes a classic

hypokalemic hyperchloremic metabolic acidosis because the intestinal mucosa absorbs chloride and secretes potassium and bicarbonate. Clinically, identifying the potassium level is the most useful first step in narrowing the differential diagnosis for a patient with a normal anion gap metabolic acidosis. Management of RTA4 focuses on dietary potassium restriction and potentially fludrocortisone or diuretics to lower serum potassium levels.

Examination Paper July 2023 Question
(C) VED Analysis
(D) System Analysis
AAns

(B) ABC Analysis
The scenario described is a classic application of ABC Analysis in inventory management. This method categorizes items based on their cumulative cost and consumption volume. Category A (Option B) items are the few high-value drugs that account for the majority of the budget (here, 35,000 Rs for type A). Category B items have moderate value (10,000 Rs), and Category C items are the numerous low-cost items that consume the smallest portion of the budget. VED Analysis (Option C) categorizes drugs based on their clinical criticality (Vital, Essential, Desirable) rather than cost. Network Analysis (Option A) and System Analysis (Option D) are broader management tools for planning and process evaluation. ABC analysis allows hospital administrators to prioritize strict control over high-investment (Type A) drugs while using more relaxed control for low-cost (Type C) items. Combining ABC and VED analyses is the gold standard for efficient hospital pharmacy management, ensuring that critical life-saving drugs are always available without wasting the budget on non-critical, expensive items.

Question 85. A physician uses the STEP approach to collect essential clinical information. A patient presents with fatigue and dizziness. Which parameter would NOT be assessed using this approach?

A. Blood group
B. Blood pressure
C. Blood sugar
D. Blood lipid

Correct answer: A

The STEP approach stands for Surveillance of risk factors of Non-Communicable Diseases (NCDs) as recommended by the World Health Organization. It focuses on collecting modifiable risk factor data in a stepwise manner.
1.

Step : Questionnaire (behavioral factors like diet, smoking)
2.
Step : Physical measurements (e.g., blood pressure)
3.
Step : Biochemical measurements (e.g., blood sugar and blood lipids)
Thus, blood pressure, blood sugar, and blood lipid levels are all included in the STEP approach.

PEDIATRICS

Question 86. A patient presents with seizures, and CT head imaging reveals multiple parenchymal cysts. What is the appropriate management for this patient?

Examination Paper July 2023 Question
A. Perform a Laparotomy to remove the stones
B. Undertake
Cystoscopic
retrieval of the foreign body
C. Opt to leave the foreign body
inside
D. Utilize Lithotripsy to remove
recurrent stones
Correct answer: B
In a patient with a history of urological surgery who presents with fever and flank pain (potential signs of infection or obstruction), imaging showing a "retained foreign body" often refers to a forgotten or migrated double-J stent. Stents left in place for too long become encrusted with minerals, mimicking new kidney stones. The most suitable management approach is the Cystoscopic retrieval of the foreign body. This minimally invasive procedure allows for the visualization and removal of the stent or foreign object via the urethra. Laparotomy (Option A) is excessively invasive for standard retrieval. Leaving the body inside (Option C) would lead to worsening infection (pyelonephritis), stone formation, and eventual renal failure. Lithotripsy (Option D) is used to break up large stones but would not be the primary choice for removing a mechanical foreign object like a stent. Clinicians must meticulously track all stents placed and ensure they are removed within the recommended timeframe (usually 6-12 weeks) to avoid these common urological complications.

Question 87. A 60-year-old man with a history of smoking and anemia presents for consultation. His

family history includes a sister diagnosed with endometrial cancer. What is the most appropriate method to screen for colorectal malignancy in this patient?

A. Barium enema

B. Colonoscopy every 10 yrs

C. Check for occult blood in stool

D. Flexible Sigmoidoscopy yearly

Correct answer: B

For an average-risk adult (starting at age 45-50), a Colonoscopy every 10 years is considered the "gold standard" and most appropriate screening method for colorectal cancer. This patient is at high risk due to his age (60) and family history; the combination of a sister with endometrial cancer may suggest Lynch Syndrome (HNPCC), which significantly increases the risk for colorectal and endometrial malignancies. Colonoscopy is preferred because it allows for both direct visualization and the removal of precancerous polyps (polypectomy) during the same procedure. Fecal Occult Blood Testing (Option C) and Flexible Sigmoidoscopy (Option D) are valid alternatives but are less sensitive and do not examine the entire colon. Barium enema (Option A) is no longer a standard primary screening tool. Given his anemia (a potential sign of right-sided occult bleeding), a colonoscopy is both a screening and diagnostic requirement to rule out synchronous lesions. If Lynch syndrome is formally suspected, the screening interval is shortened to every 1-2 years.

184. A 45-year-old woman presents with redness and a Peau d’orange appearance involving more than two-thirds of her breast, without a palpable lump. The skin involvement extends to the chest wall, suggestive of inflammatory breast carcinoma. What is the appropriate TNM stage for this patient?

(A) T4a

However, blood group is a genetic/non-modifiable characteristic and is not relevant to NCD risk assessment, so it is not included in the STEP framework.

Why other options are correct (i.e., included in STEP):

(B)

Blood pressure: Measured in Step 2

(C)

Blood sugar: Measured in Step 3

(D)

Blood lipid: Measured in Step 3

Therefore, the parameter NOT assessed is (A) Blood group.

Question 88. colonoscopy is both a screening and diagnostic requirement to rule out synchronous lesions. If Lynch syndrome is formally suspected, the screening interval is shortened to every 1-2 years.

A 45-year-old woman presents with redness and a Peau d'orange appearance involving more than two-thirds of her breast, without a palpable lump. The skin involvement extends to the chest wall, suggestive of inflammatory breast carcinoma. What is the appropriate TNM stage for this patient?

A. T4a

B. T4b

C. T3

D. T4d

Correct answer: D

In the TNM classification for breast cancer, Inflammatory Breast Cancer (IBC) is uniquely and specifically categorized as T4d. IBC is a clinical diagnosis characterized by rapid onset of breast erythema, edema, and a Peau d'orange (orange peel) skin texture, which results from the blockage of dermal lymphatics by tumor emboli. It is distinct from other T4 stages: T4a (Option A) refers to involvement of the chest wall (ribs, serratus, or intercostals); T4b (Option B) refers to skin involvement (ulceration or nodules) that does not meet the clinical criteria for inflammatory cancer. T3 (Option C) refers only to tumor size (>5 cm). IBC is a highly aggressive form of breast cancer with a high risk of early systemic metastasis. Management involves a multimodal approach: neoadjuvant chemotherapy to downstage the disease, followed by modified radical mastectomy and post-operative radiation. The clinical presence of diffuse skin edema (peau d'orange) is the

definitive marker that elevates the stage to T4d.

A patient presents after a road traffic accident with a pulse of 120 bpm and systolic BP < 80 mmHg, and continues to have severe hepatic bleeding. A specific surgical technique is used to control the massive hemorrhage. Which procedure is associated with this intervention?

(A)

Pringle's Maneuver

(B)

Cattell-Braasch Maneuver

(C)

Kocher Maneuver

(D)

Mattox Maneuver

Question 89. A patient presents after a road traffic accident with a pulse of 120 bpm and systolic BP < 80 mmHg, and continues to have severe hepatic bleeding. A specific surgical technique is used to control the massive hemorrhage. Which procedure is associated with this intervention?

A. Pringle's Maneuver

B. Cattell-Braasch Maneuver

C. Kocher Maneuver

D. Mattox Maneuver

Correct answer: A

The Pringle Maneuver is a classic surgical technique used to control massive bleeding from the liver during trauma or elective surgery. It involves the cross-clamping of the hepatoduodenal ligament, which contains the portal vein, the hepatic artery, and the common bile duct. By temporarily halting the inflow of blood to the liver, the surgeon can localize the site of injury and attempt repair. The Cattell-Braasch Maneuver (Option B) is a right-sided medial visceral rotation used to expose the retroperitoneum. The Kocher Maneuver (Option C) is the mobilization of the duodenum to expose the pancreas or distal common bile duct. The Mattox Maneuver (Option D) is a left-sided medial visceral rotation to expose the entire length of the abdominal aorta. The Pringle maneuver is an essential "maneuver of last resort" in hemodynamically unstable trauma patients with hepatic lacerations. It can be safely applied for up to 60 minutes in a healthy liver, though shorter times are preferred to minimize ischemic damage.

Question 90. What type of material is the mesh used in Lichtenstein hernioplasty?

A. Polypropylene

B. Polydioxanone

C. Polyacrylamide

D. Polyglactin

Correct answer: A

The Lichtenstein hernioplasty is a "tension-free" open surgical technique for inguinal hernia repair. The standard material used for the mesh in this procedure is Polypropylene. Polypropylene is a synthetic, non-absorbable, monofilament material that is favored because it triggers a strong fibroblastic response, leading to robust tissue integration and a permanent strengthening of the posterior inguinal wall. Polyglactin (Option D, Vicryl) and Polydioxanone (Option B, PDS) are absorbable suture materials that would lose their strength over time, leading to high recurrence rates if used as a primary hernia mesh. Polyacrylamide (Option C) is not a standard surgical mesh material. The use of polypropylene mesh has dramatically reduced the recurrence rate of inguinal hernias compared to older suture-only techniques (like Bassini's). While generally safe, potential complications include chronic pain due to nerve entrapment or rare mesh infection. The monofilament nature of the mesh helps reduce the risk of harboring bacteria within the weave.

Question 91. A 25-year-old patient is brought to the emergency department after a road traffic accident, presenting with bradycardia, elevated blood pressure, and a GCS score < 8. What is the most critical immediate step in managing this patient?

A. Urgent CT head

B. Intubate and IPPV

C. Polyacrylamide

D. Polyglactin

Correct answer: B

In any trauma patient with a Glasgow Coma Scale (GCS) score of less than 8 ("GCS 8, Intubate"), the most critical immediate step is securing a definitive airway through endotracheal intubation and providing mechanical ventilation (IPPV). This is mandatory to prevent hypoxia and hypercapnia, both of which cause cerebral vasodilation and exacerbate secondary brain injury. The patient’s bradycardia and hypertension (part of Cushing's triad) are ominous signs of severely increased intracranial pressure and impending brain herniation. While an urgent CT head (Option A) is essential for diagnosis, it should never be performed before the airway is secured and the patient is stabilized. Options C and D refer to suture materials and are entirely irrelevant to emergency neuro-trauma management. Stabilization

focuses on "Airway, Breathing, and Circulation" (the ATLS ABCs). Following intubation, management shifts to neurosurgical consultation for potential evacuation of hematomas and monitoring of intracranial pressure. Rapid intervention is the key to minimizing permanent neurological damage.

Question 92. A 20-year-old man presents with abdominal pain, fever, and vomiting for five days. Examination reveals a mass in the right iliac fossa, and total leukocyte count is decreased. The clinical findings suggest an acute appendicular mass. What is the most appropriate management approach in this case?

A. Alvarado regime

B. Ochsner sherren regime

C. Cholecystectomy

D. LAP appendectomy

Correct answer: B

When a patient presents with an appendicular mass (formed by the omentum and bowel loops walling off an inflamed appendix), the standard-of-care management approach is conservative treatment, classically known as the Ochsner-Sherren regimen. This involves making the patient NPO (nil per oral), administering intravenous fluids and broad-spectrum antibiotics, and maintaining a careful vital sign and mass-size chart. Attempting an immediate appendectomy (Option D, either open or laparoscopic) in the presence of an inflammatory mass is technically difficult and carries a high risk of bowel injury or fistula formation. Cholecystectomy (Option C) is for gallbladder disease. The Alvarado score (Option A) is a tool for diagnosing acute appendicitis, not managing a mass. Approximately 90% of masses resolve with conservative management. Following resolution, an "interval appendectomy" is traditionally performed 6-8 weeks later to prevent recurrence, although some modern guidelines suggest this may be optional in asymptomatic patients. Any sign of clinical deterioration during conservative therapy warrants emergency surgical exploration.

Question 93. A 39-year-old man sustains significant chest trauma from a road traffic accident. After chest tube insertion, there is an acute blood loss of approximately 1800 mL within an hour. What is the most appropriate immediate step in managing this patient?

A. Conservative management for the next 6 hours

B. Emergency Thoracotomy

C. Continue resuscitation

D. Wait and watch

Correct answer: B

In a patient with a massive hemothorax following chest trauma, the indications for an Emergency Thoracotomy are very specific. The most appropriate immediate step is surgery if there is an initial chest tube drainage of (as in this case with 1800 ml) OR a continuous drainage of per hour for 2 to 4 consecutive hours. Such massive blood loss suggests a major injury to a hilar vessel, the heart, or an intercostal artery that cannot be managed conservatively. Continuing resuscitation (Option C) alone without surgical control of the bleeding is insufficient. Options A and D (conservative management or waiting) are life-threatening delays in the face of active, high-volume hemorrhage. The goal of emergency thoracotomy is to control the source of bleeding, evacuate clots, and repair major structural damage. This is a critical trauma skill. Rapid assessment and immediate decision-making are necessary to prevent exsanguination and hypovolemic shock in these high-stakes trauma scenarios.

Question 94. A 70-year-old man presents with progressively worsening dysphagia for both solids and liquids. Esophageal manometry shows absent or uncoordinated peristalsis and elevated resting pressure of the lower esophageal sphincter (LES). What is the most probable diagnosis?

A. Stomach cancer

B. Cancer esophagus

C. GERD

D. Achalasia Cardia

Correct answer: D

The clinical and physiological profile provided is diagnostic for Achalasia Cardia. Achalasia is a primary esophageal motility disorder characterized by the hallmark manometric triad: aperistalsis (absent contractions), failure of the LES to relax, and elevated resting LES pressure. Clinically, it presents with progressive dysphagia for both solids and liquids from the onset, which distinguishes it from esophageal cancer (Option B), where dysphagia typically starts with solids and progresses to liquids. Stomach cancer (Option A) and GERD (Option C) do not produce these specific manometric findings. Barium swallow in achalasia characteristically shows a "bird's beak" appearance due to the persistent narrowing at the GE junction. Management options include pneumatic balloon dilation, botulinum toxin injections, or definitive surgical Heller's myotomy (often performed laparoscopically with a partial

fundoplication). While more common in younger adults, achalasia can certainly occur in the elderly and must be differentiated from "pseudoachalasia" caused by a tumor at the cardia.

Question 95. For a 40-year-old patient undergoing a minor surgical procedure, which type of intravenous fluid is considered most appropriate for use during the surgery?

A. Isolyte p

B. Colloids

C. Crystalloids

D. Anemia

Correct answer: C

For a standard or minor surgical intervention in a healthy adult, Crystalloids (such as Normal Saline or Ringer's Lactate) are the most appropriate and commonly used intraoperative fluids. Crystalloids are effective for replacing insensible losses and maintaining hemodynamic stability during the procedure. They are safe, inexpensive, and readily available. Colloids (Option B), such as albumin or starch solutions, are reserved for cases with significant blood loss or severe capillary leak, as they remain in the intravascular space longer but carry risks of allergic reactions and renal issues. Isolyte P (Option A) is a maintenance fluid typically used in pediatric populations due to its lower sodium content; using it in an adult could lead to hyponatremia. Option D is a medical condition, not a fluid. Standard surgical management focuses on "goal-directed" fluid therapy to avoid both dehydration and fluid overload, both of which can impair postoperative recovery and wound healing. Crystalloids remain the foundational choice for routine volume maintenance.

Question 96. A 45-year-old man presents with abdominal pain, hypotension, and a CT scan showing no abnormalities. On physical examination, there is blackish discoloration of the perineal skin. What is the most likely diagnosis?

A. Necrotizing fasciitis

B. Acute pancreatitis

C. Chronic pancreatitis

D. Traumatic fat necrosis

Correct answer: B

The combination of severe abdominal pain, systemic hypotension (shock), and blackish discoloration of the perineal skin (specifically known as Turner's sign) is highly suggestive of severe, necrotizing Acute Pancreatitis. Turner's sign results from the retroperitoneal tracking of blood from the inflamed pancreas into the subcutaneous tissues of the flanks or perineum.

While Necrotizing fasciitis (Option A) also presents with skin discoloration and shock, the primary symptom is typically excruciating local pain rather than general abdominal pain with a normal abdominal CT. Pancreatitis-related skin signs include Cullen's sign (periumbilical) and Turner's sign (flank). A "normal" CT scan very early in the disease course does not rule out pancreatitis, as radiographic signs of necrosis can take 48-72 hours to develop. Management involves intensive fluid resuscitation, analgesia, and monitoring for organ failure. These skin signs are ominous indicators of a poor prognosis and severe internal hemorrhage.

Question 97. A 32-year-old patient is admitted following a road traffic accident with a GCS score of E2 M4 V2. CT imaging suggests the presence of a hematoma. Which treatment option is most appropriate for this patient?

A. Ventilation

B. Craniotomy with evacuation of hematoma

C. Anticoagulants

D. Steroids

Correct answer: B

This patient has severe traumatic brain injury (TBI), as indicated by a Glasgow Coma Scale (GCS) score ≤ 8. In a patient with GCS ≤ 8 and a CT-confirmed intracranial hematoma such as an epidural hematoma (EDH) or subdural hematoma (SDH) causing mass effect, the definitive and most appropriate treatment is urgent craniotomy with evacuation of the hematoma. Early surgical decompression is essential to relieve raised intracranial pressure, prevent brain herniation, and limit secondary ischemic injury. Endotracheal intubation and ventilation (Option A) are mandatory supportive measures in severe TBI to protect the airway and optimize oxygenation but do not treat the underlying cause of neurological deterioration. Anticoagulants (Option C) are absolutely contraindicated as they would exacerbate intracranial bleeding. Corticosteroids (Option D) are contraindicated in acute TBI, as large trials (e.g., CRASH) have shown increased mortality. The cornerstone of management in severe TBI is rapid identification and surgical evacuation of mass lesions. Neurological outcome and survival depend critically on the time interval between injury and definitive surgical decompression.

Question 98. A 56-year-old patient presents with prominent, dilated veins on the legs. Which diagnostic test is most appropriate for evaluating varicose veins in this patient?

A. Duplex ultrasound scan

B. Plethysmography

C. MRI

D. CT scan

Correct answer: A

For the evaluation of varicose veins and chronic venous insufficiency, a Duplex ultrasound scan is considered the gold standard and most appropriate diagnostic test. It is non-invasive and provides both anatomical information (identifying the location of dilated veins) and functional information (demonstrating the direction of blood flow and the presence of valvular reflux). This precise mapping is essential for planning treatments such as endovenous laser ablation or sclerotherapy. Plethysmography (Option B) measures changes in limb volume and can assess global venous function but lacks the anatomical detail of Duplex. MRI (Option C) and CT (Option D) are rarely indicated for simple varicose veins, although they may be used for complex pelvic venous congestion syndromes. Clinicians use the Duplex scan to evaluate the saphenofemoral and saphenopopliteal junctions for incompetence. Accurate diagnostic mapping significantly reduces the risk of recurrence after surgical or minimally invasive interventions.

Question 99. A 45-year-old patient presents with vomiting and diarrhea occurring about 20 minutes after meals following a Billroth II gastrectomy. What is the most appropriate initial management strategy for this condition?

A. Low-fat diet

B. Small frequent meals

C. Insulin with protein

D. Conversion of Billroth II to Billroth I procedure

Correct answer: B

The patient is experiencing Early Dumping Syndrome, a common complication following gastric surgeries like a Billroth II gastrectomy. It results from the rapid delivery of hyperosmolar food into the small intestine, leading to fluid shifts and vasomotor symptoms. The most appropriate initial management involves dietary modification, specifically eating small, frequent meals and avoiding large amounts of simple carbohydrates. Patients should also be advised to separate solid food and liquid intake (avoiding drinking with meals). A low-fat diet (Option A) is not the primary focus for dumping. Insulin (Option C) would worsen the hypoglycemia seen in late dumping. Surgical conversion (Option D) is a last resort reserved only for severe cases refractory to all medical and dietary management. Most patients achieve significant symptomatic relief by simply changing their eating habits to slow the transit of food into the jejunum. These dietary adjustments are the cornerstone of post-gastrectomy care.

Question 100. During intercostal drain insertion, which

anatomical location is considered the most appropriate for placing the chest tube?

A. Upper border of the lower rib

B. Lower border of the lower rib

C. Lower border of the upper rib

D. Middle of the intercostal space

Correct answer: A

The most critical anatomical consideration during the insertion of an intercostal tube drain is the location of the neurovascular bundle (intercostal vein, artery, and nerve). This bundle runs in the costal groove along the lower border of each rib. Therefore, to avoid catastrophic hemorrhage or nerve injury, the tube must be inserted by sliding over the upper border of the lower rib in the chosen intercostal space. Placing the tube near the lower border of the upper rib (Option C) would directly risk damaging these structures. The middle of the space (Option D) and the lower border of the lower rib (Option B) are less anatomically precise and do not offer the same safety margin. The standard insertion site is within the "safe triangle" bounded by the pectoralis major, the latissimus dorsi, and the 5th intercostal space. Adhering to this "upper border" rule is a fundamental surgical safety principle to minimize procedural morbidity.

Question 101. A 65-year-old man, working in a dye manufacturing industry, presents with urinary complaints. Ultrasound shows markedly thickened and irregular bladder walls. What is the most definitive management approach for this patient?

A. Cystoscopy with tumor removal

B. Instillation of BCG

C. Radical cystectomy

D. Intravesical mitomycin C

Correct answer: C

The patient's occupational history as a dye manufacturing worker is a classic risk factor for developing bladder cancer (exposure to aromatic amines). The ultrasound finding of thickened and irregular bladder walls in a symptomatic older male strongly suggests muscle-invasive bladder cancer (MIBC). For MIBC, the most definitive management approach is Radical cystectomy (removal of the bladder and associated lymph nodes) with urinary diversion. Cystoscopy with transurethral removal (TURBT) (Option A) is used for initial diagnosis and

treatment of non-muscle-invasive disease. BCG instillation (Option B) and intravesical Mitomycin C (Option D) are adjuvant therapies for non-muscle-invasive tumors to prevent recurrence. Because MIBC has a high risk of systemic spread, radical surgery is necessary for a potential cure. This often follows neoadjuvant cisplatin-based chemotherapy to improve survival. Recognizing high-risk occupational histories is vital for suspecting aggressive bladder malignancies in the clinical setting.

Question 102. A 28-year-old woman presents with a bluish, translucent swelling under her tongue. She describes it as cystic, with visible veins on the surface. On examination, the swelling transilluminates, indicating a fluid-filled structure. What is the most likely diagnosis?

A. Ranula

B. Dermoid cyst

C. Thyroglossal cyst

D. Sublingual tumor

Correct answer: A

The clinical presentation of a bluish, translucent, cystic swelling located specifically under the tongue on the floor of the mouth is highly characteristic of a ranula. A ranula is a type of mucocele that arises from the sublingual salivary gland due to ductal obstruction or trauma, leading to mucus extravasation into the surrounding tissues. Its characteristic "frog-belly" appearance and positive transillumination confirm its fluid-filled nature. In contrast, a dermoid cyst (Option B) typically presents as a midline swelling that is doughy on palpation and does not transilluminate. A thyroglossal cyst (Option C) is a midline neck mass that moves with tongue protrusion and is not located sublingually. A sublingual tumor (Option D) would typically be firm, non-translucent, and solid rather than cystic. Therefore, the anatomical location and classic physical signs documented in this 28-year-old patient definitively point toward a ranula as the most probable diagnosis.

Question 103. A 35-year-old patient is scheduled for

laparoscopic surgery, and the surgical team plans to create a pneumoperitoneum to facilitate the procedure. Which gas is most commonly used to establish pneumoperitoneum in laparoscopic surgeries?

A. Helium

B. Oxygen

C. Carbon dioxide

D. Nitrogen

Correct answer: C

Carbon dioxide (CO_2) is the gold standard and most commonly used gas for creating pneumoperitoneum during laparoscopic procedures. Its widespread use is attributed to several critical physiological and safety advantages. is highly soluble in blood, which significantly reduces the risk of a fatal gas embolism compared to other gases. Furthermore, is non-combustible, ensuring safety during the use of electrosurgical instruments like cautery or lasers within the abdominal cavity. While helium (Option A) is also non-combustible, its low solubility increases the risk of embolism. Oxygen (Option B) is strictly avoided as it supports combustion and poses a fire hazard. Nitrogen (Option D) is insoluble in blood, making any potential embolism extremely dangerous. Consequently, due to its high margin of safety regarding embolism and its non-flammable properties, carbon dioxide remains the preferred medium for maintaining the necessary workspace and visibility required for successful laparoscopic interventions.

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Question 104. A 50-year-old man presents to the outpatient department with hematuria, and evaluation reveals a 2×2 cm bladder mass consistent with low-grade transitional cell carcinoma. What is the most appropriate management approach for this patient?

A. Transurethral resection of the tumour

B. Resection with ileal conduit

C. Partial
cystectomy
with
bladder reconstruction

D. Neoadjuvant chemotherapy

Correct answer: A

For a patient with a localized, small (2x2 cm), low-grade transitional cell carcinoma (TCC) of the bladder, the most appropriate initial management is a Transurethral Resection of the Bladder Tumor (TURBT). TURBT serves both a diagnostic and therapeutic purpose, allowing for complete removal of the visible tumor while providing a tissue sample for histological staging of the muscle layer. Radical resection with an ileal conduit (Option B) is reserved for muscle-invasive bladder cancer or high-grade refractory disease. Partial cystectomy (Option C) is rarely indicated and only for very specific, isolated tumor locations. Neoadjuvant chemotherapy (Option D) is standard for muscle-invasive disease but not for a low-grade, non-invasive mass. In low-grade TCC, a single post-operative dose of intravesical chemotherapy (like Mitomycin C) is often added to the TURBT to further reduce the risk of recurrence. Thus, TURBT remains the standard-of-care for managing early-stage, low-grade bladder malignancies.

(B) T4b
(C) T3
(D) T4d
AAns

(D) T4d

In the TNM classification for breast cancer, Inflammatory Breast Cancer (IBC) is uniquely and specifically categorized as T4d. IBC is a clinical diagnosis characterized by rapid onset of breast erythema, edema, and a Peau d'orange (orange peel) skin texture, which results from the blockage of dermal lymphatics by tumor emboli. It is distinct from other T4 stages: T4a (Option A) refers to involvement of the chest wall (ribs, serratus, or intercostals); T4b (Option B) refers to skin involvement (ulceration or nodules) that does not meet the clinical criteria for inflammatory cancer. T3 (Option C) refers only to tumor size (>5 cm). IBC is a highly aggressive form of breast cancer with a high risk of early systemic metastasis. Management involves a multimodal approach: neoadjuvant chemotherapy to downstage the disease, followed by modified radical mastectomy and post-operative radiation. The clinical presence of diffuse skin edema (peau d'orange) is the definitive marker that elevates the stage to T4d.

Question 105. A newborn presents within 2 days of birth with bilious vomiting and abdominal distension. An abdominal X-ray has been performed (as shown). What is the most likely diagnosis?

A. Gas in bowel
B. Esophageal Atresia
C. Hypertrophic Pyloric Stenosis

D. Duodenal Atresia

Correct answer: D

The clinical presentation of bilious vomiting in a newborn within the first 48 hours of life is a red flag for high intestinal obstruction. The provided X-ray demonstrates the classic "double bubble" sign, which consists of two large air-filled spaces in the upper abdomen—one representing the stomach and the other the dilated proximal duodenum. This finding is pathognomonic for duodenal atresia. Bilious vomiting occurs because the obstruction is typically distal to the ampulla of Vater where bile enters the gut. Esophageal atresia (Option B) would present with drooling and inability to feed from birth, often with a gasless abdomen on X-ray. Hypertrophic Pyloric Stenosis (Option C) presents later (3–6 weeks) with non-bilious projectile vomiting. "Gas in bowel" (Option A) is a normal finding and does not explain bilious vomiting. Duodenal atresia is frequently associated with Trisomy 21 (Down syndrome), making it a critical pediatric diagnostic pattern to recognize.

Question 106. Within Freud’s psychosexual stages of development, a patient exhibits stubbornness, rigidity, and frugality, suggesting fixation due to unresolved conflicts during a particular developmental phase. At which stage does this type of behavior typically manifest as a result of fixation?

A. Anal

B. Oral

C. Phallic

D. Genital

Correct answer: A

Sigmund Freud’s theory of psychosexual development proposes that unresolved conflicts during specific childhood stages lead to adult personality traits or fixations. The anal stage, occurring between ages 1 and 3, focuses on toilet training and the control of bodily functions. Fixation at this stage can result in a character type known as "anal-retentive," which is clinically characterized by a triad of traits: extreme stubbornness, rigidity (obsession with order), and frugality (parsimony). Fixation at the oral stage (Option B) results in dependence or excessive smoking/eating. The phallic stage (Option C) involves the Oedipus complex and concerns about sexual identity. The genital stage (Option D) represents the mature integration of adult

sexuality. The specific behavioral pattern of meticulousness and control-oriented stubbornness is classically attributed to the power struggle experienced during the anal phase of development.

Question 107. An 11-year-old child is brought to the clinic by their parents due to the forearm angling outward relative to the upper arm, associated with discomfort and limited range of motion. Which condition is most likely responsible for this physical presentation?

A. Cubitus Valgus

B. Cubitus Varus

C. Gunstock deformity

D. Coxa Vara

Correct answer: A

Cubitus valgus is a clinical condition characterized by an abnormal increase in the "carrying angle" of the elbow, causing the forearm to angle outward away from the body when the arm is extended. A normal carrying angle is typically 5–15 degrees; in cubitus valgus, this angle significantly exceeds these parameters. This deformity often results from a prior fracture of the lateral humeral condyle during childhood that failed to heal correctly. Cubitus varus (Option B), or "gunstock deformity" (Option C), is the opposite condition, where the forearm angles inward toward the body, usually following a malunited supracondylar fracture. Coxa vara (Option D) is a deformity of the hip, not the elbow. Clinically, cubitus valgus is significant because it puts the ulnar nerve under chronic stretch as it passes behind the medial epicondyle, potentially leading to delayed-onset ulnar nerve palsy (tardy ulnar palsy) later in life.

Question 108. A 3-year-old child presents with a widespread vesicular rash that initially appeared as red spots and then developed into fluid-filled blisters. The child also has a mild fever and appears irritable. What is the most likely diagnosis?

A. Varicella

B. Shingles

C. Smallpox

D. Dermatomyositis

Correct answer: A

The clinical presentation of a widespread vesicular rash that starts as red spots and progresses to fluid-filled blisters (vesicles) in a 3-year-old is classic for varicella, commonly known as chickenpox. A hallmark of varicella is the presence of lesions in multiple stages of development

simultaneously (pleomorphism). Shingles (Option B) is a reactivation of the same virus but typically presents in a localized, dermatomal distribution in adults who have already had chickenpox. Smallpox (Option C) is eradicated; its rash characteristically featured lesions all at the same stage of development and was more concentrated on the face and extremities. Dermatomyositis (Option D) is an inflammatory muscle disease that presents with a distinct "heliotrope" rash on the eyelids rather than widespread blisters. Chickenpox is highly contagious and usually self-limiting in children, though it can cause more severe disease in immunocompromised individuals or adults.

Question 109. What is the underlying defect in the congenital malformation shown below?

A. Morulation

B. Neurulation

C. Gastrulation

D. Lateral folding

Correct answer: C

The image shows a fetus with caudal regression (sirenomelia/mermaid-like deformity) characterized by fusion of lower limbs and absent or malformed lower body structures. This type of congenital anomaly arises due to a defect in mesoderm formation, particularly in the caudal region of the embryo.

During gastrulation (3rd week), the primitive streak forms, and cells migrate to create the three germ layers—ectoderm, mesoderm, and endoderm. The mesoderm is responsible for forming muscles, bones, blood vessels, and lower limb structures. If there is defective migration or formation of mesoderm (especially caudal mesoderm), it leads to severe malformations like sirenomelia or caudal regression syndrome.

Why other options are wrong:

(A)

Morulation : Early cell division stage; no organ or limb formation involved

(B)

Neurulation : Affects neural tube → causes spina bifida/anencephaly, not limb fusion

(D)

Lateral folding : Causes body wall defects (e.g., omphalocele), not caudal limb anomalies

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Question 110. A newborn is brought to the pediatric clinic with early-onset jaundice and abnormal ocular findings. Ophthalmologic examination shows multiple small, white, punctate opacities

clustered in the central part of the lens, consistent with an oil-drop cataract. Considering the combination of neonatal jaundice and this characteristic lens opacity, which underlying metabolic disorder is the most likely diagnosis?

A. Phenylketonuria (PKU)

B. Maple syrup urine disease

C. Galactosemia

D. Wilson's disease

Correct answer: C

The clinical combination of neonatal jaundice and an oil drop cataract is the classic diagnostic indicator for Galactosemia. As established in Q.221, this metabolic disorder leads to the accumulation of toxic galactose metabolites, specifically galactitol, within the lens, which draws water in and creates a characteristic drop-like opacity. Early jaundice results from hepatic toxicity and impaired bilirubin conjugation. Phenylketonuria (Option A) leads to intellectual disability and "mousy" odor but not primary cataracts. Maple syrup urine disease (Option B) presents with severe ketoacidosis and a burnt-sugar odor in the urine. Wilson's disease (Option D) involves copper deposition, which causes "Kayser-Fleischer rings" in the cornea and "sunflower cataracts," but it typically presents in older children and adults, not neonates. Therefore, given the immediate neonatal presentation of jaundice and this specific lens finding, Galactosemia is the pathognomonic diagnosis.

Question 111. A 3-year-old child presents with profuse diarrhea and vomiting, along with deeply sunken eyes and complete absence of urine output. On examination, the child is severely dehydrated, lethargic, tachypneic, and hypotensive with a blood pressure of 80/60 mmHg. In this clinical scenario of severe dehydration with shock, which intravenous fluid should be administered for management?

A. ORS

B. Ringer lactate with 5% dextrose

C. Normal Saline

D. Dextrose

Correct answer: B

The child presents with severe dehydration and hypovolemic shock, indicated by lethargy, hypotension (80/60 mmHg), tachypnea, sunken eyes, and anuria. This is a life-threatening

condition requiring immediate intravenous fluid resuscitation.

In pediatric diarrheal dehydration, Ringer lactate (RL) is the preferred fluid because it is a balanced crystalloid solution containing electrolytes such as sodium, potassium, calcium, and chloride. Importantly, the lactate component is metabolized to bicarbonate, helping to correct metabolic acidosis, which commonly occurs due to severe diarrhea.

The addition of 5% dextrose is beneficial in children to prevent hypoglycemia and provide energy, especially when oral intake is compromised.

Why other options are wrong:

(A)

ORS → Not suitable in shock or severe dehydration

(C)

Normal saline → Effective but may cause hyperchloremic acidosis; less physiological than RL

(D)

Dextrose → Does not restore intravascular volume

Question 112. A 30-year-old patient presents with a history of an untreated traumatic dislocation of the hip and now complains of hip pain, discomfort, and restricted range of movement. In the context of a neglected hip dislocation, which clinical test is most likely to be positive on examination?

A. Lasegue test

B. Thomas test

C. Telescopy

D. McMurray test

Correct answer: B

A untreated or chronic hip dislocation often leads to the development of a permanent fixed flexion deformity. The Thomas test is the standard clinical maneuver used to identify and measure such a fixed flexion deformity of the hip. During the test, the patient flexes the healthy hip fully toward the chest to flatten the lumbar spine; if a flexion deformity is present in the opposite (affected) hip, that thigh will involuntarily lift off the examining table. The Lasegue test (Option A) is used to identify sciatic nerve irritation. Telescopy (Option C) is a test for hip instability, where the femur can be manually shifted up and down, characteristically seen in developmental dysplasia or acute dislocation, but Thomas test specifically evaluates the chronic deformity. The McMurray test (Option D) is used to detect meniscal tears in the knee. Therefore, the Thomas test is the key clinical tool for assessing chronic postural changes following significant hip trauma.

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(A) FSH

(B) LH

(C) GnRH

(D) HCG

AAns

(D) HCG

The image displays the classic "snowstorm" appearance on ultrasound, which is pathognomonic for a molar pregnancy (hydatidiform mole). In this condition, the abnormal trophoblastic proliferation leads to the production of excessively high levels of human chorionic gonadotropin (HCG). Serum HCG levels in molar pregnancies often exceed mIU/mL, which is significantly higher than levels seen in a normal pregnancy of the same gestational age. FSH (Option A), LH (Option B), and GnRH (Option C) are involved in the normal hypothalamic-pituitary-ovarian axis and are not the primary hormones secreted by gestational trophoblastic tissue. These extreme HCG levels are responsible for clinical signs such as hyperemesis gravidarum and early-onset pre-eclampsia. Following suction and evacuation of the mole, serial monitoring of serum HCG is mandatory to ensure the levels return to zero and to detect early malignant transformation into gestational trophoblastic neoplasia (choriocarcinoma). This hormone serves as both a sensitive diagnostic marker and a vital surveillance tool.

Question 113. A 39-year-old woman presents to the outpatient department with a complaint of bloody nipple discharge. Clinical examination reveals that the discharge is arising from a single lactiferous duct. Given this localized finding, what is the most appropriate management or treatment for this condition?

A. Hadfield's operation

B. IV antibiotics + incision

C. Microdiscectomy

D. Microdochectomy

Correct answer: D

A spontaneous bloody nipple discharge originating from a single duct in a 39-year-old woman is most likely caused by an intraductal papilloma. The standard-of-care surgical management for this presentation is a Microdochectomy. This precise procedure involves the excision of the single, offending lactiferous duct and its surrounding tissue through a periareolar incision. Hadfield’s operation (Option A), or total duct excision, is reserved for multi-duct discharge or

more extensive disease. IV antibiotics and incision (Option B) are used for treating an acute breast abscess, not a ductal growth. Microdiscectomy (Option C) is a neurosurgical procedure for the spine. While most intraductal papillomas are benign, they can occasionally contain areas of atypia or early cancer; therefore, histological examination of the excised duct is mandatory. Microdochectomy effectively stops the discharge while preserving the rest of the breast tissue.

Question 114. Labour induction is not done in which of the following?

A. Central placenta previa

B. Gestational HTN

C. PROM

D. Abruptio placenta

Correct answer: A

Induction of labor (artificial initiation of contractions) is contraindicated in Central (Type IV) Placenta Previa. In this condition, the placenta completely covers the internal os of the cervix. Attempting a vaginal delivery (via induction) would lead to massive, life-threatening maternal hemorrhage and fetal distress as the cervix dilates. All such cases must be delivered via a planned or emergency cesarean section. Gestational hypertension (Option B), Premature Rupture of Membranes (PROM) (Option C), and certain cases of stable Abruptio placenta (Option D) are actually common indications for induction to ensure the safety of the mother and fetus. Other contraindications for induction include prior classical C-section scars and active genital herpes. Proper selection of patients for induction is critical in obstetric practice to avoid high-risk vaginal delivery attempts where the placental position or structural anomalies make it unsafe.

Question 115. A pregnant woman at 21 weeks of gestation is found to have a fetus diagnosed with meningomyelocele (a type of spina bifida) and is considering medical termination of pregnancy. In this situation, what legal and medical requirements must be fulfilled to proceed with MTP?

A. Consent of Husband with opinion of one doctor

B. Her consent with consent of 2 doctors

C. Opinion of 2 doctors

D. All of the Above

Correct answer: B

According to the Medical Termination of Pregnancy (Amendment) Act, 2021 in India, for an MTP

performed between 20 and 24 weeks of gestation (such as in this 21-week case with a substantial fetal anomaly), the mandatory legal requirement is the opinion and consent of two registered medical practitioners. Most importantly, only the pregnant woman's own written consent is legally required; the consent of the husband or partner (Option A) is not a requirement under Indian law. Option C is incomplete as the patient's consent is the primary legal prerequisite. For terminations up to 20 weeks, only one doctor's opinion is required. Terminations beyond 24 weeks for fetal anomalies require the permission of a State-level Medical Board. Therefore, for this specific second-trimester scenario, the woman’s autonomous consent alongside the professional agreement of two doctors constitutes the full legal and medical requirement.

Question 116. The quadruple test for antenatal screening of Down syndrome is performed in the second trimester of pregnancy, typically between 15 and 20 weeks of gestation (most commonly around 16–18 weeks).

A. 1st trimester

B. 3rd trimester

C. 2nd trimester

D. 4th trimester

Correct answer: C

The Quadruple test is a vital biochemical screening tool for Down syndrome (Trisomy 21), Edwards syndrome (Trisomy 18), and neural tube defects. It is characteristically performed during the 2nd trimester, ideally between 15 and 20 weeks of gestation. The test measures four maternal serum markers: Alpha-fetoprotein (AFP), human Chorionic Gonadotropin (hCG), unconjugated Estriol (uE3), and Inhibin-A. First trimester screening (Option A) typically involves the "Double marker" test (PAPP-A and free beta-hCG) combined with nuchal translucency ultrasound at 11–14 weeks. There is no standard "screening" for these conditions in the 3rd trimester (Option B) or a 4th trimester (Option D), as the window for diagnostic follow-up and clinical decision-making would be closed. The quadruple test provides a risk estimate; if the result is "screen positive" (high risk), the patient is offered definitive diagnostic testing via amniocentesis.

Question 117. When the fetal scalp becomes visible at the vulva, the maneuver performed to control delivery of the head and prevent perineal tears is the Ritgen’s maneuver.

A. Ritgen maneuver

B. Loveset's maneuver

C. Pinard maneuver

D. Mauriceau-Smellie-Veit maneuver

Correct answer: A

The image depicts the Ritgen maneuver, a clinical technique used during the second stage of labor when the fetal scalp is visible at the vulva (crowning). The clinician applies pressure through the perineum onto the fetal chin with one hand while the other hand controls the crowning vertex. The primary objective is to facilitate the slow, controlled delivery of the fetal head in a state of extension, thereby minimizing the risk of severe perineal tears. By ensuring the head emerges during the interval between contractions, the maneuver protects the maternal pelvic floor. Loveset’s maneuver (Option B) is used for delivering the arms in a breech presentation. Pinard maneuver (Option C) is utilized to bring down a leg in a frank breech. The Mauriceau-Smellie-Veit maneuver (Option D) is employed for the delivery of the after-coming head in breech. Therefore, given the visual of head crowning and the specific protective hand placement shown, Ritgen maneuver is the correct identification for this obstetric procedure.

252. Just after delivery, the position of the uterus
corresponds to the level of how many weeks?

(A) 20 weeks

(B) 16 weeks

(C) 12 weeks

Question 118. 251. (A) Ritgen maneuver
The image depicts the Ritgen maneuver, a clinical technique used during the second stage of labor when the fetal scalp is visible at the vulva (crowning). The clinician applies pressure through the perineum onto the fetal chin with one hand while the other hand controls the crowning vertex. The primary objective is to facilitate the slow, controlled delivery of the fetal head in a state of extension, thereby minimizing the risk of severe perineal tears. By ensuring the head emerges during the interval between contractions, the maneuver protects the maternal pelvic floor. Loveset’s maneuver (Option B) is used for delivering the arms in a breech presentation. Pinard maneuver (Option C) is utilized to bring down a leg in a frank breech. The Mauriceau-Smellie-Veit maneuver

(Option D) is employed for the delivery of the after-coming head in breech. Therefore, given the visual of head crowning and the specific protective hand placement shown, Ritgen maneuver is the correct identification for this obstetric procedure.

Just after delivery, the position of the uterus corresponds to the level of how many weeks?

A. 20 weeks

B. 16 weeks

C. 12 weeks

D. 28 weeks

Correct answer: A

Immediately after delivery of the baby (and placenta), the uterus undergoes rapid contraction and retraction. At this stage, the uterine fundus is palpable at the level of the umbilicus, which corresponds approximately to the size of a 20-week pregnant uterus.

Question 119. A 31-year-old woman who develops pain and sensory loss over the anterolateral aspect of the thigh following vaginal delivery is most likely experiencing injury to the lateral femoral cutaneous nerve.

A. Sciatic Nerve

B. Obturator Nerve

C. Ilioinguinal Nerve

D. The lateral cutaneous nerve of thigh

Correct answer: D

Pain and numbness confined to the anterolateral aspect of the thigh are classic for meralgia paresthetica, which results from compression or injury to the lateral cutaneous nerve of the thigh (also called the lateral femoral cutaneous nerve). This nerve is a pure sensory nerve that

passes beneath the inguinal ligament, making it vulnerable to compression.
Such injury commonly occurs after prolonged vaginal delivery, especially when the patient is maintained in a forced lithotomy position for an extended period. Compression may result from leg supports, prolonged hip flexion, or pressure from the fetal head.
The sciatic nerve (Option A) causes sensory loss over the posterior leg with associated motor weakness. The obturator nerve (Option B) supplies the medial thigh and affects thigh adduction. The ilioinguinal nerve (Option C) provides sensation to the groin and labia majora.
Most cases of meralgia paresthetica are self-limiting and resolve with conservative management, but correct identification of the sensory distribution is essential to exclude more serious motor nerve injuries.

(D) 28 weeks
AAns

(A) 20 weeks
Immediately after delivery of the baby (and placenta), the uterus undergoes rapid contraction and retraction. At this stage, the uterine fundus is palpable at the level of the umbilicus, which corresponds approximately to the size of a 20-week pregnant uterus.
During pregnancy, the uterus gradually enlarges:
1.
At 12 weeks → just above the symphysis pubis
2.
At 20 weeks → at the level of the umbilicus
3.
At 28 weeks → above the umbilicus
After delivery, although the fetus and placenta are expelled, the uterus does not immediately return to its pre-pregnant size. Instead, it remains enlarged and firm to prevent hemorrhage. This postpartum uterine size corresponds to about 20 weeks gestation, and then it gradually involutes over the next few weeks.
Why other options are wrong:
(B)
16 weeks → Below umbilicus
(C)
12 weeks → Too small; uterus already involutes later
(D)
28 weeks → Too large; corresponds to late pregnancy

Question 120. A young girl presents with irregular menstrual

cycles,
acne,
hirsutism,
and
ultrasound
evidence of multiple ovarian follicles. In this
clinical setting, which hormone or biochemical
parameter is most likely to be elevated?

A. Sex hormone binding globulin levels

B. Serum testosterone

C. FSH levels

D. FSH/LH ratio

Correct answer: B

The clinical presentation of irregular periods, acne, and hirsutism (increased facial hair), combined with the ultrasound finding of polycystic ovaries, is pathognomonic for Polycystic Ovary Syndrome (PCOS). The characteristic biochemical abnormality in PCOS is an increase in androgens; therefore, Serum testosterone levels would be elevated. Sex hormone binding globulin (SHBG) (Option A) levels are characteristically decreased in PCOS (due to insulin resistance), which further increases the bioavailability of free testosterone. FSH levels (Option C) are often normal or low. The LH:FSH ratio is typically increased (often), but Option D incorrectly lists the "FSH/LH ratio," which would be decreased. Insulin resistance is a central feature of the syndrome, leading to the compensatory hyperinsulinemia that stimulates the ovarian theca cells to produce more testosterone. Management focuses on lifestyle modification, hormonal contraceptives to regulate cycles, and anti-androgens like spironolactone to treat the cutaneous symptoms of hirsutism and acne.

276. A woman is found to have a hard, irregular mass located in the upper outer quadrant of the breast. A histopathological slide of the lesion is shown. Based on the clinical and microscopic findings, what is the most likely diagnosis?

Examination Paper July 2023 Question

Question 121. polycystic
ovaries,
is
pathognomonic
for

Polycystic Ovary Syndrome (PCOS). The characteristic biochemical abnormality in PCOS is an increase in androgens; therefore, Serum testosterone levels would be elevated. Sex hormone binding globulin (SHBG) (Option A) levels are characteristically decreased in PCOS (due to insulin resistance), which further increases the bioavailability of free testosterone. FSH levels (Option C) are often normal or low. The LH:FSH ratio is typically increased (often), but Option D incorrectly lists the "FSH/ LH ratio," which would be decreased. Insulin resistance is a central feature of the syndrome, leading to the compensatory hyperinsulinemia that stimulates the ovarian theca cells to produce more testosterone. Management focuses on lifestyle modification, hormonal contraceptives to regulate cycles, and anti-androgens like spironolactone to treat the cutaneous symptoms of hirsutism and acne.

A woman is found to have a hard, irregular mass located in the upper outer quadrant of the breast. A histopathological slide of the lesion is shown. Based on the clinical and microscopic findings, what is the most likely diagnosis?

A. Phyllodes tumor

B. Inflammatory breast carcinoma

C. Invasive lobular carcinoma

D. Fibroadenoma

Correct answer: C

The histopathological slide demonstrates the characteristic "Indian file" pattern, where small, uniform malignant cells are arranged in single-file rows infiltrating the stroma. This microscopic appearance is pathognomonic for Invasive lobular carcinoma (ILC). ILC is the second most common type of invasive breast

cancer and is often more difficult to detect on mammography than ductal cancer because it does not always form a distinct, discrete mass. A Phyllodes tumor (Option A) would show a leaf-like architecture with significant stromal cellularity. Inflammatory breast carcinoma (Option B) is a clinical diagnosis characterized by dermal lymphatic invasion and skin edema. A Fibroadenoma (Option D) is a benign biphasic tumor with proliferating glands and stroma. Invasive lobular carcinoma has a high tendency to be bilateral and multicentric. Unlike ductal cancers, it often lacks the expression of E-cadherin, which explains the loss of cell-to-cell adhesion and the resulting single-file growth pattern. Accurate histological diagnosis is essential for planning surgical and systemic therapy.

During the assessment of an elderly man with multiple comorbidities including chronic obstructive pulmonary disease, hypertension, and diabetes, which prescribing criteria should be used to systematically review and optimize his medications?

(A)

Duke's criteria

(B)

Light criteria

(C)

Beer's criteria

(D)

Jones criteria

Question 122. During the assessment of an elderly man with multiple comorbidities including chronic obstructive pulmonary disease, hypertension, and diabetes, which prescribing criteria should be used to systematically review and optimize

his medications?

A. Duke's criteria

B. Light criteria

C. Beer's criteria

D. Jones criteria

Correct answer: C

The Beers Criteria (American Geriatrics Society Beers Criteria) is the standard clinical guide used for medication review in elderly patients. It identifies "potentially inappropriate medications" (PIMs) that should be avoided or used with caution in the geriatric population due to an increased risk of adverse events, drug-drug interactions, or lack of efficacy. This is particularly relevant for a patient with multiple comorbidities like COPD, hypertension, and diabetes, who is likely on multiple medications (polypharmacy). Duke's criteria (Option A) are used for diagnosing infective endocarditis. Light’s criteria (Option B) are used to differentiate exudative from transudative pleural effusions. Jones criteria (Option D) are used for the diagnosis of acute rheumatic fever. Utilizing the Beers criteria helps physicians optimize drug therapy for the elderly, reducing the incidence of falls, cognitive impairment, and GI bleeding. It provides a structured framework for de-prescribing unnecessary or high-risk medications, thereby improving the overall safety and quality of care for older adults.

DERMATOLOGY

Question 123. A 45-year-old patient presents to the dermatology clinic with a concerning mole on the back. The mole has changed in size, shape, and color over the past six months. The patient reports the lesion occasionally itches and bleeds. On examination, the mole is asymmetric, has irregular borders, varies in color from brown to black, and measures 8 mm in diameter. The patient has a history of extensive sun exposure and a family history of skin cancer. A biopsy of the lesion is performed. What is the most likely diagnosis?

A. Basal cell Carcinoma

B. Squamous cell Carcinoma

C. Malignant Melanoma

D. Hepatocellular carcinoma

Correct answer: C

The clinical description of the lesion fulfills the ABCDE criteria for the early detection of Malignant Melanoma: Asymmetry, Border irregularity, Color variation (brown to black), Diameter mm, and Evolution (change over 6 months). Symptoms like itching and bleeding in a pigmented lesion are also significant warning signs. Basal Cell Carcinoma (Option A) typically appears as a pearly nodule with rolled edges. Squamous Cell Carcinoma (Option B) often presents as a scaly, ulcerated plaque. Hepatocellular carcinoma (Option D) is a liver cancer unrelated to skin moles. Malignant melanoma arises from melanocytes and is the most lethal form of skin cancer due to its high potential for rapid metastasis. Chronic UV exposure and a positive family history are major risk factors. Management involves wide local excision with adequate margins, often guided by the Breslow depth of the tumor on biopsy. Early identification of suspicious moles is the most critical factor for improving survival in melanoma patients.

Question 124. A 45-year-old patient presents with characteristic facial changes marked by thickened, coarse, and deeply furrowed skin over the cheeks, forehead, and nose. The patient also complains of numbness and weakness in the limbs. Cutaneous examination reveals hypopigmented and erythematous patches with areas of sensory loss. The facial appearance described as “leonine facies” is classically associated with which medical condition?

A. Acromegaly

B. Myasthenia gravis

C. Lepromatous Leprosy

D. Bells palsy

Correct answer: C

The term "Leonine facies" (lion-like face) is a classic clinical description for the facial appearance in advanced Lepromatous Leprosy. It results from the diffuse infiltration of the facial skin with lepra bacilli, leading to coarsening, thickening, and deep furrowing of the skin, often accompanied by the loss of eyebrows (madarosis). The patient's associated symptoms of anesthetic skin patches and peripheral nerve involvement (numbness and weakness) confirm the diagnosis of Hansen's disease. Acromegaly (Option A) involves coarsening of facial features

due to bone growth but lacks the specific skin furrows and anesthetic patches. Myasthenia gravis (Option B) involves muscle weakness (ptosis) but no primary skin changes. Bell's palsy (Option D) is an isolated facial nerve paralysis. Lepromatous leprosy is the multibacillary form of the disease seen in patients with low cell-mediated immunity. Management involves a two-year course of Multi-Drug Therapy (MDT) with rifampicin, dapsone, and clofazimine. Recognizing leonine facies is a fundamental task in identifying late-stage leprosy in endemic regions.

Question 125. A 50-year-old patient presents with complaints of skin lesions and joint pain. Cutaneous examination reveals erythematous, scaly plaques, while musculoskeletal examination shows a painful, swollen, and tender finger joint with signs of inflammation. Based on these clinical features, what is the most likely diagnosis?

A. Reactive arthritis

B. Pseudo gout

C. Osteoarthritis

D. Psoriatic Arthritis

Correct answer: D

The combination of a chronic skin condition (red, scaly patches characteristic of psoriasis) and inflammatory joint pain involving a specific digit is diagnostic for Psoriatic Arthritis. This seronegative spondyloarthropathy often presents with "dactylitis" (sausage digit) and can involve the distal interphalangeal (DIP) joints, which is less common in rheumatoid arthritis. The provided image further supports the diagnosis by showing pathognomonic psoriatic nail changes, such as pitting, onycholysis, and oil spots. Reactive arthritis (Option A) typically follows a GI/GU infection and presents with a classic triad including uveitis and urethritis. Pseudogout (Option B) is a crystal-induced arthropathy characterized by chondrocalcinosis on X-ray. Osteoarthritis (Option C) is a degenerative "wear and tear" disease that lacks the primary scaly skin rash of psoriasis. Up to 30% of patients with psoriasis will eventually develop psoriatic arthritis. Management involves a combination of NSAIDs, conventional DMARDs like methotrexate, and modern biologic therapies (TNF inhibitors) to control both skin and joint inflammation.

Question 126. A 40-year-old woman presents with raised,

erythematous nodular skin lesions, respiratory symptoms, and lymphadenopathy. Chest X-ray reveals bilateral hilar lymphadenopathy, and biopsy demonstrates granulomas without central necrosis. Based on this presentation,

which histopathological finding is most likely to be seen?

A. Caseating granuloma

B. Stellate granuloma

C. Non caseating granuloma

D. Eosinophilic granuloma

Correct answer: C

The clinical constellation of skin nodules (erythema nodosum), respiratory symptoms, and bilateral hilar lymphadenopathy is highly characteristic of Sarcoidosis. The definitive histological marker for sarcoidosis is the presence of Non-caseating granulomas. These are well-formed aggregates of epithelioid histiocytes and giant cells that lack central (caseous) necrosis. Caseating granulomas (Option A) are the hallmark of tuberculosis, which presents similarly but shows central necrotic "cheesy" debris. Stellate granulomas (Option B) are seen in cat-scratch disease or lymphogranuloma venereum. Eosinophilic granulomas (Option D) are a manifestation of Langerhans cell histiocytosis. Sarcoidosis granulomas may also contain inclusions like Asteroid bodies or Schaumann bodies. Diagnosis is established when these histological findings are correlated with the classic radiographic signs. While many cases resolve spontaneously, symptomatic pulmonary involvement often requires treatment with corticosteroids to suppress the granulomatous inflammation and prevent long-term fibrosis. Accurate histological identification is critical for differentiating sarcoidosis from systemic infections like TB.

ANAESTHESIA

Question 127. In a patient with maxillofacial trauma, airway protection is a critical priority because facial injuries can compromise airway patency. Among the various options available for airway control in this setting, which technique is considered the most appropriate for securing the airway?

A. Tracheostomy

B. Laryngeal mask airway

C. Orotracheal intubation

D. Mask ventilation

Correct answer: A

In severe maxillofacial trauma, airway management becomes extremely challenging due to bleeding, edema, disrupted anatomy, and possible obstruction by fractured bones or soft tissue. In such cases, conventional airway methods like orotracheal intubation may be difficult or even impossible, especially if:

1.

The mouth cannot be opened (trismus/fracture)

2.

There is profuse bleeding or debris

3.

There is a risk of worsening injury

Under these conditions, tracheostomy provides a definitive and secure airway by bypassing the upper airway entirely. It ensures direct access to the trachea, making ventilation reliable even in distorted facial anatomy.

Why other options are wrong:

(C)

Orotracheal intubation : May not be feasible in severe facial trauma

(B)

Laryngeal mask airway : Not a definitive airway; poor seal, aspiration risk

(D)

Mask ventilation : Ineffective due to facial disruption

Question 128. During a preoperative assessment, a 45-year-old patient undergoes evaluation of the airway to predict the likelihood of difficulty during endotracheal intubation. On inspection, the soft palate, uvula, fauces (pillars), and tonsils are all fully visible without any obstruction. Based on these findings, which Mallampatti score does this airway correspond to?

A. Grade 1

B. Grade 2

C. Grade 3

D. Grade 4

Correct answer: A

The Mallampati classification is used by anesthesiologists to predict the ease of endotracheal intubation. A Mallampati Score of 1 is assigned when there is complete visualization of the soft palate, uvula, fauces, and tonsillar pillars. This score indicates that intubation is likely to be straightforward. Score 2 (Option B) involves visualization of the soft palate and the majority of the uvula, but the pillars are obscured. Score 3 (Option C) allows for the visualization of the soft palate and the base of the uvula only. Score 4 (Option D) is assigned when the soft palate is not visible at all, and only the hard palate can be seen; this score predicts a "difficult airway." Accurate assessment requires the patient to sit upright, open their mouth wide, and protrude the tongue without phonating. Identifying a Score 1 allows the surgical team to proceed with standard intubation protocols, while higher scores necessitate preparation for advanced airway management techniques.

Question 129. Which vertebral level corresponds to Tuffier's line, a clinically relevant anatomical landmark?

A. L2-L3

B. L4-L5

C. L5-S1

D. L3-L4

Correct answer: B

Tuffier's line (also known as the intercristal line) is a horizontal line connecting the highest points of the iliac crests. In most adults, this line passes through either the body of the L4 vertebra or the L4-L5 intervertebral space. This landmark is of critical clinical importance for performing a lumbar puncture or administering spinal and epidural anesthesia. Since the adult spinal cord typically ends (conus medullaris) at the L1-L2 level, inserting a needle at or below Tuffier's line (such as the L3-L4 or L4-L5 spaces) provides a significant safety margin to avoid direct cord injury. Options A (L2-L3), C (L5-S1), and D (L3-L4) are incorrect Anatomical correlates for this specific surface landmark. While the exact level can vary slightly with age or positioning, using Tuffier's line as the primary guide remains the standard practice in clinical neurology and anesthesia to ensure the safe entry into the subarachnoid space.

RADIOLOGY

Question 130. Which of the following condition is depicted in the given CT image?

A. HCC

B. Hepatitis

C. Congenital Adrenal Hyperplasia

D. Cirrhosis

Correct answer: C

The CT image shows bilaterally enlarged adrenal glands with a lobulated / cerebriform appearance, which is a classic radiological finding of congenital adrenal hyperplasia. In CAH, chronic ACTH stimulation leads to diffuse adrenal hyperplasia, typically involving both adrenal glands symmetrically.

Why the other options are incorrect

(A)

HCC (Hepatocellular carcinoma) – Would show a focal liver mass with arterial enhancement and washout, not bilateral adrenal enlargement.

(B)

Hepatitis – Causes diffuse liver changes, not adrenal enlargement.

(D)

Cirrhosis – Shows a shrunken, nodular liver with portal hypertension features (splenomegaly, ascites), not this appearance.

Question 131. A 55-year-old man presents to the emergency department with high-grade chills and violent shaking (rigors), along with sudden-onset severe pain in the right flank. This clinical picture raises concern for a serious infectious or inflammatory condition involving the abdomen or flank. Based on these symptoms and the expected findings from appropriate diagnostic investigations, including imaging studies, which of the following conditions should be considered in the differential diagnosis?

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A. Cholecystitis

B. Emphysematous Pyelonephritis

C. Small Bowel Obstruction

D. Volvulus

Correct answer: B

The clinical combination of high-grade fever with rigors and acute right flank pain in a 55-year-old patient points strongly toward a severe renal infection. As established in the previous analysis, Emphysematous Pyelonephritis is the most likely diagnosis that accounts for such intense systemic symptoms and localized flank distress. This condition involves gas-forming bacteria invading the kidney tissue. Cholecystitis (Option A) would typically present with right upper quadrant pain radiating to the shoulder and positive Murphy's sign, rather than

primary flank pain and rigors. Small Bowel Obstruction (Option C) and Volvulus (Option D) present with diffuse abdominal distension, vomiting, and constipation rather than localized flank pain and a high febrile response. Diagnosis of emphysematous pyelonephritis is confirmed via CT scan showing gas in the kidney. Immediate management focuses on broad-spectrum antibiotics and stabilization of any underlying diabetes, as this condition carries a high mortality rate without rapid intervention.

Question 132. A newborn presents with bilious vomiting, prompting a radiographic evaluation to determine the underlying cause. Since bilious vomiting in a neonate is a critical sign of intestinal obstruction, the imaging findings are key to establishing the diagnosis. Which characteristic radiographic sign is most likely to be observed in this scenario

A. Air crescent sign

B. Double bubble sign

C. Cupola sign

D. None of the above

Correct answer: B

Bilious vomiting in a newborn is a pediatric emergency indicating a high intestinal obstruction. The most likely radiographic sign identified on an abdominal X-ray is the "Double bubble sign." This sign consists of two large, air-filled bubbles in the upper abdomen—one in the stomach and the other in the proximal duodenum—with no gas seen distally. This is the pathognomonic finding for Duodenal Atresia. The Air crescent sign (Option A) is seen in pulmonary aspergilloma. The Cupola sign (Option C) refers to air trapped under the central tendon of the diaphragm in pneumoperitoneum. Duodenal atresia is frequently associated with Down syndrome (Trisomy 21). Management involves immediate decompression with an orogastric tube and surgical correction (duodenoduodenostomy) once the infant is stabilized. Correctly identifying the "double bubble" is the critical step for diagnosing neonatal duodenal obstruction and preventing life-threatening aspiration and electrolyte imbalances.

Question 133. A 35-year-old patient living with HIV presents with a chronic cough, persistent fever, and marked weight loss over several months.

Considering the patient’s immuno compromised state and the strong suspicion of tuberculosis, which diagnostic investigation should be prioritized to confirm TB?

A. Culture

B. Chest x-ray

C. CBNAAT

D. PCR

Correct answer: C

In a patient living with HIV who presents with classic symptoms of Tuberculosis (cough, fever, weight loss), the diagnostic priority according to modern guidelines (including India's NTEP) is CBNAAT (Cartridge Based Nucleic Acid Amplification Test), commonly known as GeneXpert. CBNAAT is prioritized because it is highly sensitive and can simultaneously detect the M. tuberculosis genome and rifampicin resistance in less than two hours. Culture (Option A) is the gold standard but takes weeks to produce results. Chest X-ray (Option B) is a vital screening tool but cannot provide a definitive diagnosis or resistance profile, and in HIV patients, it may show atypical patterns or even be normal. Standard PCR (Option D) is less standardized for routine TB diagnosis than the specific CBNAAT system. Early and accurate diagnosis of TB in HIV-infected individuals is critical, as TB is a leading cause of mortality in this population. CBNAAT allows for the immediate initiation of correct, resistance-based antitubercular therapy.

Question 134. Accurate assessment of renal perfusion requires an appropriate diagnostic investigation to evaluate blood flow to the kidneys. This is essential for detecting conditions such as renal artery stenosis or impaired renal function. Among the following options, which investigation is most appropriate for assessing renal perfusion?

A. DTPA scan

B. RGU

C. DMSA

D. CT Urogram

Correct answer: A

The DTPA (Diethylenetriaminepentaacetic acid) scan is a nuclear medicine study and is considered the best investigation for assessing renal perfusion and glomerular filtration rate (GFR). DTPA is handled by the kidneys purely through glomerular filtration, allowing for the real-time visualization of blood flow to each kidney and the calculation of their individual functional contribution. RGU (Retrograde Urethrogram, Option B) is used to visualize the urethra. DMSA (Dimercaptosuccinic acid, Option C) is another nuclear scan, but it binds to the renal cortex and is the gold standard for identifying renal scarring and cortical defects rather than acute perfusion. CT Urogram (Option D) provides excellent anatomical detail of the entire urinary tract but is not a primary tool for quantifying physiological perfusion. DTPA scans are particularly valuable for diagnosing renal artery stenosis (often using a captopril-enhanced scan) and monitoring the function of transplanted kidneys. Accurate assessment of perfusion is essential for determining the viability of a diseased kidney.

Question 135. A patient sustains a head injury after being struck on the skull by a falling hammer. Subsequent CT imaging demonstrates characteristic findings related to this mechanism of trauma. Based on the nature of the injury and the typical appearance on imaging, what is the most likely diagnosis?

A. Epidural Hematoma

B. Concussion

C. Depressed skull fracture

D. Subarachnoid hemorrhage

Correct answer: C

A high-force impact to a small, localized area of the skull—such as being hit by a hammer—characteristically results in a Depressed skull fracture. In this type of injury, a fragment of the skull is driven inward toward the brain. On a head CT (bone window), this appears as an area where the bone is displaced below the level of the surrounding skull vault. Epidural Hematoma (Option A) would show a biconvex lens-shaped bleed. Concussion (Option B) is a functional brain injury that typically shows no visible abnormalities on CT. Subarachnoid hemorrhage (Option D) would show blood within the sulci and cisterns. Depressed skull fractures are significant because they may be "open" (if the skin is torn) and can cause direct underlying brain contusions or dural tears, leading to an increased risk of infection and post-traumatic epilepsy. If the bone is depressed by more than the thickness of the skull,

surgical elevation is often required to minimize complications.

Question 136. A 28-year-old patient presents with a history of recurrent urinary tract infections and chronic pain in the left flank. Further evaluation with a CT scan of the abdomen reveals characteristic findings pointing toward a renal structural abnormality. Based on these clinical features and imaging results, what is the most likely diagnosis?

A. Horseshoe kidney

B. Polycystic kidney disease

C. Renal ectopia

D. Hydronephrosis

Correct answer: A

The CT scan demonstrates a Horseshoe kidney, which is the most common renal fusion anomaly. It is characterized by the fusion of the lower poles of both kidneys across the midline by an isthmus of either functioning renal tissue or fibrous band. This fusion usually occurs anterior to the aorta and the inferior vena cava. Polycystic kidney disease (Option B) would show numerous, fluid-filled cysts within normal-shaped but enlarged kidneys. Renal ectopia (Option C) refers to a kidney located in an abnormal position (e.g., pelvic kidney) but not fused to the other. Hydronephrosis (Option D) is the dilation of the renal pelvis and calyces. Patients with horseshoe kidneys are at a higher risk for frequent UTIs and stone formation due to the abnormal orientation of the ureters, which often leads to urinary stasis. The isthmus is characteristically trapped by the inferior mesenteric artery during embryonic ascent. Recognition of this anomaly is vital for surgical planning in the retroperitoneum.

Question 137. A patient presents with a painless, palpable hard mass arising near the metaphyseal region of a long bone. Radiographic evaluation shows characteristic X-ray features associated with this lesion. Based on the clinical presentation and imaging findings, what is the most likely diagnosis?

A. Osteosarcoma

B. Multiple myeloma

C. Osteochondroma

D. Osteoid Osteoma

Correct answer: C

A painless, palpable bony mass located near the metaphysis is the classic clinical presentation of an Osteochondroma (exostosis). It is the most common benign bone tumor and is essentially an outgrowth of the growth plate. The pathognomonic radiographic finding is a bony projection that is continuous with the cortex and medullary cavity of the host bone, often pointing away from the nearest joint. Osteosarcoma (Option A) is a highly malignant tumor that presents with severe pain, swelling, and aggressive bone destruction (e.g., "sunburst" appearance). Multiple myeloma (Option B) typically presents in older adults with systemic bone pain and "punched-out" lytic lesions. Osteoid Osteoma (Option D) is a very small lesion (cm) that characteristically causes intense night pain which is relieved by aspirin. Osteochondromas typically stop growing once skeletal maturity is reached. While generally benign, a sudden increase in size or pain after puberty may signal a rare malignant transformation into a chondrosarcoma.

Question 138. A 40-year-old patient with a history of smoking and diagnosed hypertension presents to the outpatient department for a routine health evaluation. As part of cardiovascular risk assessment, a device is used to evaluate vascular health and arterial status. The device is shown below. Which of the following statements regarding its functions and capabilities is NOT correct?

A. Based on infrared emitted from RBC's

B. Checks blood flow

C. Localize calcified plaque

D. Check thickness of artery and vein

Correct answer: A

The device shown is a Doppler ultrasound machine, which is a cornerstone for evaluating vascular health. The statement that it is "based on infrared emitted from RBC's" (Option A) is NOT accurate. Doppler technology is based on the Doppler shift principle, where high-frequency ultrasound waves (sound, not light/infrared) reflect off moving red blood cells to determine the velocity and direction of blood flow. The other statements are accurate: the device checks blood flow (Option B) to identify stenosis or occlusion; it can localize calcified plaques (Option C) which appear as bright echogenic areas with shadowing; and it can check the thickness of the vessel walls (Option D), such as measuring the carotid intima-media thickness (CIMT) as a marker of atherosclerosis. Doppler ultrasound is a non-invasive, safe, and highly effective tool for assessing cardiovascular risk in hypertensive patients and smokers. Understanding the fundamental physics of ultrasound versus infrared is essential for clinical practice.

Question 139. Which statement accurately characterizes radiotherapy?

A. Intensity is inversely proportional to square of the distance

B. Vomiting is a late adverse reaction

C. Rapidly proliferating cells are most radioresistant

D. All the adverse effects are reversible

Correct answer: A

Radiotherapy is based on the principles of physics and radiobiology. The statement that "Intensity is inversely proportional to the square of the distance" (Option A) is an accurate characterization, reflecting the Inverse Square Law. This means as the distance from the radiation source doubles, the intensity of the radiation reaching the patient falls to one-fourth. Vomiting (Option B) is typically an acute (early), not a late, adverse reaction to radiation, often occurring within hours of treatment. According to the law of Bergonié and 'Tribondeau, rapidly proliferating cells (Option C) are actually the most radiosensitive, not radioresistant. While many acute side effects resolve, not all adverse effects are reversible (Option D); late effects like fibrosis, tissue atrophy, and secondary malignancies are often permanent. Accurate knowledge of the inverse square law is vital for medical physicists and oncologists to ensure precise dose delivery to the tumor while minimizing exposure to surrounding healthy tissues.

Question 140. Which type of radiation is produced using the principle of linear accelerators?

A. Protons

B. X-rays

C. Gamma rays

D. Neutrons

Correct answer: B

Linear accelerators (LINACs) are the most common devices used for external beam radiation therapy. They work by accelerating electrons to near light speed and striking a heavy metal target (like tungsten), which results in the production of high-energy X-rays (photons). LINACs

can also be configured to deliver electron beams directly. Protons (Option A) are produced in cyclotrons or synchrotrons for specialized proton beam therapy. Gamma rays (Option C) are emitted by the decay of radioactive isotopes like Cobalt-60. Neutrons (Option D) are produced in nuclear reactors or specialized neutron generators. LINACs are favored because they allow for highly precise conformal therapy (like IMRT), targeting the tumor with high-dose X-rays while sparing adjacent healthy organs. Unlike cobalt units, they do not require a radioactive source, making them safer to house and maintain in clinical settings. The ability to vary the X-ray energy allows for the treatment of both superficial and deep-seated tumors.

PSYCHIATRY

Question 141. A 65-year-old patient presents with a recently developed fixed false belief in which a close family member, though identical in appearance, is perceived as an imposter. This delusion is causing marked distress and disruption in family interactions. This phenomenon is characteristic of a specific neuropsychiatric syndrome seen in certain forms of cognitive decline. In which type of dementia is this belief—where a familiar person is thought to be replaced by a look-alike—most commonly encountered?

A. Embolism

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B. Frontotemporal dementia

C. Dementia with lewy body

D. Vascular dementia

Correct answer: C

The belief that a familiar person has been replaced by a look-alike imposter is a specific delusion known as Capgras syndrome (or Capgras delusion). While it can occur in several psychiatric and neurological disorders, it is most commonly observed and highly characteristic of Dementia with Lewy Bodies (DLB). DLB is defined by its core features: fluctuating cognition, vivid visual hallucinations, and spontaneous motor features of parkinsonism. Capgras syndrome is thought to result from a disconnection between the brain's facial recognition system and its emotional appraisal system. Frontotemporal dementia (Option B) primarily presents with personality changes or language deficits. Vascular dementia (Option D) follows a "step-wise" decline related to cerebrovascular events. Embolism (Option A) is a cause of stroke but not a type of dementia. Recognizing Capgras syndrome in an elderly patient with cognitive decline is

a vital clinical clue for differentiating DLB from Alzheimer's disease. Management involves the cautious use of atypical antipsychotics or cholinesterase inhibitors.

Question 142. A 35-year-old patient presents with complaints of sudden, intense urges to carry out certain actions that arise abruptly and without prior planning. These urges are experienced as uncontrollable and are not triggered by any external stimulus. This clinical presentation is most consistent with which psychiatric symptom?

A. Hallucination

B. Pseudohallucinations

C. Delusion

D. Impulse

Correct answer: D

The clinical presentation of a sudden, overwhelming, and uncontrollable urge to perform an action without premeditation or clear rational motivation is the definition of an Impulse. Impulses are characteristically experienced as "ego-dystonic" urges that the individual feels compelled to act upon, often followed by a sense of relief or gratification. Hallucinations (Option A) are sensory perceptions in the absence of an external stimulus. Pseudohallucinations (Option B) are similar to hallucinations but are perceived in internal subjective space and recognized as "unreal" by the patient. Delusions (Option C) are fixed, false beliefs that are not amenable to reason or contrary evidence. Impulses are central to disorders such as kleptomania, pyromania, and borderline personality disorder. Understanding the spontaneous and uncontrollable nature of impulses is vital for psychiatric diagnosis and risk assessment. Management typically involves cognitive-behavioral therapy and sometimes pharmacological intervention to improve impulse control and reduce the associated distress or harmful behaviors.

Question 143. A 30-year-old patient presents with several weeks of persistent low mood, marked fatigue, reduced appetite, and loss of motivation. They also report a constant sense of hopelessness and a clear lack of interest or pleasure in activities they previously enjoyed. Based on this clinical picture, which core symptom is most characteristic and fundamental to a diagnosis of depression?

A. Suicidal ideations

B. Low mood

C. Loss of interest in pleasurable activity

D. Loss of Appetite

Correct answer: C

In the clinical diagnosis of Major Depressive Disorder (MDD), the fundamental and highly specific symptom is Loss of interest in pleasurable activities, also known as Anhedonia. While Low mood (Option B) is a core diagnostic criterion, anhedonia is often considered the most biological and pervasive marker of the depressive state. Suicidal ideation (Option A) and Loss of appetite (Option D) are common and significant symptoms included in the diagnostic criteria but are considered secondary to the primary core emotional deficits. According to the ICD-10 and DSM-5, a diagnosis of depression requires at least one of the two "core" symptoms: persistent low mood or anhedonia. Anhedonia represents a significant disruption in the brain's reward system and is often associated with more severe or melancholic subtypes of depression. Identifying this specific lack of "drive" and pleasure is essential for clinicians to distinguish clinical depression from ordinary sadness or grief.

Question 144. In psychiatry, it is important to differentiate between different types of perceptual disturbances, particularly true hallucinations and pseudohallucinations. Pseudohallucinations have distinct defining features. Which of the following statements does NOT correctly describe a characteristic of pseudohallucinations?

A. They are not vivid

B. They are perceived in the outer objective space

C. They are voluntarily produced

D. They occur with an external stimulus

Correct answer: B

In descriptive psychopathology, specifically Karl Jaspers' criteria, the defining difference between a true hallucination and a pseudohallucination is the location of the perception. True hallucinations are perceived in the outer objective space, whereas pseudohallucinations are characteristically perceived in internal subjective space (e.g., "voices in the head"). Therefore, Statement B is not accurate. Pseudohallucinations are also described as lacking the "concrete reality" or vividness (Option A) of true perceptions. Importantly, they are not voluntarily produced (Option C) and do not require an external stimulus (Option D); perceptions occurring with a stimulus are called illusions. Distinguishing these is vital; true hallucinations suggest a psychotic process (like schizophrenia), while pseudohallucinations may be seen in personality disorders or dissociative states. Recognizing that pseudohallucinations lack the quality of "external reality" helps clinicians accurately categorize a patient's perceptual disturbances and guide subsequent treatment.

Question 145. A 38-year-old woman presents to a psychiatrist with a two-month history of persistent low mood, loss of interest in routine activities, reduced appetite, and sleep disturbances. Following detailed assessment, she is diagnosed with major depressive disorder (MDD). In view of this diagnosis and the requirement for appropriate pharmacological management, which medication would be most suitable to initiate treatment?

A. Divalproex

B. Buspirone

C. Lithium

D. Fluoxetine

Correct answer: D

For the initial treatment of Major Depressive Disorder (MDD), Selective Serotonin Reuptake Inhibitors (SSRIs) like Fluoxetine are the first-line pharmacological agents of choice. They are preferred due to their superior safety profile, lower side-effect burden compared to older

antidepressants, and high patient acceptability. Divalproex (Option A) and Lithium (Option C) are mood stabilizers primarily used for Bipolar Disorder and are not first-line for unipolar depression. Buspirone (Option B) is an anxiolytic used for Generalised Anxiety Disorder but is not effective as a primary treatment for MDD. Fluoxetine works by increasing the synaptic concentration of serotonin, which helps alleviate the core symptoms of low mood and anhedonia over a period of several weeks. Clinicians must counsel patients that the full therapeutic effect typically takes 2 to 4 weeks to manifest. Monitoring for early side effects like nausea or increased anxiety is essential during the initiation phase of therapy to ensure long-term medication adherence.
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points to the lingual branch of the mandibular
nerve.
After sustaining trauma to the anatomical snuff box—a triangular depression on the lateral aspect of the wrist just below the thumb—a patient is assessed for an underlying fracture. Given the anatomical importance of this region and its association with specific carpal bones, which bone is most likely to be fractured in such an injury?
(A)
Scaphoid
(B)
Lunar
(C)
Cuboid
(D)
Trapezius
9.
(A) Scaphoid
The scaphoid is the bone most commonly fractured in the carpal region, especially following trauma where tenderness is localized in the anatomical snuff box. The scaphoid forms the floor of this triangular space, making it directly accessible to palpation. A fall on an outstretched hand (FOOSH) is the typical mechanism of injury that leads to this fracture.
The lunate (Option B, often called lunar) is frequently involved in dislocations but less commonly fractured in the snuff box. The cuboid

(Option C) is a tarsal bone in the foot, not the hand. While the trapezius (Option D, referring to the trapezium bone) also contributes to the floor of the snuff box distally, the scaphoid is significantly more prone to clinical fractures. Recognition of snuff box tenderness is vital because scaphoid fractures carry a high risk of avascular necrosis due to their retrograde blood supply.

A 42-year-old man sustains a head injury following which blood accumulates around his eyes, leading to periorbital swelling. This presentation is due to disruption of a specific anatomical attachment. Which structural attachment is responsible for this condition??

(A)
Aponeurosis attachment

(B)
Periosteum

(C)
Cellulitis

(D)
None of the above

10. (A) Aponeurosis attachment

The condition described is "raccoon eyes" (periorbital ecchymosis), which often follows a head injury involving the scalp's loose areolar tissue layer. The scalp has five layers: Skin, Connective tissue, Aponeurosis (galea aponeurotica), Loose areolar tissue, and Periosteum. When bleeding occurs in the loose areolar tissue, the blood can track anteriorly into the eyelids. This happens because the epicranial aponeurosis has no bony attachment anteriorly; its fibers instead blend with the orbicularis oculi muscle.

Conversely, the periosteum (Option B) is

firmly attached at the sutures, which would prevent such extensive tracking of fluid.
Cellulitis (Option C) is a bacterial skin infection that presents with warmth, redness, and fever, rather than immediate post-traumatic blood collection. The "raccoon eyes" sign is a critical clinical indicator of a basal skull fracture or severe scalp trauma, facilitated specifically by the lack of an anterior bony attachment of the aponeurosis.

A 32-year-old patient presents with a visible swelling just below the ear accompanied by pain in the earlobe. The patient also reports difficulty in completely closing the left eye and problems while eating. This combination of findings points toward involvement of a cranial nerve. Which nerve is most likely damaged based on this presentation?

(A)

Greater Auricular nerve

(B)

Auriculotemporal nerve

(C)

Facial nerve

(D)

Vagus nerve

11. (C) Facial nerve

The patient’s inability to fully close the eye and difficulty eating (likely due to cheek muscle weakness) are classic signs of facial nerve (Cranial Nerve VII) palsy. The facial nerve passes through the parotid gland, located just beneath the ear. A swelling in this area, such as a parotid tumor or inflammation, can compress the nerve and result in paralysis of the muscles of facial expression, including the orbicularis oculi and buccinator.

The greater auricular nerve (Option A) provides sensation to the earlobe and skin over the parotid but is not involved in eye closure or mastication movements. The auriculotemporal nerve (Option B) provides sensory innervation

to the temple and ear but not motor control of the face. The vagus nerve (Option D) controls visceral functions and palate/throat muscles. Therefore, the combination of periauricular swelling and motor facial paralysis identifies the facial nerve as the site of injury.

A patient exhibits an abnormal gait in which the legs cross over each other while walking, producing a characteristic scissoring pattern. This finding suggests increased muscle tone due to excessive neural activity. Hyperactivity of which nerve is most likely responsible for this scissoring gait?

(A)
Superior gluteal nerve

(B)
Inferior gluteal nerve

(C)
Obturator nerve

(D)
Femoral nerve

12. (C) Obturator nerve

A "scissoring gait" is caused by excessive adduction of the thighs, leading to the legs crossing over each other during ambulation. This is primarily driven by hyperactivity or spasticity of the hip adductor muscles, which are innervated by the obturator nerve. This gait pattern is commonly seen in patients with upper motor neuron lesions, such as those with cerebral palsy.

The superior gluteal nerve (Option A) innervates the gluteus medius and minimus; its weakness causes a Trendelenburg gait. The inferior gluteal nerve (Option B) supplies the gluteus maximus, and its dysfunction leads to difficulty in standing up or climbing stairs. The femoral nerve (Option D) supplies the quadriceps, primarily facilitating knee extension. Because the scissoring movement is a direct result of overactive adduction, the

obturator nerve's role in supplying the adductor longus, brevis, and magnus makes it the correct choice.

Considering the structural organization of the esophageal wall, which consists of several distinct layers, which of the following is NOT a recognized layer of the esophagus?

(A)
Mucosa

(B)
Submucosa

(C)
Serosa

(D)
Muscularis

13. (C) Serosa

The esophagus is unique among the organs of the gastrointestinal tract because it lacks a true