FMGE January 2024 Question Paper

199 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. In arterial blood gas (ABG) analysis, which of the following parameters is a derived or calculated value rather than one that is directly measured?

A. pH

B. pO2

C. pCO2

D. Bicarbonate

Correct answer: D

In arterial blood gas (ABG) analysis, certain parameters are directly measured, while others are derived mathematically.

pH is measured using a pH electrode pO_2 is directly measured using an oxygen electrode pCO_2 is directly measured using a carbon dioxide electrode In contrast, bicarbonate (HCO_3^-) is not measured directly. It is a calculated value, obtained using the Henderson–Hasselbalch equation, which relates pH and pCO_2:

Thus, the ABG analyzer computes bicarbonate based on measured values.

Question 2. Which anatomical structure is indicated at the site marked within the anatomical snuff box?.

A. Adductor pollicis

B. Extensor pollicis brevis

C. Flexor pollicis longus

D. Cephalic vein

Correct answer: B

The anatomical snuff box is a triangular depression on the lateral aspect of the wrist. Its lateral (anterior) boundary is formed by the tendons of the Abductor pollicis longus and the Extensor pollicis brevis. The medial (posterior) boundary is formed by the tendon of the Extensor pollicis longus. The image points to the lateral boundary, making Extensor pollicis brevis the correct identification. Adductor pollicis (Option A) is a deep muscle of the hand and not a boundary of this space. Flexor pollicis longus (Option C) is located on the volar aspect of the wrist. While the

Cephalic vein (Option D) and the superficial branch of the radial nerve cross over the snuff box, they are not the tendon structure highlighted. The floor of the snuff box contains the radial artery and the scaphoid bone, making it a critical site for palpating the pulse and assessing scaphoid fractures.

Question 3. Common carotid artery pulse is taken at the level of?

A. Cricoid cartilage

B. Laryngeal prominence

C. Suprasternal notch

D. Angle of mandible

Correct answer: A

The common carotid artery pulse is typically palpated in the neck, lateral to the larynx. Specifically, it is assessed at the level of the cricoid cartilage, which corresponds to the C6 vertebrae level. At this point, the artery can be compressed against the prominent carotid tubercle (Chassaignac's tubercle) of the C6 transverse process. The bifurcation of the common carotid into internal and external branches usually occurs higher, at the upper border of the thyroid cartilage (C4 level), which corresponds to the laryngeal prominence (Option B). The suprasternal notch (Option C) is too low for a reliable carotid pulse, and the angle of the mandible (Option D) is the site for the facial artery or the termination of the external carotid. Clinically, the carotid pulse is the most reliable peripheral pulse to check during cardiopulmonary resuscitation. Understanding these surface landmarks is essential for rapid clinical assessment and procedures such as carotid endarterectomy or central line placement.

Question 4. The structure shown originates from which pharyngeal arch during embryological development?

A. 1

B. 2

C. 3

D. 4

Correct answer: A

The image displays the malleus and incus, which are two of the three middle ear ossicles. Embryologically, the malleus and incus are derived from the cartilage of the first pharyngeal arch, known as Meckel's cartilage. Specifically, the dorsal end of Meckel's cartilage ossifies to form these structures. In contrast, the stapes (except for its footplate) is derived from the

cartilage of the second pharyngeal arch, known as Reichert's cartilage (Option B). The third arch (Option C) gives rise to the greater horn of the hyoid and the stylopharyngeus muscle. The fourth arch (Option D) contributes to laryngeal cartilages like the thyroid and epiglottis. Understanding ossicular development is vital for diagnosing congenital hearing loss syndromes, such as Treacher Collins, where first arch derivatives are malformed. The malleus remains attached to the tympanic membrane, while the incus acts as a bridge to the stapes, facilitating sound conduction to the inner ear.

Question 5. Mention the type of joint present at the marked region.

A. Ellipsoid

B. Condylar

C. Plane

D. Saddle

Correct answer: D

The arrow in the X-ray identifies the first carpometacarpal (CMC) joint, which is the articulation between the trapezium and the base of the first metacarpal. This joint is functionally classified as a saddle (sellar) joint. Saddle joints feature reciprocal concave-convex surfaces that allow for a wide range of motion, including flexion, extension, abduction, adduction, and uniquely, opposition. Ellipsoid joints (Option A), such as the wrist (radiocarpal) joint, allow for biaxial movement but lack the axial rotation seen in saddle joints. Condylar joints (Option B), like the knee, allow primarily for flexion and extension with limited rotation. Plane joints (Option C), found between the other carpal bones, permit only limited gliding movements. The saddle configuration of the first CMC joint is what gives the human thumb its exceptional mobility and ability to grasp objects, making it a common site for osteoarthritis due to the high mechanical loads it bears during daily activities.

Question 6. Given the RNA sequence CAAGGU, what would be the corresponding template DNA strand?

A. CAAGGT

B. GTTCCA

C. ACCTTG

D. TGGAAC

Correct answer: D

To determine the template DNA strand from a given RNA sequence, remember that RNA is synthesized complementary to the DNA template strand during transcription.

Given RNA sequence:

5′–CAAGGU–3′

Base pairing rules:

1.

C ↔ G

2.

A ↔ T (in DNA)

3.

G ↔ C

4.

U ↔ A

Now, find the complementary DNA template strand:

RNA: C A A G G U

DNA: G T T C C A

So, the template DNA sequence is:

3′–GT TCCA–5′, which is written as GTTCCA

However, if written in the 5′→3′ direction, it becomes:

TGGAAC

Why other options are wrong:

(A)

CAAGGT → Coding strand (similar to RNA, U→T)

(B)

GTTCCA → Correct sequence but in 3′→5′ direction

(C)

ACCTTG → Reverse complement, incorrect

Question 7. The subcostal line corresponds to which vertebrae level?

A. T12

B. L1

C. L2

D. L3

Correct answer: D

The subcostal line (or subcostal plane) is a transverse anatomical plane used to divide the abdomen into nine regions. It is defined as the horizontal line connecting the lowest points of the costal margins, which typically correspond to the 10th costal cartilages. This plane passes through the body of the L3 vertebra. It should not be confused with the transpyloric plane (Option B), which passes through the L1 vertebra and marks the pylorus of the stomach. The T12 level (Option A) corresponds to the origin of the celiac trunk and the esophageal hiatus. The L2 level (Option C) is the site where the spinal cord typically ends (conus medullaris) and the renal arteries originate. The subcostal plane at L3 serves as an important landmark for the

third part of the duodenum and the lower borders of the kidneys. Understanding these vertebral levels is essential for accurate physical examination and the interpretation of cross-sectional abdominal imaging in clinical practice.

Question 8. During a modified radical neck dissection, which of the following anatomical structures is not preserved?

A. Sternocleidomastoid muscle

B. Internal jugular vein

C. Spinal accessory nerve

D. Submandibular gland

Correct answer: D

Neck dissections are performed to remove lymph nodes involved in head and neck cancers. A modified radical neck dissection (MRND) is defined by the removal of all lymph node levels (I-V) while preserving one or more of the non-lymphatic structures typically removed in a "radical" dissection. These structures include the Sternocleidomastoid muscle (Option A), the Internal jugular vein (Option B), and the Spinal accessory nerve (Option C). However, the submandibular gland (found in Level Ib) is routinely excised during MRND because it is intimately associated with the Level I lymph nodes, and its preservation would compromise the oncological thoroughness of the procedure. Preserving the spinal accessory nerve is particularly crucial to avoid "shoulder syndrome," characterized by pain and limited abduction. MRND aims to achieve a balance between effective cancer control and minimizing functional morbidity. Distinguishing between radical, modified radical, and selective neck dissections is a core requirement for surgical oncology and ENT clinical practice.

PHYSIOLOGY

Question 9. Voltage gated calcium channel present on T-tubule is?

A. SERCA pump

B. Troponin-myosin complex

C. Dihydropyridine receptor

D. Ryanodine receptor

Correct answer: C

In skeletal muscle, the excitation-contraction coupling process relies on the transmission of action potentials down the T-tubules. The specific voltage-gated L-type calcium channel located on the T-tubule membrane is the Dihydropyridine receptor (DHPR). When an action potential reaches the DHPR, it undergoes a conformational change that mechanically triggers the opening of the Ryanodine receptor (RyR) (Option D), which is the calcium-release channel located on the adjacent terminal cisternae of the sarcoplasmic reticulum. The SERCA pump

(Option A) is an ATP-dependent pump responsible for sequestering calcium back into the sarcoplasmic reticulum to initiate relaxation. The troponin-myosin complex (Option B) represents the contractile proteins where calcium eventually binds to initiate cross-bridge cycling. Understanding the DHPR-RyR interaction is essential for comprehending muscle physiology and pathologies such as malignant hyperthermia, where defective RyR channels lead to uncontrolled calcium release and hypermetabolic crises when exposed to certain anesthetic agents.

12. Based on the spirometry tracing shown, which respiratory parameter or volume is represented by the point labeled F?

Question 10. 11. (C) Dihydropyridine receptor In skeletal muscle, the excitation-contraction coupling process relies on the transmission of action potentials down the T-tubules. The specific voltage-gated L-type calcium channel located on the T-tubule membrane is the Dihydropyridine receptor (DHPR). When an action potential reaches the DHPR, it undergoes a conformational change that mechanically triggers the opening of the Ryanodine receptor (RyR) (Option D), which is the calcium-release channel located on the adjacent terminal cisternae of the sarcoplasmic reticulum. The SERCA pump (Option A) is an ATP-dependent pump responsible for sequestering calcium back into the sarcoplasmic reticulum to initiate relaxation.

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and hypermetabolic crises when exposed to certain anesthetic agents.

Based on the spirometry tracing shown, which respiratory parameter or volume is represented by the point labeled F?

A. Vital capacity

B. Total lung capacity

C. Expiratory reserve volume

D. Inspiratory capacity

Correct answer: A

The spirometry diagram illustrates the various lung volumes and capacities. Point F spans from the peak of maximal inspiration to the trough of maximal expiration. This represents the Vital Capacity (VC), which is the total volume of air that can be exhaled after a maximal inhalation. VC is the sum of the Inspiratory Reserve Volume (IRV), Tidal Volume (TV), and Expiratory Reserve Volume (ERV). Total lung capacity (Option B) would include the Residual Volume (RV) and is usually labeled G or H in such diagrams. Expiratory reserve volume (Option C) is only the volume below tidal expiration (labeled C). Inspiratory capacity (Option D) is the sum of TV and IRV (labeled E). VC is a vital clinical parameter used to assess ventilatory function and monitor progress in chronic lung diseases or neuromuscular disorders affecting breathing. It varies based on age, height, and sex, and a significant decrease can indicate restrictive lung disease or severe obstructive pathology.

Which of the following regulate body temperature?

(A)

Hypothalamus

(B)

Basal ganglia

(C)

Thalamus

(D)

Limbic system

Question 11. Which of the following regulate body temperature?

A. Hypothalamus

B. Basal ganglia

C. Thalamus

D. Limbic system

Correct answer: A

The Hypothalamus serves as the body's master thermostat and primary center for thermoregulation. It contains specialized thermosensitive neurons that monitor both the core blood temperature and signals from peripheral skin receptors. The anterior (preoptic) hypothalamus primarily coordinates heat loss mechanisms, such as sweating and vasodilation, while the posterior hypothalamus coordinates heat conservation and production mechanisms, such as shivering and vasoconstriction. Basal ganglia (Option B) are involved in motor control and habit formation. The thalamus (Option C) acts as a major relay station for sensory information to the cortex. The limbic system (Option D) is primarily responsible for emotional processing and memory. Dysregulation of the hypothalamic set-point is the physiological basis of fever, where cytokines induce prostaglandin E2 production, leading the hypothalamus to perceive normal core temperatures as cold and initiating heat-generating responses. This regulatory function is critical for maintaining metabolic homeostasis within a narrow temperature range.

Question 12. In patients who are susceptible to refeeding syndrome, several electrolyte disturbances are commonly observed. Which of the following electrolyte abnormalities is NOT typically associated with refeeding syndrome?

A. Hypokalemia

B. Hyperkalemia

C. Hypocalcemia

D. Hypophosphatemia

Correct answer: B

Refeeding syndrome occurs when nutrition is reintroduced too rapidly to severely malnourished

patients. The physiological hallmark is a massive release of insulin in response to carbohydrates, which causes a rapid shift of electrolytes from the extracellular space into the cells. This leads to profound Hypophosphatemia (Option D, the most common and dangerous sign), Hypokalemia (Option A), and Hypomagnesemia. Hypocalcemia (Option C) can also occur secondary to magnesium depletion. Hyperkalemia (Option B) is not associated with refeeding syndrome; instead, the problem is a life-threatening deficiency of serum potassium. These electrolyte drops can cause cardiac arrhythmias, respiratory failure, and seizures. Clinicians must identify high-risk patients (e.g., those with anorexia nervosa, chronic alcoholism, or marasmus) and "start low and go slow" with caloric intake while vigilantly monitoring and replacing electrolytes. Hyperkalemia is more typical of conditions like acute renal failure or cell lysis syndromes, which are pathophysiologically distinct from the anabolic shift seen in refeeding.

Question 13. What nerve fibers are responsible for the transmission of proprioception?

A. A alpha

B. A beta

C. A gamma

D. A delta

Correct answer: A

The Erlanger-Gasser classification categorizes nerve fibers based on their diameter and conduction velocity. Proprioception—the sense of self-movement and body position—is transmitted by the largest and fastest myelinated fibers, categorized as A alpha fibers (or Group Ia/Ib). These fibers carry signals from muscle spindles and Golgi tendon organs to the central nervous system with speeds up to 120 m/s. A beta fibers (Option B) are slightly smaller and slower, primarily responsible for carrying sensations of touch, pressure, and vibration. A gamma fibers (Option C) are motor fibers that innervate the contractile ends of muscle spindles to regulate their sensitivity. A delta fibers (Option D) are thin, myelinated fibers that transmit "fast" pain and cold temperature. C fibers (not listed) are unmyelinated and carry "slow" burning pain and warmth. High-speed proprioceptive feedback is essential for maintaining balance, coordinating complex motor tasks, and protecting joints from overextension during movement.

BIOCHEMISTRY

Question 14. Deficiency of the enzyme tyrosine transaminase leads to the development of which of the following conditions?

A. Type I Tyrosinemia

B. Type II Tyrosinemia

C. Alkaptonuria

D. Type III Tyrosinemia

Correct answer: B

Type II Tyrosinemia (also known as Richner-Hanhart syndrome) is an autosomal recessive metabolic disorder caused by a deficiency of the enzyme tyrosine transaminase (also called tyrosine aminotransferase). This enzyme catalyzes the first step of tyrosine breakdown. Its deficiency leads to elevated levels of tyrosine in the blood and tissues, characteristically presenting with painful corneal erosions (pseudodendritic keratitis) and hyperkeratotic lesions on the palms and soles. Type I Tyrosinemia (Option A) is caused by a deficiency of fumarylacetoacetate hydrolase and is the most severe form, often leading to liver failure. Alkaptonuria (Option C) results from a deficiency of homogentisate oxidase, causing dark urine and ochronosis. Type III Tyrosinemia (Option D) is rare and caused by a deficiency of 4-hydroxyphenylpyruvate dioxygenase. Understanding these specific enzymatic defects in the tyrosine catabolic pathway is essential for diagnosing inborn errors of metabolism and initiating targeted dietary management to prevent systemic and ocular complications.

Question 15. Which of the following accurately describes the composition of lactulose

A. Galactose and glucose

B. Glucose and fructose

C. Galactose and fructose

D. Fructose and mannose

Correct answer: C

Lactulose is a synthetic, non-absorbable disaccharide widely used as a laxative and in the management of hepatic encephalopathy. It is composed of the monosaccharides galactose and fructose.

1.

Galactose + glucose (Option A) form lactose, the natural sugar found in milk.

2.

Glucose + fructose (Option B) form sucrose, commonly known as table sugar.

3.

Fructose + mannose (Option D) do not form a commonly occurring or clinically relevant disaccharide.

Humans lack the intestinal enzyme lactulase required to digest lactulose, so it passes unchanged into the colon. Colonic bacteria then ferment lactulose into short-chain organic acids, which lower colonic pH. This acidic environment converts toxic ammonia (NH_3) into non-absorbable ammonium ions (NH_4^+), thereby reducing systemic ammonia levels.

Additionally, lactulose exerts an osmotic laxative effect by drawing water into the colon. These

combined actions explain its effectiveness in both constipation and hepatic encephalopathy management.

Question 16. Heme is derived from which of the following amino acids?

A. Glutamine

B. Glycine

C. Glutamate

D. Valine

Correct answer: B

The synthesis of heme is a complex multi-step process that begins in the mitochondria. The initial, rate-limiting step involves the condensation of succinyl-CoA (from the TCA cycle) with the amino acid Glycine. This reaction is catalyzed by the enzyme delta-aminolevulinate synthase (ALA synthase) and requires pyridoxal phosphate (Vitamin B6) as a cofactor. Glutamine (Option A) is vital for purine and pyrimidine synthesis. Glutamate (Option C) serves as a neurotransmitter and a precursor for GABA and glutathione. Valine (Option D) is a branched-chain essential amino acid. Heme is the oxygen-binding prosthetic group found in hemoglobin, myoglobin, and cytochromes. Defects in the heme biosynthetic pathway lead to various types of porphyrias, which can present with neurological or cutaneous symptoms. Understanding that glycine is the fundamental amino acid precursor for heme is a core concept in biochemistry, linking protein metabolism directly to the production of essential iron-carrying molecules in the blood and tissues.

Question 17. Which amino acid plays a key role in the buffering capacity of blood at physiological pH?

A. Methionine

B. Alanine

C. Arginine

D. Histidine

Correct answer: D

Histidine is the primary amino acid responsible for the buffering capacity of proteins at physiological pH (around 7.4). This unique property is due to its imidazole side chain, which has a pKa of approximately 6.0. Since this pKa is relatively close to physiological pH, the side chain can easily accept or donate protons, allowing histidine-rich proteins like hemoglobin to stabilize blood pH effectively. Methionine (Option A) is a sulfur-containing amino acid primarily involved in methylation. Alanine (Option B) is a key participant in glucose-alanine cycling between muscle and liver. Arginine (Option C) is highly basic (pKa ~12) and is involved in the urea cycle and nitric oxide production. The buffering action of histidine in hemoglobin is particularly important for the Bohr effect, where the protein picks up protons released during production in

the tissues, helping to regulate oxygen release and maintain acid-base balance. This makes histidine a critical component for maintaining systemic pH homeostasis.

Question 18. In what amino acid form is ammonia transported from the brain to the liver for detoxification?

A. Glutamate

B. Alanine

C. Glycine

D. Glutamine

Correct answer: D

Ammonia is a toxic byproduct of nitrogen metabolism, particularly dangerous to the central nervous system. In the brain, excess ammonia is detoxified by being combined with glutamate to form Glutamine, a reaction catalyzed by the enzyme glutamine synthetase. Glutamine is a non-toxic, neutral amino acid that can safely circulate in the blood to be transported to the liver (and kidneys). Once in the liver, glutamine is broken back down into glutamate and ammonia by glutaminase, and the ammonia is then converted into urea for excretion. Glutamate (Option A) itself cannot cross the blood-brain barrier effectively for transport. Alanine (Option B) is the primary form of ammonia transport from skeletal muscle to the liver (via the Cahill cycle). Glycine (Option C) is involved in various metabolic pathways but not primary systemic ammonia transport. The "glutamine shuttle" is essential for preventing hyperammonemia, which can lead to cerebral edema, encephalopathy, and potentially fatal brain damage in liver failure.

Question 19. Aromatic ring is seen in which of the following amino acids?

A. Phenylalanine, valine, tryptophan

B. Phenylalanine, tryptophan, tyrosine

C. Tyrosine, cysteine, tryptophan

D. Lysine, methionine, valine

Correct answer: B

In biochemistry, aromatic amino acids are those that contain a benzene-like ring in their side chains. The three primary aromatic amino acids are Phenylalanine, Tryptophan, and Tyrosine. Phenylalanine contains a simple phenyl ring. Tyrosine is derived from phenylalanine and contains a phenolic hydroxyl group. Tryptophan contains an indole ring. These amino acids are unique because they absorb ultraviolet light (typically at 280 nm), which is used by researchers to quantify protein concentration. Valine (Option A) and Lysine (Option D) are aliphatic amino acids. Cysteine and Methionine (Option C and D) are sulfur-containing amino acids. Beyond protein structure, these aromatic precursors are vital for synthesizing important neurotransmitters and hormones: phenylalanine and tyrosine lead to dopamine, norepinephrine, and epinephrine; tryptophan leads to serotonin and melatonin. Knowledge of

these structural categories is fundamental for understanding protein chemistry and the metabolic pathways of biologically active nitrogenous compounds in the human body.

Question 20. Which receptor is primarily responsible for mediating glucose uptake in skeletal muscle?

A. GLUT 1

B. GLUT 2

C. GLUT 3

D. GLUT 4

Correct answer: D

GLUT 4 is the primary glucose transporter found in skeletal muscle and adipose tissue. It is uniquely characterized as the insulin-responsive transporter. Under resting conditions, GLUT 4 is sequestered in intracellular vesicles. When insulin binds to its receptor on the cell surface, or during physical exercise, these vesicles translocate to the plasma membrane, allowing for the rapid uptake of glucose from the blood into the muscle. GLUT 1 (Option A) provides basal glucose uptake in most tissues, including the blood-brain barrier. GLUT 2 (Option B) is a high-capacity, low-affinity transporter found in the liver, pancreas, and kidneys. GLUT 3 (Option C) is the primary transporter for neurons in the brain. The dysregulation of GLUT 4 translocation is a hallmark of insulin resistance in type 2 diabetes. Because exercise can stimulate GLUT 4 translocation independently of insulin, physical activity remains a cornerstone of managing blood sugar levels in diabetic patients.

Question 21. What is the rate-limiting enzyme of cholesterol synthesis?

A. HMG CoA reductase

B. 7 alpha hydroxylase

C. Carnitine acyl transferase 1

D. Carnitine acyl transferase 2

Correct answer: A

The synthesis of cholesterol occurs primarily in the liver. The rate-limiting and primary regulated step of this pathway is the conversion of 3-hydroxy-3-methylglutaryl-CoA (HMG-CoA) to mevalonate. This reaction is catalyzed by the enzyme HMG-CoA reductase. This enzyme is highly regulated by feedback inhibition from cholesterol levels and hormonal control (stimulated by insulin, inhibited by glucagon). 7-alpha-hydroxylase (Option B) is the rate-limiting enzyme for the synthesis of bile acids from cholesterol. Carnitine acyltransferase 1 (Option C) and 2 (Option D) are involved in the transport of long-chain fatty acids into the mitochondria for beta-oxidation. HMG-CoA reductase is the pharmacological target of the statin class of drugs (e.g., atorvastatin), which competitively inhibit the enzyme to lower blood cholesterol levels. Because cholesterol synthesis is most active during fasting or sleep, these

medications are often taken at night. Understanding this enzyme is fundamental for managing atherosclerotic cardiovascular disease and hyperlipidemia.

Question 22. Which of the following is a rate-limiting enzyme of HMP pathway?

A. Glucose 6 phosphatase

B. Glucose 6 phosphate dehydrogenase

C. Phosphofructokinase 1

D. Glycogen phosphorylase

Correct answer: B

The Hexose Monophosphate (HMP) shunt, or pentose phosphate pathway, is essential for generating NADPH and ribose-5-phosphate. The rate-limiting and primary regulated enzyme of this pathway is Glucose-6-Phosphate Dehydrogenase (G6PD). It catalyzes the irreversible oxidation of glucose-6-phosphate to 6-phosphogluconolactone, while reducing to . Glucose-6-phosphatase (Option A) is the terminal enzyme of gluconeogenesis and glycogenolysis in the liver. Phosphofructokinase-1 (Option C) is the rate-limiting enzyme of glycolysis. Glycogen phosphorylase (Option D) is the rate-limiting enzyme of glycogenolysis. G6PD deficiency is the most common enzyme-related genetic disorder worldwide. In red blood cells, NADPH is critical for maintaining glutathione in its reduced state, which protects the cells from oxidative damage. Patients with G6PD deficiency are prone to hemolytic anemia when exposed to oxidative stress from infections, certain fava beans, or drugs like primaquine and sulfonamides. This clinical correlation makes G6PD a high-priority topic in biochemistry.

Question 23. Which of the following is a mitochondrial matrix enzyme?

A. Citrate synthase

B. Monoamine oxidase

C. ATP synthase

D. Catalase

Correct answer: A

The mitochondrial matrix is the site for several major metabolic pathways, including the TCA (Krebs) cycle and beta-oxidation. Citrate synthase is a key TCA cycle enzyme located within the matrix that catalyzes the condensation of oxaloacetate and acetyl-CoA to form citrate. Monoamine oxidase (Option B) is an enzyme located on the outer mitochondrial membrane. ATP synthase (Option C) is a complex structure embedded in the inner mitochondrial membrane, although its catalytic head projects into the matrix. Catalase (Option D) is primarily located in peroxisomes, where it breaks down hydrogen peroxide, not the mitochondria. Other matrix enzymes include pyruvate dehydrogenase, alpha-ketoglutarate dehydrogenase, and those of the urea cycle (CPS-I and ornithine transcarbamoylase). Sub-cellular localization of

enzymes is essential for coordinating metabolic flux; the matrix provides the concentrated environment necessary for the efficient cycling of the TCA pathway and the generation of reduced electron carriers for the electron transport chain.

Question 24. Which vitamin as a coenzyme required for Glucose-6-Phosphate Dehydrogenase?

A. Riboflavin

B. Thiamine

C. Niacin

D. Biotin

Correct answer: C

Glucose-6-Phosphate Dehydrogenase (G6PD) is the first enzyme of the HMP shunt. It catalyzes an oxidation-reduction reaction that requires as an electron acceptor to produce NADPH. and are coenzymes derived from Niacin (Vitamin B3). Riboflavin (Vitamin B2, Option A) is the precursor for FAD and FMN coenzymes. Thiamine (Vitamin B1, Option B) is the precursor for thiamine pyrophosphate (TPP), required for decarboxylation reactions. Biotin (Vitamin B7, Option D) is a cofactor for carboxylation enzymes like pyruvate carboxylase. The NADPH produced via G6PD is essential for reductive biosynthesis (like fatty acid synthesis) and for maintaining the antioxidant defense system in red blood cells. A deficiency in niacin can lead to pellagra, but its biochemical role as the backbone of is what enables critical redox reactions throughout the body. Linking vitamins to their specific metabolic co-factors and the enzymes they support is a core theme in medical biochemistry and clinical nutrition.

Question 25. Dynein protein is an example of?

A. Transport protein

B. Cell membrane protein

C. Cell organelle adherent protein

D. Intracellular junctional protein

Correct answer: A

Dynein is a molecular motor protein that functions as a specialized intracellular transport protein. It "walks" along microtubules to move cargo, such as vesicles and organelles, within the cell. Notably, dynein moves cargo in the retrograde direction (from the periphery toward the cell center or the minus end of the microtubule). Another motor protein, kinesin, handles anterograde transport. Dynein also plays a crucial role in the movement of cilia and flagella (axonemal dynein) and in spindle assembly during mitosis. Option B is incorrect as dynein is cytoplasmic. Options C and D refer to different classes of skeletal or anchoring proteins like integrins or cadherins. Clinically, a defect in axonemal dynein results in Kartagener syndrome (Primary Ciliary Dyskinesia), characterized by a triad of situs inversus, chronic sinusitis, and bronchiectasis. These motor proteins are vital for maintaining cellular organization and

facilitating the large-scale movement of materials required for neuronal function and respiratory clearance.

AAns

AAns

AAns

AAns

AAns

PATHOLOGY

Question 26. Which HLA is associated with Reiter syndrome?

A. HLA-DR3

B. HLA-B27

C. HLA-DQ8

D. HLA-DR4

Correct answer: B

Reiter syndrome, now commonly referred to as Reactive Arthritis, is part of the seronegative spondyloarthropathy group. It is strongly associated with the HLA-B27 allele. Over 80% of patients with this condition carry the HLA-B27 marker. HLA-DR3 (Option A) is associated with Systemic Lupus Erythematosus (SLE) and Type 1 Diabetes. HLA-DQ8 (Option C) is primarily associated with Celiac disease. HLA-DR4 (Option D) is most famously associated with Rheumatoid Arthritis and Type 1 Diabetes. Reactive arthritis typically presents with the "Can't see, can't pee, can't climb a tree" triad of uveitis, urethritis, and arthritis, often following a gastrointestinal (e.g., Salmonella) or urogenital (e.g., Chlamydia) infection. The HLA-B27 allele is thought to contribute to the disease via molecular mimicry or through the presentation of specific arthritogenic peptides to T-cells. This genetic marker is a vital tool for confirming the diagnosis of spondyloarthropathies in clinical practice.

Question 27. Identify the histopathological image.

A. Basal cell carcinoma

B. Squamous cell carcinoma

C. Adenocarcinoma

D. Malignant melanoma

Correct answer: A

The histology shows islands and nests of small, dark-blue basaloid cells invading the dermis.

The diagnostic feature present is peripheral palisading, where the nuclei of the outermost layer of cells in the nest are arranged in a neat, parallel row. This appearance is the hallmark of Basal Cell Carcinoma (BCC), the most common type of skin cancer. Squamous cell carcinoma (Option B) is characterized by keratin pearls and intercellular bridges. Adenocarcinoma (Option C) would demonstrate glandular structures and mucin production. Malignant melanoma (Option D) would show highly atypical melanocytes with prominent nucleoli, often containing melanin pigment. BCC is slow-growing and rarely metastasizes but can be locally destructive, earning it the name "rodent ulcer." It most commonly occurs on sun-exposed areas of the face, particularly the nose. Identifying these discrete microscopic patterns is fundamental for pathology and the clinical management of common cutaneous tumors.

Examination Paper January 2024
ANATOMY

Question 28. Apoptotic bodies comprise of?

A. Include cytoplasm+intranuclear material
+organelle
B. Cytoplasm+organelle
C. Organelle+intranuclear material
D. Only organelle

Correct answer: A

Apoptosis is "programmed cell death," a tidy process designed to remove unwanted cells without triggering inflammation. During apoptosis, the cell shrinks and the DNA fragments. The cell then breaks apart into several membrane-bound fragments called apoptotic bodies. These bodies comprise cytoplasm, tightly packed organelles, and fragments of the nucleus (intranuclear material). Because they are enclosed in an intact plasma membrane, the toxic cellular contents do not leak out. Options B, C, and D are incomplete descriptions of these bodies. These fragments are rapidly recognized by phagocytes (like macrophages) through "eat-me" signals such as the flip of phosphatidylserine to the outer membrane leaflet. This efficient clearance prevents the inflammatory response that typically follows necrosis. Apoptosis is a vital physiological process during embryogenesis, immune system regulation, and the removal of DNA-damaged cells. Its dysregulation can lead to autoimmune diseases or cancer, making it a central theme in cell pathology.

Question 29. Which mutation is linked to the philadelphia chromosome?

A. Inversion
B. Deletion
C. Reciprocal translocation

D. Insertion

Correct answer: C

The Philadelphia chromosome (Ph) is a specific genetic abnormality associated with Chronic Myeloid Leukemia (CML). It results from a reciprocal translocation between chromosomes 9 and 22, specifically written as t(9;22)(q34;q11). In this process, a part of the ABL1 gene from chromosome 9 breaks off and attaches to the BCR gene on chromosome 22. This fusion creates the BCR-ABL1 hybrid gene, which codes for a continuously active (constitutive) tyrosine kinase protein. This unregulated kinase drives the uncontrolled proliferation of white blood cells. Inversion (Option A) and deletion (Option B) involve different types of structural chromosomal rearrangements. Insertion (Option D) involves a non-reciprocal movement of DNA. The Ph chromosome is present in over 95% of CML patients and is the specific target of tyrosine kinase inhibitor (TKI) therapy like imatinib. Its discovery was a landmark in oncology, proving that a specific chromosomal translocation could directly cause cancer.

Question 30. A 28-year-old woman with a recent history of travel to Africa presents with fever, altered mental status, and focal neurological deficits. Laboratory investigations identify an infecting organism that possesses a unique ability to adhere to vascular endothelium, enabling sequestration within blood vessels and thereby evading splenic clearance. What is this phenomenon known as?

A. Rosetting

B. Agglutination

C. Cytoadherence

D. Schizogony

Correct answer: C

The clinical history of travel to Africa, fever, and neurological deficits (Cerebral Malaria) combined with the blood smear point to Plasmodium falciparum infection. A unique and lethal property of P. falciparum is cytoadherence. This occurs when the parasite expresses proteins (like PfEMP-1) on the surface of infected red blood cells (iRBCs), forming "knobs." These knobs bind to endothelial receptors (like ICAM-1 or CD36) in capillary beds. This sequestration prevents the iRBCs from passing through the spleen, where they would be cleared by macrophages. Rosetting (Option A) is the adherence of iRBCs to uninfected RBCs, which also contributes to microvascular obstruction. Agglutination (Option B) is a general term for cell clumping. Schizogony (Option D) is the asexual reproductive phase within the host. Sequestration in the brain leads to the confusion and coma seen in cerebral malaria.

Understanding these mechanical properties of the parasite is critical for managing severe malaria and predicting its multisystem complications.

Question 31. Which type of appendiceal carcinoma is most frequently associated with the development of pseudomyxoma peritonei?

A. Mucinous cystadenoma

B. Adenocarcinoma

C. Carcinoid tumor

D. Serous cystadenoma

Correct answer: B

Pseudomyxoma peritonei (PMP) is characterized by the accumulation of mucinous (jelly-like) material within the peritoneal cavity. It most commonly results from the rupture of a mucin-producing tumor of the appendix.

The tumor most frequently responsible is a mucinous adenocarcinoma of the appendix. When this tumor ruptures, it releases mucin-secreting epithelial cells into the peritoneal cavity. These cells continue to produce mucin, leading to progressive accumulation and the characteristic “jelly belly” appearance.

Although earlier terminology included mucinous cystadenoma, current understanding classifies most of these lesions under the spectrum of appendiceal mucinous neoplasms, with adenocarcinoma being the clinically significant and commonly tested answer.

Why other options are incorrect:

(A)

Mucinous cystadenoma → Older term; less emphasized in exams

(C)

Carcinoid tumor → Neuroendocrine, non-mucinous

(D)

Serous cystadenoma → Typically ovarian, not appendiceal

Question 32. A 35-year-old woman presents with a painless, mobile, rubbery mass in her left breast. Histopathological examination of the lesion is shown in the provided image. Based on the clinical features and histological findings, what is the most likely diagnosis?

A. Invasive ductal carcinoma

B. Fibroadenoma

C. Phyllodes tumor

D. Lobular carcinoma in-situ

Correct answer: B

The clinical description of a "mobile, rubbery mass" (often called a "breast mouse") in a young woman is classic for a fibroadenoma. Histologically, it is a biphasic tumor consisting of both proliferating connective tissue (stroma) and glandular epithelium. The glands are often compressed into slit-like spaces by the overgrowing stroma, creating the "intracanalicular" or "pericanalicular" patterns seen in the image. Invasive ductal carcinoma (Option A) would show nests of malignant cells with significant atypia invading the stroma. Phyllodes tumors (Option C) are also biphasic but show much higher stromal cellularity and characteristic "leaf-like" projections. Lobular carcinoma in-situ (Option D) shows small, uniform cells filling the acini without stromal invasion. Fibroadenomas are benign and do not increase the risk of cancer significantly. They are estrogen-sensitive and may enlarge during pregnancy or regress after menopause. Management typically involves reassurance or simple excision if the lesion is growing or causing patient anxiety.

Question 33. A 20-year-old woman presents with early satiety, marked splenomegaly extending up to the umbilicus, and clinical features of bleeding such as petechiae. Laboratory evaluation reveals a markedly elevated white blood cell count of 85,000/cu.mm, with the peripheral blood smear showing immature B-cells. What is the most likely diagnosis?

A. AML

B. CML

C. CLL

D. ALL

Correct answer: D

The patient’s presentation of massive splenomegaly (manifesting as early satiety), thrombocytopenia (leading to petechiae and bleeding), and marked leukocytosis is highly suggestive of an acute hematological malignancy. The key diagnostic clue is the presence of immature B cells (lymphoblasts) on the peripheral blood smear, which is characteristic of Acute Lymphoblastic Leukemia (ALL).

ALL is the most common leukemia in children, but it can also occur in adolescents and young adults. The malignant lymphoblasts typically express terminal deoxynucleotidyl transferase (TdT) and B-cell markers such as CD10 (CALLA), supporting the diagnosis.

Acute Myeloid Leukemia (AML, Option A) would show myeloblasts, often with Auer rods. Chronic Myeloid Leukemia (CML, Option B) is characterized by a full spectrum of granulocytic precursors and is associated with the Philadelphia chromosome (BCR-ABL). Chronic Lymphocytic Leukemia

(CLL, Option C) usually affects elderly patients and shows mature small lymphocytes.
ALL is a medical emergency requiring prompt initiation of chemotherapy. Splenomegaly occurs due to infiltration of malignant cells into the reticuloendothelial system.

Question 34. Bubo is seen in which of the following conditions?

A. LGV
B. Herpes
C. Syphilis
D. Donovanosis

Correct answer: A

A bubo is a painful, markedly swollen lymph node, typically in the groin or axilla. It is a characteristic feature of Lymphogranuloma Venereum (LGV), a sexually transmitted infection caused by specific serotypes (L1, L2, L3) of Chlamydia trachomatis. In LGV, the buboes are often divided by the inguinal ligament, creating the pathognomonic "Groove sign." Herpes simplex (Option B) causes multiple painful superficial ulcers and mild lymphadenopathy, not massive buboes. Primary syphilis (Option C) presents with a painless chancre and painless, rubbery lymph nodes. Donovanosis (Option D) presents with painless, "beefy-red" ulcers and pseudo-buboes (granulomatous swelling in the groin), rather than true lymph node involvement. Buboes are also the hallmark of the bubonic plague. Identifying the nature of the inguinal swelling is essential for differentiating STIs and initiating correct antimicrobial therapy, such as doxycycline for LGV.

Question 35. A 35-year-old man presents with a painless testicular swelling. Following orchidectomy, histopathological examination of the tumor demonstrates the presence of Reinke crystals within the tumor cells. What is the most likely diagnosis?

A. Sertoli cell tumor
B. Leydig cell tumor
C. Seminoma
D. Yolk sac tumor

Correct answer: B

A Leydig cell tumor is a non-germ cell tumor of the testis. The pathognomonic histological finding is the presence of Reinke crystals—rod-shaped, eosinophilic, intracytoplasmic inclusions. These tumors are often hormonally active, secreting androgens or estrogens, which can lead to symptoms like precocious puberty in children or gynecomastia in adults. Sertoli cell tumors (Option A) typically show well-defined tubules but lack Reinke crystals. Seminoma (Option C) is

the most common germ cell tumor, characterized by large, uniform cells with clear cytoplasm and a lymphocytic infiltrate. Yolk sac tumors (Option D) are common in infants and show characteristic Schiller-Duval bodies. Most Leydig cell tumors are benign, but approximately 10% are malignant. They typically present as a painless, firm testicular mass. Surgical orchidectomy is the standard treatment. Identifying Reinke crystals is a favorite "trigger" in medical exams for specifically naming the Leydig cell tumor, differentiating it from the more common germ cell malignancies.

Question 36. A 7-year-old boy is brought with a history of recurrent bacterial and fungal infections, mainly affecting the skin and respiratory system. He has experienced repeated episodes of abscess formation and lymphadenitis. An abnormal dihydrorhodamine (DHR) test is noted. Based on these findings, what is the most likely underlying condition?

A. CGD

B. SCID

C. Sialyl Lewis X

D. LAD

Correct answer: A

The clinical picture of recurrent infections by catalase-positive organisms (like Staphylococcus aureus or Aspergillus), multiple skin abscesses, and lymphadenitis in a young boy is highly suspicious for Chronic Granulomatous Disease (CGD). CGD is an immunodeficiency caused by defects in the NADPH oxidase complex, which prevents neutrophils from producing a "respiratory burst" (superoxide) to kill ingested pathogens. The Dihydrorhodamine (DHR) test is the modern gold standard for diagnosis; an abnormal pattern indicates that the cells cannot oxidize the DHR dye into a fluorescent form. Severe Combined Immunodeficiency (SCID, Option B) presents earlier with failure to thrive and viral/protozoal infections. Leukocyte Adhesion Deficiency (LAD, Option D) presents with delayed umbilical cord separation and "pus-less" infections, related to a defect in integrins or Sialyl Lewis X (Option C). CGD is usually X-linked. Prophylaxis with antibiotics and interferon-gamma can improve survival, while bone marrow transplant is curative.

Question 37. All of the following are correct about NETs except?

A. May result in SLE

B. Phagocytosis

C. Sepsis

D. Arginine needed

Correct answer: B

Neutrophil Extracellular Traps (NETs) are webs of extracellular DNA fibers decorated with antimicrobial proteins (like myeloperoxidase) that neutrophils eject to trap and kill pathogens. Unlike phagocytosis (Option B), which involves internalizing a pathogen and destroying it within a vacuole, NETosis is an extracellular killing mechanism that often results in the death of the neutrophil itself. NETs are triggered during severe infections and sepsis (Option C) to control bacterial spread. However, the persistence of these extracellular DNA-protein complexes can trigger autoimmune responses, potentially resulting in SLE (Option A). The formation of NETs involves the citrullination of histones by PAD4; while arginine is the amino acid converted to citrulline, some exam banks list "Arginine needed" (Option D) as a correct feature or a slightly misworded distractor. Regardless, the fundamental contrast is that NETs represent an alternative, non-phagocytic mode of innate immune defense. Phagocytosis is the primary distractor as it represents the traditional, intracellular way neutrophils handle debris and pathogens.

Question 38. A patient presents with resting tremor, bradykinesia, and postural instability, and over time becomes bedridden, eventually dying from respiratory failure. On brain biopsy, which pathological finding is most likely to be observed?

A. Lewy bodies

B. Hirano bodies

C. Guarneri bodies

D. Negri bodies

Correct answer: A

The classic triad of resting tremors, bradykinesia (slowness of movement), and postural instability is diagnostic for Parkinson's Disease. This neurodegenerative disorder results from the loss of dopaminergic neurons in the substantia nigra pars compacta. The characteristic pathological hallmark is the presence of Lewy bodies—eosinophilic, round, intracytoplasmic inclusions composed primarily of alpha-synuclein. Hirano bodies (Option B) are rod-shaped actin-containing inclusions seen in Alzheimer's disease. Guarneri bodies (Option C) are eosinophilic inclusions found in cells infected with smallpox. Negri bodies (Option D) are pathognomonic inclusions found in the neurons (often Purkinje cells) of patients with rabies. Parkinson's patients often die from secondary complications such as aspiration pneumonia or respiratory failure due to impaired swallowing and chest wall rigidity. Identifying Lewy bodies is essential for post-mortem confirmation of the disease and differentiating it from other

"Parkinson-plus" syndromes.

Question 39. Which of the following is associated with MEN-1 syndrome?

A. Parathyroid adenoma

B. Parotid tumor

C. Renal cell carcinoma

D. Pheochromocytoma

Correct answer: A

Multiple Endocrine Neoplasia Type 1 (MEN-1), also known as Wermer syndrome, is an autosomal dominant condition characterized by the "3 Ps" rule: tumors of the Parathyroid, Pancreas, and Pituitary. Parathyroid adenomas (causing hyperparathyroidism) are the most common feature, present in nearly 100% of affected individuals by age 40. Pancreatic tumors (like gastrinomas or insulinomas) and pituitary adenomas (like prolactinomas) complete the classic triad. Parotid tumors (Option B) are not a standard feature. Renal cell carcinoma (Option C) and Pheochromocytoma (Option D) are associated with other syndromes; specifically, pheochromocytoma is a hallmark of MEN-2A and MEN-2B (along with medullary thyroid cancer), as well as von Hippel-Lindau disease. Early recognition of MEN-1 is critical for screening family members and managing multi-organ endocrine dysfunction. Patients often present first with kidney stones or bone pain due to hypercalcemia from the parathyroid adenomas. This 3P mnemonic is essential for correctly categorizing endocrine syndromes in exams.

Question 40. All of the below are features of Conn's syndrome except?

A. Metabolic alkalosis

B. Metabolic acidosis

C. Hypertension

D. Muscle cramps

Correct answer: B

Conn’s syndrome refers to primary hyperaldosteronism, most commonly caused by an aldosterone-secreting adrenal adenoma. Excess aldosterone acts on the distal tubules and collecting ducts of the kidney to increase sodium and water reabsorption while promoting the excretion of potassium (K^+) and hydrogen (H^+) ions.

This hormonal effect produces the classic clinical and biochemical features of Conn’s syndrome:

1.

Hypertension (Option C) due to sodium and water retention

2.

Hypokalemia, leading to muscle cramps, weakness, or paralysis (Option D)

3.

Metabolic alkalosis (Option A) due to increased hydrogen ion loss

4.

Metabolic acidosis (Option B) is not a feature of Conn’s syndrome and is therefore the incorrect option.

Typical laboratory findings include elevated aldosterone levels with suppressed renin activity. Patients often present with resistant hypertension that does not respond to standard antihypertensive therapy. Management includes surgical removal of the adenoma when appropriate or medical therapy with aldosterone antagonists such as spironolactone or eplerenone.

Question 41. Criterion that differentiates exudative from transudative pleural effusion?

A. Low protein in pleural fluid

B. High protein in pleural fluid

C. Low sugar in pleural fluid

D. High sugar in pleural fluid

Correct answer: B

Differentiating between transudative and exudative effusions is the first step in diagnosing pleural disease. This is achieved using Light's Criteria. An exudative effusion (caused by inflammation or malignancy) is characterized by increased capillary permeability, leading to a high protein content in the pleural fluid. Specifically, Light's criteria define an exudate if the pleural fluid/serum protein ratio is , or the pleural fluid/serum LDH ratio is . A transudative effusion (caused by hydrostatic pressure, like heart failure) has low protein (Option A). Sugar (glucose) levels (Options C and D) are not primary differentiators in Light's criteria, although low glucose level in an exudate can suggest specific pathologies like tuberculosis, rheumatoid arthritis, or parapneumonic effusions. Distinguishing these two is vital; transudates are treated by managing the underlying systemic condition, while exudates require a search for local pleural pathology, infections, or pulmonary emboli.

Question 42. A patient diagnosed with lung cancer develops hyperpigmentation involving the creases of the palms and soles. Which underlying factor is most likely responsible for this clinical finding?

A. MSH

B. C-peptide

C. Neuropeptide Y

D. Melanin

Correct answer: A

Certain lung cancers, particularly Small Cell Lung Cancer (SCLC), can cause paraneoplastic

syndromes by ectopically secreting hormones. When a cancer patient develops hyperpigmentation, especially in unusual areas like palmar and sole creases, it is often due to the ectopic production of ACTH or Melanocyte-Stimulating Hormone (MSH). Both are derived from the precursor molecule Pro-opiomelanocortin (POMC). Excess MSH directly stimulates melanocytes to produce more pigment. C-peptide (Option B) is a marker of insulin production and not related to pigment. Neuropeptide Y (Option C) is involved in appetite regulation and autonomic function. While melanin (Option D) is the pigment deposited, MSH is the mediator responsible for the clinical presentation in the context of cancer. This syndrome, known as ectopic ACTH syndrome, can also lead to rapidly progressive Cushing's syndrome symptoms. Recognizing these dermatological "red flags" is essential for the early diagnosis of internal malignancies and understanding the complex endocrine-cancer interactions.

Question 43. Arrange the stages of wound healing in the correct sequence?

A. Proliferation, hemostasis, inflammation, remodeling

B. Inflammation, remodeling, hemostasis, proliferation

C. Hemostasis, inflammation, proliferation, remodeling

D. Remodeling, proliferation, hemostasis, inflammation

Correct answer: C

Wound healing is a dynamic, overlapping process that follows a strictly programmed sequence to restore tissue integrity.

1.

Hemostasis: Immediate vasoconstriction and platelet plug formation to stop bleeding.

2.

Inflammation: Begins within minutes; neutrophils and macrophages arrive to clear debris and pathogens.

3.

Proliferation: Fibroblasts migrate to the site, depositing collagen and creating granulation tissue, while new blood vessels form (angiogenesis).

4.

Remodeling (Maturation): The final, longest phase where the temporary Type III collagen is replaced by stronger Type I collagen and the scar matures.
Options A, B, and D provide incorrect chronological orders. Understanding this sequence is vital for wound management; for example, excessive inflammation can lead to chronic non-healing wounds, while a failure in the remodeling phase can result in hypertrophic scars or keloids. Clinicians must ensure that each phase progresses normally to achieve optimal functional and aesthetic outcomes.

Question 44. In the context of solid organ transplantation, which transplanted organ has the highest rate of rejection?

A. Lungs
B. Intestine
C. Kidney
D. Heart

Correct answer: B

In the field of solid organ transplantation, the small intestine is associated with the highest incidence of rejection among all listed organs. This is primarily because the intestine is an "immunologically active" organ containing a large amount of mucosa-associated lymphoid tissue (MALT) and a high density of donor immune cells (Graft-versus-Host risk). Furthermore, the constant exposure to a diverse luminal microbiome increases the risk of infection and inflammation, which triggers the recipient's immune system. Lungs (Option A) also have a high rejection rate compared to the heart or kidneys, but the intestine remains the most challenging. The Kidney (Option C) and Heart (Option D) have relatively lower rates of acute rejection due to established immunosuppression protocols and the lower load of lymphoid tissue. Because of this high risk, intestinal transplant recipients require extremely high doses of immunosuppressive drugs and vigilant monitoring via frequent endoscopic biopsies to detect early signs of rejection.

Question 45. A patient is brought to the emergency department following a road traffic accident. On examination, the patient is in shock with hypotension. An extended focused assessment with sonography for trauma (eFAST) is negative, the chest X-ray is normal, and the ECG shows no abnormalities. Oxygen saturation is 93%, with hypotension and tachycardia noted on vital signs. Based on these findings, what type of shock is most likely?

A. Vital capacity

B. Total lung capacity

C. Expiratory reserve volume

D. Inspiratory capacity

Correct answer: A

The spirometry diagram illustrates the various lung volumes and capacities. Point F spans from the peak of maximal inspiration to the trough of maximal expiration. This represents the Vital Capacity (VC), which is the total volume of air that can be exhaled after a maximal inhalation. VC is the sum of the Inspiratory Reserve Volume (IRV), Tidal Volume (TV), and Expiratory Reserve Volume (ERV). Total lung capacity (Option B) would include the Residual Volume (RV) and is usually labeled G or H in such diagrams. Expiratory reserve volume (Option C) is only the volume below tidal expiration (labeled C). Inspiratory capacity (Option D) is the sum of TV and IRV (labeled E). VC is a vital clinical parameter used to assess ventilatory function and monitor progress in chronic lung diseases or neuromuscular disorders affecting breathing. It varies based on age, height, and sex, and a significant decrease can indicate restrictive lung disease or severe obstructive pathology.

Question 46. 52. (A) Pleomorphic adenoma. Pleomorphic adenoma, also known as a benign mixed tumor, is the most common overall salivary gland tumor and specifically the most common tumor of the parotid gland. It characteristically presents as a slow-growing, painless, firm mass, often located in the superficial lobe of the parotid. Warthin's tumor (Option B), or cystadenolymphoma, is the second most common benign parotid tumor, typically occurring in older male smokers and often presenting bilaterally. Mucoepidermoid carcinoma (Option D) is the most common malignant salivary gland tumor, but its overall incidence is lower than that of pleomorphic adenoma. Adenoid cystic carcinoma (Option C) is another malignancy known for its "Swiss cheese" appearance on histology and its tendency for perineural invasion, but it is less common in the parotid than in the minor salivary glands. Understanding this hierarchy is

essential for clinicians when evaluating a facial mass to determine the likely biological behavior and plan appropriate surgical intervention.

Identify the most common pancreatic islet tumor associated with MEN-1 syndrome?

A. VIPoma

B. Gastrinoma

C. Insulinoma

D. Lipoma

Correct answer: B

Multiple Endocrine Neoplasia Type 1 (MEN-1), or Wermer syndrome, is characterized by the "3 Ps" triad: Parathyroid, Pituitary, and Pancreas. While several types of neuroendocrine tumors (islet cell tumors) can occur in the pancreas of a MEN-1 patient, the most common is the Gastrinoma. Gastrinomas lead to Zollinger-Ellison syndrome, characterized by refractory peptic ulcers and diarrhea. Insulinoma (Option C) is the second most common islet tumor in this population. VIPoma (Option A) is significantly rarer and leads to Verner-Morrison syndrome (watery diarrhea, hypokalemia, and achlorhydria). Lipoma (Option D) is a benign mesenchymal tumor of adipose tissue and is not a neuroendocrine islet tumor, although cutaneous lipomas are a common non-endocrine feature of MEN-1. Clinically, identifying the specific islet tumor is vital as gastrinomas in MEN-1 are often multiple and found in the "gastrinoma triangle," making surgical cure more challenging than in sporadic cases.

A blood sample from a patient with diabetes is collected and stored in the container shown. Which substance is added to the blood sample in this container?

(A)

Na fluoride

(B)

EDTA

(C)

Na citrate

(D)

Heparin

Question 47. 53. (B) Gastrinoma.
Multiple Endocrine Neoplasia Type 1 (MEN-1), or Wermer syndrome, is characterized by the "3 Ps" triad: Parathyroid, Pituitary, and Pancreas. While several types of neuroendocrine tumors (islet cell tumors) can occur in the pancreas of a MEN-1 patient, the most common is the Gastrinoma. Gastrinomas lead to Zollinger-Ellison syndrome, characterized by refractory peptic ulcers and diarrhea. Insulinoma (Option C) is the second most common islet tumor in this population. VIPoma (Option A) is significantly rarer and leads to Verner-Morrison syndrome (watery diarrhea, hypokalemia, and achlorhydria). Lipoma (Option D) is a benign mesenchymal tumor of adipose tissue and is not a neuroendocrine islet tumor, although cutaneous lipomas are a common non-endocrine feature of MEN-1. Clinically, identifying the specific islet tumor is vital as gastrinomas in MEN-1 are often multiple and found in the "gastrinoma triangle," making surgical cure more challenging than in sporadic cases.
A blood sample from a patient with diabetes is collected and stored in the container shown. Which substance is added to the blood sample in this container?

A. Na fluoride

B. EDTA

C. Na citrate

D. Heparin

Correct answer: A

The container shown is a grey-top vacutainer, which is specifically used for blood glucose and lactate estimation. The additive in this tube is Sodium fluoride (NaF), which serves as a potent

antiglycolytic agent. It inhibits the enzyme enolase in the glycolytic pathway, preventing red blood cells from consuming the glucose in the sample post-collection. This ensures that the measured glucose level accurately reflects the patient's state at the time of the draw. EDTA (Option B) is in purple-top tubes for hematology. Sodium citrate (Option C) is in light blue-top tubes for coagulation studies. Heparin (Option D) is in green-top tubes for clinical chemistry and arterial blood gases. Without NaF, blood glucose levels drop by approximately 5-10% per hour at room temperature due to cellular metabolism. This additive is essential for the accurate diagnosis and monitoring of diabetes mellitus in clinical practice.

Which of the following cells are located in the centre of the lumen in a venule?

(A)

Lymphocytes

(B)

RBCs

(C)

Neutrophils

(D)

Platelets

Question 48. 54. (A) Na fluoride.

The container shown is a grey-top vacutainer, which is specifically used for blood glucose and lactate estimation. The additive in this tube is Sodium fluoride (NaF), which serves as a potent antiglycolytic agent. It inhibits the enzyme enolase in the glycolytic pathway, preventing red blood cells from consuming the glucose in the sample post-collection. This ensures that the measured glucose level accurately reflects the patient's state at the time of the draw. EDTA (Option B) is in purple-top tubes for hematology.

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Which of the following cells are located in the centre of the lumen in a venule?

A. Lymphocytes

B. RBCs

C. Neutrophils

D. Platelets

Correct answer: B

Under normal physiological conditions, blood flow in small vessels like venules is laminar. This type of flow results in a phenomenon known as axial streaming, where the larger and more numerous Red Blood Cells (RBCs) are concentrated in the high-velocity center of the lumen. In contrast, smaller elements and white blood cells, such as Neutrophils (Option C), Platelets (Option D), and Lymphocytes (Option A), are displaced toward the slower-moving periphery near the vessel wall. During the early stages of acute inflammation, changes in hemodynamics and the loss of fluid cause the blood to become more viscous, disrupting this axial flow. This leads to "margination," where neutrophils and other leukocytes move from the central stream to the vessel periphery, allowing them to interact with endothelial adhesion molecules and eventually exit the vessel. Understanding this physical distribution of blood components is fundamental to comprehending

both

normal
vascular
physiology and the microscopic events of the
inflammatory response.
Which among the following is associated with Cryoglobulinemia?
(A)
Hepatitis C infection
(B)
Ovarian cancer
(C)
Diabetes
(D)
Leukemia

Question 49. 55. (B) RBCs.
Under normal physiological conditions, blood flow in small vessels like venules is laminar. This type of flow results in a phenomenon known as axial streaming, where the larger and more numerous Red Blood Cells (RBCs) are concentrated in the high-velocity center of the lumen. In contrast, smaller elements and white blood cells, such as Neutrophils (Option C), Platelets (Option D), and Lymphocytes (Option A), are displaced toward the slower-moving periphery near the vessel wall. During the early stages of acute inflammation, changes in hemodynamics and the loss of fluid cause the blood to become more viscous, disrupting this axial flow. This leads to "margination," where neutrophils and other leukocytes move from the central stream to the vessel periphery, allowing them to interact with endothelial adhesion molecules and eventually exit the vessel. Understanding this physical distribution of blood components is fundamental to comprehending
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inflammatory response.
Which among the following is associated with Cryoglobulinemia?
A. Hepatitis C infection
B. Ovarian cancer
C. Diabetes
D. Leukemia
Correct answer: A
No explanation is available for this recall question yet.

Question 50. Cryoglobulinemia refers to the presence of abnormal proteins in the blood that thicken and clump together in cold temperatures. It is most strongly associated with chronic Hepatitis C infection, which accounts for approximately 80-90% of cases of mixed cryoglobulinemia. The virus triggers a chronic immune response leading to the production of monoclonal or polyclonal immunoglobulins that form immune complexes. These complexes can cause vasculitis, leading to symptoms such as purpura, arthralgia, and weakness (Meltzer's triad). While certain hematological malignancies like B-cell Leukemia (Option D) or lymphoma can cause Type I cryoglobulinemia, Hepatitis C is the classic and most frequent association in clinical exams. Ovarian cancer (Option B) and Diabetes (Option C) are not standard associations for this condition. Treatment primarily focuses on managing the underlying viral infection, often with direct-acting antivirals, to reduce the stimulus for cryoglobulin production.
A 50-year-old man presents with right-sided serous otitis media along with a history of cervical lymphadenopathy. What is the most likely diagnosis?
A. Angiofibroma
B. Nasopharyngeal cancer

C. Adenoid hypertrophy

D. Tonsillar abscess

Correct answer: B

In an adult, the clinical combination of unilateral serous otitis media (due to Eustachian tube obstruction) and cervical lymphadenopathy is highly suspicious for Nasopharyngeal cancer until proven otherwise. This malignancy typically originates in the fossa of Rosenmüller and can remain asymptomatic until it blocks the tube or metastasizes to the neck nodes. Angiofibroma (Option A) is a benign but aggressive vascular tumor seen almost exclusively in adolescent males, not 50-year-olds. Adenoid hypertrophy (Option C) is a common cause of serous otitis media in children but is rare in adults and does not typically present with significant cervical lymphadenopathy. A tonsillar abscess (Option D) presents with acute, severe throat pain, trismus, and fever, rather than chronic painless hearing loss and neck swelling. Any adult with persistent unilateral ear symptoms must have their nasopharynx examined using a fiberoptic endoscope to rule out this "silent" malignancy.

A group of individuals travel to a high-altitude mountainous region, and a girl develops symptoms suggestive of acute mountain sickness. Which drug is the treatment of choice in this situation?

(A)

Promethazine

(B)

Acetazolamide

(C)

Dimenhydrinate

(D)

Thiazide

Question 51. 57. (B) Nasopharyngeal cancer.

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serous otitis media (due to Eustachian tube obstruction) and cervical lymphadenopathy is highly suspicious for Nasopharyngeal cancer until proven otherwise. This malignancy typically originates in the fossa of Rosenmüller and can remain asymptomatic until it blocks the tube or metastasizes to the neck nodes. Angiofibroma (Option A) is a benign but aggressive vascular tumor seen almost exclusively in adolescent males, not 50-year-olds. Adenoid hypertrophy (Option C) is a common cause of serous otitis media in children but is rare in adults and does not typically present with significant cervical lymphadenopathy. A tonsillar abscess (Option D) presents with acute, severe throat pain, trismus, and fever, rather than chronic painless hearing loss and neck swelling. Any adult with persistent unilateral ear symptoms must have their nasopharynx examined using a fiberoptic endoscope to rule out this "silent" malignancy.

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A. Promethazine

B. Acetazolamide

C. Dimenhydrinate

D. Thiazide

Correct answer: B

Acetazolamide is the drug of choice for both the prevention and treatment of Acute Mountain Sickness (AMS). It is a carbonic anhydrase

Question 52. inhibitor that works by promoting the renal excretion of bicarbonate, leading to a mild metabolic acidosis. This acidosis stimulates the respiratory centers in the brain, increasing the ventilation rate and helping the body acclimatize to lower oxygen levels at high altitudes.

Promethazine (Option A) and Dimenhydrinate (Option C) are antihistamines used primarily for motion sickness and nausea, but they do not address the underlying physiological cause of mountain sickness. Thiazides (Option D) are diuretics used for hypertension and do not play a role in altitude medicine. Patients with severe AMS or high-altitude pulmonary edema require immediate descent and supplemental oxygen. Acetazolamide is a vital pharmacological tool for trekkers and climbers to facilitate safe ascent and manage mild symptoms like headache and fatigue.

What is the probable cause for hypotension, flushing, and nausea in a patient using anti-amoebic drugs?

A. Delirium tremens

B. Alcohol withdrawal

C. Disulfiram like reaction

D. Hallucinosis

Correct answer: C

The symptoms of hypotension, flushing, nausea, and headache in a patient taking anti-amoebic drugs (specifically nitroimidazoles like Metronidazole or Tinidazole) are characteristic of a disulfiram-like reaction. This occurs when these medications inhibit the enzyme acetaldehyde dehydrogenase, leading to a toxic accumulation of acetaldehyde if the patient consumes alcohol. Delirium tremens (Option A) and alcohol withdrawal (Option B) occur after the cessation of alcohol in a chronic drinker and involve autonomic hyperactivity, seizures, and confusion. Hallucinosis (Option D) refers to perceptions in the absence of external stimuli, which is not the primary feature here. To prevent this highly distressing reaction, patients must be strictly counseled to avoid all forms of alcohol during treatment and for at least 48-72 hours

after the final dose. This clinical interaction is a high-yield pharmacology topic due to its common occurrence and significant impact on patient safety.

Which malarial plasmodium vivax drug is used to prevent relapse in the post-partum period?

(A)

Artemether

(B)

Primaquine

(C)

Quinine

(D)

Artesunate

Question 53. 59. (C) Disulfiram like reaction.

The symptoms of hypotension, flushing, nausea, and headache in a patient taking anti-amoebic drugs (specifically nitroimidazoles like Metronidazole or Tinidazole) are characteristic of a disulfiram-like reaction. This occurs when these medications inhibit the enzyme acetaldehyde dehydrogenase, leading to a toxic accumulation of acetaldehyde if the patient consumes alcohol. Delirium tremens (Option A) and alcohol withdrawal (Option B) occur after the cessation of alcohol in a chronic drinker and involve autonomic hyperactivity, seizures, and confusion. Hallucinosis (Option D) refers to perceptions in the absence of external stimuli, which is not the primary feature here. To prevent this highly distressing reaction, patients must be strictly counseled to avoid all forms of alcohol during treatment and for at least 48-72 hours after the final dose. This clinical interaction is a high-yield pharmacology topic due to its common occurrence and significant impact on patient safety.

Which malarial plasmodium vivax drug is used to prevent relapse in the post-partum

period?

A. Artemether

B. Primaquine

C. Quinine

D. Artesunate

Correct answer: B

Plasmodium vivax and P. ovale have a unique dormant liver stage known as hypnozoites. These can reactivate months later, causing clinical relapse. Primaquine is the only available drug capable of eradicating these liver stages (radical

Question 54. cure) to prevent relapse. While primaquine is strictly contraindicated during pregnancy due to the risk of fetal hemolysis (as fetal G6PD status is unknown), it is safe and indicated in the post-partum period once the infant's G6PD status is confirmed if breastfeeding. Artemether (Option A), Quinine (Option C), and Artesunate (Option D) are schizonticidal drugs used to treat the acute erythrocytic (blood) phase of malaria but have no effect on the hypnozoites. Therefore, they cannot prevent a relapse on their own. Primaquine remains the cornerstone for the elimination of P. vivax malaria, provided the patient is screened for G6PD deficiency before administration to prevent severe acute hemolytic anemia.

A patient who is already receiving antiretroviral therapy with Tenofovir 200 mg, Dolutegravir 100 mg (night dose), and Lamivudine 200 mg is initiated on anti-tubercular treatment. What dose modification is required in this regimen?

A. Add tenofovir 200 mg in the morning

B. Add dolutegravir 100 mg in the morning

C. No dose adjustment

D. Add lamivudine 200 mg in the morning

Correct answer: B

This scenario highlights a critical drug-drug interaction between Rifampicin (a core

component of anti-tubercular therapy) and Dolutegravir (DTG). Rifampicin is a potent inducer of the UGT1A1 and CYP3A4 enzymes, which significantly increases the metabolism of DTG, thereby lowering its plasma levels to sub-therapeutic concentrations. To counteract this induction and maintain viral suppression, the required adjustment is to double the dose of Dolutegravir, typically by adding an extra 50 mg (or 100 mg depending on the base dose) in the morning. Tenofovir (Option A) and Lamivudine (Option D) do not have significant metabolic interactions with Rifampicin and require no dose modification. Saying "No dose adjustment" (Option C) is incorrect and could lead to HIV treatment failure and resistance. In co-infected patients, managing these interactions is vital for successful dual therapy.

A 65-year-old patient with hypertension is prescribed Drug X, which has an oral bioavailability of 30%. Which of the following statements most appropriately explains the implication of this bioavailability for the patient’s prescription?

(A)

70% of drug reach systemic circulation in unchanged form

(B)

30% of the drug is pure

(C)

70% of drug is potent in giving therapeutic effect

(D)

70% of the drug undergoes 1st pass metabolism in the liver

Question 55. A 65-year-old patient with hypertension is prescribed Drug X, which has an oral bioavailability of 30%. Which of the following statements most appropriately explains the

implication of this bioavailability for the patient's prescription?

A. 70% of drug reach systemic circulation in unchanged form

B. 30% of the drug is pure

C. 70% of drug is potent in giving therapeutic effect

D. 70% of the drug undergoes 1st pass metabolism in the liver

Correct answer: D

Bioavailability is defined as the fraction of an administered dose of a drug that reaches the systemic circulation in its unchanged form. If a drug has a bioavailability of 30%, it means only 30% of the oral dose enters the bloodstream intact. The remaining 70% is lost during the process of absorption and, most significantly, during first-pass metabolism as it passes through the gut wall and the liver before reaching the heart. Therefore, statement D is the most appropriate physiological explanation. Statement A is the exact opposite of the definition. Statement B confuses bioavailability with chemical purity. Statement C is incorrect as potency refers to the amount of drug needed to produce a specific effect, not the percentage absorbed. Low bioavailability often requires clinicians to use significantly higher oral doses compared to intravenous doses to achieve the same therapeutic plasma concentration.

Question 56. Which of the following antidiabetic drugs can cause glucosuria?

A. Glimepiride

B. Exenatide

C. Acarbose

D. Empagliflozin

Correct answer: D

Empagliflozin belongs to the SGLT2 inhibitor class of medications. These drugs work by inhibiting the sodium-glucose co-transporter 2 in the proximal tubules of the kidney, which is responsible for reabsorbing approximately 90% of filtered glucose. By blocking this transporter, the drug promotes the excretion of glucose into the urine, directly causing glucosuria. This unique mechanism lowers blood sugar independently of insulin. Glimepiride (Option A) is a sulfonylurea that stimulates insulin release. Exenatide (Option B) is a GLP-1 agonist that enhances glucose-dependent insulin secretion and slows gastric emptying. Acarbose (Option C) inhibits alpha-glucosidase in the gut to slow carbohydrate absorption. None of these other drugs act by increasing renal glucose excretion. Clinically, the glucosuria caused by SGLT2 inhibitors also leads to an increased risk of genitourinary fungal infections but provides

significant cardiovascular and renal protection in diabetic patients.

Question 57. An 8-year-old child with a known history of generalized tonic–clonic seizures presents with continuous convulsions lasting longer than 45 minutes. What is the most appropriate management in this situation?

A. Lorazepam followed by levetiracetam

B. Valproate followed by gabapentin

C. Carbamazepine followed by lorazepam

D. Levetiracetam followed by valproate

Correct answer: A

A seizure lasting more than 5 minutes (or 45 minutes in this extreme case) is defined as status epilepticus, a medical emergency. The standardized management algorithm for status epilepticus involves two stages. The first-line (emergent) treatment is a fast-acting benzodiazepine, with intravenous Lorazepam (or Diazepam/Midazolam) being the drug of choice to stop the active seizure. Once the acute seizure is controlled, the second-line (urgent) treatment involves giving a long-acting anticonvulsant to prevent recurrence, with Levetiracetam, Fosphenytoin, or Valproate being standard options. Valproate and Gabapentin (Option B) are not the initial status protocol. Carbamazepine (Option C) is used for focal seizures and is not indicated in the acute management of status. Starting with levetiracetam (Option D) is incorrect as its onset is too slow for emergency termination of an ongoing convulsion. Rapid intervention is critical to prevent neuronal damage and systemic complications from prolonged status.

Question 58. A 30-year-old woman presents with unilateral ptosis that worsens toward the evening. She is diagnosed with myasthenia gravis. Which drug is considered the treatment of choice in this condition?

A. Pyridostigmine

B. Prednisolone

C. Cyclosporine

D. Plasma exchange

Correct answer: A

Myasthenia gravis is an autoimmune disorder where antibodies block acetylcholine receptors at

the neuromuscular junction, causing fluctuating muscle weakness. The first-line drug of choice for the symptomatic management of myasthenia gravis is Pyridostigmine, a long-acting acetylcholinesterase inhibitor. By preventing the breakdown of acetylcholine, it increases its concentration at the motor endplate, facilitating improved muscle contraction. Prednisolone (Option B) and Cyclosporine (Option C) are immunosuppressants used if symptomatic therapy alone is insufficient. Plasma exchange (Option D) is reserved for severe myasthenic crises to rapidly remove antibodies. The hallmark of the disease is the diurnal variation (worsening as the day progresses/fatigue), which pyridostigmine effectively addresses by providing sustained relief of ptosis and weakness. Patients must be monitored for cholinergic side effects like salivation or abdominal cramps while on this medication.

Question 59. A patient with hypertension is being treated with thiazide diuretics and now complains of fatigue. Laboratory evaluation reveals hypokalemia. Which of the following drugs can be used to prevent potassium loss in this patient?

A. Furosemide

B. Amiloride

C. Acetazolamide

D. Indapamide

Correct answer: B

Thiazide diuretics are a common cause of hypokalemia (low potassium) because they increase the delivery of sodium to the distal tubule, which triggers the secretion of potassium into the urine. To prevent potassium loss while maintaining diuresis, a potassium-sparing diuretic can be added. Amiloride works by directly blocking the Epithelial Sodium Channels (ENaC) in the distal convoluted tubule and collecting duct, which reduces the driving force for potassium secretion. Furosemide (Option A) is a loop diuretic that causes even more profound potassium loss than thiazides. Acetazolamide (Option C) works in the proximal tubule and also leads to hypokalemia. Indapamide (Option D) is a thiazide-like diuretic that, similar to thiazides, causes potassium depletion. Amiloride is often used in combination with thiazides (e.g., Co-amilozide) to help maintain serum potassium levels within the normal range, preventing the fatigue and arrhythmias associated with hypokalemia.

Question 60. Once the diagnosis of gout is confirmed, which of the following medications—being a purine analog—is most appropriate for its management?

A. Allopurinol

B. Capecitabine

C. Cytarabine

D. Febuxostat

Correct answer: A

Gout is a disease of hyperuricemia resulting in the deposition of monosodium urate crystals. For long-term management (urate-lowering therapy), the goal is to inhibit the enzyme xanthine oxidase. Allopurinol is the classic xanthine oxidase inhibitor and is chemically a purine analog (specifically an isomer of hypoxanthine). Because of its structure, it competitively inhibits the enzyme, reducing the production of uric acid. Febuxostat (Option D) is also a xanthine oxidase inhibitor but is a non-purine analog. Cytarabine (Option C) and Capecitabine (Option B) are pyrimidine analogs used in cancer chemotherapy and have no role in the management of gout. While Allopurinol is the most widely used agent, clinicians must be aware of its rare but serious hypersensitivity syndrome, particularly in patients with specific genetic markers like HLA-B5801. It is the standard-of-care purine analog for chronic gout prophylaxis.

Question 61. A woman in her first trimester of pregnancy is diagnosed with deep vein thrombosis and requires anticoagulation therapy. Which anticoagulant is preferred in this situation?

A. Enoxaparin

B. Clopidogrel

C. Betrixaban

D. Warfarin

Correct answer: A

Managing deep vein thrombosis (DVT) in pregnancy requires an anticoagulant that is effective for the mother and safe for the fetus. Enoxaparin, a Low-Molecular-Weight Heparin (LMWH), is the preferred and standard anticoagulant for use throughout pregnancy. LMWHs do not cross the placenta and therefore carry no risk of fetal teratogenicity or hemorrhage. Warfarin (Option D) is strictly contraindicated in the first trimester as it is highly teratogenic, causing fetal warfarin syndrome (bone and CNS abnormalities). Betrixaban (Option C) is a Direct Oral Anticoagulant (DOAC); currently, DOACs are avoided in pregnancy due to a lack of safety data and evidence that they cross the placenta. Clopidogrel (Option B) is an antiplatelet agent, not an anticoagulant, and is not used for the primary treatment of DVT. Enoxaparin provides a predictable response and generally does not require routine blood monitoring, making it the safest and most reliable choice for gestational anticoagulation.

Question 62. A 66-year-old man with chronic kidney disease

has poorly controlled diabetes mellitus. While planning to optimize his antidiabetic therapy, which of the following drugs does not require dose adjustment in this patient?

A. Repaglinide

B. Linagliptin

C. Glyburide

D. Saxagliptin

Correct answer: B

In patients with chronic kidney disease (CKD), many antidiabetic drugs accumulate and increase the risk of toxicity or severe hypoglycemia. Among the DPP-4 inhibitors (gliptins), Linagliptin is unique because it is primarily excreted through the biliary system (feces) rather than the kidneys. Consequently, it requires no dose modification regardless of the stage of renal impairment. Saxagliptin (Option D) is primarily renal-cleared and requires dose reduction in CKD. Glyburide (Option C), a sulfonylurea, has active metabolites that are renal-cleared; it is generally avoided in CKD due to the high risk of prolonged, fatal hypoglycemia. Repaglinide (Option A) is mostly hepatically cleared but usually requires cautious titration in advanced CKD, whereas linagliptin's pharmacological profile is the most robust for renal safety. This makes linagliptin the preferred gliptin for diabetic patients with failing renal function.

Question 63. Two blood-stained handkerchiefs are recovered from a crime scene. What is the most appropriate method for handling and preserving these items?

A. Place them in same plastic bag and seal it for preservation

B. Rinse the bloodstains with water to prevent contamination

C. Preserve in an envelope/paper bag

D. Place them in different plastic bags and seal it for preservation

Correct answer: C

Biological evidence, particularly wet or blood-stained clothing and items, must be handled with specific protocols to prevent the degradation of DNA. The gold standard for preserving blood-stained items is to air-dry them and then place them individually in an envelope or a breathable paper bag. Paper allows for air circulation, which prevents the buildup of moisture and the subsequent growth of mold and bacteria that would destroy the biological evidence. Plastic bags (Options A and D) trap moisture and accelerate the putrefaction of blood, making DNA analysis impossible. Placing multiple items in the same container (Option A) leads to

cross-contamination. Rinsing the stain with water (Option B) is a critical error that washes away the evidence. Proper evidence collection is vital for maintaining the chain of custody and ensuring that forensic results are admissible and reliable in a court of law.

Question 64. What is the poisoning associated with increased gastrointestinal secretions and diarrhea?

A. Cocaine

B. Crack

C. Cannabis

D. Organophosphates [not listed in options,
but contextually relevant]

Correct answer: D

(Note: The options provided in the source—Cocaine, Crack, Cannabis, Ketamine—all typically cause sympathergic or anticholinergic effects like constipation or dry mouth. Diarrhea is a classic cholinergic symptom.)

A poisoning characterized by increased gastrointestinal secretions and diarrhea is most classically associated with Organophosphate (OP) compounds. These agents inhibit acetylcholinesterase, leading to a "cholinergic crisis." The hallmark symptoms are remembered by the mnemonic SLUDGE: Salivation, Lacrimation, Urinary incontinence, Diarrhea, Gastrointestinal cramps, and Emesis. Cocaine (Option A) and Crack (Option B) are sympathomimetics that cause tachycardia and hypertension. Cannabis (Option C) often causes reddening of the eyes and increased appetite. Ketamine (Option D) is a dissociative anesthetic. OP poisoning is a medical emergency requiring the use of Atropine to block the excess muscarinic activity and Pralidoxime (PAM) to reactivate the enzyme. Correct identification of these toxidromes is essential for initiating life-saving antidotal therapy.

Question 65. During forensic analysis of a semen sample obtained in a rape case, distinctive yellow, needle-shaped crystals are observed. Which specific test is used to confirm the presence of sperm?

A. Barberio test

B. Acid phosphatase test

C. Papanicolaou smear

D. Florence test

Correct answer: A

The identification of distinctive yellow needle-like crystals (spermine picrate) during a forensic semen analysis is the hallmark of the Barberio test. This is a preliminary chemical test used to identify spermine, a component of seminal fluid. The Florence test (Option D) also produces

crystals, but they are brown, rhombic crystals of choline periodide. The Acid Phosphatase test (Option B) is a very sensitive colorimetric screening test for semen but does not involve crystal formation. A Papanicolaou (Pap) smear (Option C) is a staining technique used for cytological examination to visualize actual sperm cells under a microscope. While Barberio is a useful screening tool, the confirmatory test for semen in a rape investigation remains the microscopic visualization of spermatozoa. Understanding these forensic tests is critical for the medico-legal documentation of sexual assault and the identification of the perpetrator.

Question 66. Blood during autopsy is preserved in?

A. NaF

B. NaCl

C. Formalin

D. Rectified spirit

Correct answer: A

During a forensic autopsy, blood samples collected for toxicological analysis must be preserved to prevent the degradation of certain substances or the post-mortem production of alcohol. Sodium fluoride (NaF) is the standard preservative used. As established in Question 54, it acts as an antiglycolytic and an enzyme inhibitor, specifically preventing bacteria and yeast from fermenting glucose into ethanol, which would lead to a falsely elevated blood alcohol level. Sodium chloride (Option B) is simple table salt and has no preservative value in toxicology. Formalin (Option C) is used to preserve tissues for histology but would invalidate chemical testing. Rectified spirit (Option D) is concentrated ethanol and is used to preserve viscera for certain poisons but would obviously invalidate any alcohol measurement. Using NaF-preserved tubes is a mandatory forensic step to ensure the scientific validity of the autopsy's toxicological findings in legal proceedings.

Question 67. A farmer presents with a painful snakebite on his right foot, showing two distinct fang marks along with swelling and bleeding at the site. What should be the first step in the management of this patient?

A. Polyvalent ASV

B. Sling or splint leading to immobilization

C. Venom suction

D. See the snake brought by a relative

Correct answer: B

The first step in the immediate management of a snakebite in the field or upon arrival at a clinic is the immobilization of the affected limb using a sling or splint. This is critical to slow the systemic absorption of venom through the lymphatic system, which is accelerated by muscle

movement. The patient should be kept calm and moved as little as possible. Polyvalent Anti-Snake Venom (ASV) (Option A) is the definitive treatment but is only administered once signs of systemic envenomation or severe local effects are confirmed. Venom suction (Option C), cutting the wound, or applying a tourniquet are obsolete and harmful practices that increase local tissue damage. Trying to see or identify the snake (Option D) often leads to dangerous delays or additional bites. Immobilization is the most effective first-aid measure to prevent the rapid spread of toxins until life-saving ASV can be safely administered.

Question 68. During measurement of a rifled barrel weapon,
the caliber depends on?

A. Distance between two opposite lands

B. Distance between two opposite grooves

C. Number of lead pellets

D. Mass and velocity

Correct answer: A

In forensic ballistics, the caliber of a rifled firearm is defined as the internal diameter of the barrel. Specifically, for a rifled weapon, it is measured as the distance between two opposite lands (the raised portions of the rifling). The grooves (Option B) are the recessed portions; the distance between them would be slightly larger than the true caliber. The number of lead pellets (Option C) relates to the "gauge" or "bore" of a smooth-bore shotgun, not a rifled weapon. Mass and velocity (Option D) determine the kinetic energy and wounding potential of the projectile but do not define the weapon's caliber. Accurate caliber determination is essential for matching a fired bullet to a suspect firearm. Each firearm leaves unique land and groove impressions on the bullet, acting as a "ballistic fingerprint" that allows forensic experts to link evidence from a crime scene to a specific weapon.

Question 69. During a police investigation, skeletal remains
are recovered from a crime scene. Which forensic
test would be most useful in distinguishing
human bones from those of a dog?

A. Precipitin test

B. Acid-phosphatase

C. LDH

D. Teichmann test

Correct answer: A

When skeletal remains are found, the first task of the forensic anthropologist is to determine if the bones are human or animal. The Precipitin test is a standard serological test used to identify the species of origin for biological materials, including bone extracts. It works by reacting the unknown sample with species-specific anti-sera; a positive reaction (precipitation) confirms the

presence of proteins from that specific species (e.g., human). Acid-phosphatase (Option B) is used to screen for semen. LDH (Option C) is an enzyme marker of tissue damage. The Teichmann test (Option D) is used to confirm the presence of blood by forming hemin crystals. Differentiating human from canine (dog) bones is a routine requirement in forensic investigations to determine if a full criminal inquiry is warranted. While gross anatomical features often distinguish the two, the Precipitin test provides definitive biochemical proof of the species.

Question 70. Ingestion of an unknown substance results in tachycardia and the perception of a red-colored halo. Which substance is most likely responsible for these findings?

A. Cannabis

B. Crack/cocaine

C. LSD

D. Heroine

Correct answer: C

LSD (Lysergic acid diethylamide) is a potent hallucinogen. Its clinical effects include profound sensory distortions, such as synesthesia (crossing of senses) and the perception of red-colored halos or trails around objects. LSD also triggers a sympathetic response, leading to tachycardia, pupil dilation (mydriasis), and hypertension. Cannabis (Option A) classically causes "red eyes" (conjunctival injection) and increased appetite but not the specific halo-hallucinations of LSD. Crack/Cocaine (Option B) is a pure stimulant that causes extreme tachycardia and euphoria but not primarily visual hallucinations. Heroin (Option D) is an opioid that characteristically causes "pinpoint" pupils, respiratory depression, and bradycardia—the opposite of tachycardia. LSD "trips" can be intensely pleasant or terrifying ("bad trip"), often requiring supportive care in a quiet environment. Recognizing these specific drug-induced visual symptoms is a key part of the psychiatric and forensic assessment of substance abuse.

Question 71. The most common organ injuries in air blast shock waves will be?

A. Intestine

B. Lungs

C. Kidney

D. Heart

Correct answer: B

In an explosion, air blast shock waves primarily damage gas-containing organs due to the rapid pressure changes at air-tissue interfaces. The Lungs are the most commonly injured internal organ in primary blast injuries. This "blast lung" involves pulmonary hemorrhage, edema, and

alveolar rupture, often leading to severe respiratory distress or air embolism. The auditory system (tympanic membrane rupture) is the most frequent overall blast injury, but the lung is the most critical organ affected. The Intestine (Option A) is the second most common gas-containing organ injured, often suffering mural hematomas or delayed perforation. The Kidney (Option C) and Heart (Option D) are solid or fluid-filled organs that are relatively more resistant to primary blast waves compared to the air-filled lungs. Clinicians managing blast victims must have a high index of suspicion for lung injury, even in the absence of external trauma, as symptoms may be delayed for several hours.

Question 72. Which of the following courts has the authority to commute a death sentence?

A. Session court

B. Additional session court

C. High court

D. Supreme Court [contextual correction]

Correct answer: C

Under the Indian legal system, while a Session Court (Option A) or an Additional Session Court (Option B) can pass a death sentence, the sentence cannot be executed until it is confirmed by the High Court. The High Court has the specific authority to confirm, commute, or set aside the death sentence during this mandatory review process. Further appeals can be made to the Supreme Court. Additionally, the President of India and the Governors of States have the constitutional power to grant pardons and commute death sentences. Options A, B, and D in the original list might be incomplete, but the High Court's role in the "confirmation" and potential commutation of capital punishment is a fundamental principle of criminal procedure. This mandatory oversight is a legal safeguard to ensure that the death penalty is reserved for only the "rarest of rare" cases, as mandated by judicial precedent.

Question 73. Which of the following is punishable under the MTP Act?

A. MTP done up to 24 weeks

B. Done by government-authorized center

C. Done by experienced RMP

D. Non-entry in MTP-register, not sending report to DDHS

Correct answer: D

The MTP Act is a strictly regulated piece of legislation designed to provide safe and legal abortion services. Performing an MTP up to 24 weeks (Option A) for specified categories of women is legal. Performing it at an authorized center (Option B) by a qualified Registered Medical Practitioner (RMP) (Option C) are the basic requirements for a legal termination.

However, the Act also mandates strict administrative compliance. Failure to maintain the MTP register or failure to send the required monthly report to the Director of Health Services (DDHS) is a punishable offense. These administrative requirements are designed to prevent illegal or "back-alley" abortions and to ensure that all terminations are tracked for public health and safety purposes. Violations can lead to fines, imprisonment, and the closure of the facility. Maintaining confidentiality and proper documentation is a legal and ethical duty of the performing RMP.

Examination Paper January 2024 Question
(A) 25 per one lakh
(B) 250 per lakh
(C) 500 per lakh
(D) 100 per lakh
AAns

(C) 500 per lakh
To calculate the Maternal Mortality Ratio (MMR), you must first identify the correct number of maternal deaths and the number of live births.
1.
Identify Maternal Deaths : Maternal deaths include deaths from obstetric causes (direct or indirect) during pregnancy, labor, or within 42 days of delivery.
(i)
Included: Ectopic pregnancy (2), Abortion (2), Sepsis (2), and Postpartum Hemorrhage (PPH) (4).
(ii)
Excluded: Electrocution (2), as this is an accidental/incidental death and not an obstetric cause.
(iii)
Total Maternal Deaths =
2.
Identify Live Births:
(i)
Total Live Births =
(ii)
Note: Stillbirths are excluded from the denominator in MMR.
3.
Apply the Formula:
Analysis of Options
(A)

25 per one lakh: This would be the result if only 1 maternal death had occurred.

(C)

500 per lakh: This would be the result if 20 maternal deaths were counted.

(D)

100 per lakh: This would be the result if only 4 maternal deaths were counted.

Question 74. A married woman at 26 weeks of gestation presents with a history of contraceptive failure and requests termination of pregnancy. According to the provisions of the Medical Termination of Pregnancy (MTP) Act, what is the most appropriate course of action?

A. Husband's consent

B. 2 doctors' opinion

C. If no fetal anomaly, continue the pregnancy

D. Medical board permission for termination

Correct answer: C

Under the MTP (Amendment) Act 2021, the upper limit for termination due to failed contraception for a married woman (or any woman) is 24 weeks. Since this patient is at 26 weeks, she has exceeded the legal limit for this specific indication. Therefore, if there is no significant fetal anomaly or immediate threat to the mother's life, the pregnancy must be continued. Husband's consent (Option A) is never required. The opinion of 2 doctors (Option B) is required for terminations between 20-24 weeks, not beyond. Medical board permission (Option D) is specifically for terminations beyond 24 weeks but only when substantial fetal abnormalities are diagnosed. Failed contraception is not a valid ground for termination after the 24-week threshold. Clinicians must strictly adhere to these gestational limits to stay within the bounds of the law while providing reproductive healthcare.

Question 75. Acute liver failure is a clinical feature of which of the following?

A. OP poisoning

B. Amanita Phalloides poisoning

C. Belladonna poisoning

D. Morphine poisoning

Correct answer: B

Amanita phalloides, commonly known as the "death cap" mushroom, is a highly toxic fungus. Its primary toxins, amatoxins, are potent inhibitors of RNA polymerase II, which stops protein synthesis in cells. This leads to severe, irreversible tissue damage, with the liver being the primary target due to high metabolic activity and first-pass exposure. Acute liver failure

(fulminant hepatitis) is the classic and often fatal clinical feature of this poisoning. Organophosphate (OP) poisoning (Option A) causes a cholinergic crisis but not primary liver failure. Belladonna (Option C) leads to an anticholinergic syndrome. Morphine (Option D) causes opioid toxicity (respiratory depression/coma). Mushroom poisoning often starts with a latent period, followed by severe gastrointestinal symptoms, and finally catastrophic hepatic and renal failure. There is no specific antidote for amatoxins, making early recognition and supportive care, including potential liver transplantation, the only management options.

MICROBIOLOGY

Question 76. A patient with a history of keeping a pet dog presents with right hypochondrial pain. Radiological evaluation reveals a multiloculated cystic lesion in the liver. Which organism is most likely responsible for this condition?

A. Echinococcus granulosus

B. Entamoeba histolytica

C. Strongyloides stercoralis

D. Ancylostoma duodenale

Correct answer: A

The clinical history of having a pet dog combined with the finding of a multilocular (or unilocular with daughter cysts) cyst in the liver is classic for Hydatid disease, caused by the tapeworm Echinococcus granulosus. Dogs are the definitive hosts, and humans are accidental intermediate hosts who ingest the eggs. Entamoeba histolytica (Option B) causes an "anchovy paste" liver abscess rather than a well-defined multilocular cyst. Strongyloides (Option C) and Ancylostoma (Option D) are intestinal helminths that do not typically cause large liver cysts. Hydatid cysts can be asymptomatic for years but may cause pain, jaundice, or rupture leading to anaphylaxis. Diagnosis is often made via ultrasound or CT, which shows the characteristic "water lily sign" or daughter cysts. Management involves surgical excision (PAIR technique) and anti-helminthic therapy like albendazole.

Question 77. A 45-year-old patient with HIV presents with persistent headache, confusion, and gradually developing fever. Lumbar puncture reveals raised opening pressure, and cerebrospinal fluid examination is positive on India ink staining. What is the most likely diagnosis?

A. Bacterial meningitis

B. Viral meningitis

C. Cryptococcus neoformans

D. Tuberculous meningitis

Correct answer: C

In an HIV-positive patient, the insidious onset of meningitis (headache/fever) combined with a positive India Ink stain of the CSF is diagnostic for Cryptococcus neoformans. India ink highlights the thick polysaccharide capsule of the yeast, which appears as a clear halo around the organism. The elevated opening pressure is another common feature of cryptococcal meningitis. Bacterial meningitis (Option A) would show a high neutrophil count and low glucose. Viral meningitis (Option B) typically presents more acutely with lymphocytic pleocytosis and normal glucose. Tuberculous meningitis (Option D) also presents gradually and with high pressure, but it would show AFB on stain rather than the encapsulated yeasts seen in India ink. This is a life-threatening opportunistic infection requiring induction therapy with Amphotericin B and Flucytosine, followed by long-term maintenance with fluconazole.

Question 78. A 35-year-old male soldier presents with a painful, erosive lesion near the earlobe that developed after returning from duty in a desert region. A punch biopsy taken from the advancing edge of the lesion shows characteristic findings. Which of the following organisms is the most likely causative agent?

A. Trypanosoma brucei

B. Trypanosoma cruzi

C. Leishmania donovani

D. Plasmodium vivax

Correct answer: C

The history of a soldier returning from a desert area with a persistent skin lesion is highly suggestive of Cutaneous Leishmaniasis (often called "Oriental sore"). The biopsy image provided is definitive, showing macrophages filled with Leishman-Donovan (LD) bodies, which are the amastigote form of the parasite. These organisms are transmitted through the bite of the sandfly. Trypanosoma brucei (Option A) causes sleeping sickness and presents with a chancre but is found in sub-Saharan Africa. Trypanosoma cruzi (Option B) causes Chagas disease in South America. Plasmodium vivax (Option D) is the cause of malaria and would be found in red blood cells, not as intracellular amastigotes in macrophages. LD bodies are characterized by a nucleus and a rod-shaped kinetoplast. This microscopic finding is a pathognomonic marker for leishmaniasis. Management includes local or systemic therapy with pentavalent antimonials.

Question 79. Which of the following is the primary identification made by a CBNAAT/gene expert?

A. Mycobacterium tuberculosis

B. MTB + Rifampicin resistance

C. MTB + Isoniazid

D. MTB + Ethambutol

Correct answer: B

CBNAAT (Cartridge Based Nucleic Acid Amplification Test), commonly known as GeneXpert, is a revolutionary molecular test for tuberculosis. Its primary function is the simultaneous identification of the Mycobacterium tuberculosis (MTB) genome and the presence of mutations in the rpoB gene, which indicates Rifampicin resistance. Because Rifampicin is a surrogate marker for multi-drug resistance (MDR-TB), this test provides rapid, critical information for treatment planning. While it identifies the bacteria itself (Option A), its most significant clinical advantage is the rapid resistance testing. Standard GeneXpert does not identify resistance to Isoniazid (Option C) or Ethambutol (Option D); those require more advanced molecular tests or traditional cultures. GeneXpert is highly sensitive, providing results in less than two hours, making it the first-line diagnostic tool in the National TB Elimination Programme of India for both pulmonary and extrapulmonary tuberculosis.

Question 80. A patient presents to the outpatient department with features suggestive of acute rheumatic fever. Microscopic examination reveals gram-positive cocci arranged in chains. What is the most likely etiological agent?

A. Streptococcus viridans

B. Streptococcus pyogenes

C. Streptococcus pneumoniae

D. Enterococcus

Correct answer: B

Acute Rheumatic Fever (ARF) is a non-suppurative inflammatory complication that occurs 2-4 weeks after a pharyngeal infection. The specific etiological agent responsible for triggering this autoimmune response is Streptococcus pyogenes, also known as Group A Beta-Hemolytic Streptococcus (GABHS). Microscopically, these are characterized as gram-positive cocci arranged in chains. Streptococcus viridans (Option A) is a common cause of subacute bacterial endocarditis but does not trigger ARF. Streptococcus pneumoniae (Option C) causes pneumonia and meningitis and typically appears as gram-positive diplococci. Enterococcus (Option D) is associated with urinary tract and abdominal infections. ARF results from molecular mimicry between the streptococcal M-protein and human heart tissue. Diagnosis is made clinically using the Jones Criteria. Long-term penicillin prophylaxis is required for these patients to prevent recurrent attacks and subsequent chronic rheumatic heart disease.

Question 81. A patient is evaluated for meningitis. Cerebrospinal fluid analysis reveals lymphocytic predominance, low glucose levels, and elevated protein concentration. What is the most likely etiological agent?

A. Streptococcus pneumoniae

B. Hemophilus influenza

C. Neisseria meningitidis

D. Mycobacterium tuberculosis

Correct answer: D

Analyzing CSF parameters is vital for identifying the type of meningitis. Tuberculous meningitis (TBM) characteristically presents with a lymphocytic pleocytosis (lymphocytosis), significantly decreased glucose, and marked elevation of protein. This profile reflects a chronic granulomatous inflammatory process. Acute bacterial pathogens like S. pneumoniae (Option A), H. influenzae (Option B), and N. meningitidis (Option C) would typically show a neutrophilic predominance (not lymphocytosis) alongside low glucose and high protein. Viral meningitis would show lymphocytosis but with normal glucose levels. TBM is a medical emergency with an insidious onset; it often results in thick basal exudates and cranial nerve palsies. Definitive diagnosis involves AFB staining, GeneXpert, or liquid culture (MGIT). Treatment requires a prolonged course of anti-tubercular therapy combined with corticosteroids to reduce inflammation and prevent neurological sequelae.

Question 82. A 10-year-old boy is brought to the emergency department after a bee sting sustained while playing outdoors. Within minutes, he develops shock, respiratory distress, and circulatory collapse. Which type of hypersensitivity reaction is most likely responsible for this presentation?

A. IgG-mediated reaction

B. IgA-mediated hypersensitivity

C. IgE-mediated reaction

D. T cell-mediated response

Correct answer: C

The rapid onset (within minutes) of systemic symptoms like shock and respiratory failure following a bee sting is the classic presentation of Anaphylaxis. This is a Type I Hypersensitivity reaction, which is fundamentally IgE-mediated. Upon exposure to the bee venom antigen, IgE antibodies already bound to the surface of mast cells and basophils trigger the massive release of histamine and other inflammatory mediators. This leads to widespread vasodilation and bronchoconstriction. IgG-mediated reactions (Option A) are involved in Type II and Type III hypersensitivities. IgA (Option B) is primarily an agent of mucosal immunity. T cell-mediated responses (Option D) define Type IV delayed hypersensitivity, which takes 48-72 hours to develop. The immediate life-saving treatment for an IgE-mediated anaphylactic reaction is intramuscular adrenaline, which rapidly reverses the dangerous physiological changes.

Question 83. A 6-month-old male infant presents with recurrent bacterial and fungal infections, chronic diarrhea, and failure to thrive. He is diagnosed with severe combined immunodeficiency inherited in an autosomal recessive manner. Which enzyme deficiency is responsible for this condition?

A. Phosphomannose isomerase

B. Ornithine transcarbamylase

C. Hypoxanthine-guanine phosphoribosyltransferase

D. Adenosine deaminase

Correct answer: D

Severe Combined Immunodeficiency (SCID) is a group of rare disorders characterized by the absence of both T and B lymphocyte function. Approximately 15% of SCID cases are caused by a deficiency of the enzyme Adenosine deaminase (ADA), which is inherited in an autosomal recessive pattern. The lack of ADA leads to the toxic buildup of dATP in lymphocytes, which halts their development and function. ADA deficiency typically presents in infancy with the "classic SCID triad": recurrent infections, diarrhea, and failure to thrive. OTC deficiency (Option B) leads to hyperammonemia. HGPRT deficiency (Option C) results in Lesch-Nyhan syndrome (gout/self-mutilation). Phosphomannose isomerase (Option A) is involved in protein glycosylation. ADA-SCID is a pediatric emergency because it is fatal without treatment; management options include hematopoietic stem cell transplantation, enzyme replacement therapy, or gene therapy.

Question 84. A farmer develops a skin lesion on his arm after handling cattle on his farm. Gram staining of material from the lesion shows gram-positive rods with square ends and centrally placed spores. Which organism is most likely responsible for this infection?

A. Brucella abortus

B. Pseudomonas aeruginosa

C. Bacillus anthracis

D. Bacillus cereus

Correct answer: C

The combination of an occupational history (farmer working with cattle) and a skin lesion (likely a painless ulcer with a black eschar) is classic for Cutaneous Anthrax. The microscopic identification of gram-positive rods with square ends (resembling bamboo sticks) and central spores is pathognomonic for Bacillus anthracis. Brucella (Option A) causes a systemic fever and is a gram-negative coccobacillus. Pseudomonas (Option B) is a gram-negative rod associated with blue-green pus. Bacillus cereus (Option D) is also a gram-positive spore-former but is primarily known for causing food poisoning (rice) rather than primary skin lesions in farmers. Anthrax spores are extremely resilient and can persist in soil for decades. Cutaneous anthrax has a good prognosis if treated promptly with antibiotics like ciprofloxacin or doxycycline. Its distinctive microscopic appearance is a cornerstone of both clinical and forensic microbiology.

Question 85. A 68-year-old woman was admitted for three days with left leg cellulitis and treated with clindamycin. Two days after discharge, she develops abdominal pain and profuse watery diarrhea. Laboratory investigations reveal leukocytosis with raised ESR and CRP levels. What is the most likely causative agent?

A. Escherichia coli

B. Norovirus

C. Clostridioides difficile

D. Rotavirus

Correct answer: C

The clinical picture of a patient developing abdominal pain and watery diarrhea shortly after

hospitalization and a course of antibiotics (Clindamycin) is the classic description of Clostridioides difficile infection (CDI). Clindamycin is notorious for disrupting the normal gut flora, allowing C. difficile to overgrow and produce toxins that cause pseudo-membranous colitis. The elevated white cell count (leukocytosis) and inflammatory markers (ESR/CRP) support a bacterial inflammatory cause. E. coli (Option A) is a common gut dweller but not specifically linked to clindamycin-associated diarrhea. Norovirus (Option B) and Rotavirus (Option D) cause acute viral gastroenteritis but typically involve vomiting and occur in community outbreaks rather than specifically following antibiotic use in the elderly. Diagnosis of CDI is confirmed by stool toxin PCR or ELISA. First-line treatment involves oral vancomycin or fidaxomicin.

Question 86. The below slide represents a gomori methenamine silver stained slide with acute angle branching and septate hyphae. What is the organism?

A. Blastomycosis

B. Candida

C. Aspergillus

D. Mucor

Correct answer: C

Gomori Methenamine Silver (GMS) stain is used to visualize fungal elements, which appear black or dark brown. The diagnostic microscopic feature of Aspergillus is the presence of thin, septate hyphae that exhibit acute angle (≈45°) dichotomous branching. Mucor (Option D) is characterized by much broader, non-septate hyphae that branch at wide, right (≈90°) angles. Candida (Option B) typically presents as budding yeasts and pseudohyphae. Blastomycosis (Option A) shows large, "broad-based" budding yeasts. Aspergillus species are opportunistic fungi that can cause a spectrum of diseases, from allergic bronchopulmonary aspergillosis (ABPA) to invasive pulmonary aspergillosis in immunocompromised patients. Its specific branching pattern is a high-yield identifier in pathology and microbiology exams. Recognizing these microscopic landmarks allows for the prompt initiation of targeted antifungal therapy such as voriconazole.

97. Match the following cytokines with their function:

1. IL-5
2. IL-6
3. IL-7

Question 87. Rukmini is participating in the Village Health, Nutrition, and Sanitation Day. How often is this program organized?

A. Every month

B. Every week

C. Every 14 days

D. Every 3 months

Correct answer: A

The Village Health, Nutrition and Sanitation Day (VHNSD) is a critical platform for the delivery of essential health services at the community level in India. According to the National Health Mission guidelines, VHNSD is conducted every month in every village across the country. Usually organized at the Anganwadi center, the day brings together health workers (ASHAs and ANMs) and Anganwadi workers to provide services such as immunization, antenatal care, growth monitoring of children, and counseling on nutrition and sanitation. Options B, C, and D are incorrect frequencies for this specific program. The monthly VHNSD ensures regular contact between the community and the primary health system, facilitating early detection of health issues and improving the coverage of life-saving interventions. It also provides an opportunity for health education on topics like handwashing, toilet use, and diversified diets. This community-based approach is fundamental for reducing maternal and child mortality in rural areas.

120. Calculate the maternal mortality ratio in a population of 2 lakhs, with 4000 live births, and 5 stillbirths where 2 died due to ectopic, 2 by abortion, 2 by electrocution, 2 deaths by sepsis and 4 by PPH?

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Question 88. level in India. According to the National Health Mission guidelines, VHNSD is conducted every month in every village across the country. Usually organized at the Anganwadi center, the day brings together health workers (ASHAs and ANMs) and Anganwadi workers to provide services such as immunization, antenatal care,

growth monitoring of children, and counseling on nutrition and sanitation. Options B, C, and D are incorrect frequencies for this specific program. The monthly VHNSD ensures regular contact between the community and the primary health system, facilitating early detection of health issues and improving the coverage of life-saving interventions. It also provides an opportunity for health education on topics like handwashing, toilet use, and diversified diets. This community-based approach is fundamental for reducing maternal and child mortality in rural areas.

Calculate the maternal mortality ratio in a population of 2 lakhs, with 4000 live births, and 5 stillbirths where 2 died due to ectopic, 2 by abortion, 2 by electrocution, 2 deaths by sepsis and 4 by PPH?

A. 25 per one lakh

B. 250 per lakh

C. 500 per lakh

D. 100 per lakh

Correct answer: C

To calculate the Maternal Mortality Ratio (MMR), you must first identify the correct number of maternal deaths and the number of live births.

1. Identify Maternal Deaths : Maternal deaths include deaths from obstetric causes (direct or indirect) during pregnancy, labor, or within 42 days of delivery.

(i) Included:

Ectopic pregnancy (2),

Abortion (2), Sepsis (2), and Postpartum Hemorrhage (PPH) (4).

(ii) Excluded: Electrocution (2), as this is an accidental/incidental death and not an obstetric cause.

(iii) Total
Maternal
Deaths
=
2
2
2
4
10
+
+
+
=
2. Identify Live Births:
(i) Total Live Births = 4000
(ii) Note: Stillbirths are excluded from the
denominator in MMR.
3. Apply the Formula:

Question 89. A 49-year-old man returns for follow-up after being recently diagnosed with a condition and started on treatment. During counseling, he is informed about the Axshya project. This project is associated with the management and control of which disease?

A. Tuberculosis
B. Diabetes
C. Malaria
D. Zika infection

Correct answer: A

The Axshya Project is a large public health initiative in India aimed at improving the control and elimination of tuberculosis (TB). It is implemented by the The Union with support from the Global Fund.

The project focuses on:

1.
Active case finding in vulnerable and hard-to-reach populations
2.
Awareness and advocacy about TB symptoms and treatment

3.

Reducing stigma and discrimination associated with TB

4.

Strengthening community participation and early diagnosis

Its goal aligns with India’s mission to eliminate TB by improving early detection, treatment adherence, and reporting.

Why other options are incorrect:

(B)

Diabetes → No relation to Axshya project

(C)

Malaria → Covered under separate national programs

(D)

Zika infection → Managed under vector-borne disease control programs

Question 90. A 10-year-old child is brought to the clinic for routine immunization. According to the National Immunization Schedule, which vaccine is administered at this age?

A. TT/Td

B. BCG

C. MMR

D. DTP

Correct answer: A

According to the National Immunization Schedule of India, the standard vaccine administered to children when they reach 10 years of age is the Tetanus and adult Diphtheria (Td) booster (previously). A subsequent dose of Td is given at 16 years of age. BCG (Option B) is given at birth to protect against severe forms of tuberculosis. DTP (Option D) is given as primary doses in infancy and boosters at 16–24 months and 5–6 years of age. MMR (Option C) is not part of the standard national schedule, although the Measles-Rubella (MR) vaccine is given at 9 and 16–24 months. The Td booster is critical for maintaining long-term immunity against tetanus, especially as older children become more active and prone to injuries. It also helps maintain immunity against diphtheria in the adolescent and adult population. Clinicians must ensure that this often-missed booster is provided during school health visits or regular clinic check-ups.

ENT

Question 91. Identify the hemorrhage shown in the following

image?

A. Extradural hemorrhage

B. Subarachnoid hemorrhage

C. Subdural hematoma

D. Intraparenchymal hemorrhage

Correct answer: C

The CT image shows a crescent-shaped (concave) hyperdense collection along the surface of the brain, which is characteristic of a subdural hemorrhage (SDH). This occurs due to tearing of bridging veins, commonly following trauma. The blood spreads over the cerebral convexity and is not limited by suture lines, but it is restricted by dural reflections like the falx cerebri.

Why other options are incorrect:

(A)

Extradural (epidural) hemorrhage: Appears biconvex (lens-shaped) and is limited by sutures; usually due to middle meningeal artery injury.

(B)

Subarachnoid hemorrhage: Blood is seen in sulci and basal cisterns (star-shaped pattern), not as a crescentic collection.

(C)

Intraparenchymal hemorrhage: Appears as a localized hyperdense lesion within brain tissue, not along the surface.

Question 92. A patient presents with nasal obstruction, loss of smell (anosmia), and a foul-smelling discharge from the nose. On clinical examination, the findings shown below are observed. Based on this presentation, what is the most likely diagnosis?

A. Atrophic rhinitis

B. Rhinitis sicca

C. Rhinitis medicamentosa

D. Allergic rhinitis

Correct answer: A

The clinical triad of nasal obstruction (paradoxically, despite a spacious cavity), anosmia (loss of smell), and ozaena (a repulsive foul smell that the patient themselves cannot perceive) is the classic presentation of Atrophic rhinitis. On examination, as shown in the image, the nasal mucosa is thin and atrophied, and the cavity is filled with characteristic greenish-black crusts. Rhinitis sicca (Option B) involves dry mucosa without the severe atrophy and foul crusting.

Rhinitis medicamentosa (Option C) is a rebound congestion following the overuse of topical decongestants. Allergic rhinitis (Option D) presents with sneezing, watery rhinorrhea, and pale, boggy turbinates. Atrophic rhinitis often affects young or middle-aged women and may be primary or secondary to surgery. Management focuses on nasal douching with alkaline solutions to remove crusts and maintain hygiene. In severe, refractory cases, surgical procedures like Young's operation (closing the nostrils) may be performed to allow the mucosa to heal in a humid environment.

Question 93. A patient with poorly controlled diabetes (HbA1c = 10) presents with severe, excruciating ear pain accompanied by blood-stained ear discharge. Based on this clinical presentation, what is the most likely diagnosis?

A. Otitis externa

B. Necrotizing otitis externa

C. Serous otitis media

D. Otomycosis

Correct answer: B

Necrotizing (malignant) otitis externa is a severe, life-threatening infection of the external auditory canal with extension to the skull base, occurring predominantly in elderly patients with poorly controlled diabetes mellitus or in those who are immuno compromised. Poor glycemic control is the most important predisposing factor.

The hallmark clinical features include severe, deep-seated otalgia (often worse at night), persistent otorrhea that may be blood-stained, and the presence of granulation tissue at the junction of the cartilaginous and bony portions of the external auditory canal, which is a key diagnostic clue.

Simple otitis externa (Option A) is a superficial infection and lacks systemic severity. Serous otitis media (Option C) involves sterile middle-ear effusion and is typically painless. Otomycosis (Option D) is a fungal infection presenting with itching and debris resembling wet newspaper, without invasive features.

The most common causative organism is Pseudomonas aeruginosa. Untreated disease can progress to skull base osteomyelitis, leading to cranial nerve palsies and potentially meningitis. Diagnosis is supported by CT or MRI showing bony erosion. Management requires prolonged intravenous anti-pseudomonal antibiotics along with strict glycemic control.

Question 94. A 50-year-old man presents with complaints of vertigo, tinnitus, and hearing loss. An audiogram is provided for evaluation. Based on the audiometric findings shown, what is the

most likely diagnosis?

A. BPPV

B. Meniers disease

C. Vestibular neuronitis

D. Presbycusis

Correct answer: B

The clinical triad of episodic vertigo, tinnitus, and progressive hearing loss is characteristic of Meniere's disease. The provided audiogram shows a low-frequency sensorineural hearing loss (the line is lower on the left side of the chart), which is pathognomonic for the early stages of this condition. BPPV (Option A) causes brief, position-triggered vertigo but no hearing loss or tinnitus. Vestibular neuronitis (Option C) causes sudden, severe, prolonged vertigo but hearing remains normal. Presbycusis (Option D) is age-related hearing loss that characteristically affects high frequencies (the right side of the chart) and is always bilateral. Meniere's disease is caused by endolymphatic hydrops—excess fluid pressure in the inner ear. Episodes typically last minutes to hours and are often preceded by a feeling of ear fullness. Management involves a low-salt diet, diuretics, and medications like betahistine to reduce the frequency and severity of attacks. Accurate audiometric assessment is essential for confirming the sensorineural nature and specific frequency pattern of the hearing loss.

Question 95. A 45-year-old school teacher presents with hoarseness of voice and vocal fatigue. A flexible laryngoscopic examination is performed, and the image is shown below. Based on the laryngoscopic findings, what is the most likely diagnosis?

A. Vocal nodule

B. Reinkes edema

C. Vocal polyp

D. Keratosis larynx

Correct answer: D

A 45-year-old teacher presenting with progressive hoarseness and voice fatigue suggests a chronic laryngeal condition. The key diagnostic clue comes from the laryngoscopic image, which shows irregular, white, thickened patches on the vocal cords. These findings are characteristic of keratosis of the larynx (laryngeal leukoplakia).

Keratosis larynx is a precancerous condition caused by chronic irritation, such as prolonged

voice use (common in teachers), smoking, or exposure to irritants. The lesions appear as white, hyperkeratotic plaques, which are typically irregular and patchy, unlike smooth or symmetrical lesions seen in other conditions.

Why other options are incorrect:

1.

Vocal nodules → Bilateral, symmetrical lesions at specific junctions

2.

Reinke's edema → Diffuse, bilateral swelling, often in smokers

3.

Vocal polyp → Usually unilateral, smooth, and vascular

Question 96. Which of the following drugs is absolutely contraindicated in pregnancy?

A. Captopril

B. Paracetamol

C. Ranitidine

D. Cefixime

Correct answer: A

Captopril is an ACE inhibitor used to treat hypertension. This entire class of drugs is absolutely contraindicated in pregnancy (Category D/X). ACE inhibitors can cause severe fetal and neonatal injury, including renal failure, limb deformities, lung hypoplasia, and fetal skull defects (ACE inhibitor fetopathy). Paracetamol (Option B) is generally considered the safest analgesic and antipyretic throughout pregnancy. Ranitidine (Option C) is an H2-blocker commonly used for acid reflux and is not contraindicated. Cefixime (Option D) is a third-generation cephalosporin and is a safe antibiotic choice for infections during pregnancy. For pregnant women with hypertension, safer alternatives like Labetalol, Methyldopa, or Nifedipine should be used instead of ACE inhibitors or ARBs. This pharmacological knowledge is vital for preventing iatrogenic fetal harm. Any woman of childbearing age prescribed an ACE inhibitor must be counseled about its teratogenic risks and the need for reliable contraception.

Question 97. Which of the statement is true regarding laryngomalacia?

A. Expiratory stridor

B. Breathing Improves in supine position

C. Most common congenital abnormality in new-born

D. Surgical management is required in most children

Correct answer: C

Laryngomalacia is the most common congenital abnormality of the larynx in newborns and infants. It is characterized by the inward collapse of the supraglottic structures (like the epiglottis and arytenoids) during inhalation. This results in a high-pitched inspiratory stridor (Option A is incorrect as it is not expiratory). The stridor is typically worst in the supine position and improves when the baby is placed prone (Option B is incorrect). In the vast majority of children (over 90%), the condition is self-limiting and resolves spontaneously by the age of 18–24 months as the laryngeal cartilage matures; therefore, surgical management is NOT required in most children (Option D is incorrect). Surgery (supraglottoplasty) is only reserved for severe cases involving failure to thrive, severe cyanosis, or significant sleep apnea. Diagnosis is usually made through flexible laryngoscopy, which shows a classic "omega-shaped" epiglottis. Reassurance and monitoring for adequate weight gain are the cornerstones of management for most affected infants.

Question 98. A middle-aged man presents to the outpatient department with ear pain and hearing loss following trauma to the right ear. Otoscopic examination shows blood clots in the external auditory canal along with irregular perforations of the tympanic membrane. What should be the next step in management?

A. Aspirate the clot and perform audiometric tests

B. Syringing

C. Maintain dry ear with systemic analegesics

D. Gentamycin and levofloxacin ear drops

Correct answer: C

Following acute traumatic perforation of the tympanic membrane, the best management is conservative. The primary goal is to maintain a dry ear to prevent secondary infection, which allows the vast majority of these perforations to heal spontaneously within 6–12 weeks. Systemic analgesics can be used to manage pain. Aspirating clots or performing extensive tests (Option A) should be avoided in the acute stage to minimize irritation. Syringing (Option B) is absolutely contraindicated in the presence of a perforation as it can introduce bacteria and water into the middle ear, causing otitis media. Routine antibiotic ear drops (Option D) are

generally avoided unless active infection is present, as some drops (like Gentamycin) can be ototoxic if they reach the inner ear through the perforation. Patients should be counseled to avoid blowing their nose forcefully and to keep water out of the ear during bathing. If the perforation fails to heal after 3 months, surgical repair (myringoplasty) may then be considered.

Question 99. Which bones are cut during/removed during external Dacryocystorhinostomy?

A. Zygomatic

B. Maxillary

C. Lacrimal

D. Frontal

Correct answer: C

Note: The question should ideally specify both bones involved. In external DCR, portions of the Lacrimal bone and the Maxillary bone (specifically the frontal process) are removed to create a permanent fistula between the lacrimal sac and the nasal cavity.

Dacryocystorhinostomy (DCR) is the standard surgical treatment for nasolacrimal duct obstruction. During the procedure, a bony ostium is created by removing the thin lacrimal bone (Option C) and a portion of the thick frontal process of the maxilla (Option B). This allows tears to bypass the blocked duct and drain directly into the middle meatus of the nose. The Zygomatic bone (Option A) and Frontal bone (Option D) are not part of the lacrimal fossa and are not removed. External DCR involves a skin incision, while endoscopic DCR is performed through the nose without an external scar. Both methods rely on the successful creation of this bony opening. Precise knowledge of this anatomy is essential for ophthalmic and ENT surgeons to ensure a successful outcome and avoid complications like orbital injury or severe bleeding from the angular vessels.

OPHTHALMOLOGY

132. What is the order of insertion of muscles on Annulus of Zinn?

1. Medial rectus
2. Inferior rectus
3. Lateral rectus

Question 100. 131. (C) Lacrimal

Note: The question should ideally specify both bones involved. In external DCR, portions of the Lacrimal bone and the Maxillary bone (specifically the frontal process) are removed to create a permanent fistula between the lacrimal sac and the nasal cavity.

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What is the order of insertion of muscles on Annulus of Zinn?

1. Medial rectus

2. Inferior rectus

3. Lateral rectus

4. Superior rectus

A. A, B, C, D

B. B, C, A, D

C. D, C, A, B

D. C, A, B, D

Correct answer: A

The Annulus of Zinn (or common tendinous ring) is a circular fibrous structure at the apex of the orbit that serves as the origin for the four rectus muscles. In standard anatomical descriptions and medical board questions, the order of insertion around the ring is often listed

as:

1. Medial Rectus (A)
2. Inferior Rectus (B)
3. Lateral Rectus (C)

Question 101. The first line of treatment for glaucoma in adults is?

A. PG analogues

B. Atropine

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C. Acetazolamide

D. Pilocarpine

Correct answer: A

In modern ophthalmology, Prostaglandin (PG) analogues (such as latanoprost, bimatoprost, or travoprost) are considered the first-line medical treatment for primary open-angle glaucoma and ocular hypertension in adults. They are highly effective at lowering intraocular pressure (IOP) by increasing the uveoscleral outflow of aqueous humor. Their advantages include once-daily dosing and a relatively mild systemic side-effect profile compared to other agents. Atropine (Option B) is a cycloplegic that can actually worsen angle-closure glaucoma. Acetazolamide (Option C) is a potent carbonic anhydrase inhibitor used for acute pressure spikes but is not preferred for long-term first-line therapy due to systemic side effects. Pilocarpine (Option D) is a miotic drug that was once first-line but is now rarely used due to frequent side effects like brow ache and blurred vision. Beta-blockers (like timolol) are often the second-line or alternative first-line choice. Consistently maintaining low IOP is critical to prevent progressive optic nerve damage and permanent vision loss.

Question 102. A patient develops endophthalmitis following cataract surgery. On examination, visual acuity is limited to hand movements. Based on this level of vision, what is the appropriate treatment?

A. Intravitreal antibiotic injections

B. Pars planar vitrectomy

C. Redo surgery

D. Topical antibiotics

Correct answer: A

Postoperative endophthalmitis is a devastating intraocular infection and an ophthalmic emergency. The management strategy is largely determined by the patient's initial visual acuity, based on the landmark Endophthalmitis Vitrectomy Study (EVS). If the vision is "hand

movements" (HM) or better, the recommended first-line treatment is immediate Intravitreal antibiotic injections (typically vancomycin and ceftazidime) and a diagnostic vitreous tap. Pars plana vitrectomy (Option B) is only indicated as the initial treatment if the vision is "Light Perception" (LP) or worse, although it may be performed later if the condition fails to improve with injections. Redo surgery (Option C) is not a treatment for infection. Topical antibiotics (Option D) are used as an adjunct but are insufficient for treating the deep intraocular infection. Early intervention with intravitreal drugs is vital to sterilize the eye and prevent total vision loss. Patients must also be started on intensive topical fortified antibiotics and sometimes systemic steroids.

Question 103. A 62-year-old man presents with recurrent episodes of syncope. His ECG shows regular P waves occurring independently, with normal-duration QRS complexes at a ventricular rate of 35 beats per minute. Based on these findings, what is the most likely clinical diagnosis?

A. 2nd degree AV block

B. Atrial tachycardia

C. First-degree AV block

D. Stokes adams syndrome

Correct answer: D

The patient is presenting with recurrent fainting (syncope) and an ECG showing a complete mismatch between the atrial rate (75 bpm) and the ventricular rate (35 bpm). This defines complete (3rd-degree) heart block. When sudden syncope occurs due to the abrupt onset of complete heart block or an asystolic pause, it is clinically termed Stokes-Adams syndrome. 2nd-degree block (Option A) would show some P waves followed by QRS complexes and some dropped. Atrial tachycardia (Option B) involves a very high atrial rate (typically bpm). First-degree block (Option C) only involves a prolonged PR interval with a 1:1 P-to-QRS ratio. Complete heart block leads to dangerously low cardiac output, requiring an emergency temporary pacemaker followed by a permanent one. The term Stokes-Adams specifically links the physiological arrhythmia to the symptomatic neurological outcome of fainting. This is a life-threatening cardiac emergency common in the elderly with degenerative conduction system disease.

Question 104. A Patient has muffled heart sounds with low blood pressure. Correct JVP finding is?

A. Steep x descent

B. Absent y descent

C. Steep y descent

D. Blunted x descent

Correct answer: B

The clinical combination of muffled heart sounds, low blood pressure, and distended neck veins (Beck's triad) is diagnostic for cardiac tamponade. In tamponade, the heart is compressed by high-pressure pericardial fluid, which prevents rapid ventricular filling. On the Jugular Venous Pressure (JVP) waveform, the y-descent represents the rapid emptying of the right atrium into the right ventricle during early diastole. Because the high intrapericardial pressure resists this filling, the y-descent is characteristically blunted or absent. A steep x-descent (Option A) is often preserved in tamponade, but the "absent y" is the differentiating feature. Conversely, a steep y-descent (Option C, Friedreich's sign) is the hallmark of constrictive pericarditis, where filling is rapid but stops abruptly. Blunted x-descent (Option D) is seen in tricuspid regurgitation. Recognizing these JVP nuances is essential for bedside differentiation between tamponade (an emergency requiring pericardiocentesis) and constrictive pericarditis.

Question 105. A 22-year-old patient presents with fever, severe dyspnea, and expectoration of red currant jelly–like sputum. On examination, the patient has altered sensorium and an increased respiratory rate. Laboratory investigations reveal elevated serum creatinine and blood urea nitrogen levels, with a serum potassium level of 5 mmol/L. What is the most appropriate management in this case?

A. OPD management with oral drugs

B. IPD management with IV drugs

C. ICU management with IV drugs

D. ICU management with oral drugs

Correct answer: B

The patient presents with features of severe community-acquired pneumonia, likely Klebsiella pneumoniae (suggested by “red currant jelly” sputum). There are concerning signs such as tachypnea (RR ↑), altered sensorium, and renal dysfunction, indicating a serious infection requiring hospitalization.

However, ICU admission depends on specific severity criteria (e.g., septic shock, need for mechanical ventilation, severe hypoxemia, or multi-organ failure). In this case:

1.

No hypotension/shock mentioned

2.

No ventilatory support requirement given

3.

Renal involvement appears early/mild

4.

Patient is serious but not critically unstable

Thus, the patient requires:

1.

Inpatient (IPD) care for close monitoring

2.

IV broad-spectrum antibiotics (e.g., ceftriaxone, piperacillin-tazobactam)

3.

Oxygen and supportive therapy

Why other options are incorrect:

(A)

OPD oral → Too severe

(C)

ICU IV → No clear ICU criteria

(D)

ICU oral → Inappropriate

Question 106. All of the following conditions will have an elevated JVP that rises with deep inspiration except?

A. HOCM

B. Constructive pericarditis

C. Cor pulmonale

D. Restrictive cardiomyopathy

Correct answer: A

An elevated Jugular Venous Pressure (JVP) that paradoxical rises during deep inspiration is known as Kussmaul's sign. Normally, JVP falls during inspiration as the negative intrathoracic pressure sucks blood into the right heart. Kussmaul's sign indicates impaired filling of the right ventricle. It is a classic finding in Constrictive pericarditis (Option B), Restrictive cardiomyopathy (Option D), and severe right heart failure such as Cor pulmonale (Option C) or right ventricular infarction. HOCM (Hypertrophic Obstructive Cardiomyopathy) (Option A) primarily involves the left ventricle; while it can cause an elevated JVP with a prominent 'a' wave, it does not characteristically cause Kussmaul's sign. HOCM is more commonly associated with a bisferiens pulse and a heaving apex. Differentiating these signs is vital for localizing the pathology to the pericardium, the right heart, or the left-sided conduction and muscle system.

Question 107. A

smoker
presents
with
long-standing
complaints of copious, yellow, foul-smelling
sputum that markedly increases with changes in
posture. Based on this history, what is the most
likely initial differential diagnosis?

A. Asthma

B. Pneumonia

C. Bronchiectasis

D. Cancer

Correct answer: C

The chronic history of yellow, copious, foul-smelling sputum (purulent expectoration) that increases with postural change is the classic clinical description of Bronchiectasis. Bronchiectasis involves the permanent dilation of the bronchi due to chronic infection and inflammation, leading to "pools" of mucus that drain when the patient shifts position. Asthma (Option A) presents with wheezing and episodic breathlessness, not chronic foul sputum. Pneumonia (Option B) is an acute infection with a shorter duration and focal lung findings. Lung cancer (Option D) usually presents with hemoptysis and weight loss in an older smoker but not the specific postural drainage pattern of mucus. While smoking contributes to chronic bronchitis, the postural change and "foul-smelling" nature strongly favor bronchiectasis. Diagnosis is confirmed using High-Resolution CT (HRCT) showing the "signet-ring" sign. Management focuses on chest physiotherapy, postural drainage, and treating acute infectious exacerbations with targeted antibiotics.

Question 108. What is ECG change associated with the use of
anti-tubercular drug bedaquiline?

A. QT interval prolongation

B. PR interval prolongation

C. QRS widening

D. ST-segment elevation

Correct answer: A

Bedaquiline is a critical newer drug used in the treatment of multidrug-resistant tuberculosis (MDR-TB). Its most significant and life-threatening adverse effect is QT interval prolongation on the ECG. This prolongation increases the risk of Torsades de Pointes, a potentially fatal ventricular arrhythmia. PR interval prolongation (Option B) relates to AV block. QRS widening (Option C) occurs with bundle branch blocks or hyperkalemia. ST-segment elevation (Option D)

is the hallmark of acute myocardial infarction. Because of this risk, patients on bedaquiline must undergo regular ECG monitoring, especially if they are also taking other QT-prolonging drugs like moxifloxacin or clofazimine. Clinicians must be prepared to stop the medication if the QTc exceeds . This pharmacological safety requirement is a major focus in MDR-TB clinics to ensure that the benefits of treatment outweigh the cardiac risks.

Question 109. A patient presenting with signs of meningeal irritation undergoes cerebrospinal fluid (CSF) analysis, which reveals lymphocytic predominance with normal glucose levels and elevated protein. Based on these findings, what is the most likely diagnosis?

A. Pyogenic meningitis

B. Viral meningitis

C. Tubercular meningitis

D. Fungal meningitis

Correct answer: B

Differentiating meningitis types through CSF analysis is a core clinical skill. Viral (aseptic) meningitis characteristically shows a lymphocytic pleocytosis (lymphocytosis) with normal glucose (sugar) and only mildly elevated protein. Pyogenic (bacterial) meningitis (Option A) shows a neutrophilic predominance and very low glucose. Tubercular (Option C) and Fungal (Option D) meningitis both show lymphocytosis and elevated protein, but they are classically associated with very low glucose. Therefore, the "normal sugar" is the critical differentiator that points toward a viral etiology. Common viral causes include enteroviruses and herpes simplex virus. Patients typically present with fever, headache, and photophobia but are usually less critically ill than those with bacterial meningitis. While viral meningitis is often self-limiting, the normal CSF glucose is the laboratory anchor that prevents unnecessary prolonged antibiotic therapy once bacterial cultures remain negative.

Question 110. A woman with known mitral stenosis presents with sudden-onset breathlessness, swelling of the limbs, and calf pain. Based on this clinical presentation, what is the most likely diagnosis?

A. Pulmonary embolism

B. Pulmonary edema

C. Cerebral embolism

D. Paradoxical embolism

Correct answer: A

The clinical constellation of limb edema and calf pain is highly suggestive of Deep Vein Thrombosis (DVT). The sudden onset respiratory difficulty (dyspnea) that follows suggests that a part of the thrombus has broken off and traveled to the lungs, defining a Pulmonary Embolism (PE). While mitral stenosis can lead to pulmonary edema (Option B), it usually presents with more gradual dyspnea and fine crepitations without the specific asymmetric calf findings. Cerebral embolism (Option C) would present with focal neurological deficits like stroke. Paradoxical embolism (Option D) occurs when a DVT crosses from the right to left side of the heart through a septal defect (PFO), causing a systemic stroke rather than a pulmonary event. In mitral stenosis, atrial fibrillation is common, which significantly increases the risk of thromboembolic events. Management requires urgent imaging, such as CT pulmonary angiography, and immediate anticoagulation with heparin or LMWH.

Question 111. A 45-year-old man presents to the emergency department with intense abdominal pain radiating to the back. Laboratory tests show markedly elevated serum amylase and lipase levels. In the management of this condition, which of the following interventions should be avoided?

A. Nil per oral to avoid pancreatic stimulation

B. Administration of 5% dextrose

C. Parenteral nutrition is preferred for 2-3 days over the nil per oral (NPO) approach

D. Early initiation of oral feedings

Correct answer: B

The patient is suffering from acute pancreatitis, indicated by severe abdominal pain radiating to the back and elevated serum amylase and lipase levels. The mainstay of management in acute pancreatitis is aggressive fluid resuscitation, pain control, and supportive care.

The preferred fluids for resuscitation are isotonic crystalloids, especially Ringer lactate or normal saline, as they effectively restore intravascular volume and correct fluid losses due to third spacing. In contrast, 5% dextrose should be avoided because it is not an effective volume expander and does not adequately replenish electrolytes or circulating volume.

Nil per oral (NPO) is appropriate initially to rest the pancreas. Early enteral feeding is now recommended once the patient stabilizes, as it reduces complications. Although parenteral nutrition is not preferred routinely, it may be used when enteral feeding is not feasible.

Thus, among the given options, administration of 5% dextrose is inappropriate in the

management of acute pancreatitis.

Question 112. A young male presents with a one-hour history of sudden-onset chest pain. His ECG shows ST-segment elevation in leads II, III, and aVF. In a multispecialty hospital setting, what is the most appropriate treatment for this case of inferior wall myocardial infarction?

A. Alteplase

B. Streptokinase

C. Primary angioplasty

D. Dabigatran

Correct answer: C

The patient is presenting with an acute Inferior Wall ST-Elevation Myocardial Infarction (STEMI). In a multi-specialty hospital (which implies the presence of a cardiac catheterization lab), the best (gold-standard) treatment is Primary Percutaneous Coronary Intervention (PCI) or Primary Angioplasty. Primary angioplasty is superior to thrombolysis (Option A and B) because it achieves higher reperfusion rates and lower rates of re-occlusion and intracranial hemorrhage. Thrombolytic agents like Alteplase or Streptokinase are only preferred if PCI cannot be performed within 90-120 minutes of first medical contact. Dabigatran (Option D) is an oral direct thrombin inhibitor used for stroke prevention in atrial fibrillation, not for the acute management of a myocardial infarction. Inferior wall MIs are usually due to Right Coronary Artery occlusion. Immediate mechanical reperfusion is the most effective way to salvage the myocardium and improve patient outcomes.

Question 113. A patient presents with an intentional tremor, has difficulty performing the heel-to-shin test, and repeatedly misses the target on the finger-to-nose test. Based on these findings, what is the likely site of the lesion?

A. Cerebellum

B. Caudate

C. Globus pallidus

D. Subthalamic nucleus

Correct answer: A

The clinical combination of intentional tremor (tremor that worsens as the target is approached), dysmetria (repeatedly missing the finger-nose test), and ataxia (demonstrated by the failed heel-to-shin test) is the classic triad of cerebellar dysfunction. The cerebellum is the brain's primary center for coordinating smooth, precise movements and maintaining balance.

Lesions in the basal ganglia present differently: the Caudate (Option B) and Globus Pallidus (Option C) are involved in Parkinson's disease, showing resting tremors and bradykinesia. The Subthalamic nucleus (Option D) is associated with hemiballismus (violent, flinging movements). Intentional tremor is specifically a "kinetic" tremor characteristic of cerebellar strokes, tumors, or multiple sclerosis. Clinical evaluation of coordination is the cornerstone of the neurological exam for localizing the lesion to the posterior fossa. Management involves addressing the underlying cause and physical therapy for rehabilitation.

Question 114. The patient is having the following hand movements. In which of the following conditions would this be seen?

A. Thyrotoxicosis

B. Hypercarbia

C. Hemiballismus

D. Hypoxia

Correct answer: B

The image depicts asterixis, commonly known as "flapping tremors". This is a negative myoclonus characterized by a loss of muscle tone when the patient extends their wrists and fingers. Asterixis is a hallmark sign of metabolic encephalopathy. It is most classically seen in Hypercarbia (excess CO2 in the blood, often from COPD or respiratory failure) and Hepatic Encephalopathy (liver failure). It can also occur in uremia (renal failure). Thyrotoxicosis (Option A) causes a fine, fast tremor, not a slow flap. Hemiballismus (Option C) involves violent, large-amplitude flinging movements of the limbs. Hypoxia (Option D) causes confusion and cyanosis but is not the primary cause of flapping tremors. Recognizing asterixis at the bedside is a vital clinical clue for identifying systemic metabolic derangement. Treatment focuses on the underlying cause, such as non-invasive ventilation for hypercarbia or lactulose for hepatic encephalopathy.

Question 115. A 52-year-old woman suddenly develops facial asymmetry, slurred speech, and weakness in her right arm. The symptoms gradually improve and completely resolve within 48 hours. On cardiac examination, a mid-diastolic murmur is heard on the left side of the heart, and her heart

rhythm is irregular. What is the most likely diagnosis?

A. TIA

B. Thrombo-embolic stroke

C. Cardio embolic stroke

D. Paradoxical embolism

Correct answer: A

The patient presents with sudden focal neurological deficits—facial asymmetry, slurred speech, and right arm weakness—suggestive of a cerebrovascular event. The key feature in this case is that the symptoms completely resolve within 48 hours, which is characteristic of a Transient Ischemic Attack (TIA).

A TIA is defined as a transient episode of neurological dysfunction caused by temporary cerebral ischemia without permanent infarction. Most TIAs resolve within minutes to hours, but by definition, no residual deficit remains.

The presence of a mid-diastolic murmur (suggestive of mitral stenosis) and irregular rhythm (likely atrial fibrillation) indicates a cardioembolic source, which is a common cause of TIA.

Why other options are incorrect:

(B)

Thrombo-embolic stroke → Causes persistent deficits

(C)

Cardioembolic stroke → Would not completely resolve

(D)

Paradoxical embolism → Requires right-to-left shunt

Question 116. A Post-operative immobile patient develops sudden onset severe calf pain. The best investigation to be done is?

A. CTPA

B. Duplex USG

C. X-ray

D. D-dimer assay

Correct answer: B

A immobile post-operative patient presenting with sudden calf pain and swelling is a classic scenario for Deep Vein Thrombosis (DVT). The best (and first-line) investigation for confirming a suspected DVT is Duplex Ultrasonography. It is non-invasive, highly sensitive, and specific for identifying clots in the leg veins by visualizing the thrombus and demonstrating a lack of compressibility. CTPA (Option A) is the gold standard for pulmonary embolism, not for initial calf DVT diagnosis. X-ray (Option C) cannot visualize soft-tissue clots. While a D-dimer assay (Option

D) is a useful screening tool, it is often elevated post-operatively regardless of a clot, making it non-specific and less useful in this specific surgical context. Early diagnosis and initiation of anticoagulation (e.g., LMWH) are essential to prevent the clot from propagating and causing a life-threatening pulmonary embolism. Immobile patients require active thromboprophylaxis with mechanical devices and pharmacological agents.

Question 117. What is the most common complication of ERCP?

A. Duodenal perforation

B. Cholangitis

C. Hemorrhage

D. Pancreatitis

Correct answer: D

Endoscopic Retrograde Cholangiopancreatography (ERCP) is a complex procedure used to manage biliary and pancreatic diseases. The most common complication following the procedure is Post-ERCP Pancreatitis (PEP), occurring in approximately 5-10% of cases. It is characterized by new-onset upper abdominal pain and an elevation of amylase/lipase within 24 hours of the procedure. Duodenal perforation (Option A), Cholangitis (Option B), and Hemorrhage (Option C) are serious potential complications, but they are significantly less frequent than pancreatitis. Risk factors for PEP include young age, female gender, and multiple cannulation attempts. Management involves aggressive hydration and supportive care. Prophylactic measures, such as rectal indomethacin and pancreatic stent placement in high-risk patients, have been shown to reduce the incidence of this complication. Clinicians must monitor all post-ERCP patients closely for signs of pain and distress during the first 24 hours of recovery.

Question 118. A 55-year-old woman presents with dizziness and palpitations. An ECG has been performed (shown below). What is the most appropriate treatment for this patient?

A. Adenosine

B. Amiodarone

C. Beta-blocker

D. Valsalva maneuver

Correct answer: A

The ECG strip shows a regular, narrow-complex tachycardia, most consistent with paroxysmal supraventricular tachycardia (PSVT). The patient presents with palpitations and dizziness, typical symptoms of this arrhythmia.

The first-line management in a hemodynamically stable patient with PSVT is:

1.

Vagal maneuvers (e.g., Valsalva)

2.

If unsuccessful → Adenosine

Since the question asks for the most appropriate treatment, adenosine is the drug of choice because:

1.

It causes transient AV nodal block

2.

Rapidly terminates re-entrant tachycardias

3.

Has a very short half-life, making it safe and effective

Why other options are incorrect:

(B)

Amiodarone → Used for ventricular arrhythmias or refractory cases

(C)

Beta-blocker → Second-line, slower onset

(D)

Valsalva maneuver → First step, but often insufficient alone

172. A woman presents with a unilateral, pulsating headache accompanied by photophobia and phonophobia, which worsens after eating. This clinical picture is most commonly seen in which condition?

Examination Paper January 2024 Question

Question 119. Iron absorption is decreased in which of the following?

A. Amla

B. Sprouts

C. Tea

D. Lemon

Correct answer: C

Iron absorption, particularly of non-heme iron from plant sources, is significantly influenced by dietary factors. Tea contains tannins (polyphenols), which bind to iron in the gut to form insoluble complexes, thereby decreasing iron absorption. Patients with iron deficiency anemia are often counseled to avoid drinking tea with meals for this reason. In contrast, Amla (Option A), Sprouts (Option B), and Lemon (Option D) are all rich in Vitamin C (ascorbic acid). Vitamin C

is a potent enhancer of iron absorption because it reduces ferric iron to the more soluble ferrous form and creates an acidic environment for uptake. Other inhibitors (not listed) include phytates in grains and calcium in dairy. Understanding these nutritional interactions is essential for providing effective dietary advice to patients with nutritional anemias. Proper counseling can significantly improve the efficacy of oral iron supplementation and help manage a major public health challenge.

Question 120. A patient develops vomiting, abdominal pain, and chest discomfort after consuming alcohol. On examination, the patient is hypotensive. Which drug is responsible for these symptoms?

A. Cefoperazone

B. Propranolol

C. Calcium channel blockers

D. Pantoprazole

Correct answer: A

The symptoms of vomiting, abdominal/chest pain, and hypotension following alcohol consumption describe a severe disulfiram-like reaction. This reaction occurs when a drug inhibits the enzyme acetaldehyde dehydrogenase, causing toxic levels of acetaldehyde to build up. Cefoperazone, a third-generation cephalosporin, contains a methyltetrazolethiol (MTT) side chain that is specifically known to cause this reaction. Other common drugs include metronidazole and some sulfonylureas. Propranolol (Option B), Calcium channel blockers (Option C), and Pantoprazole (Option D) do not have this metabolic interaction with alcohol. The severity of the reaction can lead to cardiovascular collapse. Clinicians must strictly warn any patient prescribed cefoperazone or metronidazole to avoid all alcohol during and for several days after completing their course. This pharmacological interaction is a classic high-yield topic for preventing serious iatrogenic harm in patients who may consume alcohol socially.

Question 121. A patient presents to the outpatient department with fatigue. Laboratory investigations reveal a hemoglobin level of 5.9 g/dL, increased red cell distribution width (RDW) and total iron-binding capacity (TIBC), along with low serum ferritin. What is the most likely diagnosis?

A. Sideroblastic anemia

B. IDA

C. Megaloblastic anemia

D. Hemolytic anemia

Correct answer: B

The laboratory findings are diagnostic for Iron Deficiency Anemia (IDA). The patient has severe anemia (Hb 5.9) characterized by increased Red Cell Distribution Width (RDW), which indicates anisocytosis (variation in cell size). The biochemical hallmark of IDA is low Ferritin (depleted iron stores) and increased Total Iron Binding Capacity (TIBC), as the body tries to increase iron uptake. Sideroblastic anemia (Option A) would show increased ferritin and decreased TIBC. Megaloblastic anemia (Option C) is macrocystic and unrelated to these specific iron parameters. Hemolytic anemia (Option D) usually presents with increased bilirubin and reticulocytes. IDA is the most common cause of anemia worldwide, often due to nutritional deficiency or chronic blood loss (e.g., from hookworms or GI malignancy). Management involves identifying the source of loss and oral iron supplementation. Recognizing the specific pattern of low ferritin and high TIBC is critical for medical licensing examinations.

Question 122. A diabetic patient presents to the outpatient department with fatigue and polyuria. On examination, vital signs are stable, and an HbA1c test is performed. What is the HbA1c cut-off percentage used to define well-controlled diabetes?

A. 6.0

B. 6.5

C. 7.0

D. 7.5

Correct answer: C

As established in Question 35, Glycosylated Hemoglobin (HbA1c) is the standard for monitoring long-term glycemic control. For the majority of non-pregnant adults with diabetes, the American Diabetes Association (ADA) and other global guidelines recommend an HbA1c cut-off of less than 7.0% to define controlled diabetes. Maintaining this level significantly reduces the risk of long-term microvascular complications like retinopathy and nephropathy. A cut-off of 6.5% (Option B) is used as a diagnostic threshold to define the presence of diabetes, rather than the target for control. 6.0% (Option A) is near the normal range and may be too strict for many patients, increasing the risk of hypoglycemia. 7.5% (Option D) is considered suboptimal control. These targets must be individualized; for example, elderly patients or those with short life expectancy may have a more relaxed target (e.g.,). However, "7.0%" is the standard "general" goal for effective diabetes management.

Question 123. In an asymptomatic individual, what is the most appropriate diagnostic criterion for diabetes mellitus according to the ADA 2023 guidelines?

A. Oral glucose tolerance test: 2 hrs value

B. HbA1C

C. Fasting plasma glucose

D. 2 hrs plasma glucose

Correct answer: A

According to the ADA 2023 guidelines, the diagnostic criteria for diabetes mellitus in an asymptomatic patient include: a Fasting Plasma Glucose (FPG) , an HbA1c , or a 2-hour plasma glucose during an Oral Glucose Tolerance Test (OGTT). Therefore, Option A is the only correct diagnostic threshold listed. HbA1c of 5.9% (Option B) falls into the prediabetes range (5.7-6.4%). Fasting glucose (approx.) (Option C) is completely normal. 2-hour glucose (approx.) (Option D) is also within the normal or prediabetic range. For an asymptomatic patient, these tests usually require confirmation with a second test result from a different day. Accurate diagnosis is essential to begin early lifestyle and pharmacological interventions to prevent the progression of the disease and its subsequent systemic complications.

Question 124. A male patient with infertility presents with a combination of situs inversus, chronic sinusitis, and bronchiectasis. What is the most likely diagnosis?

A. Kartageners syndrome

B. Cystic fibrosis

C. Mucovicidosis

D. Klinefelter syndrome

Correct answer: A

Kartagener’s syndrome is a specific variant of Primary Ciliary Dyskinesia (PCD) characterized by the classic triad of situs inversus, chronic sinusitis, and bronchiectasis. It results from a genetic defect in the axonemal dynein arms of motile cilia, leading to immotile or dyskinetic cilia.

Because ciliary motion is essential for mucociliary clearance, affected individuals develop recurrent respiratory tract infections, chronic sinusitis, and progressive bronchiectasis. The same dynein arm defect also affects flagellar movement of sperm, resulting in male infertility due to immotile sperm.

Cystic fibrosis (Option B)—also known as mucoviscidosis (Option C)—can cause bronchiectasis and infertility, but it does not cause situs inversus, which is the key distinguishing feature here. Klinefelter syndrome (Option D) leads to primary testicular failure and infertility but is not associated with respiratory disease or situs inversus.

Thus, the presence of situs inversus (e.g., dextrocardia on imaging) is the crucial diagnostic clue confirming Kartagener’s syndrome.

Question 125. Which condition is characterized by a reduced FEV1/FVC ratio and FEV1 as a percentage of the

predicted value, along with morning wheezing and shortness of breath?

A. Asthma

B. ILD

C. IPF

D. Silicosis

Correct answer: A

The spirometric finding of an FEV1/FVC ratio is the hallmark of an obstructive lung disease. Among the options, Asthma (Option A) is the only obstructive condition. Asthma characteristically presents with episodic shortness of breath and wheezing, which is often worse in the morning or at night. Interstitial Lung Disease (ILD) (Option B), Idiopathic Pulmonary Fibrosis (IPF) (Option C), and Silicosis (Option D) are all restrictive lung diseases. Restrictive diseases are characterized by a normal or increased FEV1/FVC ratio and reduced lung volumes (Total Lung Capacity). COPD also shows an obstructive ratio, but the reversible nature and morning symptoms in a potentially younger patient favor asthma. Diagnosis is confirmed by demonstrating bronchodilator reversibility (an increase in FEV1 by). Identifying the "obstructive" vs. "restrictive" patterns is the first and most vital step in interpreting pulmonary function tests.

Question 126. A 70-year-old man presents with progressive difficulty swallowing, especially solids, over several months, accompanied by significant weight loss and cachexia. Which diagnostic test is most appropriate for evaluating this patient?

A. UGIE

B. Manometry

C. Barium swallow

D. Barium meal follow through

Correct answer: A

In an elderly patient (70 years old) presenting with progressive dysphagia for solids and significant weight loss, esophageal cancer must be the primary suspicion. The best diagnostic choice is Upper Gastrointestinal Endoscopy (UGIE). UGIE allows for direct visualization of the tumor and, most importantly, provides the ability to take biopsies for histological confirmation, which is required for a definitive diagnosis. Barium swallow (Option C) can show a "rat-tail" or irregular narrowing, but it cannot provide a tissue diagnosis. Manometry (Option B) is used to diagnose motility disorders like Achalasia, which characteristically presents with dysphagia for both solids and liquids from the start. Barium meal follow-through (Option D) is used for the small intestine, not the esophagus. Once the cancer is confirmed via UGIE biopsy, CT or PET/CT

is used for staging. Early diagnosis via endoscopy is critical for determining the feasibility of surgical resection or palliative therapy.

Question 127. A 70-year-old man presents to the outpatient department with multiple, recurrent episodes of syncope. His ECG shows P waves at a rate of 75 bpm and QRS complexes at a rate of 35 bpm. What is the most likely diagnosis?

A. Mobitz type II heart block

B. Stokes adams syndrome

C. First degree heart block

D. Wolf parkinson white syndrome

Correct answer: B

This question is a duplicate of Question 155. The patient presents with syncope (fainting) and an ECG showing atrioventricular dissociation (P-rate 75, QRS-rate 35). This is diagnostic for complete (3rd-degree) heart block. Syncope resulting from this sudden cardiac output drop is termed Stokes-Adams syndrome. Mobitz Type II (Option A) is a 2nd-degree block where the PR interval is constant but some P-waves are not followed by QRS complexes; it often progresses to complete block. First-degree block (Option C) involves simple PR prolongation and is usually asymptomatic. WPW syndrome (Option D) involves an accessory pathway causing pre-excitation and a delta wave on ECG, not heart block. Complete heart block in an elderly patient is a high-risk condition and is the most common indication for permanent pacemaker implantation. The term "Stokes-Adams" remains a classic clinical eponym for this life-threatening interaction between arrhythmia and cerebral perfusion.

Question 128. In a triage setting, which of the following categories requires the highest priority intervention?

A. Red

B. Yellow

C. Green

D. Black

Correct answer: A

In disaster medicine and emergency departments, triage is used to prioritize patients based on the severity of their condition. The Red category (Priority I) is reserved for patients with

life-threatening injuries who have a high chance of survival if given immediate intervention. Examples include tension pneumothorax or major airway obstruction. The Yellow category (Priority II) includes patients with serious but not immediately life-threatening injuries who can wait for a few hours (e.g., stable large fractures). The Green category (Option C, Priority III) includes the "walking wounded" with minor injuries. The Black category (Option D, Priority 0) is for those who are already deceased or have injuries so catastrophic that survival is unlikely even with care. Therefore, "Red" always receives the absolute highest priority. Efficient triage is essential to maximize the number of lives saved when medical resources are limited during a mass casualty incident.

Question 129. A 28-year-old woman with a history of beta-thalassemia develops anxiety, hypotension, and fever during a blood transfusion. What is the next appropriate step in managing this transfusion reaction?

A. Stop the blood transfusion and restart after stabilization

B. Continue the blood transfusion and perform an ECG

C. Investigate for clerical errors in the blood transfusion process

D. Administer corticosteroids and monitor vital signs

Correct answer: A

The patient develops fever, hypotension, and anxiety during transfusion, which strongly suggests an acute transfusion reaction (possibly acute hemolytic or severe febrile reaction). This is a medical emergency.

The first and most critical step in managing any suspected transfusion reaction is to immediately stop the transfusion to prevent further exposure to the offending blood product.

After stopping:

1.

Maintain IV access with normal saline

2.

Assess vitals and stabilize the patient

3.

Send blood samples and the transfused unit for investigation

Once the patient is stabilized and the cause is identified, further transfusion (if needed) can be considered cautiously.

Why other options are incorrect:

(B)

Continue transfusion → Dangerous; worsens reaction

(C)

Clerical check → Important but not the first step

(D)

Corticosteroids → May be used later, not initial action

Question 130. A 20-year-old woman with a known history of sickle cell anemia presents to the emergency department with severe pain in her legs and fingers for the past 4 hours. Examination reveals tenderness in the right upper quadrant, and investigations show sickle cells on peripheral smear along with elevated indirect bilirubin. What is the most likely diagnosis?

A. IDA

B. Thalassemia

C. Anemia of chronic disease

D. Sickle cell crisis

Correct answer: D

The patient is presenting with a classic Vaso-occlusive (Pain) Crisis, the most common type of Sickle cell crisis. The extreme pain in the extremities (dactylitis) results from sickled RBCs blocking small capillaries, leading to tissue ischemia. Right upper quadrant pain and high indirect bilirubin indicate a superimposed hemolytic crisis and potential pigment gallstones, which are common in sickle cell disease. IDA (Option A) and Thalassemia (Option B) would not present with this acute pain/sickle cell smear. Anemia of chronic disease (Option C) is a different pathology. Management of a vaso-occlusive crisis involves aggressive hydration, oxygenation, and potent analgesia (often opioids). Triggers such as infection, dehydration, or cold exposure should be identified and managed. This clinical scenario is a hallmark of sickle cell management in emergency medicine, emphasizing the need for rapid pain control and fluid resuscitation to improve microvascular flow.

SURGERY

Question 131. Based on the image, what condition has developed three days after catheterization?

A. Fournier's gangrene

B. Gas gangrene

C. Wet gangrene

D. Scrotal hematoma

Correct answer: A

The image displays extensive necrotic sloughing of the scrotal skin, which is the hallmark of Fournier's gangrene. This is a rapidly progressive necrotizing fasciitis of the perineum and genitalia. While it can be idiopathic, it often follows local trauma or instrumentation, such as catheterization in a high-risk patient (e.g., diabetic). Gas gangrene (Option B) involves muscle necrosis and crepitus, usually in the limbs. Wet gangrene (Option C) is a more general term for infected necrotic tissue. Scrotal hematoma (Option D) would appear as a tense, purple swelling but not as open necrotic sloughing. Fournier's gangrene is a surgical emergency with a high mortality rate. It requires immediate, aggressive surgical debridement of all non-viable tissue, broad-spectrum intravenous antibiotics, and intensive supportive care. The goal of surgery is to stop the spread of the polymicrobial infection along the fascial planes. Early recognition of the "dirty" dishwater-fluid and necrotic skin is vital for saving the patient's life.

Question 132. A 22-year-old man with recurrent bleeding undergoes a CECT scan showing several findings. Which of the following statements is true?

A. Outgrown the blood supply

B. Tumor

vessels

lack

contractility

C. Bleeding is from the adjacent

invading blood vessels

D. It lacks capsule

Correct answer: B

The clinical scenario of a 22-year-old male with recurrent epistaxis (bleeding) and a mass on CECT is characteristic of Juvenile Nasopharyngeal Angiofibroma (JNA). A fundamental and dangerous pathological feature of JNA is that its tumor vessels lack a muscular coat (tunica media), which means they lack the ability to contract. This absence of contractility explains why even minor trauma to the tumor results in profuse, life-threatening hemorrhage that is difficult to stop. JNA is characteristically benign but locally aggressive and typically has a pseudo-capsule, making Option D false. The tumor does not usually outgrow its supply; it is highly vascular (Option A). The bleeding comes from the tumor's own abnormal vessels, not just invaded ones (Option C). Because of this hemorrhage risk, preoperative embolization of the feeding vessels (e.g., maxillary artery) is mandatory before surgical excision. JNA is a classic medical licensing topic due to these unique vascular properties.

Question 133. Which of the following is most likely to show the following finding on USG?

A. Fibroadenoma

B. Breast cyst

C. Breast carcinoma

D. Metastasis to the breast from another primary site

Correct answer: A

The ultrasound image displays a classic Fibroadenoma. Its key benign sonographic features include a well-circumscribed margin, an oval shape, and a characteristic "wider than tall" orientation (horizontal diameter is greater than the vertical height). A breast cyst (Option B) would be completely "anechoic" (black) with posterior acoustic enhancement. Breast carcinoma (Option C) characteristically appears as an irregular, ill-defined mass that is often "taller than wide" with posterior acoustic shadowing. Metastasis (Option D) usually presents as multiple, discrete solid masses but is much rarer than a primary fibroadenoma. The "wider than tall" sign is a very reliable indicator of a benign lesion in breast imaging. In a young woman, such a finding on USG often precludes the need for biopsy unless the lesion is growing or atypical. Standard management for a classic fibroadenoma is clinical observation and reassurance.

Question 134. A 35-year-old woman, 10 years post-mastectomy, reports gradual swelling and heaviness in her right upper limb without pain. Examination reveals bluish skin nodules without signs of infection. What is the most likely cause of her symptoms?

A. Lymphangiosarcoma

B. Thoracic outlet syndrome

C. Chronic venous insufficiency

D. Recurrent breast cancer

Correct answer: A

A patient who develops Lymphangiosarcoma in the setting of chronic, long-standing lymphedema following a radical mastectomy is suffering from Stewart-Treves Syndrome. This is a rare but highly malignant vascular tumor. It characteristically presents approximately 10 years after the initial surgery as a gradual worsening of the swelling and the appearance of bluish-red nodules or plaques on the skin of the lymphedematous arm. Thoracic outlet syndrome (Option B) and venous insufficiency (Option C) can cause swelling but do not explain the localized bluish skin nodules in a post-mastectomy patient. Recurrent breast cancer (Option D) usually presents as a discrete mass or skin thickening (peau d'orange) rather than

widespread vascular nodules. Stewart-Treves syndrome has an extremely poor prognosis due to early metastasis. The definitive treatment usually involves radical amputation of the limb, although results are often suboptimal. This condition highlights the importance of long-term monitoring for chronic lymphedema.

Question 135. What is the preferred treatment for a benign tumor of the superficial parathyroid gland?

A. Enucleation

B. Superficial parathyroidectomy

C. Chemotherapy

D. Radiation therapy

Correct answer: B

(Note: The question likely refers to the parotid gland, not the parathyroid, given the options.)

For a benign tumor (like a pleomorphic adenoma) located in the superficial lobe of the parotid gland, the preferred and standard treatment is a superficial parotidectomy. This procedure involves removing the entire superficial lobe along with the tumor, which allows the surgeon to definitively identify and preserve the facial nerve. Simple enucleation (Option A)—just "shelling out" the tumor—is strictly avoided because it leads to a very high rate of recurrence (up to 25%) due to microscopic extensions of the tumor through its capsule. Chemotherapy (Option C) and Radiation therapy (Option D) have no role in the primary treatment of benign parotid neoplasms. During a superficial parotidectomy, the facial nerve acts as the anatomical plane dividing the gland. Preserving this nerve while ensuring an adequate margin around the tumor is the primary goal. Accurate surgical technique is critical to prevent complications like facial palsy or Frey's syndrome.

Question 136. A 60-year-old morbidly obese patient develops respiratory distress on the third day after major surgery. What is the most likely initial differential diagnosis?

A. Pulmonary embolism

B. Air embolism

C. Atelectasis

D. Pneumothorax

Correct answer: A

A morbidly obese patient who develops sudden respiratory distress on postoperative day 3 is at extremely high risk for Pulmonary Embolism (PE). Obesity and major surgery are potent risk factors for DVT and subsequent PE (as established in Question 161). The timing is also characteristic, as PE most commonly occurs between days 3 and 7 post-op. Atelectasis (Option C) is the most common cause of fever and mild distress in the first 24-48 hours, but day 3 with

"respiratory distress" strongly favors PE. Air embolism (Option B) occurs during the procedure or line insertion. Pneumothorax (Option D) usually presents immediately after trauma or a procedure. Clinicians must immediately order a CTPA or V/Q scan and start anticoagulation if clinical suspicion is high. This case highlights the critical importance of post-operative mobilization and prophylactic anticoagulation in high-risk patients to prevent this common and potentially fatal surgical complication.

Question 137. A 55-year-old woman with chronic pancreatitis undergoes a Puestow procedure. What is the preferred route for providing postoperative nutritional support in this patient?

A. TPN

B. Oral feeding

C. Feeding gastrostomy

D. Feeding jejunostomy

Correct answer: A

After a Puestow procedure (longitudinal pancreaticojejunostomy) in chronic pancreatitis, the preferred postoperative nutritional support is TPN. This is because the primary goal is to provide adequate nutrition while ensuring complete pancreatic rest. Any enteral feeding (oral, gastric, or jejunal) can stimulate pancreatic exocrine secretion through hormonal and neural mechanisms, potentially stressing the anastomosis and worsening inflammation. TPN bypasses the gastrointestinal tract entirely, thereby minimizing pancreatic stimulation, reducing pain, and allowing optimal healing in the early postoperative period.

Why other options are incorrect:

(B)

Oral feeding: Not advised early postoperatively, as it directly stimulates pancreatic secretion and may aggravate symptoms or disrupt healing.

(C)

Feeding gastrostomy: Feeding into the stomach triggers hormonal responses (like gastrin and CCK release), leading to pancreatic stimulation, which is undesirable.

(D)

Feeding jejunostomy: Although it reduces stimulation compared to gastric feeding, it still causes some pancreatic secretion. Hence, it is not preferred immediately after surgery when complete pancreatic rest is required.

Question 138. During endoscopy, a man is found to have the squamocolumnar junction positioned more proximally than usual. Which condition is most likely responsible for this finding?

A. Achalasia cardia

B. Sliding hernia

C. Rolling hernia

D. Gastroesophageal reflux disease

Correct answer: B

In a sliding hiatus hernia, the gastroesophageal junction (the squamocolumnar junction or Z-line) and a portion of the stomach slide proximally into the thoracic cavity through the esophageal hiatus. This is the most common type of hiatus hernia and is strongly associated with GERD. A rolling (paraesophageal) hernia (Option C) involves a portion of the stomach protruding beside the esophagus, but the Z-line typically remains in its normal anatomical position. Achalasia cardia (Option A) involves a failure of the lower sphincter to relax, which does not displace the junction proximally. While chronic GERD (Option D) can lead to Barrett's esophagus (where the Z-line also appears proximal), the anatomical displacement of the junction itself is the definitive endoscopic finding of a sliding hernia. Sliding hernias are often managed medically unless severe reflux or complications occur. Identifying the location of the Z-line relative to the diaphragmatic pinch is the key to endoscopic diagnosis.

Question 139. In a patient with severe maxillofacial trauma following a road traffic accident, which airway management technique is most appropriate as the initial step?

A. Tracheostomy

B. Orotracheal intubation

C. Nasotracheal intubation

D. Oxygen therapy

Correct answer: A

In severe maxillofacial trauma, the airway is often compromised due to bleeding, edema, fractured bones, and distorted anatomy. In such situations, tracheostomy is the safest and most appropriate initial airway management, as it bypasses the upper airway entirely. This avoids the risk of failed intubation and prevents further injury. It provides a definitive airway quickly, especially when conventional routes are difficult or dangerous.

Why other options are incorrect:

(B)

Orotracheal intubation: Although usually first-line, it may be difficult or impossible here due to distorted anatomy and can worsen injuries or dislodge clots.

(C)

Nasotracheal intubation:Contraindicated in maxillofacial trauma, especially with possible basilar skull fracture, as the tube may enter the cranial cavity.

(D)

Oxygen therapy: Provides only supportive care and does not secure the airway, which is critical in severe trauma.

Question 140. Seizures are seen in what percentage of RTA patients with brain contusion/loss of consciousness?

A. Development of seizures in 17%

B. Development of seizures in 45%

C. Development of seizures in 75%

D. No relation between trauma and seizures.

Correct answer: A

Post-traumatic seizures (PTS) are a well-recognized complication of Traumatic Brain Injury (TBI). For patients who have sustained significant head trauma in a road traffic accident, characterized by brain contusion or a prolonged loss of consciousness, the incidence of developing seizures is approximately 17%. These are classified as "early" if they occur within the first week and "late" if they occur after seven days. Options B and C (45% and 75%) significantly overestimate the clinical risk for most contusion cases. Statement D is incorrect as the relationship between brain trauma and epilepsy is well-established. Because of this risk, prophylactic anticonvulsants like Levetiracetam or Phenytoin are often administered for the first 7 days following severe TBI to prevent early PTS, which can worsen secondary brain injury. Accurate knowledge of these statistics helps clinicians counsel families and plan appropriate neurological follow-up.

Question 141. In a postoperative patient who is hypotensive, which finding is considered a "sure sign" of abdominal wound dehiscence?

A. Increased bowel sounds

B. Persistent abdominal pain

C. Serosanguinous drainage from the wound

D. Widening of the abdominal scar with palpable edges

Correct answer: D

In postoperative patients, the most definitive and “sure sign” of abdominal wound dehiscence is widening of the abdominal scar with palpable separation of wound edges. This finding indicates an actual failure of fascial closure, meaning the deeper layers of the abdominal wall have separated. It is a late and confirmatory sign, often preceding or associated with complications like burst abdomen or evisceration, and requires urgent surgical intervention.

Why other options are incorrect:

(A)

Increased bowel sounds: This is a nonspecific finding and may occur during recovery from ileus or other benign conditions; it is not related to wound integrity.

(B)

Persistent abdominal pain: Pain is common postoperatively and may indicate various issues such as infection or inflammation, but it is not specific for dehiscence.

(C)

Serosanguinous drainage from the wound: Although it can be an early warning sign, it is not a definitive (“sure”) sign of dehiscence on its own.

Question 142. A 55-year-old farmer presents with a neck ulcer, and biopsy confirms squamous cell carcinoma with no lymph node involvement. What is the most appropriate management approach for this patient?

A. Radiotherapy

B. Wide local excision with radiation

C. Wide local excision with frozen border

D. Skin grafting

Correct answer: C

For a localized Squamous Cell Carcinoma (SCC) of the neck in a patient with negative lymph nodes, the standard-of-care and most appropriate management is Wide Local Excision. This surgical approach aims to remove the entire tumor along with a safe margin of healthy tissue. Performing the excision with a frozen border (section) is highly recommended, as it allows the pathologist to confirm during the surgery that all margins are negative, ensuring a complete oncological resection. Radiotherapy (Option A) is generally reserved as an adjuvant treatment if the margins are positive or if there is lymph node involvement. Wide excision with radiation (Option B) is not routinely required for an N0 (node-negative) patient with clear margins. Skin grafting (Option D) is a method of reconstruction but not the primary management strategy for the cancer itself. This comprehensive surgical approach maximizes the chances of local control and survival while minimizing the need for more invasive treatments.

Question 143. A patient with a crush injury following a road traffic accident develops crepitus, and the amputation site shows a reddish-brown wound within three days. What is the most likely condition?

A. Gas gangrene

B. Impetigo

C. Tetanus

D. Cellulitis

Correct answer: A

The clinical presentation of a crush injury following a road traffic accident (RTA), characterized by the presence of crepitus (air in tissues) and a reddish-brown discharge within a short three-day window, is pathognomonic for Gas gangrene. This life-threatening infection is primarily caused by Clostridium perfringens, an anaerobic, spore-forming bacterium that thrives in devitalized, ischemic tissue. Impetigo (Option B) is a superficial skin infection. Tetanus (Option C) presents with neuromuscular symptoms like lockjaw rather than tissue necrosis and crepitus. Cellulitis (Option D) involves spreading inflammation of the dermis but lacks the rapid gas production and severe toxemia associated with clostridial myonecrosis. Management is a surgical emergency requiring aggressive debridement, high-dose intravenous antibiotics (penicillin and clindamycin), and sometimes hyperbaric oxygen therapy. Failure to recognize the early signs of gas gangrene, such as a "mousy" odor and rapid skin discoloration, can result in high mortality or the need for extensive limb amputation to control the spread of the infection.

Question 144. A patient presents to the emergency department with severe maxillofacial trauma from a road traffic accident, resulting in airway compromise. What is the most appropriate immediate airway management?

A. Tracheostomy

B. Orotracheal intubation

C. Cricothyroidotomy

D. Bag mask with jaw thrust

Correct answer: C

In the setting of severe maxillofacial trauma where the airway is acutely compromised, standard methods such as orotracheal intubation (Option B) may be impossible due to massive bleeding, edema, or anatomical disruption. In such an emergency "can't intubate, can't oxygenate" scenario, Cricothyroidotomy is the most appropriate immediate surgical airway intervention. It is faster and easier to perform than a formal tracheostomy (Option A) and provides a secure airway below the site of the trauma. Bag-mask ventilation (Option D) is often ineffective when there is structural damage to the face or upper airway obstruction. Cricothyroidotomy involves an incision through the cricothyroid membrane, allowing for rapid cannulation. While it is a temporary life-saving measure, it must eventually be converted to a formal tracheostomy if long-term airway support is needed. Clinicians must be trained in this procedure as part of advanced trauma life support (ATLS) to prevent hypoxic brain injury or

death in patients with complex head and neck injuries.

Question 145. In a seat belt injury, which of the following organs is most commonly affected?

A. Liver

B. Spleen

C. Pancreas

D. Hollow viscus

Correct answer: D

The "seat belt sign"—a pattern of bruising on the abdomen or chest—is a critical indicator of potential internal damage following a high-velocity collision. In patients with this sign, the most commonly affected internal organs are the hollow viscera, particularly the small intestine and the mesentery. The sudden deceleration forces the belt to compress the abdominal contents, leading to shearing or burst injuries of the bowel. While the spleen (Option B) and liver (Option A) are the most commonly injured organs in general blunt abdominal trauma, the specific mechanism of seat belt compression significantly increases the risk of a hollow viscus injury compared to solid organs. Pancreatic injuries (Option C) are rarer and usually result from direct compression against the vertebral column. Clinicians must maintain a high index of suspicion for delayed bowel perforation in these patients, as early CT scans may be inconclusive. Observation and repeated physical examinations are essential to detect signs of peritonitis that necessitate urgent surgical exploration.

Question 146. Which of the following is the surest sign of wound dehiscence?

A. Serosanguinous discharge

B. Infection

C. Hypotension

D. Rebound tenderness

Correct answer: A

Abdominal wound dehiscence, or "burst abdomen," is a serious surgical complication where the fascial closure fails. As discussed in Q.199, the surest clinical sign of impending or actual dehiscence is the sudden, profuse discharge of pinkish, serosanguinous fluid from the wound. This "salmon-pink" drainage represents peritoneal fluid leaking through a compromised fascial layer and is often described by patients as a feeling that "something gave way" during coughing or straining. Infection (Option B) is a risk factor for dehiscence but not a diagnostic sign of the dehiscence itself. Hypotension (Option C) and rebound tenderness (Option D) are signs of systemic sepsis or peritonitis, which can complicate but do not define the mechanical failure of the wound. Recognizing serosanguinous discharge is vital, as it often precedes the physical evisceration of bowel loops. Treatment involves immediate protection of the wound

with sterile saline-soaked dressings followed by an urgent return to the operating room for a formal re-closure, typically using non-absorbable tension sutures.

Question 147. A patient, 10 years post-mastectomy, presents with multiple confluent, hemorrhagic, necrotic, elevated purple-black papules on the right upper limb. What is the most likely diagnosis?

A. Metastasis

B. Lymphangiosarcoma

C. Squamous cell carcinoma

D. Kaposi sarcoma

Correct answer: B

This presentation describes Stewart-Treves Syndrome, which is the development of Lymphangiosarcoma in a limb affected by chronic, long-standing lymphedema. It classically occurs in women approximately 10 years after a radical mastectomy with axillary lymph node dissection. The lesion characteristically appears as confluent, purple-black, hemorrhagic nodules that may undergo necrosis. While cutaneous metastasis (Option A) can occur after breast cancer, it usually presents as firm, flesh-colored nodules rather than the distinct vascular-necrotic appearance of an angiosarcoma. Squamous cell carcinoma (Option C) arises from the epidermis and lacks this specific hemorrhagic/vascular profile. Kaposi sarcoma (Option D) is an opportunistic malignancy associated with HHV-8 and usually presents in different clinical contexts (e.g., HIV/AIDS). Lymphangiosarcoma is highly aggressive with an extremely poor prognosis due to rapid hematogenous spread. Treatment often involves radical amputation, though survival rates remain low. The primary prevention strategy is the aggressive management of post-mastectomy lymphedema through compression garments and physical therapy to reduce the chronic stimulus for malignant transformation.

Question 148. A young patient, in the first decade of life, presents with a grade II splenic injury without evidence of active bleeding. What is the appropriate management for this patient?

A. Splenectomy

B. Splenorrhaphy

C. Embolization

D. Conservative

Correct answer: D

In pediatric trauma management, conservative (non-operative) management is the gold standard for hemodynamically stable patients with splenic injuries, regardless of the injury grade (provided there is no active bleeding). Children have a more robust splenic capsule and

more efficient vasospasm, which facilitates self-healing. Furthermore, maintaining the spleen is vital in children to prevent the life-threatening risk of Overwhelming Post-Splenectomy Infection (OPSI). Splenectomy (Option A) is reserved for patients with uncontrollable hemorrhage or hemodynamic instability. Splenorrhaphy (Option B) or embolization (Option C) are interventions used if conservative measures fail or in specific adult scenarios, but they are not the initial treatment of choice for a stable pediatric Grade II injury. Management involves admission to the intensive care unit for strict bed rest, serial physical examinations, and regular monitoring of hemoglobin levels. Most such injuries heal completely without surgery within a few weeks. This "spleen-sparing" approach has significantly improved long-term outcomes in pediatric trauma care.

Question 149. A child under 5 years of age presents with a painless, soft, and fluctuant mass on the lateral side of the neck. What is the most likely diagnosis?

A. Thyroglossal cyst

B. Cystic hygroma

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Correct answer: A

The patient has a large (12 cm), symptomatic incisional hernia. Because the hernia is reducible and the patient is relatively recent from their primary surgery (1 month), the most appropriate next step for definitive management is surgical repair. Modern standards dictate that for an incisional hernia of this size, a mesh repair (either laparoscopic or open) is mandatory to reduce the very high rate of recurrence associated with primary suture closure. Laparoscopic closure without mesh (Option D) is incorrect due to the high failure rate. While an abdominal belt (Option B) can provide temporary symptomatic relief, it is not a "management step" toward a cure. Observation (Option C) is generally only for asymptomatic patients who are poor surgical candidates. Laparoscopic Intraperitoneal Onlay Mesh (IPOM) is a common technique for such repairs, offering less postoperative pain and faster recovery. Preoperative optimization, including weight loss and smoking cessation, is critical for surgical success.

Question 150. An adult male presents with a history of intermittent purulent discharge, occasionally tinged with blood, from an external opening in the perianal region. What is the most likely diagnosis?

A. Hemorrhoids

B. Pilonidal sinus

C. Perianal abscess

D. Fistula in ano

Correct answer: D

The clinical presence of an external opening in the perianal region that produces intermittent purulent discharge and blood is the hallmark of a Fistula in ano. This is a chronic abnormal track communicating between the anal canal and the perianal skin, most commonly resulting from a previous perianal abscess. Hemorrhoids (Option A) cause painless bright red bleeding during defecation but not a discharging skin opening. A pilonidal sinus (Option B) is located in the sacrococcygeal (tailbone) region, further from the anus. A perianal abscess (Option C) is the acute, painful inflammatory stage before a fistula forms. Goodsall's rule is used to predict the internal path of the fistula based on the location of the external opening. Diagnosis is clinical but may be aided by MRI to map complex tracks. Management is surgical, involving fistulotomy for simple tracks or specialized procedures like the Seton technique or LIFT for complex fistulas to preserve anal sphincter function and prevent incontinence.

PEDIATRICS

Question 151. At what age does stranger anxiety appear?

A. 7 months

B. 9 months

C. 12 months

D. 15 months

Correct answer: A

Stranger anxiety—the normal developmental stage where an infant becomes distressed when approached by unfamiliar people—characteristically appears around 9 months of age. This milestone reflects the infant's developing cognitive ability to differentiate between known caregivers and strangers, as well as an increasing sense of attachment. It often peaks between 12 and 15 months before gradually declining. 7 months (Option A) is when attachment behaviors begin to strengthen, but true stranger anxiety is more specific to the 9-month mark. By 12 months (Option C) and 15 months (Option D), the behavior is usually well-established. Understanding these social-emotional milestones is essential for pediatricians to distinguish normal development from potential behavioral or attachment disorders. Caregivers should be reassured that this is a healthy sign of brain development and can be managed through gentle introductions to new people. Accurate knowledge of these age-specific behaviors is a common requirement for assessing a child’s developmental trajectory during routine check-ups.

Question 152. Identify the image?

A. Omphalocele

B. Urachal cyst

C. Umbilical hernia

D. Umbilical adenoma

Correct answer: A

The image identifies an Omphalocele, a congenital midline abdominal wall defect at the base of the umbilical cord. The defining characteristic is that the herniated abdominal organs (bowel, liver) are covered by a translucent sac composed of peritoneum and amnion. This distinguishes it from gastroschisis, where the bowel is "naked" and to the right of the cord. An umbilical hernia (Option C) is a smaller defect covered by intact skin. An umbilical adenoma (Option D) is a small, red, fleshy mass of gastric or intestinal mucosa found at the umbilicus. A urachal cyst (Option B) is an internal remnant of the urachus and is not visible as an external organ-filled sac. Omphaloceles are frequently associated with other genetic and structural anomalies, most notably Trisomy 13, 18, and 21, and Beckwith-Wiedemann syndrome. Immediate management involves covering the sac with sterile, moist dressings and surgical closure, which may be performed in stages if the defect is large.

Question 153. A child presents to the outpatient department with fatigue, bone pain, and swollen, bleeding gums. On examination, petechiae are noted on the skin. Which treatment option is appropriate for this condition?

A. Vitamin A

B. Vitamin D

C. Vitamin E

D. Vitamin C

Correct answer: D

The clinical triad of swollen, bleeding gums, bone pain (due to subperiosteal hemorrhage), and petechiae on the skin is the classic presentation of Scurvy, caused by a profound deficiency of Vitamin C (ascorbic acid). Vitamin C is an essential cofactor for the hydroxylation of proline and lysine in collagen synthesis; its deficiency leads to weak connective tissues and fragile capillary walls. Vitamin A (Option A) deficiency causes night blindness. Vitamin D (Option B) deficiency causes rickets, which involves bone changes but not bleeding gums. Vitamin E (Option C) deficiency is rare and primarily neurological. Scurvy is often seen in children with highly restricted diets or neurodevelopmental disorders. Treatment involves oral Vitamin C supplementation, which leads to a rapid resolution of the bleeding and bone pain within days. Pediatricians must perform a detailed dietary history in children presenting with unexplained bruising or musculoskeletal pain to rule out this entirely preventable nutritional disorder.

Question 154. At what age does transfer of one object to another hand happen?

A. 6 months

B. 9 months

C. 7 months

D. 12 months

Correct answer: C

The ability to transfer an object from one hand to the other is a significant fine motor milestone that is typically achieved by 6 months of age. This skill requires the development of bilateral coordination and purposeful release. At 7 months (Option C), the child usually refines this and begins to use a raking grasp. By 9 months (Option B), the child develops the immature pincer grasp (using the pads of the fingers). By 12 months (Option D), the child masters the mature pincer grasp (using the tips of the thumb and index finger) and can release objects with precision into a container. Missing the 6-month milestone for hand-to-hand transfer may indicate developmental delays or motor impairments requiring further evaluation. Early childhood screening focuses on these predictable sequences to ensure that fine motor, gross motor, and cognitive development are progressing in harmony. Pediatricians use these specific milestones as "anchors" during well-child visits.

Question 155. A neonate is diagnosed with gastroschisis. What is the most appropriate management approach for this condition?

A. Surgical wall repair

B. Wait and watch

C. Slowly putting it inside

D. Surgical excision

Correct answer: A

Gastroschisis is a neonatal emergency characterized by an abdominal wall defect (usually to the right of the umbilicus) through which the bowel herniates without a protective sac. The most appropriate management strategy is prompt surgical wall repair. Because the bowel is exposed directly to the air and amniotic fluid, the neonate is at high risk for fluid loss, hypothermia, and infection. Immediate care involves placing the lower half of the baby in a sterile "bowel bag" to minimize losses. The repair may be a "primary closure" if the abdominal cavity can accommodate the bowel, or a "staged closure" using a preformed silo (Option C, "slowly putting it inside," describes the process of staged closure, but the overall strategy is the surgical repair). Wait and watch (Option B) is fatal. Surgical excision (Option D) is incorrect as the bowel must be preserved. Unlike omphalocele, gastroschisis is rarely associated with other genetic syndromes but often involves significant bowel dysmotility post-repair.

Question 156. A 28-year-old pregnant woman presents with decreased fetal movements, and her newborn shows respiratory distress. On examination,

the neonate is cyanotic with increased work of breathing, and bowel sounds are auscultated in the left hemithorax. A chest X-ray is provided. Which congenital anomaly is most likely responsible for these findings?

A. Congenital diaphragmatic hernia

B. Tetralogy of Fallot

C. Transposition of the great vessels

D. Tracheoesophageal fistula

Correct answer: A

The clinical finding of bowel sounds in the left hemithorax combined with severe neonatal respiratory distress and a scaphoid abdomen is diagnostic for Congenital Diaphragmatic Hernia (CDH). The X-ray confirms this by showing multiple loops of air-filled bowel occupying the left chest and a contralateral shift of the mediastinum. CDH results from a failure of the pleuroperitoneal membrane to close (Bochdalek hernia). The presence of abdominal contents in the chest prevents normal lung development, leading to life-threatening pulmonary hypoplasia and hypertension. Tetralogy of Fallot (Option B) and Transposition (Option C) are cyanotic heart diseases that would show normal lung fields and no bowel in the thorax. Tracheoesophageal fistula (Option D) typically presents with excessive salivation and choking during feeds. Management of CDH involves immediate stabilization with intubation (avoiding bag-mask to prevent bowel distension), gentle ventilation, and eventual surgical repair of the diaphragm once pulmonary pressures are controlled.

Question 157. A child with diarrhea is eager to drink, but the skin pinch returns slowly. According to IMNCI guidelines, into which category does this child fall?

A. Pink

B. Yellow

C. Green

D. None

Correct answer: B

Under the Integrated Management of Neonatal and Childhood Illness (IMNCI) guidelines, the classification of dehydration is based on specific clinical signs. A child who is eager to drink (thirsty) and has a skin pinch that goes back slowly (less than 2 seconds) meets the criteria for "Some Dehydration", which is coded as the Yellow category. The Pink category (Option A) is for "Severe Dehydration," characterized by lethargy, inability to drink, and a skin pinch that goes

back very slowly (more than 2 seconds). The Green category (Option C) is for "No Dehydration," where the child has none of these signs. Management for the Yellow category involves "Plan B" rehydration—providing oral rehydration solution (ORS) in the health facility over a 4-hour period while monitoring the child’s progress. This standardized color-coded system allows health workers to rapidly identify the severity of illness and initiate life-saving treatment protocols in resource-limited settings.

Question 158. A 10-year-old child presents to the outpatient department with poor appetite and failure to thrive. On examination, signs of dehydration such as decreased skin turgor and dry mucous membranes are noted. What is the glucose concentration of the oral rehydration solution used to manage this condition?

A. 100 mmol/L

B. 125 mmol/L

C. 150 mmol/L

D. 200 mmol/L

Correct answer: B

The child presents with "poor appetite and failure to thrive" along with signs of dehydration, which in a 10-year-old in a clinical setting often implies severe acute malnutrition (SAM). For the rehydration of children with SAM, a specific solution called ReSoMal (Rehydration Solution for Malnutrition) is used. ReSoMal differs from standard ORS; it contains more glucose (125 mmol/L) and less sodium to account for the unique physiological needs and electrolyte imbalances of malnourished children. Standard low-osmolarity ORS contains of glucose. Options A, C, and D do not represent the standard glucose concentrations for these rehydration protocols. Management of dehydration in SAM must be very cautious and slow to prevent heart failure. ReSoMal is administered orally or via a nasogastric tube over a longer period compared to children without SAM. This specific biochemical composition is a critical detail in pediatric nutritional rehabilitation.

Question 159. A 5-year-old boy presents to the outpatient department with low-grade fever, headache, and mild upper respiratory symptoms for the past four days. On examination, an erythematous rash is noted on the cheeks, which, according to the parents, appeared on the face first and then spread to the trunk and limbs. The causative agent of this disease is a single-stranded DNA

virus. What is the most likely diagnosis?

A. Hand, foot and mouth disease

B. Measles

C. Erythema infectiosum

D. Rubella

Correct answer: C

The clinical presentation of a "slapped-cheek" erythematous rash that spreads to the trunk in a "lace-like" pattern, following a mild febrile prodrome, is diagnostic for Erythema infectiosum (Fifth disease). The question confirms this by mentioning the causative agent is a single-stranded DNA virus, which is Parvovirus B19. Hand, foot, and mouth disease (Option A) involves painful vesicles on the palms, soles, and mouth. Measles (Option B) presents with high fever, Koplik spots, and a confluent rash that starts behind the ears. Rubella (Option D) involves a rapid-spreading rash and significant retroauricular lymphadenopathy. Parvovirus B19 is unique as the only SS-DNA virus significant in human disease. In children, it is a benign, self-limiting illness. However, it is clinically critical in patients with sickle cell disease (where it can cause an aplastic crisis) and in pregnant women (where it can cause hydrops fetalis).

Question 160. Which of the following primitive reflexes do not disappear?

A. Rooting reflex

B. Parachute reflex

C. Moro's reflex

D. Palmar grasp reflex

Correct answer: B

Primitive reflexes are automatic movements present at birth that are eventually integrated into voluntary actions as the nervous system matures. Most, such as the Rooting reflex (Option A), Moro reflex (Option C), and Palmar grasp (Option D), disappear (integrate) within the first 6 months of life. However, the Parachute reflex is a protective reflex that appears around 6–9 months and does not disappear; it persists throughout life. It is elicited by suddenly tilting the infant forward; the child reflexively extends their arms to "break the fall." The persistence of primitive reflexes beyond their expected age or the absence of the parachute reflex can indicate central nervous system dysfunction or developmental delays. The parachute reflex is an essential marker of neurological maturity, ensuring the individual can protect their head and body during a fall. Clinicians assess these reflexes to determine the functional integrity of the infant's sensory and motor pathways.

Question 161. A 2-year-old child presents to the emergency department with a barking cough and noisy breathing. Anteroposterior neck X-ray reveals

a steeple sign. What type of stridor is most commonly seen in this condition?

A. Inspiratory

B. Expiratory

C. Biphasic

D. Uniphasic

Correct answer: C

In a child with croup (acute laryngotracheobronchitis), the presence of a steeple sign on AP neck X-ray indicates subglottic narrowing. This region lies between the vocal cords and upper trachea, so obstruction here affects airflow during both inspiration and expiration, producing biphasic stridor.

Although croup is commonly associated with inspiratory stridor in mild cases, classically and in exam context, subglottic involvement leads to biphasic stridor, especially when narrowing is significant.

Why other options are incorrect:

(A)

Inspiratory: Seen in obstruction above the vocal cords (e.g., supraglottic), not typical for subglottic lesions.

(B)

Expiratory: Seen in lower airway obstruction (bronchi, bronchioles), such as asthma or bronchiolitis.

(D)

Uniphasic: Not a standard clinical classification of stridor and is not used diagnostically.

Question 162. Identify the given instrument?

A. Montgomery T- tube

B. Tracheoesophageal prosthesis

C. BAHA

D. PORP prosthesis

Correct answer: B

The instrument shown is a tracheoesophageal prosthesis (TEP), commonly used in patients who have undergone total laryngectomy for voice rehabilitation. It is a one-way valve device placed between the trachea and esophagus, allowing air from the lungs to pass into the esophagus to produce speech while preventing aspiration of food or fluids into the airway. The flanged ends help secure its position within the fistula.

Why other options are incorrect:

(A)

Montgomery T-tube: A silicone T-shaped stent used to maintain airway patency in tracheal

stenosis; it has a distinct T shape, not a short flanged valve.

(C)

BAHA (Bone Anchored Hearing Aid): An external/internal hearing device fixed to the skull, completely different in structure and function.

(D)

PORP prosthesis: A Partial Ossicular Replacement Prosthesis used in middle ear surgery, much smaller and designed for ossicular chain reconstruction, not airway use.

ORTHOPEDICS

Question 163. Identify the fracture?

A. Lateral epicondyle fracture

B. Medial epicondyle fracture

C. Supra condyle fracture

D. Infra condyle fracture

Correct answer: A

The X-ray shows a fracture fragment located at the lateral epicondyle of the distal humerus, with fixation in place. The supracondylar region appears intact, which rules out a supracondylar fracture. The fracture is localized laterally, confirming involvement of the lateral epicondyle, a site of muscle attachment. Such fractures are often associated with a fall on an outstretched hand (FOOSH injury) and are among the common pediatric elbow injuries.

Why other options are incorrect:

(B)

Medial epicondyle fracture: The medial epicondyle is intact in the image, with no avulsion fragment seen on the medial side.

(C)

Supracondylar fracture: There is no fracture line above the condyles; the supracondylar area is preserved. Typical signs like displacement or angulation are absent.

(D)

Infra-condylar fracture: This is not a standard classification for humeral fractures (more relevant to femur), so it is not applicable here.

Examination Paper January 2024 Question

Question 164. What is the most likely diagnosis in a patient who is unable to perform internal and external rotation of the hip?

A. Femur head fracture

B. Acetabular fractures

C. Dislocation of hip

D. Pelvis fracture

Correct answer: C

The total inability to perform internal and external rotation of the hip is the pathognomonic physical sign of a Hip Dislocation. In a dislocation, the femoral head is completely out of the acetabulum, which "locks" the joint and prevents any rotational movement. In contrast, with a femoral head fracture (Option A) or acetabular fracture (Option B), rotation is typically possible but extremely painful. Pelvis fractures (Option D) involve the pelvic ring and may not necessarily lock the hip joint itself unless the acetabulum is severely involved. Posterior dislocation is the most common type (often from "dashboard" injuries), presenting with the leg in a "shortened, adducted, and internally rotated" position. Anterior dislocation presents with an "abducted and externally rotated" leg. Emergency reduction under anesthesia is required within 6 hours to minimize the risk of avascular necrosis of the femoral head. This loss of rotation is the critical clinical differentiator from an isolated fracture.

Question 165. A 30-year-old man presents to the outpatient department with left knee pain, which he notes is often worse at night. He has been using aspirin for pain relief. An X-ray of the knee is provided. What is the most likely diagnosis?

A. Chondroblastoma

B. Osteoid osteoma

C. Skeletal TB

D. Osteosarcoma

Correct answer: B

The clinical hallmark of Osteoid osteoma is bone pain that is worse at night and is dramatically relieved by Aspirin or other NSAIDs. This is due to the high concentration of prostaglandins within the tumor. The radiograph confirms the diagnosis by showing a radiolucent nidus (less than 2 cm) surrounded by an area of reactive sclerotic (dense) bone. Chondroblastoma (Option A) is an epiphyseal lesion with a different radiological appearance. Skeletal TB (Option C) causes "cold abscesses" and joint destruction rather than a discrete cortical nidus. Osteosarcoma (Option D) is a highly aggressive malignant tumor showing a "sunburst" periosteal reaction and large-scale bone destruction. Osteoid osteoma is a benign tumor, most common in the femur and tibia of young adults. While some may resolve spontaneously over several years, the preferred treatment is percutaneous radiofrequency ablation, which provides immediate and permanent pain relief. The specific response to Aspirin is the key diagnostic "trigger" in medical examinations.

Question 166. All of the following is seen in the terrible triad of elbow, except.

A. Elbow dislocation

B. Radial head fracture

C. Fracture of the olecranon

D. Fracture of the coronoid process of ulna

Correct answer: C

The "Terrible Triad" of the elbow is a severe injury pattern characterized by the combination of three specific components:

1.

Posterior elbow dislocation (Option A).

2.

Radial head fracture (Option B).

3.

Coronoid process fracture of the ulna (Option D).

A fracture of the olecranon (Option C) is NOT a component of this specific triad. This injury is labeled "terrible" because it is highly unstable and notoriously difficult to manage, often leading to chronic joint instability, stiffness, and early-onset osteoarthritis. The coronoid process and radial head are critical "anterior" and "lateral" stabilizers of the elbow; their simultaneous fracture, combined with ligamentous injury during dislocation, leads to total joint incompetence. Management almost always requires surgery to repair or replace the radial head, fix the coronoid, and restore the lateral collateral ligament. Accurate knowledge of these anatomical triads is essential for orthopedic surgeons to plan complex reconstructive procedures and to counsel patients on the challenging recovery process.

OBS & GYNE

Question 167. In a case of shoulder dystocia, if the McRoberts maneuver fails, what is the next appropriate step in management?

A. Woods maneuver

B. Gaskin maneuver

C. Suprapubic pressure

D. Zavanelli maneuver

Correct answer: C

Shoulder dystocia is an obstetric emergency where the fetal head is delivered but the anterior shoulder remains stuck behind the maternal symphysis pubis. The first-line management is the McRoberts maneuver (hyperflexing the mother's hips). If this fails, the next immediate step is applying Suprapubic pressure (Rubin I maneuver) to help dislodge the shoulder. Woods maneuver (Option A, internal rotation) and Gaskin maneuver (Option B, all-fours position) are subsequent internal or positional maneuvers performed if suprapubic pressure is unsuccessful.

The Zavanelli maneuver (Option D) is an extreme "last resort" involving pushing the head back into the uterus for an emergency C-section. A useful mnemonic for the sequence is ALARMER: Ask for help, Legs (McRoberts), Anterior shoulder pressure (Suprapubic), Rubun/Woods, Manual delivery of posterior arm, Episiotomy, Roll (Gaskin). Rapid and sequential application of these maneuvers is critical to prevent neonatal brachial plexus injury or hypoxic brain damage.

Question 168. A teenage girl presents to the outpatient department with delayed puberty, short stature, and widely spaced nipples. What is the most likely karyotype?

A. 46, XO

B. 45, XO

C. 47, XXX

D. 46, XY

Correct answer: B

The clinical presentation of delayed puberty, short stature, and a "shield chest" with widely spaced nipples is pathognomonic for Turner Syndrome. As discussed in Q.148, this is a chromosomal disorder where one X chromosome is partially or completely missing. The most common and probable karyotype is 45, XO. 46, XO (Option A) is a non-standard notation for Turner's. 47, XXX (Option C), or Triple X syndrome, usually involves tall stature and mild learning disabilities, but not primary amenorrhea or short stature. 46, XY (Option D) is the normal male karyotype; in a phenotypic female, it would suggest Swyer syndrome (pure gonadal dysgenesis), which presents with delayed puberty but normal height. Turner patients also frequently have webbed necks and cardiovascular anomalies. Management focuses on growth hormone therapy during childhood and estrogen replacement to induce secondary sexual characteristics at puberty. This specific physical triad is a classic board exam "spotter" for the 45, XO genotype.

Question 169. Which of the following hormones primarily acts on the post-ovulatory endometrium?

A. Luteinizing hormone

B. Follicular stimulating hormone

C. Progesterone

D. Estrogen

Correct answer: C

Following ovulation, the ruptured follicle transforms into the corpus luteum, which secretes high levels of Progesterone. Progesterone is the primary hormone that acts on the post-ovulatory endometrium, transforming it into a secretory state that is receptive to embryo implantation.

While Estrogen (Option D) is present throughout the cycle and helps maintain the lining, it is the dominant hormone of the pre-ovulatory (proliferative) phase. Luteinizing hormone (Option A) and Follicular stimulating hormone (Option B) are pituitary gonadotropins that stimulate the ovaries but do not directly act on the endometrial tissue to induce secretory changes. If fertilization does not occur, the corpus luteum regresses, leading to a sharp drop in progesterone, which triggers the shedding of the endometrium during menstruation. Understanding this hormonal sequence is fundamental for evaluating menstrual irregularities and infertility. The secretory transformation of the endometrium is the defining biological event of the luteal phase.

Examination Paper January 2024 Question

Question 170. What is the content present in the contraceptive shown below?

A. Nonoxynol 9

B. Menfegol

C. Octoxynol 8

D. None of the above

Correct answer: A

The image displays a vaginal contraceptive sponge (such as Today Sponge). These devices are impregnated with a spermicide, and the most common and standard active ingredient used is Nonoxynol-9. Nonoxynol-9 works by disrupting the cell membrane of the spermatozoa, rendering them immobile and unable to fertilize the egg. Menfegol (Option B) and Octoxynol-8 (Option C) are also spermicides, but they are significantly less common in commercial sponge formulations compared to Nonoxynol-9. The sponge provides triple protection by acting as a mechanical barrier over the cervix, absorbing semen, and releasing spermicide over a 24-hour period. While convenient and available over-the-counter, it is less effective than hormonal or intrauterine methods. Clinicians must counsel users that Nonoxynol-9 does not protect against STIs and may even increase the risk of HIV transmission due to localized mucosal irritation.

Question 171. Which of the following conditions is least likely to cause postmenopausal bleeding?

A. Endometrial CA

B. Granulosa cell tumor

C. Genital tract trauma

D. Ovarian follicular cyst

Correct answer: D

Postmenopausal bleeding is any vaginal bleeding occurring 12 months or more after the final menstrual period and must always be investigated. An ovarian follicular cyst (Option D) is a

physiological cyst that occurs only during active ovulation in the reproductive years; therefore, it is least likely to be found or cause bleeding in a postmenopausal woman. Endometrial carcinoma (Option A) is the most concerning cause, and Granulosa cell tumors (Option B) of the ovary can cause postmenopausal bleeding by secreting excess estrogen. Genital tract trauma (Option C), such as atrophic vaginitis leading to tearing, is a common benign cause of postmenopausal spotting. Atrophic endometrium is actually the most common overall cause of postmenopausal bleeding, followed by endometrial polyps. Any postmenopausal patient presenting with bleeding must undergo transvaginal ultrasound or endometrial biopsy to rule out malignancy, particularly when risk factors like obesity or tamoxifen use are present.

Question 172. A patient’s hysterosalpingogram shows fluid-filled, S-shaped structures on both sides. What is the most likely diagnosis corresponding to this finding?

A. Normal HSG

B. Bilateral cornual block

C. Extravasation into venous system

D. Bilateral hydrosalpinx

Correct answer: D

A hysterosalpingogram (HSG) that demonstrates dilated, fluid-filled, S-shaped structures on both sides of the pelvis is diagnostic for bilateral hydrosalpinx. Hydrosalpinx occurs when the distal end of the fallopian tube becomes blocked, often due to past pelvic inflammatory disease, causing the tube to fill with fluid and become tortuous. In a normal HSG (Option A), the contrast should be seen spilling freely into the peritoneal cavity. A bilateral cornual block (Option B) would show contrast stopping at the junction of the uterus and the tubes, with no visualization of the tubes themselves. Extravasation into the venous system (Option C) appears as a fine, reticular pattern of contrast moving away from the uterus into the pelvic veins. Bilateral hydrosalpinx is a major cause of infertility, as it prevents egg pick-up and sperm transport. Management typically requires surgical intervention, such as salpingectomy or IVF, depending on the severity of the tubal damage.

Question 173. Which Leopold's maneuver is done to assess the lie of the fetus?

A. Leopold's 1

B. Leopold's 2

C. Leopold's 3

D. Leopold's 4

Correct answer: A

Leopold’s maneuvers are a systematic method of abdominal palpation used in obstetrics to

assess the fetal lie, presentation, position, and engagement. Among these, Leopold's first maneuver (fundal grip) is specifically used to determine the fetal lie. In this maneuver, the examiner palpates the uterine fundus using both hands to identify which fetal pole occupies the upper part of the uterus. If the head is felt in the fundus, the fetus is in a breech presentation, while if the breech is felt, it suggests a cephalic presentation, both indicating a longitudinal lie. If neither pole is clearly identified, it may indicate a transverse or oblique lie.

Leopold's second maneuver assesses fetal position by locating the back and limbs. Leopold's third maneuver identifies the presenting part above the pelvic inlet, and Leopold's fourth maneuver evaluates engagement of the presenting part. Therefore, the first maneuver is most important for determining the fetal lie.

DERMATOLOGY

Question 174. A 45-year-old patient presents with itchy, flat-topped, polygonal, violaceous papules on the inner wrists and flexor surfaces of the forearms. The lesions have a shiny surface and appear in a linear arrangement. There is no history of recent medication use. What is the appropriate treatment for this condition?

A. Topical steroids

B. Antibiotics

C. Immunosuppressants

D. Anti-fungal

Correct answer: A

The clinical description of itchy, flat-topped, polygonal, violaceous papules on the flexor surfaces of the wrists is pathognomonic for Lichen Planus. These lesions often display a characteristic shiny surface known as Wickham striae and can demonstrate the Koebner phenomenon, where lesions appear in a linear pattern along sites of trauma. The first-line treatment for localized Lichen Planus is topical steroids, which work by reducing the T-cell mediated inflammatory response at the dermo-epidermal junction. Antibiotics (Option B), immunosuppressants (Option C), and anti-fungals (Option D) are not the primary treatments for this autoimmune condition. While systemic steroids or other immunosuppressants may be used for widespread or recalcitrant disease, topical therapy remains the standard of care for initial management. Clinicians should also screen these patients for Hepatitis C infection, which has a documented association with Lichen Planus.

Question 175. Which skin condition

shows
coral-red
fluorescence when examined under a Wood’s
lamp?

A. Erythrasma

B. Acanthosis nigricans

C. Allergic contact dermatitis

D. Cutaneous candidiasis

Correct answer: A

Erythrasma is a common superficial bacterial infection of the intertriginous areas (axilla, groin) caused by Corynebacterium minutissimum. The pathognomonic diagnostic finding is the presence of coral-red fluorescence when the skin is viewed under a Wood’s lamp. This distinct color is produced by the bacterium's secretion of porphyrins. Acanthosis nigricans (Option B) is a sign of insulin resistance and shows hyperpigmented, velvety plaques. Allergic contact dermatitis (Option C) and Cutaneous candidiasis (Option D) do not exhibit this specific fluorescence pattern. Candidiasis characteristically shows "satellite lesions" and a white curd-like surface. Clinically, erythrasma appears as well-demarcated, reddish-brown, scaly patches that can be mistaken for fungal infections. Treatment typically involves topical or oral macrolide antibiotics like erythromycin or clindamycin. Accurate identification via Wood's lamp allows for rapid bedside diagnosis and prevents unnecessary antifungal therapy for a bacterial condition.

Question 176. 265. (B) Rolled out.
The image displays a characteristic Basal Cell Carcinoma (rodent ulcer), and the defining clinical feature of its margin is a rolled-out (or "pearly, rolled") edge. These raised, semi-translucent borders are a classic hallmark of this slow-growing malignancy. Everted edges (Option A) are characteristic of squamous cell carcinoma, where the tissue is growing outward. Sloping edges (Option C) are typical of healing venous ulcers. Punched-out edges (Option D) are seen in trophic or syphilitic ulcers, which appear deep and cleanly cut. Recognizing these edge characteristics is fundamental for the clinical diagnosis of chronic skin lesions.
A rodent ulcer, while locally invasive, rarely

metastasizes but can cause significant tissue destruction if left untreated. It typically occurs on sun-exposed areas of the head and neck. Definitive management involves wide local excision or Mohs micrographic surgery to ensure clear margins while preserving healthy tissue.

Which of the following deficiencies causes follicular hyperkeratosis?

A. Vitamin A

B. Vitamin C

C. Vitamin E

D. Vitamin B6

Correct answer: A

Follicular hyperkeratosis (also known as phrynoderma or "toad skin") is a skin condition characterized by the excessive development of keratin in hair follicles. It is a classic dermatological manifestation of Vitamin A deficiency. Vitamin A is essential for the normal differentiation and maintenance of epithelial tissues; its lack leads to squamous metaplasia and keratin buildup.

While Vitamin C deficiency (Option B, scurvy) causes "corkscrew hairs" and perifollicular hemorrhage, it does not cause primary follicular hyperkeratosis. Vitamin E (Option C) and Vitamin B6 (Option D) deficiencies do not have this specific cutaneous presentation. Follicular hyperkeratosis typically appears as small, firm, rough papules on the extensor surfaces of the limbs and the back. It is often accompanied by other signs of Vitamin A lack, such as night

blindness or conjunctival xerosis. Treatment involves dietary improvements and oral Vitamin A supplementation, which usually results in a slow resolution of the skin changes.

The condition shown in the image below is seen in which vitamin deficiency?

(A)
Pyridoxine

(B)
Cobalamin

(C)
Niacin

(D)
Riboflavin

Question 177. 268. (B) Dermatomyositis. The image depicts a heliotrope rash—a characteristic violaceous/purple discoloration of the upper eyelids, often accompanied by periorbital edema. This rash is a pathognomonic skin finding for Dermatomyositis, an autoimmune inflammatory myopathy. Other classic skin features include Gottron papules over the knuckles and a "shawl sign" on the back. Polymyositis (Option A) involves similar muscle weakness but lacks the characteristic skin manifestations of dermatomyositis. Inclusion body myositis (Option C) typically affects older males and involves distal muscle weakness without a primary rash. Discoid lupus erythematosus (Option D) presents with well-defined, scarred plaques, usually

in different facial locations than the eyelids. Dermatomyositis requires a comprehensive workup because it is associated with an increased risk of internal malignancies, particularly in older adults. Management involves high-dose corticosteroids and immunosuppressive agents. The heliotrope rash is the key clinical anchor for differentiating these inflammatory muscle diseases.

Which of the following drugs is not used in the treatment of acne vulgaris?

A. Topical Benzoyl peroxide

B. Topical Fluocinolone

C. Topical Tazarotene

D. Topical antibiotics

Correct answer: B

Topical Fluocinolone is a potent corticosteroid. It is NOT used for the treatment of acne vulgaris; in fact, the prolonged use of topical steroids on the face can actually cause or worsen an acneiform eruption known as "steroid-induced acne". Benzoyl peroxide (Option A) is a standard antibacterial and comedolytic agent used for mild-to-moderate acne. Tazarotene (Option C) is a topical retinoid that is highly effective at normalizing follicular keratinization. Topical antibiotics (Option D, like clindamycin or erythromycin) are standard for reducing C. acnes colonization and inflammation. Effective acne management relies on targeting the four pathogenic factors: follicular hyperkeratosis, sebum production, bacterial colonization, and inflammation. Corticosteroids like fluocinolone should be avoided in acne patients unless being used briefly to manage a severe "flare" triggered by other treatments (e.g., acne fulminans). Therefore, fluocinolone is the correct "incorrect" drug for standard acne therapy.

Question 178. During epidural anesthesia, which of the following layers is least likely to be punctured?

A. Arachnoid mater

B. Ligamentum flavum

C. Supraspinatus

D. Infraspinatus

Correct answer: A

In epidural anesthesia, the goal is to place the local anesthetic into the potential space just outside the dural sac. Therefore, the Arachnoid mater is the layer least likely to be punctured; if the arachnoid is breached, the procedure becomes a spinal (subarachnoid) block rather than an epidural. During a standard midline approach, the needle passes through the skin, subcutaneous tissue, Supraspinatus ligament (Option C), interspinatus ligament, and finally the Ligamentum flavum (Option B) to reach the epidural space. The Infraspinatus (Option D) is a muscle of the rotator cuff in the shoulder and is entirely irrelevant to spinal or epidural anatomy. Successful epidural placement relies on the "loss of resistance" technique as the needle exits the dense ligamentum flavum. Accidental puncture of the dura/arachnoid is a recognized complication known as a "dural tap," which can lead to a significant post-dural puncture headache. Knowledge of these spinal layers is critical for safe regional anesthesia.

Question 179. Which inhalational anesthetic agent has a blood–gas partition coefficient most similar to that of nitrous oxide?

A. Isoflurane

B. Desflurane

C. Sevoflurane

D. Halothane

Correct answer: B

The blood-gas partition coefficient determines the solubility of an anesthetic in the blood and directly influences the speed of induction and emergence. Nitrous oxide has a very low coefficient (approximately 0.47), which explains its rapid effects. Among the volatile agents, Desflurane has the most similar coefficient (approximately 0.42), making it the least soluble volatile agent. Sevoflurane (Option C) has a slightly higher coefficient of 0.65. Isoflurane (Option A) has a coefficient of 1.4, and Halothane (Option D) is the most soluble with a coefficient of 2.4, leading to a much slower recovery. Because desflurane is so insoluble, it provides the fastest emergence of all currently used volatile agents, allowing patients to wake up very quickly even after long procedures. However, its use is limited by its high cost and pungent odor, which can cause airway irritation. Identifying these coefficients is essential for understanding the clinical pharmacokinetics of inhalation anesthesia.

Question 180. Which of the following conditions is considered a contraindication to the use of bi-level positive airway pressure (BiPAP)?

A. Obstructive sleep apnea

B. Unconscious/sedation

C. High oxygen levels

D. Low partial pressure of oxygen

Correct answer: B

Bi-level Positive Airway Pressure (BiPAP) is a form of non-invasive ventilation (NIV) that requires the patient to be alert, cooperative, and able to protect their own airway. Therefore, being unconscious or heavily sedated is an absolute contraindication for its use. In such patients, BiPAP carries a high risk of aspiration and gastric insufflation; they require invasive endotracheal intubation instead. Obstructive sleep apnea (Option A) is a primary indication for positive pressure therapy (usually CPAP or BiPAP). Low oxygen levels (hypoxia) (Option D) are often the very reason BiPAP is initiated (e.g., in COPD or heart failure). High oxygen levels (Option C) are not a direct contraindication, although therapy would be unnecessary if oxygenation is normal. Other contraindications for BiPAP include severe facial trauma, vomiting, or excessive secretions. The success of BiPAP depends heavily on the patient's ability to synchronize with the machine and maintain their airway reflexes. Clinicians must meticulously screen patients before initiating non-invasive support.

RADIOLOGY

Question 181. Radioisotope used in PET-CT scan?

A. 18F-FDG

B. Iodine

C. Radium

D. Cesium-131

Correct answer: A

The most common and standard radioisotope used in PET-CT scanning for oncological and metabolic imaging is Fluorine-18, typically attached to a glucose analog known as 18F-FDG (Fluorodeoxyglucose). As established in Q.281, cancer cells uptake this glucose analog at high rates, which the PET scanner detects as "hot spots." Iodine (Option B, typically I-131) is used primarily for the diagnosis and treatment of thyroid conditions. Radium (Option C) and Cesium-131 (Option D) are used in brachytherapy for cancer treatment, not as diagnostic tracers for PET imaging. 18F-FDG has a half-life of approximately 110 minutes, allowing enough time for production, transport, and imaging while ensuring a relatively low radiation dose to the patient. PET-CT is an essential tool for staging malignancies, monitoring therapy response, and identifying hidden metastases. Clinicians must consider physiological uptake in the brain and

heart when interpreting FDG-PET results.

Question 182. Which of the following conditions exhibit the given radiological findings?

A. Miliary TB

B. Aspergillosis

C. Consolidation

D. Lung metastasis

Correct answer: D

The Chest X-ray demonstrates multiple, large, discrete, and well-circumscribed bilateral nodules, a classic finding known as "cannon-ball metastasis". This pattern is highly characteristic of Lung metastasis, most commonly originating from primary tumors such as renal cell carcinoma, testicular seminoma, or choriocarcinoma. Miliary TB (Option A) presents with numerous tiny (1–2 mm), millet-seed-like nodules distributed evenly throughout the lungs. Aspergillosis (Option B) usually presents as a mass within a pre-existing cavity or as areas of consolidation. Consolidation (Option C) appears as a more confluent, ill-defined area of opacity, often within a single lobe, rather than multiple discrete round masses. Cannon-ball metastases typically signify an advanced, disseminated malignancy. Identifying this specific radiological pattern is a high-yield clinical clue that directs the search for a primary malignancy elsewhere in the body.

277. Which among the following is the least radiosensitive cell?

(A) Red blood cells

Understanding ossicular development is vital for diagnosing congenital hearing loss syndromes, such as Treacher Collins, where first arch derivatives are malformed. The malleus remains attached to the tympanic membrane, while the incus acts as a bridge to the stapes, facilitating sound conduction to the inner ear.

Muscle inserted on lesser trochanter?

(A)

Psoas major muscle

(B)

Psoas minor

(C)

Obturator internus

(D)
Piriformis
5.
(A) Psoas major muscle
The lesser trochanter is a posteromedial projection at the junction of the neck and shaft of the femur. It serves as the primary insertion point for the Iliopsoas complex, which includes the Psoas major and the Iliacus muscles. This muscle group is the most powerful flexor of the hip joint. Psoas minor (Option B) is absent in about 40% of the population and, when present, inserts onto the pectineal line and iliopubic eminence of the pelvis, not the femur. Obturator internus (Option C) and Piriformis (Option D) are lateral rotators of the hip that insert onto the greater trochanter (specifically the medial surface and apex, respectively). Knowledge of these insertions is clinically important in orthopedics, particularly regarding avulsion fractures of the lesser trochanter in adolescents or pathological fractures in adults, which often indicate significant mechanical stress or metastatic disease affecting the primary hip flexor's attachment point.
Mention the type of joint present at the marked region.
(A)
Ellipsoid
(B)
Condylar
(C)
Plane
(D)
Saddle
6.
(D) Saddle
The arrow in the X-ray identifies the first carpometacarpal (CMC) joint, which is the

articulation between the trapezium and the base of the first metacarpal. This joint is functionally classified as a saddle (sellar) joint. Saddle joints feature reciprocal concave-convex surfaces that allow for a wide range of motion, including flexion, extension, abduction, adduction, and uniquely, opposition. Ellipsoid joints (Option A), such as the wrist (radiocarpal) joint, allow for biaxial movement but lack the axial rotation seen in saddle joints. Condylar joints (Option B), like the knee, allow primarily for flexion and extension with limited rotation. Plane joints (Option C), found between the other carpal bones, permit only limited gliding movements. The saddle configuration of the first CMC joint is what gives the human thumb its exceptional mobility and ability to grasp objects, making it a common site for osteoarthritis due to the high mechanical loads it bears during daily activities.

In the given image, the tendon marked by the arrow is?

(A)

Flexor carpi radialis

(B)

Flexor carpi ulnaris

(C)

Flexor digitorum superficialis

(D)

Palmaris longus

7.

(A) Flexor carpi radialis

The tendon indicated in the image lies on the radial (lateral/thumb) side of the anterior wrist, which corresponds to the flexor carpi radialis (FCR). This tendon becomes prominent when the wrist is flexed, especially during a clenched fist.

The flexor carpi radialis originates from the medial epicondyle of the humerus and inserts

into the bases of the 2nd and 3rd metacarpals. Functionally, it is responsible for flexion and abduction of the wrist. Due to its position, the FCR tendon is located just lateral to the palmaris longus, which lies more centrally.
In the image, the marked tendon is clearly not in the midline, ruling out palmaris longus, and instead is positioned toward the radial side, confirming it as flexor carpi radialis.
Why other options are incorrect:
1. Palmaris longus → Midline tendon
2. Flexor carpi ulnaris → Ulnar (medial) side
3. Flexor digitorum superficialis → Deep tendon

The subcostal line corresponds to which vertebrae level?
(A)
T12
(B)
L1
(C)
L2
(D)
L3
8.
(D) L3.
The subcostal line (or subcostal plane) is a transverse anatomical plane used to divide the abdomen into nine regions. It is defined as the horizontal line connecting the lowest points of the costal margins, which typically correspond to the 10th costal cartilages. This plane passes through the body of the L3 vertebra. It should not be confused with the transpyloric plane (Option B), which passes through the L1 vertebra and marks the pylorus of the stomach. The T12 level (Option A) corresponds to the origin of the celiac trunk and the esophageal hiatus. The L2 level (Option C) is the site where

the spinal cord typically ends (conus medullaris) and the renal arteries originate. The subcostal plane at L3 serves as an important landmark for the third part of the duodenum and the lower borders of the kidneys. Understanding these vertebral levels is essential for accurate physical examination and the interpretation of cross-sectional abdominal imaging in clinical practice.

Which artery runs in close relation to the region of the skull depicted in the image?

(A)

Anterior cerebral artery

(B)

Internal carotid artery

(C)

Middle meningeal artery

(D)

Deep temporal artery

Examination Paper January 2024 Question

Question 183. of Lung metastasis, most commonly originating from primary tumors such as renal cell carcinoma, testicular seminoma, or choriocarcinoma. Miliary TB (Option A) presents with numerous tiny (1–2 mm), millet-seed-like nodules distributed evenly throughout the lungs. Aspergillosis (Option B) usually presents as a mass within a pre-existing cavity or as areas of consolidation. Consolidation (Option C) appears as a more confluent, ill-defined area of opacity, often within a single lobe, rather than multiple discrete round masses. Cannon-ball metastases typically signify an advanced, disseminated

malignancy.
Identifying
this
specific radiological pattern is a high-yield
clinical clue that directs the search for a primary
malignancy elsewhere in the body.
Which among the following is the least radiosensitive cell?
A. Red blood cells
B. Platelets
C. Lymphocytes
D. Neutrophils
Correct answer: B
Radiosensitivity depends on the rate of cell division and level of differentiation (Law of Bergonié and Tribondeau). Cells that divide rapidly are more radiosensitive, while non-dividing, mature cells are more radioresistant. Platelets are considered the least radiosensitive because they are non-dividing cell fragments derived from megakaryocytes and have minimal metabolic and genetic activity. Since they do not undergo mitosis, they are less affected by radiation compared to other blood cells.
Why other options are incorrect:
(A) Red blood cells: Although anucleate and resistant, they are not considered the least radiosensitive in standard exam context.
(C) Lymphocytes:
Among
the
most
radiosensitive cells due to high turnover and metabolic activity.
(D) Neutrophils:
Derived
from
actively
dividing precursors, making them more

radiosensitive than platelets.

What is the ideal thickness of lead aprons for personnel working in a radiology department?

(A)

0.5 mm

(B)

1 mm

(C)

0.75 mm

(D)

2 mm

Question 184. What is the ideal thickness of lead aprons for personnel working in a radiology department?

A. 0.5 mm

B. 1 mm

C. 0.75 mm

D. 2 mm

Correct answer: A

In the field of radiation protection, the goal is to reduce occupational exposure as much as possible (ALARA principle). For the majority of diagnostic radiology workers, a lead apron with a thickness of 0.5 mm lead equivalent is considered the ideal standard. This thickness provides an excellent balance between radiation attenuation and the physical comfort of the wearer; a 0.5 mm apron can block approximately 95–99% of the scattered X-ray radiation encountered in typical diagnostic settings. While a 1 mm apron (Option B) would provide even higher protection, it is significantly heavier and can cause orthopedic issues with prolonged use. 0.75 mm (Option C) and 2 mm (Option D) are not standard requirements for general diagnostic work. Proper storage (hanging rather than folding) is also essential to prevent the lead from cracking. Consistent use of these personal protective devices, along with thyroid shields and lead glasses, is mandatory for ensuring the long-term safety of radiology personnel.

Question 185. The following image shows which X-ray view?

A. Waters view

B. Caldwell's view

C. Towne view

D. Hirtz view

Correct answer: C

The image depicts the orientation of the skull for a Towne view (AP axial projection). In this view, the X-ray beam is angled caudally (downward), typically about 30° to the orbitomeatal line (OML), as shown by the green arrow passing from the frontal region toward the occipital

bone.

This projection is primarily used to visualize the occipital bone, foramen magnum, and posterior cranial fossa, and is especially helpful in assessing occipital fractures and posterior skull structures.

Why other options are incorrect:

(A)

Waters view: Used for maxillary sinuses, with the head extended so the chin touches the cassette (occipitomental view).

(B)

Caldwell view: An AP projection with slight caudal angulation (15°), mainly for frontal sinuses and orbits.

(D)

Hirtz view (submentovertex): Beam passes from below the chin upward, used to visualize the base of the skull.

Question 186. The chest X-ray below shows a right-sided lung white-out with contralateral tracheal deviation.

In which condition is this finding typically seen?

A. Pneumothorax

B. Consolidation

C. Collapse

D. Thoracic mass

Correct answer: D

The chest X-ray shows right-sided white-out (complete opacification) with contralateral (leftward) tracheal deviation. This indicates a space-occupying lesion causing a mass effect, which pushes the mediastinum away from the affected side.

White-out lung + trachea shifted away (contralateral) → suggests increased volume/pressure on that side

This is typical of large pleural effusion or thoracic mass

Why other options are incorrect:

(A)

Pneumothorax:Would show a hyperlucent (black) hemithorax, not white-out.

(B)

Consolidation:Causes white-out but usually no significant tracheal shift.

(C)

Collapse (atelectasis):Leads to tracheal deviation toward the same side (volume loss), not away.

Therefore, contralateral deviation with white-out strongly points to a thoracic mass effect (most

appropriate option here).

Question 187. A patient presents with fatigue and shortness of breath. On examination, distended neck veins and muffled heart sounds are noted. A chest X-ray is provided. What is the most likely diagnosis?

A. Acute pericarditis

B. Bronchial asthma

C. Constrictive pericarditis

D. Atrial myxoma

Correct answer: C

The clinical features—fatigue, dyspnea, distended neck veins, and muffled heart sounds—suggest impaired cardiac filling. The X-ray described is consistent with constrictive pericarditis, where the pericardium becomes thickened and non-compliant, restricting ventricular filling.

A key radiological feature is the “egg in cup” appearance, where the heart appears relatively normal or mildly enlarged but is surrounded by a rigid pericardium. Unlike pericardial effusion, there is no globular (water bottle) enlargement. The pathology involves fibrosis and sometimes calcification of the pericardium, leading to diastolic dysfunction.

Why other options are incorrect:

(A)

Acute pericarditis: Typically shows a flask-shaped enlarged cardiac silhouette due to pericardial effusion, which is not seen here.

(B)

Bronchial asthma: Shows hyperinflated lungs, not cardiac changes.

(D)

Atrial myxoma: May cause intracardiac obstruction but does not produce this characteristic X-ray appearance.

Question 188. Identify the arrow-marked chamber?

A. Right atrium

B. Left atrium

C. Right ventricle

D. Left ventricle

Correct answer: C

This is an axial CT scan of the thorax. On axial imaging, anatomical orientation is such that the anterior structures are at the top of the image, and the right side of the patient appears on the left side of the image.

The arrow points to a chamber located anteriorly and somewhat toward the patient’s right side, which corresponds to the right ventricle (RV). The right ventricle forms the most anterior part of the heart and lies just behind the sternum, making it the chamber most commonly seen in the anterior position on CT.

Why other options are incorrect:

(A)

Right atrium: Located more right-sided and slightly posterior, not the most anterior chamber.

(B)

Left atrium: Lies posteriorly, forming the base of the heart.

(D)

Left ventricle: Located more posterior and left-sided, forming the apex but not the most anterior structure.

Thus, the arrow-marked chamber is the right ventricle.

Examination Paper January 2024 Question

(A) Erythema toxicum neonatorum

(B) Pustular melanosis

(C) Mongolian spots

(D) Milia

AAns

(D) Milia.

The image displays Milia, which are extremely common, benign neonatal skin findings. They appear as tiny (1–2 mm), pearly white or yellowish papules, most commonly seen on the nose, cheeks, and chin of newborns. They represent small epidermal inclusion cysts filled with keratin. Erythema toxicum neonatorum (Option A) appears as erythematous macules with central yellow papules or pustules, usually on the trunk. Pustular melanosis (Option B) involves fragile pustules that rupture to leave hyperpigmented macules. Mongolian spots (Option C) are bluish-grey patches of congenital dermal melanocytosis, typically found on the sacral area. Milia are completely asymptomatic and require no treatment, as they typically resolve spontaneously within the first few weeks of life as the skin pores open and mature. Recognizing these benign "normal" newborn rashes is essential for pediatricians and midwives to provide appropriate reassurance to anxious parents.

ANAESTHESIA

Question 189. A barium swallow study of a woman with dysphagia is shown below. What is the most likely diagnosis?

A. Achalasia

B. Distal esophageal spasm

C. Jackhammer esophagus

D. None of the above

Correct answer: A

The barium swallow image shows the pathognomonic "bird’s beak sign"—a massive dilation of the proximal esophagus ending in a smooth, symmetric, tapering narrowing at the lower esophageal sphincter (LES). This is the classic radiological finding for Achalasia, a primary esophageal motility disorder characterized by the failure of the LES to relax and the absence of peristalsis. Distal esophageal spasm (Option B) typically shows a "corkscrew" appearance on barium swallow. Jackhammer esophagus (Option C) is a hypercontractile disorder that may show high-pressure segments but not the specific bird's beak narrowing. Clinically, achalasia presents with progressive dysphagia for both solids and liquids from the onset, often accompanied by regurgitation and weight loss. Diagnosis is confirmed by esophageal manometry, which is the gold standard. Management includes pneumatic dilation, botulinum toxin injection, or definitive surgical Heller’s myotomy. The bird's beak sign is one of the most reliable and high-yield radiological identifiers in gastroenterology.

Question 190. Identify pancreas, liver, and spleen?

A. A-liver, B-pancreas, C-spleen

B. A-Kidney, B-liver, C-pancreas

C. A-pancreas, B-liver, C-spleen

D. A-spleen, B-kidney, C-liver

Correct answer: A

On a standard axial CT scan of the upper abdomen, the organs are identified by their characteristic positions:

1.

A (Liver): The largest solid organ, occupying the right upper quadrant.

2.

B (Pancreas): A lobulated, retroperitoneal organ that lies transversely across the midline, posterior to the stomach.

3.

C (Spleen): A smaller, solid organ located in the left upper quadrant, lateral to the tail of the pancreas.

Options B, C, and D provide incorrect assignments for these anatomical landmarks. Accurately identifying these organs is the first step in abdominal CT interpretation. The liver is typically on the left side of the image (the patient's right). The pancreas is often identified by its proximity to the splenic vein and the superior mesenteric artery. The spleen's location in the far left is a

reliable marker. This anatomical spatial reasoning is a fundamental skill for medical board exams and clinical radiology practice.

Question 191. A patient presents with shortness of breath and fatigue. On examination, distended neck veins and muffled heart sounds are noted. A chest X-ray is provided. What is the most likely diagnosis?

A. Constrictive pericarditis

B. Bronchial asthma

C. Acute pericarditis

D. Atrial myxoma

Correct answer: A

The patient presents with shortness of breath, fatigue, distended neck veins, and muffled heart sounds, which strongly suggest chronic cardiac compression. These findings are classical for constrictive pericarditis, where the pericardium becomes thickened, fibrotic, and sometimes calcified, restricting normal cardiac filling.

The chest X-ray in such cases often shows pericardial calcification, which appears as curvilinear radio-opaque shadows around the cardiac silhouette. This radiological feature is highly suggestive of constrictive pericarditis and helps differentiate it from other causes of heart failure.

Why other options are wrong:

(B)

Bronchial asthma : Presents with wheezing and hyperinflated lungs, not JVD or muffled heart sounds

(C)

Acute pericarditis : Causes chest pain and pericardial effusion but not calcification

(D)

Atrial myxoma : May cause obstruction but does not show pericardial calcification on X-ray

Question 192. Radioactive isotope used for teletherapy?

A. Iridium-192

B. Iodine-125

C. Cobalt-60

D. Iodine-131

Correct answer: C

Teletherapy refers to external beam radiation therapy where the radiation source is located at a distance from the patient. Cobalt-60 is the standard radioactive isotope used for teletherapy in many centers (specifically in Cobalt units). It emits high-energy gamma rays and has a half-life

of 5.27 years. Iridium-192 (Option A) and Iodine-125 (Option B) are characteristically used for brachytherapy, where the radioactive source is placed inside or very close to the tumor. Iodine-131 (Option D) is an unsealed isotope used for the diagnosis and treatment of thyroid diseases, not for external teletherapy. While linear accelerators (LINACs) have largely replaced cobalt units in high-resource settings, Cobalt-60 remains a vital isotope for teletherapy globally due to its reliability and simpler maintenance. Understanding the differences between teletherapy and brachytherapy isotopes is a core concept in clinical oncology and radiotherapy.

Question 193. Which condition is characterized by the presence of an empty delta sign on imaging?

A. Subarachnoid hemorrhage

B. Subdural hemorrhage

C. Cerebral venous thrombosis

D. Intraparenchymal hemorrhage

Correct answer: C

The "empty delta sign" is the pathognomonic radiological finding for Cerebral Venous (Sinus) Thrombosis on a contrast-enhanced CT scan. It refers to a triangular area of non-enhancement (the thrombus) surrounded by the enhancing wall of the superior sagittal sinus. Subarachnoid hemorrhage (Option A) presents with blood in the sulci and cisterns. Subdural hemorrhage (Option B) is a crescentic blood collection, and Intra parenchymal hemorrhage (Option D) is blood within the brain tissue. Cerebral venous thrombosis is a common cause of stroke in young adults, particularly women (associated with pregnancy, oral contraceptives, or dehydration). Patients typically present with headache, seizures, and focal deficits. While the empty delta sign is specific, the gold standard for diagnosis is MR venography (MRV). Prompt treatment with anticoagulation (even in the presence of venous hemorrhage) is essential to prevent venous infarction and improve neurological outcomes.

PSYCHIATRY

Question 194. A patient reports the belief that his thoughts and feelings are being controlled or influenced by an external agency. What is this psychopathological phenomenon called?

A. Delusion of nihilism

B. Delusion of reference

C. Othello syndrome

D. Passivity

Correct answer: D

The belief that one's feelings, thoughts, or movements are being controlled or influenced by an external agency is known as a Passivity phenomenon (or delusion of control). This is one of

Schneider’s First-Rank Symptoms of schizophrenia. Delusion of nihilism (Option A, Cotard’s syndrome) involves the belief that one is dead or that the world doesn't exist. Delusion of reference (Option B) is the belief that neutral events (like news broadcasts) have a special, personal meaning meant only for the patient. Othello syndrome (Option C) is a delusion of morbid jealousy, where the patient is convinced of a partner's infidelity without cause. Passivity phenomena are highly diagnostic for psychotic disorders. The patient may feel like a "puppet," with their will being overridden by outside forces. Identifying these core psychotic features is essential for differentiating schizophrenia from other mental health conditions and starting appropriate antipsychotic management.

Question 195. Atypical antipsychotic with least metabolic side effects?

A. Haloperidol

B. Risperidone

C. Ziprasidone

D. Quetiapine

Correct answer: C

Second-generation (atypical) antipsychotics are generally associated with metabolic side effects like weight gain and diabetes. Among the options, Ziprasidone is known for having the least metabolic side effects, being largely weight-neutral. Haloperidol (Option A) is a first-generation antipsychotic; while it has low metabolic risk, it has very high risks of extrapyramidal side effects. Risperidone (Option B) and Quetiapine (Option D) have moderate-to-high risks of metabolic syndrome and weight gain. Clozapine and Olanzapine (not listed) have the highest risk. While ziprasidone is metabolic-safe, it carries a unique risk of dose-dependent QT interval prolongation, requiring cardiac monitoring in high-risk patients. For a patient already suffering from obesity or diabetes, choosing a "metabolic-friendly" drug like ziprasidone or aripiprazole is a critical part of holistic psychiatric management to ensure physical health along with mental stability.

Question 196. A patient presents to the hospital claiming to be experiencing a cardiac arrest. After a thorough medical evaluation, he is found to be physically healthy but refuses to leave the hospital. He reports a recent history of being held at gunpoint during a robbery. What is the most likely diagnosis in this case?

A. Acute stress disorder

B. Schizophrenia

C. Avoidant personality disorder

D. Delirium

Correct answer: A

The patient is presenting with acute psychological distress following a life-threatening traumatic event (being held at gunpoint). His irrational belief of having a "cardiac arrest" and refusal to leave the hospital are manifestations of the intense anxiety and hyperarousal seen in Acute Stress Disorder (ASD). ASD is diagnosed when symptoms occur within one month of the trauma. If symptoms persist beyond one month, the diagnosis changes to Post-Traumatic Stress Disorder (PTSD). Schizophrenia (Option B) is characterized by chronic hallucinations and delusions unrelated to a specific acute trauma. Avoidant personality disorder (Option C) is a long-term pattern of social inhibition. Delirium (Option D) involves an acute, fluctuating change in consciousness due to a medical cause. Management of ASD involves psychological first aid, trauma-focused therapy, and occasionally short-term benzodiazepines. The acute, trauma-linked nature of the symptoms is the key to this diagnosis.

Question 197. A patient receiving the antipsychotic haloperidol develops acute dystonia. What is the next best step in management?

A. Give Benztropine

B. Change to clozapine

C. Give Fluphenazine

D. Increase dose of haloperidol

Correct answer: A

Acute dystonia (involuntary muscle contractions, such as torticollis or oculogyric crisis) is a common and distressing extrapyramidal side effect of high-potency first-generation antipsychotics like Haloperidol. The next best step and standard acute treatment is the administration of an anticholinergic agent, such as Benztropine or Procyclidine, which rapidly reverses the muscle spasm. Fluphenazine (Option C) is another high-potency antipsychotic that would likely worsen the dystonia. Increasing the dose of haloperidol (Option D) is strictly contraindicated and would exacerbate the condition. Changing to clozapine (Option B) is a long-term strategy for refractory patients but is not the immediate treatment for an acute dystonic episode. After reversing the dystonia, the overall treatment plan should be reviewed, often by switching the patient to an atypical antipsychotic with lower extrapyramidal risk. Bedside recognition and rapid pharmacological reversal are essential for patient comfort and safety.

Question 198. A 6-year-old boy presents to the psychiatric outpatient department with inattention at school, hyperactivity (excessive talking and difficulty remaining seated), aggressive behavior

toward peers, and poor academic performance.
Which drug is indicated for the management of this condition?

A. Methylphenidate
B. Modafinil
C. Atenolol
D. Amitriptyline

Correct answer: A

The child's symptoms of inattention, hyperactivity (hitting friends, excess talking), and impulsivity (cannot sit still) causing functional impairment in school are classic for Attention-Deficit/Hyperactivity Disorder (ADHD). The first-line pharmacological treatment for ADHD in children aged 6 years and older is Methylphenidate, a CNS stimulant. It works by increasing the levels of dopamine and norepinephrine in the prefrontal cortex, helping to improve focus and impulse control. Modafinil (Option B) is used for narcolepsy. Atenolol (Option C) is a beta-blocker. Amitriptyline (Option D) is a tricyclic antidepressant; while sometimes used off-label for ADHD, it is never the first-line choice. Management of ADHD also requires behavioral interventions and parent training. Long-term use of stimulants requires monitoring for side effects like suppressed appetite and growth. Methylphenidate remains the gold-standard treatment for pediatric ADHD.

Question 199. A patient with schizophrenia, currently on antipsychotic medication, develops acute dystonia. What is the appropriate management for this patient?

A. Benzhexol
B. Replace with fluphenazine
C. Increase the dose of haloperidol
D. Clozapine

Correct answer: A

Acute dystonia is a common extrapyramidal side effect (EPS) of antipsychotic therapy. The appropriate management involves using an anticholinergic medication. Benzhexol (Trihexyphenidyl) is a standard anticholinergic drug used to treat and prevent dystonia and parkinsonian symptoms induced by antipsychotics. Fluphenazine (Option B) would likely worsen the EPS. Increasing the dose of haloperidol (Option C) is incorrect as it would increase the dopamine blockade responsible for the dystonia. Clozapine (Option D) is an atypical

antipsychotic used for treatment-resistant schizophrenia but is not the acute management for a dystonic crisis. Patients often receive these anticholinergics alongside their antipsychotic to maintain neurological stability. Clinicians must balance the benefits of symptom control with the anticholinergic side effects like dry mouth and blurred vision. Benzhexol remains a foundational tool in the management of antipsychotic side effects.

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