FMGE June 2021 Question Paper

192 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. Which label is incorrectly marked in the basal ganglia diagram?

A. Caudate nucleus

B. Globus pallidus

C. Putamen

D. External capsule

Correct answer: D

The correct answer is (D) External capsule, as it is incorrectly marked in the diagram. The external capsule is a thin white matter tract located lateral to the putamen and medial to the claustrum. In the figure, label D does not point to this thin white band; instead, it appears to indicate a broader cortical or subcortical region, making the labeling incorrect.

Other options are correctly marked:

(A)

Caudate nucleus is correctly identified. It lies adjacent to the lateral ventricle and appears as a curved gray matter structure along its margin, which matches the diagram.

(B)

Globus pallidus is also correctly labeled. It is situated medial to the putamen and forms the medial part of the lentiform nucleus, usually shown as a lighter shaded region.

(C)

Putamen is correctly marked as well. It lies lateral to the globus pallidus and is a major component of the basal ganglia, forming the outer part of the lentiform nucleus.

Thus, only the external capsule is mislabeled, while all other structures are accurately represented.

Question 2. Which of the following statements regarding the thoracolumbar fascia is incorrect?

A. They contain nociceptive nerve endings

B. In the lumbar region, it is in 4 layers

C. In the thoracic region, it is attached medially to the vertebrae

D. The anterior, posterior, and middle layers
join to form the aponeurotic origin of
transversus abdominis

Correct answer: B

The thoracolumbar fascia is a critical structural complex in the back, but statement B is incorrect because it consists of three layers in the lumbar region, not four. These are the anterior, middle, and posterior layers which envelop the psoas major, quadratus lumborum, and erector spinae muscles. Statement A is correct; the fascia is highly innervated with nociceptive and proprioceptive nerve endings, playing a significant role in chronic low back pain. Statement C is correct, as the fascia in the thoracic region is a thin fibrous layer attached medially to the thoracic spines. Statement D is also correct, as the three layers fuse laterally to form the aponeurotic origin of the transversus abdominis and internal oblique muscles. This fascia acts as a "nature's back brace," providing stability to the spine and facilitating load transfer between the upper and lower limbs. Understanding its trilaminar structure is essential for surgical approaches to the posterior abdominal wall.

Question 3. Which labeling is not correctly matched in the below image?

A. Superior thoracic artery
B. Thoracoacromial artery
C. Subscapular artery
D. Posterior circumflex artery

Correct answer: C

The axillary artery is divided into three parts by the pectoralis minor muscle, and each part gives off specific branches. Label A identifies the superior thoracic artery, which arises from the first part. Label B identifies the thoracoacromial artery, a major branch of the second part. Label D identifies the posterior circumflex humeral artery, which arises from the third part and passes through the quadrangular space. Label C is incorrectly matched if it fails to show the subscapular artery arising from the third part and dividing into the circumflex scapular and thoracodorsal arteries. The subscapular artery is the largest branch of the axillary artery and is vital for the collateral circulation around the scapula. Surgeons must accurately identify these vessels during axillary dissections for breast cancer or shoulder surgery to avoid hemorrhage. Mislabeling these branches complicates the understanding of the vascular supply to the upper limb and thoracic wall.

Question 4. What type of collagen is predominantly found in cartilage?

A. Type 1 collagen
B. Type 2 collagen

C. Type 10 collagen

D. Type 7 collagen

Correct answer: B

Cartilage is a specialized connective tissue, and its extracellular matrix composition varies by type. However, hyaline cartilage, which is the most abundant type in the body, predominantly contains Type 2 collagen fibers. This specific collagen provides the structural framework necessary to resist compressive forces within joints, the nose, and the respiratory tract. In contrast, Type 1 collagen is the primary component of bone, skin, and tendons, offering high tensile strength. Type 10 collagen is associated specifically with hypertrophic chondrocytes during endochondral ossification, marking the transition from cartilage to bone during growth. Type 7 collagen forms anchoring fibrils that secure the epidermis to the dermis at the basement membrane zone. Understanding these distribution patterns is fundamental for histology and pathology, as genetic defects in Type 2 collagen synthesis lead to skeletal dysplasias and early-onset osteoarthritis. Therefore, while various minor collagens exist in the matrix, Type 2 remains the defining structural protein of the cartilaginous framework.

6.

Corticospinal tract crosses at?

(A) Midbrain

(B) Pons

278. (B) 2 hours for liquids in adults.

According to the American Society of Anesthesiologists (ASA) guidelines, standardized NPO (nothing by mouth) times are mandated to ensure gastric emptying before anesthesia. The correct recommendation is 2 hours for clear liquids in adults (Option B). This applies to water, fruit juices without pulp, and clear tea. Option A is incorrect because 6 to 8 hours is the required time for solids in adults. For infants, the specific rules are: 4 hours for

breast milk (Option C is incorrect as it says 2 hours) and 6 hours for infant formula or solids (Option D is incorrect). These protocols are strictly enforced to prevent the life-threatening complication of Mendelson's syndrome (aspiration of gastric contents). Therefore, the 2-hour window for clear liquids is the only accurately stated guideline among the choices provided.

While observing anesthesia equipment in the operating theater, a specific vaporizer is in use. Which of the following gases is it most likely designed to contain?

(A) Desflurane

(B) Halothane

(C) Sevoflurane

(D) Isoflurane

279. (A) Desflurane.

Anesthesia equipment uses a universal color-coding system to prevent medication errors. A vaporizer with a blue color-coded dial or housing is designed exclusively for Desflurane (Option A). Desflurane requires a specialized heated and pressurized vaporizer (like the Tec 6) due to its extremely high vapor pressure and boiling point near room temperature. Halothane (Option B) is color-coded red. Sevoflurane (Option C) is color-coded yellow. Isoflurane (Option D) is color-coded purple. Identifying these colors is a fundamental safety skill for anesthetists. Since the vaporizer in the image is marked with the blue distinctive color of Desflurane, that is the gas it comprises. This visual identification

ensures that the correct agent is matched to its corresponding calibrated delivery device.

Which of the following beta blockers has a short duration of action?

(A)

Nadolol

(B)

Propranolol

(C)

Esmolol

(D)

Atenolol

280. (C) Esmolol.

Esmolol (Option C) is an ultra-short-acting cardioselective beta-1 antagonist with a half-life of only 9 minutes. It is rapidly hydrolyzed by red blood cell esterases, which allows for very precise titration when given intravenously. This makes it the drug of choice for managing acute perioperative hypertension or tachycardia.

Nadolol (Option A) is a long-acting beta-blocker with a half-life of 20–24 hours, requiring only once-daily dosing. Propranolol (Option B) is a non-selective agent with an intermediate duration of 3–6 hours. Atenolol (Option D) is also an intermediate-to-long-acting cardioselective agent. Because Esmolol's effects are almost immediately reversible by stopping the infusion, it provides a unique safety advantage in unstable patients. Therefore, Esmolol is the definitive answer for the shortest-acting beta-blocker.

A 30-year-old man presents with a gradually enlarging swelling near the wrist joint over the past three months. Based on the X-ray findings shown, what is the most likely diagnosis?

(A)

Ewing's sarcoma

(B)

Osteosarcoma

(C)

Osteoclastoma

(D)
Osteochondroma
281. (C) Osteoclastoma.
The X-ray displays an expansile, multi-loculated lytic lesion in the epiphysis of the distal radius, classically described as having a "soap-bubble" appearance. The lesion extends right up to the subchondral bone (articular surface). These are pathognomonic radiological features of Osteoclastoma, also known as a Giant Cell Tumor (GCT) (Option C). GCT is typically seen in young adults (ages 20–40) and is locally aggressive. Ewing’s sarcoma (Option A) presents with an "onion-skin" periosteal reaction in the diaphysis of long bones. Osteosarcoma (Option B) would show a "sunburst" periosteal reaction and a Codman’s triangle. Osteochondroma (Option D) appears as a bony outgrowth on a stalk (exostosis). Therefore, the subarticular location and soap-bubble morphology confirm Osteoclastoma as the definitive diagnosis.
A 34-year-old man reports progressive low back pain and morning stiffness for the past six months, with relief on physical activity. He also has a known history of ulcerative colitis. Based on the X-ray of the lumbar spine shown, what is the most likely diagnosis?
(A)
Pott's spine
(B)
Psoriatic arthritis
(C)
Ankylosing spondylitis
(D)
Rheumatoid arthritis

Question 5. 5.
A. Midbrain
B. Pons
C. Upper medulla
D. Lower medulla

Correct answer: D

The corticospinal tract is the primary descending pathway responsible for voluntary motor control. The axons originate in the motor cortex, descend through the internal capsule, midbrain (basis pedunculi), and pons. Upon reaching the medulla, they form the pyramids. The critical anatomical event, the decussation of the pyramids, occurs in the lower medulla. Approximately 80-90% of the fibers cross to the opposite side to form the lateral corticospinal

Question 6. tract, which descends in the lateral white column of the spinal cord. The remaining uncrossed fibers form the anterior corticospinal tract. This decussation is the reason why a lesion in the motor cortex on one side of the brain results in motor deficits on the contralateral (opposite) side of the body. Understanding the level of crossing is vital for clinical localization of spinal cord and brainstem lesions. Lesions above the lower medulla cause contralateral hemiparesis, while lesions below this level in the spinal cord result in ipsilateral motor deficits.

Which artery provides the primary arterial supply to the palatine tonsils?

A. Tonsillar branch of the facial artery

B. Descending palatine branch of maxillary artery

C. Buccal branch of maxillary artery

D. Ascending palatine branch of facial artery

Correct answer: A

The palatine tonsil receives a rich, multi-source arterial supply, but its primary and most significant source is the tonsillar branch of the

facial artery. This artery reaches the tonsil by piercing the superior constrictor muscle. Other contributors include the ascending palatine branch of the facial artery (Option D), the descending palatine branch of the maxillary artery (Option B), the dorsal lingual branches of the lingual artery, and the ascending pharyngeal artery. The buccal branch of the maxillary artery (Option C) supplies the cheek and buccinator muscle rather than the tonsillar lymphoid tissue. Knowledge of this vascular anatomy is crucial during tonsillectomy, as the tonsillar branch of the facial artery is the most common source of significant intraoperative or postoperative primary hemorrhage. Identifying and ligating these vessels within the tonsillar bed is a standard surgical priority to ensure patient safety and prevent complications like airway obstruction or aspiration of blood.

A young individual sustains a head injury following a road traffic accident and subsequently develops marked behavioral changes. These include excessive curiosity, compulsive touching of objects, rapid memory loss, a tendency to place non-food items in the mouth, and inappropriate sexual behaviors such as genital manipulation. Damage to which brain structure is most likely responsible for this presentation?

(A)

Gray matter around the aqueduct of Sylvius

(B)

Amygdala

(C)

Lateral nuclei of the hypothalamus

(D)

Anterior cingulate gyri

Question 7. 7.

A. Gray matter around the aqueduct of Sylvius

B. Amygdala

C. Lateral nuclei of the hypothalamus

D. Anterior cingulate gyri

Correct answer: B

The clinical presentation described is diagnostic of Klüver-Bucy syndrome, which results from bilateral lesions or injury to the anterior temporal lobes, specifically involving the amygdala. The hallmark symptoms include hyperorality (mouthing objects), hypersexuality (genital squeezing or inappropriate behavior), visual agnosia (excessive curiosity/touching to identify objects), and docility or diminished fear response. Rapid forgetfulness also points to temporal lobe involvement. Option A, the periaqueductal gray, is involved in pain modulation and defensive

Question 8. Which element acts as the cofactor for the enzyme glutathione peroxidase?

A. Manganese

B. Selenium

C. Copper

D. Magnesium

Correct answer: B

Glutathione peroxidase is a vital antioxidant enzyme that protects cells from oxidative damage by catalyzing the reduction of hydrogen peroxide and lipid hydroperoxides. Its structural and functional integrity depends on selenium, which is incorporated into the enzyme as the amino acid selenocysteine at the active site. Manganese (Option A) is a cofactor for mitochondrial superoxide dismutase (Mn-SOD). Copper (Option C) and Zinc are cofactors for the cytosolic version of superoxide dismutase (CuZn-SOD) and are also essential for cytochrome c oxidase. Magnesium (Option D) is a ubiquitous cofactor for almost all enzymes utilizing ATP, such as hexokinase. Selenium deficiency can lead to Keshan disease (a cardiomyopathy), primarily because of the resulting impairment in glutathione peroxidase activity and increased oxidative stress. This biochemical relationship highlights the importance of trace elements in the body's endogenous defense mechanisms against reactive oxygen species, a frequent theme in biochemistry and nutritional science examinations.

Question 9. behavior, not complex social/sexual changes. Option C, the lateral hypothalamus, regulates hunger; its lesion causes anorexia. Option D, the anterior cingulate gyri, are involved in emotional processing and attention, but lesions

there do not produce the specific Klüver-Bucy triad. In the context of a road traffic accident, traumatic brain injury with bilateral temporal contusions is the most likely cause. Management is primarily supportive, focusing on behavioral stabilization and safety due to the patient's lack of social inhibition and poor judgment.

Among the listed laryngeal cartilages, which is least prone to calcification?

A. Thyroid

B. Cricoid

C. Arytenoid

D. Epiglottis

Correct answer: D

The laryngeal cartilages are composed of either hyaline or elastic cartilage, and this histological difference determines their tendency to calcify with age. The thyroid (Option A), cricoid (Option B), and the majority of the arytenoid (Option C) cartilages consist of hyaline cartilage. Hyaline cartilage characteristically undergoes calcification and even ossification as a normal part of the aging process, which can be visible on radiographic imaging. In contrast, the epiglottis, corniculate, and cuneiform cartilages are composed of elastic cartilage. Elastic cartilage contains a high density of elastic fibers and does not typically undergo calcification regardless of age. This flexibility is essential for the epiglottis to function as a lid during swallowing. Clinically, understanding this pattern is important because a calcified thyroid cartilage on an X-ray can be mistaken for a foreign body by an inexperienced clinician, whereas the epiglottis remains radiolucent throughout life due to its elastic nature.

Which tooth is the first to erupt in the primary dentition?

(A)

Upper central incisor

(B)
Lower central incisor
(C)
Upper canine
(D)
Lower canine

Question 10. 9.
A. Upper central incisor
B. Lower central incisor
C. Upper canine
D. Lower canine
Correct answer: B
In the normal chronological sequence of dental development, the mandibular (lower) central incisors are the first teeth to erupt into the oral cavity. This typically occurs between the ages of 6 and 10 months. They are followed shortly by the maxillary (upper) central incisors (Option A) at approximately 8 to 12 months. The lateral incisors usually erupt next, followed by the first primary molars. The canines (Options C and D) erupt much later, generally between 16 and 22 months of age. The primary (deciduous) dentition consists of 20 teeth in total. Monitoring

Question 11. the eruption sequence is a key part of pediatric health surveillance, as significant delays or deviations from the normal pattern can indicate systemic conditions, nutritional deficiencies, or localized dental obstructions. Parents often seek guidance during this "teething" phase, which is marked by increased salivation and irritability. Therefore, the lower central incisor marks the functional beginning of the primary dentition.
Which variety of cartilage generally does not show calcification as a normal age-related change?
A. Thyroid
B. Arytenoid

C. Epiglottis

D. Cricoid

Correct answer: C

This question reinforces the histological distinction between laryngeal cartilage types and their reaction to the aging process. The thyroid, cricoid, and the base of the arytenoid are hyaline cartilages. Hyaline cartilage is prone to endochondral ossification and calcification beginning in the third decade of life. By contrast, the epiglottis is composed of elastic cartilage, characterized by an abundance of elastic fibers in its matrix. Elastic cartilage is designed for high flexibility and resilience; it does not calcify with age. This property ensures that the epiglottis remains pliable enough to fold over the laryngeal inlet during deglutition throughout a person's lifespan. Options A, B, and D are all hyaline structures that will progressively harden and become more radiopaque over time. Clinically, the calcification of hyaline laryngeal cartilages can sometimes interfere with surgical procedures or be misinterpreted on computed tomography scans of the neck, whereas the epiglottis consistently retains its cartilaginous, non-calcified density.

Which statement regarding the structure and composition of bone is incorrect?

(A)

Osteocytes are the major cell type in mature bone

(B)

Collagen is synthesized in bone osteoblasts

(C)

Bone mainly contains type 2 collagen

(D)

Calcium phosphate is one of the major inorganic minerals

Question 12. 11. (C) Epiglottis.
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non-calcified density.

Which statement regarding the structure and composition of bone is incorrect?

A. Osteocytes are the major cell type in mature bone

B. Collagen is synthesized in bone osteoblasts

C. Bone mainly contains type 2 collagen

D. Calcium phosphate is one of the major inorganic minerals

Correct answer: C

In bone histology and biochemistry, the
organic matrix (osteoid) is primarily composed

of Type 1 collagen fibers, not Type 2. Type 1 collagen provides the high tensile strength required for skeletal integrity. Type 2 collagen is characteristic of cartilage, not bone. Statement A is true; osteocytes, which are trapped osteoblasts within lacunae, are the most numerous and long-lived cells in mature bone. Statement B is true; osteoblasts are the cells responsible for the synthesis and secretion of the organic bone matrix, including collagen and non-collagenous proteins. Statement D is true; the inorganic component of bone consists mainly

Question 13. of hydroxyapatite crystals, which are a form of calcium phosphate, providing compressive strength. Understanding that bone is a Type 1 collagen-based tissue is critical for diagnosing conditions like Osteogenesis Imperfecta, which results from mutations in Type 1 collagen genes. Therefore, Option C is the only false statement among the provided choices regarding bone composition.

What does the neostriatum consist of?

A. Caudate nucleus and globus pallidus

B. Globus pallidus and putamen

C. Globus pallidus and lentiform nucleus

D. Caudate nucleus and putamen

Correct answer: D

The basal ganglia are organized into functional and phylogenetic groups. The "neostriatum" (or simply the striatum) consists of the caudate nucleus and the putamen. These two structures share the same embryological origin and histological appearance, characterized by medium spiny neurons that receive the majority of inputs to the basal ganglia. The "paleostriatum" refers to the globus pallidus. The putamen and globus pallidus together are anatomically

referred to as the "lentiform nucleus," which is a lens-shaped mass. Thus, the neostriatum (caudate and putamen) serves as the primary "input" station, while the globus pallidus (paleostriatum) serves as the primary "output" station of the basal ganglia circuitry. Lesions or neurodegeneration in the neostriatum, such as the loss of GABAergic neurons in Huntington's disease, lead to hyperkinetic movement disorders. Accurate terminology is essential for understanding neuroanatomy and the pathophysiological basis of movement disorders commonly tested in medical examinations.

Injury to which brain structure would most likely result in excessive sexual behavior, increased appetite, heightened aggression, and loss of normal fear responses?

(A)
Amygdala

(B)
Thalamus

(C)
Cingulate gyrus

(D)
Hypothalamus

Question 14. 13. (D) Caudate nucleus and putamen. The basal ganglia are organized into functional and phylogenetic groups. The "neostriatum" (or simply the striatum) consists of the caudate nucleus and the putamen. These two structures share the same embryological origin and histological appearance, characterized by medium spiny neurons that receive the majority of inputs to the basal ganglia. The "paleostriatum" refers to the globus pallidus. The putamen

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Injury to which brain structure would most likely result in excessive sexual behavior, increased appetite, heightened aggression, and loss of normal fear responses?

A. Amygdala

B. Thalamus

C. Cingulate gyrus

D. Hypothalamus

Correct answer: A

Injury to the amygdala classically produces features of Klüver–Bucy syndrome, which includes hypersexuality, hyperphagia (increased appetite), heightened aggression or placidity, and loss of normal fear responses. The amygdala plays a key role in processing emotions such as fear, aggression, and sexual behavior, so its damage disrupts these functions.

Other options are incorrect:

(B) Thalamus acts mainly as a sensory relay center, transmitting sensory and motor signals to the cerebral cortex. Damage to it leads to sensory deficits or altered

Question 15. 15. (B) Vitamin C.

Iron absorption occurs mainly in the duodenum and proximal jejunum and is strongly influenced by the oxidation state of iron. Dietary non-heme iron is predominantly present in the ferric (Fe^{3+}) form, which is poorly absorbed. For absorption to occur, ferric iron must be reduced to the ferrous (Fe^{2+}) form, which can then be transported across the intestinal mucosa via Divalent Metal Transporter-1 (DMT1).

Vitamin C (ascorbic acid) plays a crucial role in this process. It acts as a powerful reducing agent, converting Fe^{3+} to Fe^{2+}, thereby enhancing iron solubility and absorption.

This is why vitamin C markedly increases the bioavailability of non-heme iron.

Why the other options are incorrect:

1. Calcium (Option A): Inhibits iron absorption when taken simultaneously in large amounts

2. Vitamin D (Option C): Regulates calcium and phosphate metabolism, not iron absorption

3. Vitamin K (Option D): Required for synthesis of clotting factors and bone health.

In the lungs, which type of cells are responsible for the secretion of surfactant?

A. Type 1 pneumocyte

B. Alveolar macrophage

C. Dust cells

D. Type 2 pneumocyte

Correct answer: D

The alveolar epithelium consists of two main cell types. Type 2 pneumocytes are cuboidal cells

that serve as the "caretakers" of the alveoli; they are responsible for the synthesis, storage, and secretion of pulmonary surfactant. Surfactant is a lipoprotein complex that reduces surface

Question 16. tension at the air-liquid interface, preventing alveolar collapse (atelectasis) at the end of expiration. Type 1 pneumocytes (Option A) are thin, squamous cells that cover about 95% of the alveolar surface and are optimized for gas exchange. Alveolar macrophages, also known as "dust cells" (Options B and C), are the primary immune cells of the distal airway, responsible for phagocytosing inhaled particles and pathogens. Clinically, a deficiency in surfactant production by Type 2 pneumocytes in premature infants leads to Infant Respiratory Distress Syndrome (IRDS). Furthermore, Type 2 cells act as progenitor cells; following lung injury, they proliferate and differentiate into Type 1 cells to restore the alveolar lining.

Under normal physiological conditions, why is hemoglobin unable to pass through the glomerular filtration barrier?

A. It is a large molecule bound with another protein

B. It gets attracted to the negative charge of the glomerular filtration barrier

C. Both A and B

D. None of the above

Correct answer: A

protein. Under normal physiological conditions, hemoglobin is contained within red blood cells

and does not reach the glomerular filtrate. However, if free hemoglobin is present in the plasma due to mild hemolysis, it is rapidly bound by a plasma protein called haptoglobin. This hemoglobin-haptoglobin complex is too large to pass through the pores of the glomerular filtration barrier, thus preventing hemoglobinuria and protecting the renal tubules from oxidative damage. Option B is incorrect because the glomerular filtration barrier is negatively charged due to heparin sulfate proteoglycans, which "repels" rather than attracts negatively charged proteins like albumin or hemoglobin. Therefore, "Both A and B" (Option C) is incorrect as statement B is physiologically backwards. Hemoglobinuria only occurs when the hemolytic rate exceeds the binding capacity of haptoglobin (haptoglobin depletion), allowing free hemoglobin dimers to be filtered. This distinction is critical in hematology and nephrology for differentiating between various hemolytic anemias and mechanical trauma to red cells.

Which of the following substances does not usually show a reduction in concentration as the filtrate passes through the proximal convoluted tubule (PCT)?

(A)
Amino-acid

(B)
Glucose

(C)
Chloride

(D)
Bicarbonate

Question 17. Which of the following substances does not usually show a reduction in concentration as the filtrate passes through the proximal convoluted tubule (PCT)?

A. Amino-acid
B. Glucose
C. Chloride
D. Bicarbonate

Correct answer: C

The proximal convoluted tubule (PCT) is responsible for the bulk reabsorption of filtered solutes. Substances like glucose (Option B) and amino acids (Option A) are almost 100% reabsorbed in the early PCT via sodium-linked cotransporters, causing their concentration in the tubular fluid to drop precipitously. Bicarbonate (Option D) is also preferentially reabsorbed in the early PCT, leading to a decrease in its concentration. In contrast, chloride (Option C) is not actively reabsorbed in the very first segment of the PCT; instead, as water and other solutes are removed, the concentration of chloride actually "increases" slightly in the tubular fluid. It is only later in the PCT that chloride is reabsorbed down its concentration gradient through paracellular and transcellular pathways. Therefore, on a "TF/P" (Tubular Fluid/Plasma concentration) graph, glucose and amino acids show the sharpest decline, while chloride is the only substance among the choices that remains above a ratio of 1.0 throughout the PCT.

BIOCHEMISTRY

Question 18. Does Von Gierke's disease involve a deficiency of which enzyme?

A. Liver phosphorylase
B. Lysosomal glucosidase
C. Hepatic glycogen synthase
D. Glucose 6-phosphatase

Correct answer: D

Von Gierke's disease, also known as Glycogen Storage Disease Type I (GSD I), is caused by a deficiency of the enzyme glucose 6-phosphatase. This enzyme is essential for the final step of both glycogenolysis and gluconeogenesis, as it converts glucose 6-phosphate into free glucose in the liver and kidneys. Without it, patients experience severe fasting hypoglycemia, hepatomegaly (due to glycogen accumulation), hyperuricemia, and lactic acidosis. Liver phosphorylase deficiency (Option A) causes GSD Type VI (Hers disease), which is generally milder. Lysosomal alpha-glucosidase deficiency (Option B) causes GSD Type II (Pompe disease),

characterized by cardiomegaly and muscle weakness. Hepatic glycogen synthase deficiency (Option C) is known as GSD Type 0, which results in decreased glycogen stores rather than accumulation. Understanding these enzymatic defects is fundamental for metabolic biochemistry and pediatrics. Von Gierke's requires frequent feedings with uncooked cornstarch to maintain stable blood glucose levels and prevent life-threatening hypoglycemic episodes and metabolic derangements.

Question 19. Deficiency of which enzyme leads to the development of Maple Syrup Urine Disease (MSUD)?

A. Branched-chain a-ketoacid dehydrogenase

B. Isovaleryl CoA dehydrogenase

C. Pyruvate carboxylase

D. Acetyl CoA carboxylase

Correct answer: A

Maple Syrup Urine Disease (MSUD) is an autosomal recessive metabolic disorder caused by a deficiency in the branched-chain alpha-ketoacid dehydrogenase (BCKAD) complex. This enzyme complex is responsible for the oxidative decarboxylation of the ketoacids derived from the three branched-chain amino acids (BCAAs): Leucine, Isoleucine, and Valine. A defect here leads to the accumulation of these BCAAs and their toxic alpha-ketoacid byproducts, which impart a characteristic sweet, maple syrup odor to the patient's urine and earwax. Isovaleryl CoA dehydrogenase deficiency (Option B) causes Isovaleric Acidemia, which presents with a "sweaty feet" odor. Pyruvate carboxylase (Option C) and Acetyl CoA carboxylase (Option D) are involved in gluconeogenesis and fatty acid synthesis, respectively, and are not related to BCAA metabolism. MSUD is a pediatric emergency; if untreated, the leucine accumulation causes severe cerebral edema and neurological damage. Treatment involves a strict life-long diet restricted in BCAAs and specialized medical formulas.

Question 20. Deficiency of which vitamin is most commonly linked to cognitive decline in elderly individuals?

A. Vitamin C

B. Vitamin B12

C. Vitamin B6

D. Vitamin B1

Correct answer: B

In geriatric medicine, Vitamin B12 (cobalamin) deficiency is a frequent and reversible cause of cognitive impairment and dementia-like symptoms. The elderly are particularly susceptible due to a high prevalence of atrophic gastritis, which reduces the production of intrinsic factor and gastric acid needed for B12 absorption. Clinically, it presents as "megaloblastic madness,"

involving memory loss, irritability, and depression, often preceding the classic hematological finding of megaloblastic anemia. Vitamin C deficiency (Option A) causes scurvy but not primary dementia. Vitamin B6 (Option C) is involved in neurotransmitter synthesis, but its isolated deficiency is rare. Vitamin B1 (thiamine) deficiency (Option D) causes Wernicke-Korsakoff syndrome, which involves severe amnesia and confabulation, typically in the context of chronic alcoholism rather than general aging. Screening for B12 levels is a standard step in the workup for any elderly patient presenting with new-onset cognitive decline, as timely supplementation can halt or reverse neurological deterioration.

Question 21. A 4-year-old child presents with self-mutilating behavior such as biting the lips and fingers, delayed developmental milestones, hyperuricemia, and a family history of similar symptoms in male relatives. Deficiency of which enzyme is most likely responsible for this condition?

A. Purine nucleoside phosphorylase

B. Hypoxanthine-guanine phosphoribosyl transferase

C. Adenine phosphoribosyl transferase

D. Adenosine deaminase

Correct answer: B

The clinical presentation of self-mutilation (biting lips and fingers), developmental delay, and hyperuricemia in a young male is diagnostic of Lesch-Nyhan syndrome. This X-linked recessive disorder is caused by a complete deficiency of the enzyme hypoxanthine-guanine phosphoribosyl transferase (HGPRT). HGPRT is essential for the purine salvage pathway; its absence leads to the massive overproduction of uric acid and neurological dysfunction through poorly understood mechanisms. Purine nucleoside phosphorylase deficiency (Option A) and Adenosine deaminase deficiency (Option D) cause forms of Severe Combined Immunodeficiency (SCID), not self-mutilation. Adenine phosphoribosyl transferase deficiency (Option C) results in 2,8-dihydroxyadenine urolithiasis (kidney stones). Lesch-Nyhan is characterized by "orange sand" (uric acid crystals) in the diaper during infancy. Management includes allopurinol to

control hyperuricemia and prevent gout/stones, but there is no effective treatment for the severe behavioral and neurological components. The family history in male cousins reinforces the X-linked inheritance pattern.

Question 22. Which of the following factors are involved in maintaining and regulating calcium levels in the blood?

A. Calcitonin

B. Parathormone

C. Vitamin D

D. All the above

Correct answer: D

Blood calcium homeostasis is a tightly regulated process involving three primary hormones. Parathormone (PTH), secreted by the parathyroid glands, is the most important regulator for "increasing" blood calcium; it stimulates bone resorption, renal calcium reabsorption, and the activation of Vitamin D. Vitamin D (Option C), specifically its active form calcitriol, increases calcium levels by promoting its absorption from the small intestine. Calcitonin (Option A), secreted by the parafollicular C-cells of the thyroid, acts as a physiological antagonist to PTH by "decreasing" blood calcium through the inhibition of bone-resorbing osteoclasts. While calcitonin plays a smaller role in daily human calcium regulation compared to PTH, it is still a recognized component of the regulatory system. Together, these substances ensure that ionized calcium remains within a narrow physiological range, which is critical for muscle contraction, nerve conduction, and blood coagulation. Therefore, the combination of all three factors (Option D) constitutes the complete regulatory machinery for serum calcium.

Question 23. A 30-year-old woman complains of generalized body aches, fatigue, and difficulty standing. Neurological examination shows impaired vibration sense and proprioception, and laboratory tests reveal a low hemoglobin level. Based on these findings, what is the most appropriate treatment to administer?

A. Vitamin B1

B. Vitamin C

C. Vitamin B12

D. Vitamin D

Correct answer: C

The patient presents with the classic triad of Megaloblastic Anemia (Hb 7 g/dL) and Subacute Combined Degeneration of the spinal cord (SCD). The loss of vibration sense and proprioception indicates damage to the posterior columns of the spinal cord, which is pathognomonic for severe Vitamin B12 deficiency. SCD can also involve the lateral corticospinal tracts, causing spasticity. Vitamin B1 deficiency (Option A) causes Wernicke's encephalopathy (ataxia, confusion) or Beriberi but does not typically cause megaloblastic anemia or isolated posterior column loss. Vitamin C (Option B) deficiency causes scurvy (bleeding gums). Vitamin D (Option D) deficiency causes osteomalacia (bone pain), which might explain "body pain," but does not account for the specific neurological deficits or anemia. In such cases, Vitamin B12 must be administered parenterally (intramuscularly) to bypass potential malabsorption (like Pernicious Anemia). Clinicians must be careful to exclude B12 deficiency before giving folic acid, as folic acid can correct the anemia while allowing the neurological damage to progress.

Question 24. Which of the following characteristics accurately describes Taenia solium?

A. Eggs are not infective to man

B. Hooks are absent

C. The eggs do not float in saturated salt solution

D. Intermediate host is cow

Correct answer: C

Taenia solium (the pork tapeworm) has several distinct features. Statement C is correct; its eggs are "heavy" and do not float in a saturated salt solution during fecal concentration tests. Statement A is incorrect because the "eggs are highly infective to man," leading to cysticercosis (larval infection) if ingested. This distinguishes it from T. saginata, whose eggs are not infective to humans. Statement B is incorrect; T. solium is an "armed tapeworm," meaning it has a rostellum with two rows of "hooks" for attachment. T. saginata lacks hooks. Statement D is incorrect; the intermediate host for T. solium is the "pig," while the cow is the intermediate host for T. saginata. Understanding these differences is vital for diagnosing neurocysticercosis, which is a major cause of adult-onset seizures in developing countries.

Question 25. Which element plays a key role in the activation of the complement system via the alternative pathway?

A. C1

B. C2

C. C3

D. C4

Correct answer: C

The alternative complement pathway is a key component of innate immunity and is unique because it is antibody-independent. It is continuously active at a low level through a process known as “C3 tick-over.”

In this pathway, C3 undergoes spontaneous hydrolysis, generating C3b, which can bind directly to the surfaces of pathogens. This binding initiates the formation of the alternative pathway C3 convertase (C3bBb), which cleaves additional C3 molecules and creates a powerful amplification loop of complement activation.

Why the other options are incorrect:

1.

C1 (Option A), C4 (Option D), and C2 (Option B) are components of the classical and lectin pathways, not the alternative pathway. In those pathways, they form the C3 convertase C4b2a after antibody or lectin binding.

2.

Because C3 is the central component where all complement pathways converge, deficiency of C3 leads to severe, recurrent pyogenic infections due to impaired opsonization and complement activation.

Thus, C3 is the crucial element involved in activation of the complement through the alternative pathway.

PATHOLOGY

Question 26. Which color-coded waste bag is used for the disposal of waste that is treated by incineration?

A. Yellow

B. Red

C. Blue

D. Black

Correct answer: A

Under the Biomedical Waste Management rules, color-coding is used to segregate waste for appropriate treatment and disposal. The "Yellow Bag" is designated for infectious waste intended for deep burial or high-temperature incineration. This includes human anatomical waste (organs, tissues), animal waste, soiled waste (blood-soaked cotton, dressings), and expired/discarded medicines. The "Red Bag" (Option B) is used for recyclable plastic waste (tubing, bottles, gloves) which is treated via autoclaving or microwaving rather than incineration. The "Blue Bag/Cardboard box" (Option C) is for glass waste and metallic body implants. The "Black Bag" (Option D) was historically used for general municipal waste but is now largely replaced by translucent or green/blue containers for non-infectious waste in clinical

settings. Proper segregation in yellow bags ensures that highly infectious materials are completely destroyed, preventing environmental contamination and the spread of healthcare-associated infections through the safe process of controlled combustion.

Question 27. What is the Orthotolidine test used to determine?

A. Nitrates in water

B. Nitrites in water

C. Free and combined chlorine in water

D. Ammonia content in water

Correct answer: C

The Orthotolidine (OT) test is a standard colorimetric method used in public health to monitor the effectiveness of water chlorination. When the OT reagent is added to chlorinated water, it reacts with chlorine to produce a yellow color; the intensity of the color is then compared against standard discs to quantify the chlorine levels. Specifically, a reading taken after 5 seconds estimates the "free residual chlorine," while a reading after 5 minutes estimates the "total chlorine" (free plus combined). Nitrates (Option A) and Nitrites (Option B) are typically measured using the Griess test or specialized sensors. Ammonia (Option D) is often determined using the Nesslerization method or the phenate method. While the OT test is simple and fast, it has been largely superseded by the DPD (N,N-diethyl-p-phenylenediamine) test in modern settings because OT can give false positives in the presence of iron, manganese, or nitrites. Nonetheless, OT remains a classic test for ensuring water safety.

Question 28. Identify the category of immunoglobulin depicted in the provided image.

A. IgA

B. IgG

C. IgM

D. IgE

Correct answer: A

The image shows two Y-shaped immunoglobulin molecules joined together, forming a dimer, which is the characteristic structure of secretory IgA. IgA is commonly found in mucosal secretions such as saliva, tears, colostrum, and intestinal fluids. It consists of two monomer units linked by a J (joining) chain, and often a secretory component that helps protect it from enzymatic degradation. This dimeric form is essential for its role in mucosal immunity, where it prevents pathogen attachment and invasion.

Other options are incorrect:

(B)

IgG is a monomer, consisting of a single Y-shaped unit, and is the most abundant immunoglobulin in blood circulation.

(C)

IgM is a pentamer, made up of five Y-shaped units arranged in a circular or star-like pattern, not a dimer.

(D)

IgE is also a monomer, structurally similar to IgG, and is mainly involved in allergic reactions and parasitic infections.

Thus, the dimeric structure clearly identifies the immunoglobulin as IgA.

Question 29. A patient develops flaccid bullae over the trunk along with involvement of the oral mucosa. A Tzanck smear from the lesion shows the presence of acantholytic cells. What is the most likely diagnosis based on these findings?

A. Pemphigus foliaceus

B. Pemphigus vulgaris

C. Dermatitis herpetiformis

D. Bullous pemphigoid

Correct answer: B

Pemphigus vulgaris is a severe autoimmune blistering disease caused by IgG antibodies against desmoglein 3 (and often desmoglein 1), which are proteins that hold epidermal cells together. This leads to "acantholysis"—the loss of intercellular connections—resulting in "flaccid bullae" that rupture easily to leave painful erosions. Oral involvement is the most common presenting sign, appearing in nearly all cases. Pemphigus foliaceus (Option A) is a more superficial form that "spares" the mucous membranes. Bullous pemphigoid (Option D) involves subepidermal blisters that are "tense" and typically negative for acantholytic cells on Tzanck smear. Dermatitis herpetiformis (Option C) presents with extremely itchy, small, grouped vesicles on the elbows and knees, associated with celiac disease. The Tzanck smear showing "acantholytic cells" (rounded-up keratinocytes) and the involvement of the trunk and mouth are the classic diagnostic markers for Pemphigus vulgaris. Management requires systemic corticosteroids and immunosuppressants to prevent life-threatening fluid loss and sepsis.

Question 30. A woman presents with fever and a typical malar rash. Echocardiographic examination reveals vegetations on both surfaces of the heart valves. Based on these clinical and investigative findings, what is the most likely diagnosis?

A. Infective endocarditis

B. Libman-Sacks endocarditis

C. Non-bacterial thrombotic endocarditis

D. Rheumatic heart disease

Correct answer: B

The patient exhibits systemic signs of Systemic Lupus Erythematosus (SLE), specifically the fever and the characteristic "malar (butterfly) rash". In the context of SLE, the specific type of cardiac involvement described—small, sterile vegetations located on "both sides" (surfaces) of the heart valves or chordae tendineae—is known as Libman-Sacks endocarditis. Infective endocarditis (Option A) typically presents with larger, friable vegetations and positive blood cultures, usually only on the flow-facing side of the valve. Non-bacterial thrombotic endocarditis (Option C) involves sterile vegetations but is usually associated with advanced cancers (marantic endocarditis) rather than SLE and rashes. Rheumatic heart disease (Option D) typically shows "verrucae" along the lines of closure of the valves and is preceded by a streptococcal infection. Libman-Sacks vegetations are composed of immune complexes and fibrin; while often asymptomatic, they can occasionally lead to valve dysfunction or embolic events. This association with "both sides of the valves" is a classic pathognomonic description in pathology exams.

Question 31. A patient presents with lethargy, excessive sleepiness, and weight gain. Laboratory evaluation shows low plasma TSH along with reduced T3 and T4 levels, but TSH levels rise after administration of TRH. Based on these findings, what is the most likely diagnosis?

A. Hyperthyroidism due to disease in the pituitary

B. Hypothyroidism due to disease in the pituitary

C. Hypothyroidism due to disease in the hypothalamus

D. Hyperthyroidism due to disease in the hypothalamus

Correct answer: C

The patient’s symptoms of lethargy and weight gain combined with low T3 and T4 confirm "hypothyroidism". A low or inappropriately normal TSH in the setting of low T4 indicates "central" hypothyroidism (either pituitary or hypothalamic origin). To distinguish between the

two, a TRH stimulation test is used. If the TSH level "increases" following TRH administration, it demonstrates that the pituitary gland is healthy and capable of responding, but it was not receiving endogenous TRH from the brain. Therefore, the primary defect lies in the "hypothalamus" (Tertiary Hypothyroidism). If the TSH had failed to increase, the diagnosis would be pituitary disease (Secondary Hypothyroidism, Option B). Options A and D are incorrect because the patient’s labs and clinical picture represent a deficiency (hypo) rather than an excess (hyper) of thyroid hormone. This diagnostic logic is a cornerstone of endocrinology for localizing the exact level of axis failure.

Examination Paper June 2021 Question

Question 32. A 30-year-old woman presents with fatigue and pallor. Laboratory investigations reveal a hemoglobin level of 9.8 g/dL with a markedly increased MCV of 160 fL, while serum methylmalonyl-CoA levels are normal. Based on these findings, which treatment should be given?

A. Vitamin B12

B. Iron

C. Vitamin C

D. Folic acid

Correct answer: D

The patient has macrocytic anemia, as evidenced by the high MCV (160 fl; normal is 80-100 fl) and low hemoglobin. The two primary causes of megaloblastic macrocytic anemia are Vitamin B12 deficiency and Folic acid deficiency. To differentiate between them, serum methylmalonic acid (MMA) levels are used. Vitamin B12 is a cofactor for the conversion of methylmalonyl-CoA to succinyl-CoA; thus, B12 deficiency results in "elevated" MMA. Since this patient’s MMA levels are "normal," a Vitamin B12 deficiency is ruled out, leaving "Folic acid deficiency" as the most likely cause. Folic acid (Option D) should be administered to correct the anemia. Administering B12 (Option A) would not be targeted. Iron (Option B) is used for microcytic anemia, and Vitamin C (Option C) for scurvy. Distinguishing these deficiencies is critical because treating a B12 deficiency with folic acid alone can mask the anemia while allowing irreversible neurological damage to continue.

Question 33. A 25-year-old patient presents with chronic diarrhea, fatigue, and nail changes consistent with koilonychia, along with a hemoglobin level of 8 g/dL. Based on these clinical findings, what

is the most appropriate treatment approach?

A. Folic acid

B. Metronidazole

C. Iron supplements

D. Vitamin B12

Correct answer: C

The clinical triad of fatigue, pale appearance, and "Koilonychia" (spoon-shaped nails) is highly characteristic of severe chronic Iron Deficiency Anemia. The hemoglobin level of 8 gm% confirms a significant anemia. Chronic diarrhea in a young patient can lead to malabsorption of dietary iron, particularly if it involves the duodenum. Therefore, the most appropriate treatment is "Iron supplements" (Option C) to replenish the body's iron stores and restore hemoglobin levels. Folic acid (Option A) and Vitamin B12 (Option D) are used for macrocytic anemias, which typically do not present with Koilonychia. Metronidazole (Option B) might be used if the diarrhea were caused by specific parasites like Giardia, but it does not address the underlying nutritional anemia. Clinicians should also investigate the cause of the iron deficiency, such as parasitic infestations (hookworm) or GI blood loss, while initiating iron therapy. Intravenous iron may be considered if oral supplements are poorly tolerated or if the diarrhea is severe.

Question 34. A 30-year-old woman presents with gait instability, memory impairment, behavioral changes, and Kayser–Fleischer rings visible on ocular examination. Which option correctly identifies the gene mutation responsible for this condition and the chromosome on which it is located?

A. ATP7B gene on chromosome 13

B. ATP7A gene on chromosome 13

C. ATP7B gene on chromosome 17

D. ATP7A gene on chromosome 17

Correct answer: A

The symptoms described—neurological deficits (unstable gait, memory loss, mood swings) and the pathognomonic "Kayser-Fleischer (KF) rings" in the cornea—are the hallmark findings of Wilson's disease. Wilson's disease is an autosomal recessive disorder of copper metabolism. The condition is caused by mutations in the "ATP7B gene," which encodes a copper-transporting ATPase essential for biliary copper excretion and the incorporation of copper into ceruloplasmin. This gene is located on "chromosome 13". Option B is incorrect because the ATP7A gene (located on the X chromosome) is associated with Menkes disease ("kinky hair" syndrome), which involves copper deficiency rather than overload. Options C and

D are incorrect as they list the wrong chromosome. In Wilson's disease, copper accumulates in the liver and brain (specifically the basal ganglia). Early diagnosis is vital, as the disease is treatable with copper-chelating agents like penicillamine or zinc, which can prevent permanent neurological and hepatic damage.

Question 35. A child is stung multiple times after disturbing a beehive and subsequently develops shock, respiratory distress, and circulatory collapse. Which mediator released during this reaction is mainly responsible for these life-threatening effects?

A. Adrenaline

B. Histamine

C. Dopamine

D. Substance P

Correct answer: B

The child is experiencing Anaphylaxis, a life-threatening, systemic Type I hypersensitivity reaction triggered by the bee venom antigens. Upon re-exposure, the venom binds to IgE antibodies on the surface of mast cells and basophils, leading to massive degranulation. The "primary mediator" responsible for the rapid onset of vascular collapse (hypotension) and respiratory distress (bronchoconstriction and laryngeal edema) is "Histamine". Histamine causes profound vasodilation and increased capillary permeability. Adrenaline (Option A) is the "treatment" of choice used to reverse these symptoms but is not the causative substance released by the body's immune cells during the reaction. Dopamine (Option C) and Substance P (Option D) are involved in various physiological signaling processes but are not the primary mediators of acute anaphylactic shock. Immediate administration of intramuscular epinephrine is mandatory to stabilize the patient's airway and blood pressure. Understanding these mediators is essential for both emergency management and the underlying principles of immunology and pathology.

Question 36. A patient presents with a midline neck swelling, and biopsy of the lesion reveals characteristic “Orphan Annie eye” nuclei. What is the most likely diagnosis based on these findings?

A. Follicular carcinoma

B. Papillary carcinoma

C. Toxic nodular goiter

D. Medullary carcinoma

Correct answer: B

In thyroid pathology, the presence of "Orphan Annie’s eye" nuclei is pathognomonic for Papillary Carcinoma, the most common type of thyroid cancer. These nuclei are characteristically large and appear "optically clear" or empty with peripheral chromatin condensation, resembling the eyes of the comic strip character. Other classic histological features of papillary carcinoma include "Psammoma bodies" (laminated calcifications) and nuclear grooves. Follicular carcinoma (Option A) is characterized by a thick capsule and vascular/capsular invasion without these specific nuclear changes. Medullary carcinoma (Option D) arises from C-cells and shows amyloid stroma on histology. Toxic nodular goiter (Option C) is a benign condition resulting in hyperthyroidism. Papillary carcinoma typically has an excellent prognosis and tends to spread via the lymphatics to cervical lymph nodes. Identifying these specific nuclear "ground-glass" appearances on Fine Needle Aspiration Cytology (FNAC) or biopsy is a fundamental skill for diagnosing midline neck masses.

Question 37. A 5-year-old boy presents with fever, weight loss, and a painless swelling in the jaw region. His CBC shows anemia with lymphocytosis, and biopsy of the swelling suggests a malignant process. Based on these clinical and laboratory findings, what is the most likely diagnosis?

A. Hodgkin's disease

B. Acute lymphocytic leukemia

C. Chloroma

D. Burkitt's lymphoma

Correct answer: D

The clinical presentation of a rapidly growing, painless jaw swelling in a child is highly characteristic of the endemic (African) form of Burkitt's lymphoma. The diagnostic histological hallmark, as seen in the provided image, is the "starry sky appearance". This pattern is created by large, pale-staining tingible-body macrophages (the "stars") that have phagocytosed apoptotic debris, scattered against a dense background of dark, rapidly dividing malignant B-cells (the "sky"). Hodgkin’s disease (Option A) would show Reed-Sternberg cells. Acute Lymphocytic Leukemia (Option B) usually presents with more generalized lymphadenopathy and hepatosplenomegaly rather than an isolated jaw mass. Chloroma (Option C) is an extramedullary mass of leukemic cells associated with AML. Burkitt's lymphoma is associated with the Epstein-Barr Virus (EBV) and a characteristic translocation involving the MYC gene. It is one of the fastest-growing human tumors but is often highly responsive to intensive chemotherapy.

(A) Drug B is the most efficacious

(B) Drug B is the most potent
(C) Drug C is more efficacious
than drug D
(D) Drug A is more potent than
drug B
AAns

(B) Drug B is the most potent
A dose–response curve illustrates the relationship between drug dose and the magnitude of response. Two key properties are assessed: potency and efficacy. Potency refers to the amount of drug required to produce a given effect and is indicated by the position of the curve along the x-axis. A drug that achieves its effect at a lower dose appears more left-shifted and is therefore more potent. In the graph, Drug B is the leftmost curve, meaning it requires the smallest dose to produce a response, making it the most potent.
Efficacy refers to the maximum effect (Emax) a drug can produce, represented by the height of the curve. Drug B has a lower maximal response compared to Drugs A, C, and D, so it is not the most efficacious. Drug D shows the highest efficacy, not Drug C, ruling out option (C). Drug A lies to the right of Drug B, indicating lower potency.
Thus, based on its leftward position, Drug B is the most potent drug.

Question 38. A 60-year-old man presents with easy fatigability, back pain, and radiological evidence of multiple lytic lesions in the skull. Bone marrow biopsy findings point toward a hematological malignancy. Based on this presentation, what is the most likely diagnosis?
A. CML
B. CLL
C. Multiple myeloma
D. Hairy cell leukemia
Correct answer: C
The patient’s presentation of bone pain, "multiple lytic lesions" in the skull (punched-out lesions), and anemia (fatigability) in an older adult is classic for Multiple Myeloma. Multiple myeloma is a plasma cell dyscrasia characterized by the malignant proliferation of a single clone of plasma cells. The provided bone marrow histology confirms this by showing a "sheet-like proliferation of plasma cells" with eccentric nuclei and a perinuclear halo (Hoff). CML (Option A) and CLL (Option B) are leukemias involving mature myeloid and lymphoid cells, respectively, and do not typically cause lytic bone lesions. Hairy cell leukemia (Option D) is

characterized by splenomegaly and B-cells with hair-like projections, not bone destruction. Common laboratory findings in myeloma include the "M-spike" on serum protein electrophoresis, hypercalcemia, and renal insufficiency (the CRAB criteria). Treatment involves proteasome inhibitors, immunomodulators, and potentially autologous stem cell transplantation.

Question 39. A 12-year-old child presents with a cough lasting 15 days and enlarged cervical lymph nodes. Histopathological examination of a lymph node biopsy reveals characteristic features suggestive of a particular condition. Based on the clinical presentation and biopsy findings, what is the most likely diagnosis?

A. Tuberculosis

B. Leprosy

C. Sarcoidosis

D. Syphilis

Correct answer: A

The clinical combination of chronic cough and cervical lymphadenopathy (scrofula) in a pediatric patient is a classic presentation for Tuberculosis (TB). The biopsy image provided shows "caseating granulomas," which are diagnostic of TB. These consist of a central area of "caseous necrosis" (acellular, cheese-like material) surrounded by epithelioid macrophages, Langhans giant cells with horseshoe-shaped nuclei, and a rim of lymphocytes. Sarcoidosis (Option C) also presents with granulomas, but they are characteristically "non-caseating" (no central necrosis). Leprosy (Option B) and Syphilis (Option D) present with different cutaneous and systemic findings and do not typically cause isolated cervical caseating lymphadenopathy. Diagnosis of TB is further confirmed by Acid-Fast Bacilli (AFB) staining or CBNAAT (GeneXpert) testing. Early identification is essential to begin the intensive six-month multi-drug anti-tubercular therapy (AKT) regimen and prevent local complications or miliary spread.

Question 40. Which of the following is NOT typically identified using supravital staining?

A. Reticulocytes

B. Copper in tissue

C. Heinz bodies

D. Ribosomal RNA

Correct answer: B

Supravital staining is a technique used to visualize living cells or cellular components that have not been fixed. Standard examples include New Methylene Blue or Brilliant Cresyl Blue. These

stains are specifically used to identify "Reticulocytes" (Option A) by precipitating the residual "ribosomal RNA" (Option D) into a visible reticular network. They are also used to visualize "Heinz bodies" (Option C), which are inclusions of denatured hemoglobin seen in G6PD deficiency. However, "Copper in tissue" (Option B) is identified using specialized chemical stains like Rhodanine or Orcein on fixed tissue sections, not through supravital methods. Supravital staining is fundamental in hematology for assessing erythropoietic activity in the bone marrow by counting the percentage of reticulocytes in the peripheral blood. Understanding the specific applications of various histological stains is a common requirement for pathology and laboratory medicine sections of medical licensing exams.

Question 41. A 78-year-old man presents with fatigue, dyspnea, and palpitations. Echocardiography reveals features of restrictive cardiomyopathy. Cardiac biopsy stained with Congo red demonstrates apple-green birefringence under polarized light. Based on these findings, what is the most likely diagnosis?

A. Heart failure

B. Cardiac amyloidosis

C. Hemosiderosis

D. Dystrophic calcification

Correct answer: B

The patient presents with symptoms of restrictive cardiomyopathy, a condition where the heart chambers are stiff and cannot fill properly. The definitive diagnostic clue is the biopsy finding: "Congo red stain" showing "apple-green birefringence" under polarized light. This is the pathognomonic marker for Amyloidosis, a disease caused by the extracellular deposition of misfolded protein fibrils. When these fibrils accumulate in the myocardium, it leads to Cardiac Amyloidosis. Heart failure (Option A) is the clinical outcome of this disease but is not the primary histological diagnosis. Hemosiderosis (Option C) would show blue granules with a Prussian blue stain. Dystrophic calcification (Option D) involves calcium deposits in damaged tissues and would appear black on Von Kossa stain. Cardiac amyloidosis often results in thickened ventricular walls and a "granular" or "sparkling" appearance on ECHO. Management is challenging and depends on the specific protein type (e.g., AL or ATTR amyloid).

Question 42. A 24-year-old man presents with anemia, with a similar condition reported in his father and paternal aunt, both of whom showed significant improvement after splenectomy. Examination of his peripheral blood smear raises suspicion

of a hereditary hematological disorder. Based on the familial pattern and favorable response to splenectomy, which additional blood abnormality is most likely to be present in this patient?

A. Increased osmotic fragility

B. Decreased reticulocytes

C. Heinz bodies

D. Howell-jolly bodies

Correct answer: A

The clinical picture is suggestive of hereditary spherocytosis, an inherited disorder caused by defects in red blood cell membrane proteins such as spectrin. This leads to the formation of spherocytes, which have a reduced surface area-to-volume ratio and are less deformable. As a result, these cells are more prone to destruction in the spleen, causing hemolytic anemia.

A key laboratory finding in hereditary spherocytosis is increased osmotic fragility. When placed in hypotonic solutions, spherocytes cannot accommodate osmotic swelling effectively and therefore rupture more easily than normal red blood cells. This increased fragility is a hallmark diagnostic feature of the disease.

Other options are incorrect:

Decreased reticulocytes is wrong because hemolysis stimulates the bone marrow, leading to an increased reticulocyte count. Heinz bodies are seen in G6PD deficiency, not hereditary spherocytosis. Howell–Jolly bodies appear after splenectomy due to loss of splenic function, not as a primary feature of the disease.

Thus, the most appropriate abnormality is increased osmotic fragility.

Question 43. Which condition is known to produce a false-positive Barr body during diagnostic evaluation?

A. Klinefelter's syndrome

B. Turner's syndrome

C. Down's syndrome

D. Edward's syndrome

Correct answer: A

A Barr body is an inactivated X chromosome found in the nuclei of somatic cells in individuals with more than one X chromosome. Normally, phenotypic females (46,XX) have one Barr body,

while phenotypic males (46,XY) have none. "Klinefelter's syndrome" (Option A) involves a 47,XXY genotype. Because these individuals are phenotypically male but possess an extra X chromosome, they will test positive for a Barr body. In the context of sex-chromatin testing for a male, this is referred to as a "false positive" Barr body. Turner's syndrome (Option B) is 45,X; these phenotypic females have no Barr body, which is a "false negative" for their sex. Down’s (Option C) and Edward's (Option D) syndromes are autosomal trisomies (and) and do not affect the number of Barr bodies based on the underlying sex chromosomes. Identifying Barr bodies was historically used as a screening tool for chromosomal sex, and its presence in a male remains a key diagnostic indicator for Klinefelter's.

Question 44. tissues, which collapse into the airway during inspiration. The endoscopic image shows the classic triad: an omega-shaped (tightly folded) epiglottis, short and thickened aryepiglottic folds, and bulky arytenoid mucosa. The stridor typically worsens when the infant is supine or crying and improves when prone. Option B (Laryngeal papilloma) would show warty, cauliflower-like growths on the vocal cords. Option C (Chronic epiglottitis) is rare in children and would show diffuse thickening. Option D (Laryngocele) is an air-filled sac communicating with the saccule. Most cases of laryngomalacia are self-limiting and resolve by age 18–24 months as the cartilages mature. However, severe cases causing failure to thrive, hypoxia, or sleep apnea may require surgical intervention, such as a supraglottoplasty.

In a patient with CSOM, labyrinthine fistula most commonly involves

A. Superior SCC

B. Lateral SCC

C. Posterior SCC

D. Utricle

Correct answer: B

Chronic Suppurative Otitis Media (CSOM), particularly the atticoantral type associated with cholesteatoma, can cause erosion of the bony labyrinth. The lateral (horizontal) semicircular

canal (SCC) is the most common site for a labyrinthine fistula because it lies in the medial wall of the aditus and antrum, making it highly susceptible to pressure and osteolytic enzymes from a growing cholesteatoma. Option A (Superior SCC) and Option C (Posterior SCC) are involved much less frequently. Option D (Utricle) is deeper and better protected. Patients with a fistula often present with "fistula sign," where changes in ear canal pressure induce vertigo and nystagmus. Vertigo may also occur when cleaning the ear or with loud sounds (Tullio phenomenon). The presence of a fistula is a surgical priority during mastoidectomy. The surgeon must carefully remove the disease while preserving the underlying endosteum to prevent total sensorineural hearing loss (dead ear).

Samter's triad is seen in patients with

(A)

Asthma

(B)

Chronic pancreatitis

(C)

Crohn's disease

(D)

Liver cell carcinoma

Question 45. A child is brought to the emergency department after consuming an unknown fruit and shows signs of poisoning. Based on the description of

Examination Paper June 2021 Question and ORF1. Which diagnostic test was performed in this case?

A. CLIA

B. ELISA

C. CBNAAT

D. RT-PCR

Correct answer: D

The detection of specific viral genetic sequences—the "RdRp gene, E gene, N gene, and ORF1"—is the standard molecular diagnostic profile for SARS-CoV-2 (COVID-19). The gold standard test for detecting these viral RNA targets is the "Reverse Transcriptase Polymerase Chain Reaction (RT-PCR)". RT-PCR converts the viral RNA into DNA and then amplifies specific target regions to detectable levels. CLIA (Option A) and ELISA (Option B) are serological/ immunoassays used to detect "antigens or antibodies" in the blood, not specific genetic sequences. CBNAAT (Option C), while a molecular test, is primarily used in India for the rapid diagnosis of Tuberculosis. During the pandemic, the simultaneous detection of multiple genes like RdRp and E increased the specificity of the RT-PCR test. For an elderly patient with acute respiratory distress, rapid and accurate genetic testing via RT-PCR was essential for guiding isolation and clinical management protocols.

Question 46. During post-mortem examination of a person who died due to starvation, which finding is most likely to be observed?

A. Distended gallbladder

B. Enlarged liver

C. Expanded lungs

D. Hypertrophied heart

Correct answer: A

Starvation leads to a generalized atrophy of almost all internal organs as the body consumes its own tissues for energy. However, a characteristic and somewhat paradoxical finding in chronic starvation is a distended gallbladder. This occurs because there is no ingestion of food (especially fats) to trigger the release of cholecystokinin, which normally causes the gallbladder to contract and empty. Consequently, bile accumulates and thickens within the organ. Enlarged liver (Option B) is incorrect; the liver actually shrinks significantly, although it may appear fatty. Expanded lungs (Option C) and a hypertrophied heart (Option D) are not features of starvation; the heart, like other muscles, undergoes brown atrophy and decreases in size. Starvation victims also show a complete loss of subcutaneous fat (Omentum appears like a "lacy veil") and a sunken abdomen (scaphoid). The distended gallbladder is a classic forensic indicator used to support a diagnosis of death by starvation.

Question 47. In which condition is cherry red post mortem lividity observed?

A. Opioid poisoning

B. Carbon monoxide poisoning

C. Hydrogen sulfide poisoning

D. Phosphorus poisoning

Correct answer: B

Post mortem lividity (livor mortis) usually appears as a bluish-purple discoloration of the dependent parts of the body. However, certain poisonings produce a distinct color change in the blood that is reflected in the lividity. Cherry red lividity is pathognomonic for carbon monoxide (CO) poisoning. This occurs because CO binds to hemoglobin with high affinity to form carboxyhemoglobin, which is a bright cherry-red color. Opioid poisoning (Option A) usually shows dark bluish-purple lividity due to asphyxia. Hydrogen sulfide poisoning (Option C) can produce a greenish or dark lividity due to the formation of sulfhemoglobin. Phosphorus poisoning (Option D) does not have a specific characteristic lividity color like CO. Other "reddish" lividities include cyanide poisoning (bright red/brick red) and cold exposure (pinkish red). Identifying the specific hue of livor mortis is a vital forensic tool for narrowing down the cause of death before internal autopsy begins.

Question 48. If a person accused of committing a crime is produced before a criminal court and it is determined that the accused is below a specified age, the court directs that the case be transferred to the juvenile court. What is the age limit for such a transfer?

A. 21

B. 17

C. 18

D. 24

Correct answer: C

Under Indian law, the relevant legislation is the Juvenile Justice (Care and Protection of Children) Act, 2015, which defines a juvenile (or child) as any person below 18 years of age. When an accused is produced before a criminal court and it is determined that they are under 18 years at the time of the offence, the case is transferred to the Juvenile Justice Board (JJB) instead of being tried in a regular criminal court. The objective is to focus on reform, rehabilitation, and reintegration rather than punishment.

The age of 18 is internationally recognized as the threshold for adulthood in criminal responsibility under juvenile justice systems. Even if the offence is serious, the procedure initially shifts to the juvenile system, though in heinous offences (16–18 years), further assessment may occur.

Other options are incorrect:

1.

21 and 24 are not recognized legal limits in juvenile justice law.

2.

17 is incorrect because the legal cutoff is below 18, not 17.

Question 49. What is the most reliable indicator of recent malaria transmission?

A. Spleen rate

B. Infant parasite rate

C. Parasite density index

D. Slide positivity rate

Correct answer: B

In community health and malariology, the infant parasite rate (IPR) is considered the most sensitive and reliable indicator of recent malaria transmission in a specific locality. Since infants (children under 1 year of age) are usually kept indoors and have had a limited window of exposure to mosquito bites, finding parasites in their blood indicates that they were infected very recently within that area. If the IPR is zero, it suggests that transmission has been effectively interrupted. Spleen rate (Option A) measures the prevalence of enlarged spleens in children and is used to determine the endemicity of malaria but represents long-term rather than acute transmission. Parasite density index (Option C) measures the severity of infection in individuals. Slide positivity rate (Option D) indicates the percentage of fever cases that are actually malaria but can be influenced by many external factors. Therefore, IPR is the primary surveillance tool for assessing the immediate success of malaria control programs.

Question 50. A 40-year-old patient is brought to the emergency department in an unconscious state. Examination reveals needle track marks on the upper limbs along with hypertension, tachycardia, and hyperthermia. Based on these findings, which type of poisoning should be suspected?

A. Heroine

B. Cocaine

C. Cannabis

D. LSD

Correct answer: B

The patient’s symptoms represent a "sympathomimetic toxidrome," characterized by hypertension (elevated BP), tachycardia (increased HR), and hyperthermia (high body temperature). Cocaine is a potent CNS stimulant that causes these exact signs by blocking the reuptake of norepinephrine and dopamine. Heroin (Option A) is an opioid; a patient would typically present with a "triad" of pinpoint pupils, respiratory depression, and bradycardia, which is the opposite of this presentation. Cannabis (Option C) poisoning generally does not

cause severe hypertension or high fever. LSD (Option D) is a hallucinogen that can cause some sympathetic arousal but is rarely associated with unconsciousness and severe systemic instability compared to cocaine. The presence of "needle track marks" indicates intravenous drug abuse, which is common for both cocaine and heroin addicts. In a comatose patient with a racing heart and high fever, cocaine toxicity must be suspected and managed with supportive care and benzodiazepines to control the sympathetic surge.

Question 51. In which type of hanging does the weight of the head act as a constricting force?

A. Complete

B. Partial

C. Typical

D. Atypical

Correct answer: B

Hanging is defined as a form of ligature strangulation where the force is provided by the weight of the body. In "complete hanging," the entire body is suspended and the feet do not touch the ground. In "partial hanging," some part of the body (feet, knees, or even the buttocks) remains in contact with the ground or a supporting surface. In these instances, the full weight of the body is not used; instead, only the weight of the head or the upper torso acts as the constricting force on the ligature around the neck. "Typical hanging" (Option C) refers to the knot being at the occiput. "Atypical hanging" (Option D) refers to the knot being at any other position. Partial hanging is frequently seen in suicidal cases, where individuals use low points of attachment like door handles or bedposts. Forensic examiners must be aware that even a small force (about 2-5 kg) is sufficient to compress the jugular veins and carotid arteries, leading to death.

Question 52. A patient presents to the emergency department with diarrhea, profuse sweating, excessive salivation and lacrimation, a garlicky odor, bradycardia (pulse 55/min), and markedly reduced plasma cholinesterase levels (50 U/mL). Based on these clinical and laboratory findings, what is the most appropriate treatment to administer?

A. Neostigmine

B. Atropine

C. Epinephrine

D. Benztropine

Correct answer: B

The patient is presenting with a classic "cholinergic toxidrome," often summarized by the mnemonic SLUDGE: Salivation, Lacrimation, Urination, Defecation, Gastric distress, and Emesis. The bradycardia (HR 55), garlicky odor, and significantly low plasma cholinesterase level (50U/mL) are highly indicative of Organophosphate (OP) poisoning. Atropine is the physiological antidote that works by antagonizing the excess acetylcholine at muscarinic receptors, thereby reversing the life-threatening bradycardia and excessive secretions. Neostigmine (Option A) is a cholinesterase inhibitor that would dangerously worsen the condition. Epinephrine (Option C) might raise the heart rate but does not stop the secretions. Benztropine (Option D) is an anticholinergic used for Parkinsonism but is not the drug of choice for acute OP toxicity. Management also involves the use of pralidoxime (oximes) to reactivate the enzyme if administered early. Prompt atropinization (titrated until secretions dry) is the most critical life-saving step in OP poisoning.

MICROBIOLOGY

Question 53. When yellow, needle-shaped rhombic crystals are seen under microscopic examination in Barberio's test, what substance is being detected?

A. Semen

B. Blood

C. Sputum

D. CSF

Correct answer: A

Barberio's test is a forensic screening test used for the presumptive identification of semen on clothing or skin. The test involves adding a saturated solution of picric acid to the suspected stain. If semen is present, the picric acid reacts with spermine (a polyamine found in high concentrations in seminal fluid) to form spermine picrate. These appear under the microscope as characteristic yellow, needle-shaped, or rhombic-shaped crystals. Option B is incorrect; blood is detected using the Kastle-Meyer test or crystal tests like Teichmann and Takayama. Options C and D are not related to Barberio's test. While useful, Barberio's test is not as specific as the Florence test (which detects choline) or the definitive identification of spermatozoa under a microscope. Modern forensic labs now rely on more specific tests like the Prostate-Specific Antigen (PSA/p30) test to confirm the presence of seminal fluid in medicolegal cases.

Question 54. Which of the following vaccines produces seroconversion more rapidly than the incubation period of the disease it is meant to prevent?

A. Coronavirus

B. Measles

C. Polio

D. Mumps

Correct answer: B

In public health and immunology, certain vaccines can be used for post-exposure prophylaxis (PEP) because the immune system can mount a protective response faster than the virus can complete its incubation period. Measles (Option B) is the classic example of this. The incubation period for measles is approximately 10-14 days, whereas the live-attenuated measles vaccine induces protective antibodies within 3-5 days of administration. Therefore, if a susceptible individual is vaccinated within 72 hours of exposure, the infection can often be prevented or significantly modified. Coronavirus (Option A), Polio (Option C), and Mumps (Option D) have varying incubation periods and seroconversion rates, but they are not the standard examples used to illustrate this specific epidemiological concept as effectively as measles. This property makes measles vaccination a critical emergency response tool during outbreaks in refugee camps or schools. Susceptible contacts of a measles case should always be prioritized for immediate vaccination.

Question 55. A 12-year-old girl presents with severe headache, photophobia, high-grade fever, papilledema, and positive Kernig’s and Brudzinski’s signs. Cerebrospinal fluid analysis shows low glucose, elevated protein, and neutrophil-predominant pleocytosis. Gram staining of the CSF demonstrates Gram-negative diplococci. Which organism is the most likely cause of this condition?

A. Haemophilus influenzae type B

B. Neisseria meningitidis

C. Streptococcus pneumoniae

D. Listeria monocytogenes

Correct answer: B

The clinical signs of meningitis (fever, nuchal rigidity, Kernig's/Brudzinski's signs) combined with the "neutrophil-predominant" CSF profile are diagnostic of acute bacterial meningitis. The specific microbiological clue—"Gram-negative diplococci"—is pathognomonic for Neisseria meningitidis. Haemophilus influenzae (Option A) is a Gram-negative "coccobacillus," not a diplococcus. Streptococcus pneumoniae (Option B) is the most common cause overall but would

appear as "Gram-positive" diplococci. Listeria monocytogenes (Option D) is a Gram-positive bacillus, usually seen in neonates or the elderly. Meningococcal meningitis is a medical emergency because it can progress rapidly to septicemia and Waterhouse-Friderichsen syndrome. Immediate treatment with intravenous third-generation cephalosporins (like Ceftriaxone) is mandatory. Prophylaxis for close contacts is also required using rifampicin or ciprofloxacin. Identifying the morphology and Gram-stain reaction of the causative agent is the most critical early step in diagnosing bacterial meningitis.

Question 56. A 55-year-old man presents with fever, weakness, hypotension, and tachycardia. Peripheral blood smear examination confirms infection with Plasmodium falciparum. In this clinical scenario, which drug is considered the treatment of choice?

A. Plasmodium vivax

B. Plasmodium falciparum

C. Plasmodium ovale

D. Plasmodium malariae

Correct answer: B

The patient is presenting with signs of "Severe (or Complicated) Malaria," as evidenced by systemic instability (hypotension/shock, tachycardia) and a smear positive for Plasmodium falciparum. Plasmodium falciparum (Option B) is the species most frequently associated with multi-organ failure and death. Vivax (Option A) and Ovale (Option C) can cause severe malaria but are more classically known for relapses due to liver hypnozoites. Malariae (Option D) is usually a chronic, milder infection. In falciparum infections, "sequestration" of infected erythrocytes in capillaries leads to cerebral malaria, pulmonary edema, and acute renal failure. According to WHO guidelines, the immediate treatment for severe malaria is intravenous Artesunate. Falciparum malaria is a true medical emergency, especially when systemic symptoms like hypotension are present, requiring rapid parasite clearance and intensive supportive care to prevent mortality.

Question 57. Safety pin appearance is seen in -

A. Haemophilus influenzae

B. Burkholderia pseudomallei

C. Pseudomonas aeruginosa

D. Burkholderia cepacia

Correct answer: B

In microbiology, the term "safety pin appearance" refers to bipolar staining, where the ends of the bacterium stain more intensely than the center. This characteristic is famously seen in Burkholderia pseudomallei, the causative agent of Melioidosis. It is also classically associated with Yersinia pestis (the plague bacillus). Haemophilus influenzae (Option A) is a pleomorphic Gram-negative coccobacillus but does not characteristically show this bipolar pattern. Pseudomonas aeruginosa (Option C) and Burkholderia cepacia (Option D) are typical Gram-negative rods without the distinct safety pin morphology. Burkholderia pseudomallei is an environmental saprophyte common in soil and water in Southeast Asia and Northern Australia. Melioidosis can present as acute pneumonia, localized abscesses, or overwhelming septicemia. Recognizing this specific staining pattern on a Gram or Wayson stain can provide a critical early diagnostic clue for this potentially biothreat agent.

Question 58. What is the causative organism of "bull neck"?

A. Corynebacterium diphtheriae

B. Corynebacterium ulcerans

C. Corynebacterium minutissimum

D. Corynebacterium tenuis

Correct answer: A

"Bull neck" is a classic clinical description used to characterize the massive swelling of the neck seen in severe cases of diphtheria. This appearance results from extensive cervical lymphadenopathy and soft tissue edema. It is caused by the exotoxin-producing strains of Corynebacterium diphtheriae. Corynebacterium ulcerans (Option B) can cause a similar diphtheria-like illness but is rarer and often linked to raw milk. Corynebacterium minutissimum (Option C) causes erythrasma, a superficial skin infection. Corynebacterium tenuis (Option D) is associated with trichomycosis axillaris. Along with the bull neck, patients typically have a thick, adherent, greyish-white "pseudomembrane" on the tonsils and pharynx. Diphtheria is a medical emergency requiring urgent administration of diphtheria antitoxin and antibiotics (like penicillin or erythromycin). The "bull neck" is an ominous prognostic sign indicating a high toxic load and potential for airway obstruction or myocarditis.

Question 59. Identify the parasite.

A. Giardia lamblia

B. Trichomonas vaginalis

C. Trypanosoma

D. Cyclospora

Correct answer: A

The parasite depicted in the image is the trophozoite form of Giardia lamblia. It is characteristically described as having a "pear-shape" or "tennis-racket" shape, with two large

nuclei that give it a "monkey-face" appearance. It has four pairs of flagella and a large ventral sucking disc used for attachment to the intestinal mucosa. Trichomonas vaginalis (Option B) is also pear-shaped but has only one nucleus and a characteristic undulating membrane. Trypanosoma (Option C) is a spindle-shaped blood parasite. Cyclospora (Option D) is a spherical coccidian parasite seen in stool. Giardia is a major cause of malabsorptive diarrhea and steatorrhea (foul-smelling, fatty stools) worldwide. It is usually acquired by drinking contaminated water from lakes or streams ("beaver fever"). Diagnosis is made by identifying cysts or trophozoites in the stool or through an ELISA for fecal antigens.

Examination Paper June 2021 Question
the fruit and the clinical features observed, what
type of poisoning is most likely in this case?
(A) Poppy seeds poisoning
(B) Datura poisoning
(C) Mushroom poisoning
(D) Cannabis poisoning
AAns

(B) Datura poisoning.
Datura poisoning (also known as thorn apple poisoning) is common in children who ingest the seeds or fruit. The plant contains tropane alkaloids like atropine, hyoscyamine, and scopolamine, which cause a classic anticholinergic toxidrome. Symptoms are often remembered by the mnemonic: "Dry as a bone (no sweat/dry mouth), red as a beet (flushing), blind as a bat (dilated pupils), hot as a hare (fever), and mad as a hatter (delirium/ hallucinations)". Poppy seeds (Option A) would cause an opioid toxidrome with pinpoint pupils and respiratory depression. Mushroom poisoning (Option C) usually presents with severe gastrointestinal distress or liver failure depending on the species. Cannabis poisoning (Option D) results in ataxia, lethargy, and a characteristic "stoned" appearance with conjunctival congestion. Datura is a common roadside plant in India, making it a frequent topic in pediatric emergency medicine and forensic toxicology exams.

Question 60. A middle-aged man presents with a genital ulcer, as seen in the accompanying images. Microscopic examination of a sample taken from the lesion reveals characteristic findings. Based on these observations, what is the most likely diagnosis?
A. Granuloma inguinale

B. Lymphogranuloma
venereum
C. Chancroid
D. Gonorrhoea

Correct answer: A

The patient presents with a genital ulcer that appears beefy red and likely painless, which is characteristic of granuloma inguinale (Donovanosis), a sexually transmitted infection caused by Klebsiella (Calymmatobacterium) granulomatis. A key diagnostic feature is seen on microscopy: Donovan bodies, which are intracellular organisms present within macrophages. These appear as oval, safety-pin shaped inclusions on special stains such as Wright–Giemsa and are pathognomonic for this condition.

Other options are incorrect:

(B)

Lymphogranuloma venereum (LGV) typically begins with a small, painless ulcer that heals quickly, followed by painful inguinal lymphadenopathy (buboes), not a persistent beefy ulcer.

(C)

Chancroid presents with a painful, soft ulcer with ragged edges and may show organisms in a “school of fish” pattern, not Donovan bodies.

(D)

Gonorrhoea usually causes purulent urethral discharge and dysuria rather than genital ulcers.

Thus, the presence of a painless beefy red ulcer along with Donovan bodies confirms granuloma inguinale.

Question 61. What is the primary purpose of using gamma radiation in sterilization?

A. Syringes, needles, and catheters
B. Contaminated clothes and animal carcasses
C. Gloves and aprons
D. Bacterial vaccines and intravenous solutions

Correct answer: A

Gamma radiation is a form of ionizing radiation (usually from a Cobalt-60 source) used for "cold sterilization". Its primary clinical purpose is the industrial sterilization of "pre-packed, disposable, heat-sensitive" medical items like plastic syringes, needles, catheters, and surgical sutures. It is highly effective because gamma rays have deep penetrative power and can kill microorganisms without raising the temperature of the items. Contaminated clothes and carcasses (Option B) are usually disposed of via incineration. Gloves and aprons (Option C) can be sterilized with radiation, but they are more commonly treated with ethylene oxide gas or autoclaving depending on the material. Bacterial vaccines and IV solutions (Option D) are

sterilized by filtration or careful heat processing, as radiation could damage the biological/ chemical integrity of the product. Gamma radiation ensures that single-use medical devices are completely sterile before they reach the hospital setting.

Question 62. Which of the following features is not characteristic of the El Tor biotype of Vibrio cholerae, the organism responsible for epidemic diarrhea?

A. Resistant to El Tor phage V

B. Intrinsic resistance to polymyxin B

C. Voges-Proskauer test is positive

D. Not susceptible to group IV phage

Correct answer: A

Vibrio cholerae is divided into two main biotypes: Classical and El Tor. The El Tor biotype is actually "susceptible" to El Tor phage V; therefore, statement A is "not" a characteristic. The Classical biotype is resistant to phage V. The other statements are accurate descriptions of the El Tor biotype: it has "intrinsic resistance to Polymyxin B" (Option B, unlike Classical) , it is "Voges-Proskauer (VP) positive" (Option C, unlike Classical) , and it is "not susceptible to Group IV phage" (Option D, unlike Classical). Additionally, El Tor vibrios are generally more robust in the environment and are responsible for the current (seventh) cholera pandemic. These laboratory tests are used in epidemiological surveillance to track the spread of different cholera strains during outbreaks. Understanding biotype differences helps in predicting the severity and duration of diarrhea epidemics in a population.

Question 63. For assessing the viral load in a test sample, which test utilizes the provided graph?

A. Antigen test

B. Real time RT PCR

C. CBNAAT

D. TruNat

Correct answer: B

The graph depicted is an "amplification curve" characteristic of Real-time Polymerase Chain Reaction (RT-PCR). This technique measures the increase in fluorescence (representing DNA amplification) during each cycle of the PCR process. The " value" (cycle threshold) is the point where the fluorescence crosses the background noise; a lower value indicates a higher initial "viral load" in the sample. Antigen tests (Option A) are rapid immunoassays that do not involve cycles or DNA amplification. While CBNAAT (Option C) and TruNat (Option D) are also molecular tests that use similar technology, "Real-time RT-PCR" is the broader, fundamental category that this specific type of cycle-fluorescence graph represents. During the COVID-19 pandemic, this

graph became the global standard for identifying infected individuals and assessing how infectious they might be based on the value.

Question 64. A 32-year-old man with a recent travel history to Assam presents with fever, chills, seizures, altered sensorium, and severe hypotension (BP 70/50 mm Hg). Peripheral smear confirms Plasmodium falciparum infection. In this clinical scenario, which drug is the treatment of choice?

A. Chloroquine

B. Quinine

C. Intravenous artesunate

D. Artemether

Correct answer: C

The patient is presenting with "Severe Cerebral Malaria," defined by the presence of Plasmodium falciparum and neurological complications (seizures, altered sensorium) or shock (BP 70/50). According to current WHO and national guidelines, "intravenous Artesunate" is the absolute drug of choice for all cases of severe malaria in both adults and children. It is superior to quinine because it clears parasites faster and is easier to administer. Chloroquine (Option A) is no longer used for falciparum malaria due to widespread resistance. Quinine (Option B) was previously the standard but is now a second-line alternative if artesunate is unavailable, as it requires careful cardiac monitoring. Artemether (Option D) is an artemisinin derivative but is preferred in its intramuscular form only when IV access is impossible. In a comatose patient with low blood pressure, rapid parasiticidal action with IV Artesunate is life-saving.

Question 65. A 9-year-old girl presents with fever, difficulty in breathing, drooling of saliva, and inspiratory stridor. A lateral neck X-ray reveals the characteristic “thumb sign.” Which organism is most commonly responsible for causing this condition in children?

A. Haemophilus influenza B

B. Influenza virus

C. Staphylococcus

D. RSV

Correct answer: A

The clinical triad of fever, drooling (due to inability to swallow), and stridor in a child is highly characteristic of "Acute Epiglottitis". The lateral neck X-ray showing the "thumb sign" (an

enlarged, rounded epiglottis) confirms the diagnosis. "Haemophilus influenzae type B" (HiB) is the most common and classic causative organism of acute epiglottitis in children. Since the introduction of the HiB vaccine, the incidence has dropped significantly, but it remains the primary bacterial concern. Influenza virus (Option B) and RSV (Option D) are common causes of "croup" (laryngotracheobronchitis), which presents with a "barking cough" and the "steeple sign" on X-ray, not drooling or the thumb sign. Staphylococcus aureus (Option C) can occasionally cause bacterial tracheitis but is less common than HiB for primary epiglottitis. Acute epiglottitis is a pediatric airway emergency; management requires immediate preparation for endotracheal intubation in a controlled setting.

Question 66. Which organism is typically responsible for causing erythrasma?

A. Corynebacterium diphtheriae

B. Corynebacterium minutissimum

C. Corynebacterium tenuis

D. Diphtheroids

Correct answer: B

Erythrasma is a common, chronic, superficial bacterial infection that primarily affects intertriginous areas such as the axillae, groin, and between the toes. It is caused by Corynebacterium minutissimum. Clinically, it appears as reddish-brown, scaly patches that are often asymptomatic. A pathognomonic diagnostic feature of erythrasma is its "coral-red fluorescence" when viewed under a Wood’s lamp, which is caused by the production of porphyrins by the bacteria. Corynebacterium diphtheriae (Option A) causes the serious respiratory or cutaneous disease known as diphtheria. Corynebacterium tenuis (Option C) is associated with trichomycosis axillaris, which affects hair shafts. Diphtheroids (Option D) is a general term for non-pathogenic Corynebacteria found as normal skin flora. Treatment for erythrasma typically involves topical antibiotics like fusidic acid or oral erythromycin. This condition is often misdiagnosed as a fungal infection (tinea cruris), making the Wood’s lamp examination a vital clinical tool.

PSM

Question 67. What occupational health hazards or diseases are commonly associated with individuals working in a sugarcane factory?

A. Anthracosis

B. Siderosis

C. Bagassosis

D. Byssinosis

Correct answer: C

Bagassosis is an occupational hypersensitivity pneumonitis caused by inhaling the dust of moldy "bagasse"—the fibrous residue that remains after sugarcane is crushed to extract its juice. It is specifically associated with actinomycetes found in the sugarcane byproduct. Anthracosis (Option A) is the accumulation of carbon pigment in the lungs, common in coal miners or urban dwellers. Siderosis (Option B) is a form of pneumoconiosis caused by inhaling iron dust or fumes, typically seen in welders. Byssinosis (Option D), also known as "Monday morning fever," is caused by inhaling cotton, flax, or hemp dust in the textile industry. Workers with bagassosis present with acute breathlessness, cough, and fever. Prevention in sugarcane factories involves moisture control of the bagasse and the use of respiratory protection. Identifying the specific environmental dust associated with each lung disease is a fundamental topic in occupational health exams.

Question 68. A worker employed in a groundnut processing unit develops features of food poisoning after eating groundnuts that had been stored for a long duration. What is the most probable cause of this illness?

A. Beta oxalyl amino alanine

B. Smoke from factory

C. Sanguinarine

D. Aflatoxins

Correct answer: D

Aflatoxins are potent mycotoxins produced by the molds Aspergillus flavus and Aspergillus parasiticus, which commonly contaminate "groundnuts" (peanuts), maize, and other crops stored in damp conditions. Acute ingestion of high levels of aflatoxin can cause severe toxic hepatitis, while chronic exposure is one of the strongest risk factors for hepatocellular carcinoma. Beta oxalyl amino alanine (BOAA) (Option A) is the neurotoxin found in Lathyrus sativus (Khesari dal) that causes neurolathyrism. Option B is an environmental pollutant. Sanguinarine (Option C) is the toxin found in Argemone mexicana (prickly poppy) seeds; when mixed with mustard oil, it causes Epidemic Dropsy. In the context of "stored groundnuts," aflatoxin is the most probable epidemiological culprit. Public health efforts focus on proper agricultural storage and the monitoring of moisture levels to prevent the fungal growth that produces these dangerous toxins.

Question 69. A young child presents with acute diarrhea, and the clinician suspects Shigella infection rather than cholera, opting to treat with ciprofloxacin. Apart from the presence of blood in the stools, which additional clinical feature would

most strongly support a diagnosis of Shigella infection?

A. Absence of rectal pain

B. Presence of abdominal cramps

C. Presence of vomiting

D. Presence of fever

Correct answer: D

Shigellosis is a form of invasive bacillary dysentery. Unlike cholera, which is a non-invasive secretory diarrhea characteristically described as "painless" and "afebrile," Shigella infection is characteristically "inflammatory and febrile". Therefore, the "presence of fever" (Option D) strongly supports a diagnosis of Shigella or other invasive pathogens over cholera. Abdominal cramps (Option B) can occur in both, though they are often more severe in dysentery. Vomiting (Option C) is a hallmark of cholera but can also occur in Shigella. Rectal pain or "tenesmus" (Option A is absence, which is incorrect) is a classic symptom of dysentery. Shigella causes mucosal invasion and ulceration, leading to the triad of fever, abdominal pain, and small-volume stools containing blood and mucus. Clinical differentiation is vital because cholera requires massive fluid resuscitation, while dysentery like Shigellosis often requires specific antibiotic therapy with agents like ciprofloxacin.

Question 70. Which of these vaccines does not follow the open vial policy?

A. OPV (Oral Polio Vaccine)

B. DPT (Diphtheria, Pertussis, Tetanus)

C. TT (Tetanus Toxoid)

D. MEASLES

Correct answer: D

The "Open Vial Policy" allows certain multi-dose vaccine vials to be used for multiple sessions (up to 28 days) if they are stored correctly and the vaccine vial monitor (VVM) is intact. However, this policy specifically "does not apply" to reconstituted vaccines, which must be discarded within 4 to 6 hours. The "Measles" vaccine (Option D) is a lyophilized (freeze-dried) vaccine that must be reconstituted before use; therefore, it does not follow the open vial policy. Other vaccines that do not follow the policy include BCG and JE vaccines. OPV (Option A), DPT (Option B), TT (Option C), and Hepatitis B are all liquid-form vaccines that do follow the open vial policy, provided all safety criteria are met. This policy is critical in cold chain management to reduce vaccine wastage while ensuring potency and safety. Clinicians and health workers must strictly observe the 4-hour discard rule for measles to prevent serious adverse events like toxic shock syndrome.

Question 71. When a public health worker periodically visits the community every 15 days to actively collect blood smears for malaria testing, what type of surveillance is this practice called?

A. Sentinel

B. Active

C. Passive

D. None of the above

Correct answer: B

Surveillance is a cornerstone of epidemiological programs. "Active surveillance" occurs when health authorities "actively seek out" cases in the community. The scenario described—a health worker traveling to households to collect blood smears—is the standard definition of active surveillance used in malaria control programs. "Passive surveillance" (Option C) occurs when authorities simply record data from patients who voluntarily come to health centers. "Sentinel surveillance" (Option A) involves collecting detailed data from a few "watchtower" sites to represent the larger population trends. In India’s malaria program, active surveillance is critical for early case detection and prompt treatment to break the transmission cycle. It is more expensive and labor-intensive than passive surveillance but provides much more accurate data on the actual disease burden in remote areas. Therefore, the health worker's proactive outreach constitutes active case finding.

Question 72. In the demographic cycle, which phase is characterized as the low stationary phase?

A. Phase 1

B. Phase 2

C. Phase 3

D. Phase 4

Correct answer: D

The demographic cycle represents the stages of population change over time. Phase 1 is the "high stationary" stage (high birth and death rates). Phase 2 is "early expanding" (birth rates remain high, death rates fall). Phase 3 is "late expanding" (birth rates start to fall). Phase 4 is correctly identified as the "low stationary phase". In this stage, both birth rates and death rates have stabilized at a very low level, resulting in zero or very slow population growth. Many developed nations are currently in Phase 4. Phase 5 is "declining" (birth rates fall below death rates). Understanding these phases is vital for long-term health planning, as the transition from Phase 2/3 to Phase 4 usually correlates with increased urbanization and better access to family planning. A nation's economic and social development can often be predicted by its current

position in this demographic cycle.

Question 73. What is the term used for the average number of children a woman is expected to have over her lifetime if she experiences the current age-specific fertility rates throughout her reproductive years?

A. General fertility rate

B. Total fertility rate

C. Gross reproduction rate

D. Net reproduction rate

Correct answer: B

The Total Fertility Rate (TFR) is one of the most important measures of reproductive health and population growth. It represents the average number of children that would be born to a woman during her lifetime (reproductive years) based on current age-specific fertility rates. General fertility rate (Option A) is the number of births per 1,000 women of childbearing age per year. Gross reproduction rate (Option C) specifically counts only the number of "female" children born. Net reproduction rate (Option D) is the most refined measure, as it counts female children who are expected to "survive" to childbearing age themselves. A TFR of 2.1 is generally considered the "replacement level fertility" required to keep a population stable. In India, TFR has been steadily declining and is a key metric for evaluating the success of national family welfare programs.

Question 74. A 19-year-old unconscious female patient requires urgent neurosurgical treatment for hydrocephalus, but no relatives or attendants are available to provide identification or consent. In this situation, what should the doctor do?

A. Do not operate without consent

B. Wait for arrival of relatives

C. Operate without consent

D. Take consent by calling the relatives

Correct answer: C

In medical ethics and law, the "Doctrine of Necessity" allows a physician to provide life-saving treatment to a patient who is unable to give consent due to an emergency condition (such as being unconscious). In this scenario, immediate neurosurgical intervention is necessary to prevent death or permanent disability from hydrocephalus. Therefore, the surgeon can and should "operate without consent". Waiting for relatives (Option B) or delaying for formal identification (Option A) would be a breach of the duty of care and could lead to medical

negligence. Calling relatives (Option D) is ideal but should not delay the emergency procedure if they cannot be reached immediately. The doctor should document the situation clearly and seek a second opinion from another senior colleague if possible, but the priority is always to preserve life in an emergency where "implied consent" is assumed.

Question 75. Under the Ayushman Bharat scheme, what is the maximum annual health insurance coverage provided to an eligible family?

A. 5 lakhs per family per year

B. 4 lakhs per family per year

C. 6 lakhs per family per year

D. 3 lakhs per family per year

Correct answer: A

The Ayushman Bharat - Pradhan Mantri Jan Arogya Yojana (PM-JAY) is the world's largest government-funded health insurance scheme. It provides a health cover of "Rs. 5 lakhs per family per year" for secondary and tertiary care hospitalization. This benefit is provided to the bottom 40% of the Indian population (poor and vulnerable families) as identified by the Socio-Economic Caste Census (SECC) data. Options B, C, and D are incorrect. The scheme is "cashless and paperless" at all empanelled public and private hospitals across the country. There is no cap on family size or age, ensuring that all members are covered. This program aims to achieve Universal Health Coverage (UHC) and reduce the out-of-pocket expenditure that often pushes families into poverty after a serious medical crisis. It covers thousands of medical and surgical packages.

Question 76. What is the recommended method for the initial screening of cervical cancer among women at the primary health care level?

A. Visual inspection after application of freshly prepared solution 5% acetic acid solution

B. Colposcopy

C. Cervical biopsy

D. High vaginal biopsy

Correct answer: A

In resource-limited settings like a Primary Health Center (PHC) in India, the most practical and effective screening method is "Visual Inspection with Acetic Acid (VIA)". This involves applying a 3% to 5% acetic acid solution to the cervix; pre-cancerous or cancerous lesions turn white ("aceto-white") and can be easily seen by a trained health worker. Colposcopy (Option B) and Cervical biopsy (Option C) are "confirmatory" tests performed at higher centers (District hospitals or Medical colleges) once a screening test is positive. High vaginal biopsy (Option D) is

not a standard screening tool. VIA is preferred over the Pap smear at the primary level because it provides "immediate results," allows for the "see-and-treat" approach, and does not require complex laboratory infrastructure. Screening is recommended for women aged 30-65 to reduce mortality from this highly preventable cancer.

Question 77. Which entity is responsible for overseeing the school health programs?

A. Primary health centre

B. District hospital

C. Sub-centre

D. Sub-divisional hospital

Correct answer: A

The school health program is a vital part of the community health services in India. The primary responsibility for planning, executing, and overseeing these programs at the local level lies with the "Primary Health Centre (PHC)". The Medical Officer of the PHC is tasked with coordinating regular health check-ups for students, ensuring vaccinations are up to date, and providing health education. While the sub-centre (Option C) provides ground-level assistance through ANMs, the organizational leadership comes from the PHC. District hospitals (Option B) and sub-divisional hospitals (Option D) serve as referral centers for specialized care but do not manage the routine school outreach. The goal of the school health program is the "early detection" of defects and diseases, correction of nutritional deficiencies, and promotion of a healthy environment for children, which is best managed by the community-based PHC infrastructure.

Question 78. Which of the following is not considered a pillar of primary health care?

A. Health education

B. Intersectoral coordination

C. Appropriate technology

D. Equitable distribution

Correct answer: A

The four primary "pillars" (or principles) of primary health care, as defined by the Alma-Ata Declaration, are: Equitable distribution (Option D), Community participation, "Intersectoral coordination" (Option B), and "Appropriate technology" (Option C). Therefore, "Health education" (Option A) is "not" technically one of the pillars. Instead, health education is one of the "eight essential components" of primary health care. Other components include nutrition, safe water/sanitation, maternal/child health, immunization, and local disease control. Equitable distribution ensures health services are accessible to all regardless of status. Intersectoral coordination means that health programs must work with agriculture, education, and other

sectors to be effective. Appropriate technology means using methods that are scientifically sound, locally acceptable, and affordable. Differentiating between the principles (pillars) and the actual elements (components) is a common requirement for public health and social medicine examinations.

Question 79. What is the current ideal total fertility rate (TFR) in India?

A. 2.3

B. 2.2

C. 2.1

D. 2.0

Correct answer: C

In demography, a Total Fertility Rate (TFR) of "2.1" is known as the "replacement level fertility". This is the ideal rate at which a population exactly replaces itself from one generation to the next, without migration. Achieving a TFR of 2.1 has been the primary goal of India’s National Population Policy since 2000. A TFR higher than 2.1 (like Options A and B) leads to population growth. A TFR lower than 2.1 (like Option D) eventually leads to a shrinking population. According to recent data (NFHS-5), India has actually achieved a national TFR of 2.0, which is below the replacement level. However, the "ideal" or "target" replacement level remains globally recognized as 2.1. Reaching this target is essential for long-term socio-economic stability and ensuring that the dependency ratio of the country remains balanced as the population ages.

Question 80. The Sustainable Development Goals (SDGs) are implemented under the aegis of which international organization?

A. United Nations Development Programme

B. United Nations Children's Fund

C. United Nations Educational, Scientific and Cultural Organisation

D. World Health Organization

Correct answer: A

The Sustainable Development Goals (SDGs) are a universal call to action consisting of 17 global objectives established by the United Nations in 2015. While various agencies contribute to specific goals, the United Nations Development Programme (UNDP) is the lead agency tasked with assisting countries in implementing and achieving these targets by 2030. The World Health Organization (Option D) primarily leads efforts regarding Goal 3, which focuses on global health and well-being. UNICEF (Option B) specifically handles goals related to children’s rights and health. UNESCO (Option C) concentrates on educational, scientific, and cultural advancements.

The SDGs represent a broader agenda than the previous Millennium Development Goals, addressing systemic issues like climate change, economic inequality, and social justice. Because of its broad mandate and global presence, the UNDP coordinates the multi-sectoral approach required for sustainable development across nations. The integration of these goals is central to global policy and resource allocation.

Question 81. What are the primary referral centers in India's healthcare system?

A. Primary health centres and district hospitals

B. Medical colleges and district hospitals

C. Community health centres and medical colleges

D. Sub-district hospitals and community health centres

Correct answer: C

India’s healthcare system is organized into a three-tier structure: primary, secondary, and tertiary care. Primary referral centres refer to facilities where patients are first referred from lower-level institutions (like sub-centres or primary health centres) for more specialized care.

Community Health Centres (CHCs) function as the first referral units (FRUs) in rural areas. They provide specialist services such as medicine, surgery, pediatrics, and obstetrics. When cases require even more advanced care, patients are referred further to tertiary care centres, such as medical colleges, which are equipped with highly specialized services, advanced diagnostics, and teaching facilities.

Other options are incorrect:

(A) Primary health centres and district hospitals PHCs are first-contact facilities, not referral centres

(B) Medical colleges and district hospitals district hospitals are referral centres, but PHCs are missing

(D) Sub-district hospitals and CHCs these are secondary-level facilities but do not represent the full referral hierarchy

103. Based on Globocan 2020 data, which cancer type is the most prevalent among males in India?

(A) Lung

Question 82. 102. (C) Community health centres and medical colleges

India’s healthcare system is organized into a three-tier structure: primary, secondary, and tertiary care. Primary referral centres refer to facilities where patients are first referred from lower-level institutions (like sub-centres or primary health centres) for more specialized care.

Community Health Centres (CHCs) function as the first referral units (FRUs) in rural areas. They provide specialist services such as medicine, surgery, pediatrics, and obstetrics. When cases require even more advanced care, patients are referred further to tertiary care centres, such as medical colleges, which are equipped with highly specialized services, advanced diagnostics, and teaching facilities.

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PHCs are first-contact facilities, not referral centres

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district hospitals are referral centres, but PHCs are missing

(D) Sub-district hospitals and CHCs these are secondary-level facilities but do not represent the full referral hierarchy

Based on Globocan 2020 data, which cancer type is the most prevalent among males in India?

A. Lung

B. Lip and oral cavity

C. Colorectal

D. Liver

Correct answer: B

According to the Globocan 2020 report, lip and oral cavity cancer is identified as the most prevalent malignancy among the male population in India. This high incidence is largely attributed to cultural habits involving the consumption of tobacco, areca nut, and betel quid, particularly in smokeless forms like gutka and khaini. While lung cancer (Option

Question 83. Which of the following organizations does not contribute funding to India’s National Tuberculosis Control Programme?

A. Government of India

B. World Bank

C. Global Fund

D. UNICEF

Correct answer: D

India's National Tuberculosis Elimination Program (NTEP) is a massive public health initiative supported by several major domestic and international entities. The Government of India (Option A) provides the primary budgetary support. Major external funding and technical assistance come from the World Bank (Option B) through development credits and the Global Fund to Fight AIDS, Tuberculosis and Malaria (Option C). UNICEF (Option D), while a vital partner in child health and nutrition, is not a primary funding source for the adult-centric national TB elimination program. The NTEP aims to eliminate TB in India by 2025, which is five years ahead of the global Sustainable Development Goal. Funding is directed toward providing free diagnostics, medications, and nutritional support (Nikshay Poshan Yojana) to all TB patients. Understanding the financial stakeholders is important for program management, as these organizations also monitor the progress and quality of TB services.

112. What is the first step in conducting an immunization survey?

(A) Cluster identification

(B) Conducting the survey

(C) Completing the cluster and summary forms

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Question 84. aims to eliminate TB in India by 2025, which

is five years ahead of the global Sustainable Development Goal. Funding is directed toward providing free diagnostics, medications, and nutritional support (Nikshay Poshan Yojana) to all TB patients. Understanding the financial stakeholders is important for program management, as these organizations also monitor the progress and quality of TB services.

What is the first step in conducting an immunization survey?

A. Cluster identification

B. Conducting the survey

C. Completing the cluster and summary forms

D. Calculating the total fertility rate of the area

Correct answer: A

The standard methodology for assessing immunization coverage in a community is the "30-cluster sampling" technique recommended by the WHO. The first and most critical step in this process is cluster identification. This involves dividing the total population of the study area into smaller geographical units (clusters), such as villages or wards, and selecting 30 of them using a systematic random sampling method based on probability proportional to size (PPS). Option B (Conducting the survey) and Option C (Completing forms) are subsequent operational steps that can only occur after the specific clusters and households have been identified. Option D is unrelated to the specific methodology of an immunization coverage survey. Proper cluster identification ensures that the survey sample

is statistically representative of the entire population, allowing for an accurate estimation of the percentage of children who have received their scheduled vaccines. This data is vital for identifying gaps in the health system.

A 45-year-old man from Nellore, Andhra Pradesh, presents with characteristic dental lesions. Based on his geographic background and the typical appearance of these lesions, what is the most likely diagnosis?

(A)
Selenosis
(B)
Plumbism
(C)
Fluorosis
(D)
Lathyrism

Question 85. A 45-year-old man from Nellore, Andhra Pradesh, presents with characteristic dental lesions. Based on his geographic background and the typical appearance of these lesions, what is the most likely diagnosis?

A. Selenosis
B. Plumbism
C. Fluorosis
D. Lathyrism

Correct answer: C

The image displays "mottling of enamel," characterized by brownish stains and pitting, which is the pathognomonic clinical sign of dental fluorosis. This condition occurs due to chronic ingestion of excessive fluoride during the period of tooth development. The geographic clue—Nellore, Andhra Pradesh—is highly significant as several districts in Andhra Pradesh are known endemic belts where groundwater contains high fluoride levels. Selenosis (Option A) typically leads to hair loss and nail changes. Plumbism (Option B), or lead poisoning, often presents with a bluish-black "Burtonian line" on the gums rather than enamel mottling. Lathyrism (Option D) is a neurological disorder caused by consuming grass pea and does not affect the teeth. Dental fluorosis is a permanent cosmetic and structural defect. In severe cases, it can be accompanied by skeletal fluorosis, which causes crippling bone and joint deformities. Prevention relies on providing defluoridated water or alternate water sources in

endemic regions.

Question 86. Asbestosis is a chronic lung condition resulting from prolonged inhalation of asbestos fibers. Which type of cancer is most commonly linked to this disease?

A. Mesothelioma

B. Anthracosis

C. Hepatocellular carcinoma

D. Renal cell carcinoma

Correct answer: A

Asbestosis is a form of pneumoconiosis caused by the chronic inhalation of asbestos fibers, typically in occupational settings like construction or shipbuilding. While asbestos exposure significantly increases the risk of bronchogenic carcinoma, it is most uniquely and strongly associated with malignant mesothelioma. Mesothelioma is a rare and aggressive cancer that develops in the thin layer of tissue covering the lungs (pleura) or abdomen (peritoneum). Option B (Anthracosis) is not a malignancy but a benign accumulation of carbon pigment in the lungs. Option C (Hepatocellular carcinoma) and Option D (Renal cell carcinoma) are malignancies related to viral hepatitis or genetic mutations and are not linked to asbestos inhalation. The latency period between asbestos exposure and the development of mesothelioma is often 20 to 40 years. Because of this strong link, any patient with a clinical history of asbestosis must be closely monitored for pleural changes or effusions indicative of malignancy.

Question 87. Which statistical diagram has been used in the given text to represent the change in population of a particular area between the years 1983 and 1989?

A. Histogram

B. Line diagram

C. Component bar graph

D. Multiple bar graphs

Correct answer: C

The statistical diagram shown is a "Component Bar Graph," also known as a subdivided or stacked bar chart. In this representation, each bar represents the total population for a specific year (1983, 1985, 1987, 1989), and the bar is divided into segments to show the proportional contribution of different components—in this case, males and females. Option A (Histogram) is used for continuous data and features bars that touch each other. Option B (Line diagram) uses points connected by lines to illustrate trends over time. Option D (Multiple bar graphs) would

place the male and female bars side-by-side for each year rather than stacking them. Component bar graphs are excellent for visualizing both the change in the total value over time and the internal composition of that total. This allows researchers to quickly identify if the gender ratio is shifting even as the overall population grows.

Question 88. Which area is most frequently affected by head and neck cancer in India?

A. Nasopharynx

B. Oropharynx

C. Oral cavity

D. Hypopharynx

Correct answer: C

In India, the oral cavity is the most frequent site for head and neck cancers. This epidemiological pattern is distinct from many Western countries and is primarily driven by the widespread prevalence of betel quid chewing, areca nut use, and tobacco consumption in various forms like gutka or khaini. These substances are often held in the buccal vestibule for long periods, leading to chronic irritation and malignant transformation of the oral mucosa. Option A (Nasopharynx) is more common in Southeast Asia and linked to EBV. Option B (Oropharynx) is seeing a global rise due to HPV, but tobacco-related oral cavity cancer still predominates in India. Option D (Hypopharynx) is also common among smokers but occurs less frequently than oral cavity lesions. Most Indian patients present with squamous cell carcinoma. Prevention focuses on public health campaigns against "blood-red" spitting and areca nut habits, which are deeply culturally ingrained in many regions.

ENT

Question 89. Which of the following is not classified as a paired cartilage in the laryngeal structure?

A. Arytenoid

B. Thyroid

C. Corniculate

D. Cuneiform

Correct answer: B

The human larynx consists of nine cartilages: three unpaired and three pairs of cartilages. The thyroid cartilage is the largest and is an unpaired cartilage that forms the "Adam's apple". The other unpaired cartilages are the cricoid and the epiglottis. Option A (Arytenoid), Option C (Corniculate), and Option D (Cuneiform) are all paired cartilages. The arytenoids are particularly important as they provide the attachment points for the vocal cords and are involved in their movement. The corniculate cartilages sit atop the arytenoids, and the cuneiform cartilages are located within the aryepiglottic folds to provide structural support. Understanding this anatomy

is crucial for surgery, intubation, and managing laryngeal trauma. The thyroid cartilage is composed of hyaline cartilage and, unlike the elastic epiglottis, it is prone to calcification with age. Its unpaired nature means that structural damage to the thyroid cartilage often results in significant compromise of the airway and vocal production.

Question 90. Which of the following muscles primarily functions as an abductor of the vocal cords?

A. Lateral cricoarytenoid

B. Posterior cricoarytenoid

C. Thyroarytenoid

D. Vocalis

Correct answer: B

The posterior cricoarytenoid (PCA) is the only muscle that functions as a true abductor of the vocal cords. By rotating the arytenoid cartilages laterally, it opens the rima glottidis, which is essential for breathing. Damage to the recurrent laryngeal nerve, which supplies this muscle, can lead to vocal cord paralysis in an adducted position, potentially causing airway obstruction. Option A (Lateral cricoarytenoid) is a primary adductor, closing the vocal cords for speech and swallowing. Option C (Thyroarytenoid) and Option D (Vocalis) are involved in shortening and relaxing the vocal cords to change the pitch and quality of the voice. Because the PCA is the "safety muscle" of the larynx, its function is paramount during surgery on the thyroid or neck. Bilateral PCA paralysis is a medical emergency requiring tracheostomy or surgical lateralization of the cords to restore an adequate airway for the patient.

hypoventilation with a pH of 7.33 and a pCO_2
of 64 mmHg. Based on these findings, what is
the most appropriate next step in management?
(A) Non-invasive positive pressure ventilation
(PPV) should be given
(B) Invasive positive pressure ventilation (PPV)
should be given
(C) Increase the oxygen flow rate
(D) Intubate and start on a ventilator
AAns

(A) Non-invasive positive pressure ventilation (PPV) should be given

The patient is experiencing an acute exacerbation of COPD with acute respiratory acidosis (pH 7.33 and high). For COPD patients with respiratory acidosis (pH < 7.35), Non-Invasive Positive Pressure Ventilation (NIPPV), such as BiPAP, is the first-line intervention. NIPPV reduces the

work of breathing, improves gas exchange, and significantly decreases the need for endotracheal intubation. Invasive ventilation (Option B and D) is reserved for patients who fail NIPPV or have contraindications like coma or severe hemodynamics. Increasing the oxygen flow rate (Option C) without providing ventilatory support can dangerously worsen hypercapnia in COPD patients by reducing their hypoxic respiratory drive. NIPPV should be initiated promptly while continuing medical therapies like bronchodilators and steroids. Successful management is indicated by an improvement in pH and a decrease in the within the first few hours.

Question 91. Killian's dehiscence is located between which two structures?

A. Thyropharyngeus and palatopharyngeus

B. Palatopharyngeus and cricopharyngeus

C. Cricopharyngeus and thyropharyngeus

D. Palatopharyngeus and salpingopharyngeus

Correct answer: C

Killian's dehiscence is a triangular area of relative muscular weakness located in the posterior wall of the lower pharynx. It is specifically situated between the oblique fibers of the thyropharyngeus muscle and the transverse fibers of the cricopharyngeus muscle, both of which are parts of the inferior pharyngeal constrictor. This area is clinically significant because it is the most common site for the formation of a Zenker's diverticulum. Increased pressure during swallowing can cause the mucosa to herniate through this weak point. Options A, B, and D are incorrect as they involve the palatopharyngeus or salpingopharyngeus, which are internal muscles of the pharynx and do not form this specific anatomical landmark. Patients with a Zenker's diverticulum often present with dysphagia, regurgitation of undigested food, and halitosis. Surgical or endoscopic management often requires the division of the cricopharyngeus muscle (cricopharyngeal myotomy) to relieve the pressure at Killian's dehiscence.

Question 92. A 60-year-old patient with diabetes presents with severe ear pain and persistent ear discharge that does not improve with antibiotics. Otoscopic examination shows granulation tissue in the external auditory canal, along with facial nerve palsy. Based on these findings, what is the most likely diagnosis?

A. Otomycosis

B. Serous otitis media

C. Malignant otitis externa

D. Eczematous otitis externa

Correct answer: C

Malignant otitis externa (MOE), also known as necrotizing otitis externa, is a severe, life-threatening infection of the external auditory canal and skull base. It typically occurs in elderly diabetic patients or immunocompromised individuals. The causative organism is almost always Pseudomonas aeruginosa. Key clinical features—intense ear pain out of proportion to clinical signs, persistent foul-smelling otorrhea, and the presence of granulation tissue at the bony-cartilaginous junction—are classic. Facial nerve paralysis indicates that the infection has spread to the skull base, causing osteomyelitis. Option A (Otomycosis) involves fungal growth and itching rather than deep pain. Option B (Serous otitis media) presents with hearing loss and fluid behind the drum, not external canal findings. Option D is an allergic/inflammatory condition with itching and redness. MOE requires urgent intravenous antipseudomonal antibiotics and meticulous diabetic control to prevent further cranial nerve involvement or intracranial complications.

Question 93. An elderly diabetic woman with a recent history of COVID-19 treatment using steroids and remdesivir now presents with foul-smelling nasal discharge and a black necrotic lesion in the nasal cavity, with erosion of the nasal septum and hard palate. Based on these clinical features, what is the most likely diagnosis?

A. Aspergillosis

B. Mucormycosis

C. Foreign body

D. Rhinosporidiosis

Correct answer: B

Rhino-orbital-cerebral mucormycosis is an opportunistic fungal infection caused by fungi of the order Mucorales. This case describes the classic clinical scenario often seen during the COVID-19 pandemic: an immunocompromised patient (due to diabetes and steroid use) developing a fulminant infection. The "black necrotic mass" (eschar) is pathognomonic and results from the fungus's angioinvasive nature, which causes tissue infarction and necrosis. Erosion of the hard palate and nasal septum indicates rapid local spread. Option A (Aspergillosis) can be invasive but rarely presents with such rapid, aggressive necrosis in this specific context. Option C (Foreign body) would cause unilateral discharge but not palatal erosion. Option D (Rhinosporidiosis) presents as strawberry-like friable nasal polyps, usually in patients with a history of bathing in stagnant water. Mucormycosis is a surgical emergency requiring aggressive debridement and systemic antifungal therapy with amphotericin B. Delay in diagnosis often leads to blindness or fatal intracranial extension.

Question 94. Among the listed conditions, which is typically associated with the presence of a B tympanogram?

A. Ossicular dislocation

B. Otosclerosis

C. Serous otitis media

D. Normal ear

Correct answer: C

Tympanometry measures the compliance of the tympanic membrane under varying air pressure. A Type B tympanogram is a "flat" curve indicating significantly restricted mobility of the eardrum. This is most commonly seen in Serous Otitis Media (Otitis Media with Effusion), where fluid in the middle ear space prevents the membrane from vibrating. It can also be seen in cases of a perforated eardrum or a completely occluded ear canal. Option A (Ossicular dislocation) typically produces a Type Ad (deep) tympanogram due to hypermobility. Option B (Otosclerosis) results in a Type As (stiff/shallow) tympanogram, as the stapes is fixed but the drum can still move slightly. Option D (Normal ear) produces a Type A tympanogram with normal peak pressure and compliance. Understanding these patterns is essential for diagnosing hearing loss; a Type B tympanogram in a child often indicates the need for medical management or the insertion of pressure-equalizing tubes.

Question 95. In a child with bilateral sensorineural hearing loss who does not benefit from conventional hearing aids, what is the most appropriate next line of management?

A. Bone anchored hearing aid

B. Tympanoplasty

C. Normal hearing aid

D. Cochlear implant

Correct answer: D

When a child has profound bilateral sensorineural hearing loss (SNHL) and derives insufficient benefit from conventional high-power hearing aids after a trial period, a cochlear implant is the gold standard of care. Unlike hearing aids that amplify sound, a cochlear implant bypasses damaged hair cells in the cochlea and directly stimulates the auditory nerve. Option A (BAHA) is

used for conductive or mixed hearing loss where the inner ear is functional but sound cannot reach it. Option B (Tympanoplasty) is a surgical repair for a perforated eardrum or middle ear structures and does not treat sensorineural loss. Option C is what the patient has already failed. Early implantation (ideally before age 2) is critical for the development of normal speech and language skills due to the brain's neuroplasticity. The success of the procedure depends on an intact auditory nerve and dedicated post-operative auditory-verbal habilitation.

Question 96. Which nerve is responsible for causing ear pain following a tonsillectomy procedure?

A. Glossopharyngeal nerve

B. Facial nerve

C. Trigeminal nerve

D. Vagus nerve

Correct answer: A

Post-tonsillectomy ear pain is a common phenomenon known as "referred otalgia". This occurs because the tonsillar fossa is primarily supplied by the tonsillar branch of the glossopharyngeal nerve (CN IX). This same nerve also provides sensory innervation to the middle ear via Jacobson’s nerve (the tympanic branch). When the nerve endings are irritated in the throat following surgery, the brain misinterprets the signals as originating from the ear. Option B (Facial nerve) and Option C (Trigeminal nerve) provide some sensory supply to the external ear, but they are not the primary mediators of post-tonsillectomy pain. Option D (Vagus nerve) can cause referred pain from the larynx or esophagus via Arnold's nerve, but not typically from the tonsils. Management of referred otalgia involves adequate systemic analgesia and counseling the patient that the ear itself is healthy. Persistent unilateral referred otalgia in an adult smoker can also be a red flag for an occult oropharyngeal malignancy.

Question 97. A young male professional trumpet player presents with a swelling on the left side of the neck that produces a gurgling sound on compression. An X-ray of the neck demonstrates characteristic findings. Based on the clinical presentation and imaging, what is the most likely diagnosis?

A. Pharyngeal pouch

B. Laryngocele

C. Trachea-oesophageal fistula

D. Tonsillar cyst

Correct answer: B

A laryngocele is an abnormal cystic expansion of the laryngeal saccule. The patient’s profession

as a trumpet player is a classic risk factor because increased endolaryngeal pressure can force air into the saccule, causing it to dilate. The clinical sign of a "gurgling sound" or the sac emptying upon compression (Bryce’s sign) is highly suggestive. The provided X-ray confirms the diagnosis by showing a clear, air-filled radiolucent space in the neck. Option A (Pharyngeal pouch) is located lower in the neck and usually contains food/fluid rather than just air. Option C (Trachea-oesophageal fistula) presents with coughing and aspiration during feeding, not as a compressible neck mass. Option D (Tonsillar cyst) is a small, superficial lesion within the oropharynx. Laryngoceles can become infected or cause airway obstruction. They are also associated with laryngeal squamous cell carcinoma, which can obstruct the saccule opening. Surgical management is indicated for symptomatic or large lesions.

Question 98. The following image is of the most common cause of stridor in children. Identify it.

A. Laryngomalacia

B. Laryngeal papilloma

C. Chronic epiglottitis

D. Laryngocele

Correct answer: A

Laryngomalacia is the most common congenital abnormality of the larynx and the most frequent cause of inspiratory stridor in infants. It is characterized by "floppiness" of the supraglottic tissues, which collapse into the airway during inspiration. The endoscopic image shows the classic triad: an omega-shaped (tightly folded) epiglottis, short and thickened aryepiglottic folds, and bulky arytenoid mucosa. The stridor typically worsens when the infant is supine or crying and improves when prone. Option B (Laryngeal papilloma) would show warty, cauliflower-like growths on the vocal cords. Option C (Chronic epiglottitis) is rare in children and would show diffuse thickening. Option D (Laryngocele) is an air-filled sac communicating with the saccule. Most cases of laryngomalacia are self-limiting and resolve by age 18–24 months as the cartilages mature. However, severe cases causing failure to thrive, hypoxia, or sleep apnea may require surgical intervention, such as a supraglottoplasty.

127. In a patient with CSOM, labyrinthine fistula most commonly involves

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Question 99. An 11-month-old infant previously noted to have left-sided ptosis shows abnormal eyelid movements in which the left upper eyelid elevates and depresses during feeding. The ptosis disappears when the child opens his mouth or

sucks his thumb. What is this condition called?

A. Symblepharon

B. Blepharophimosis syndrome

C. Lagophthalmos

D. Marcus-Gunn jaw-winking

Correct answer: D

Marcus-Gunn jaw-winking phenomenon is a congenital synkinetic ptosis caused by an abnormal "miswiring" of the cranial nerves during development. Specifically, the levator palpebrae superioris muscle (supplied by CN III) is abnormally innervated by a branch of the trigeminal nerve (CN V) that normally supplies the muscles of mastication. Consequently, when the infant engages in jaw movements like sucking or mouth opening, the eyelid involuntarily retracts or "winks". Option A (Symblepharon) is an adhesion between the eyelid and the eyeball. Option B (Blepharophimosis syndrome) is a complex of ptosis, shortened palpebral fissures, and epicanthus inversus. Option C (Lagophthalmos) is the inability to close the eyelids completely. Marcus-Gunn phenomenon is usually unilateral. It does not typically resolve on its own, but patients often learn to mask the movement. Surgical correction is indicated if the ptosis is severe or causing amblyopia, usually involving levator excision and a frontalis suspension.

Question 100. A 3-month-old infant presents with excessive watering of the right eye and mucopurulent discharge emerging from the right punctum. Based on this presentation, what is the most appropriate management or treatment option?

A. Syringing

B. Probing with syringing

C. Sac massage with topical antibiotics

D. Dacryocystorhinostomy

Correct answer: C

This infant is presenting with Congenital Nasolacrimal Duct Obstruction (CNLDO), a common condition where the lacrimal duct fails to canalize, most often at the Valve of Hasner. This leads to chronic tearing and secondary infection, resulting in mucopurulent discharge. In infants under one year of age, the first-line treatment is "Crigler’s lacrimal sac massage" combined with topical antibiotics if infection is present. This conservative approach is successful in over 90% of cases as the duct often opens spontaneously. Option A (Syringing) and Option B (Probing) are invasive and are generally reserved for cases that fail to resolve after 12 months of age. Option D (DCR) is a major bypass surgery used for adults or older children who have failed probing. For a 3-month-old, starting with conservative massage is the most appropriate, least invasive, and highly effective initial management strategy.

Question 101. A 35-year-old man presents with a distorted or irregularly shaped eye following delayed healing of a corneal ulcer, despite appropriate antibiotic therapy. Based on the clinical features and examination findings, what is the most likely diagnosis?

A. Megalocornea

B. Conjunctivitis

C. Buphthalmos

D. Anterior staphyloma

Correct answer: D

Anterior staphyloma is a condition characterized by a bulging, ectatic scar of the cornea that is lined internally by uveal tissue (iris). It typically occurs as a late complication of a perforated corneal ulcer. When an ulcer heals with a thin, weak scar (pseudocornea), the intraocular pressure causes this weak area to protrude outward. The "deformed" and "dark" appearance mentioned comes from the iris pigment visible through the thin scar tissue. Option A (Megalocornea) is a non-progressive congenital enlargement of a clear cornea. Option B (Conjunctivitis) is a superficial inflammation and would not cause eye deformity. Option C (Buphthalmos) is an enlargement of the entire globe due to congenital glaucoma in neonates. Treatment for a large anterior staphyloma is often cosmetic (staphylomectomy or enucleation), as the eye is typically blind. This case emphasizes the importance of managing corneal ulcers aggressively to prevent perforation.

Question 102. If an individual has visual acuity worse than 3/60 but better than 1/60 in the better eye, along with a visual field restricted to less than 10° around the central fixation, how should this level of visual impairment be classified?

A. Social blindness

B. Economic blindness

C. Curable blindness

D. Manifest blindness

Correct answer: A

Visual impairment is classified based on visual acuity in the better eye with best possible correction and visual field. According to standard public health definitions used in India and by the WHO, social blindness refers to a level of vision where a person has visual acuity worse than 6/60 but equal to or better than 1/60, or a visual field restricted to less than 10° around central fixation.

In the given case, the individual has:

1.

Visual acuity worse than 3/60 but better than 1/60, and

2.

Visual field < 10°

These findings clearly fall within the category of social blindness, as both the acuity and field criteria match this classification.

Other options are incorrect:

(B)

Economic blindness is not a standard WHO classification.

(C)

Curable blindness refers to cause, not severity.

(D)

Manifest blindness is not a recognized classification term.

Question 103. A child develops fever, severe pain, and swelling of the left eye a few days after sustaining a dog bite near the eye. Clinical examination reveals mild proptosis with restricted ocular movements. Based on these findings, what is the most likely diagnosis?

A. Orbital cellulitis

B. Endophthalmitis

C. Panophthalmitis

D. Preseptal cellulitis

Correct answer: D

The key clinical findings that point specifically to Orbital Cellulitis in this scenario are restricted ocular movements (ophthalmoplegia) and proptosis (bulging of the eye). These signs indicate that the infection has spread posterior to the orbital septum, affecting the extraocular muscles and orbital contents.

Why the other options are incorrect:

(D)

Preseptal cellulitis: While this also causes eyelid swelling and fever, it is a superficial infection. Crucially, in preseptal cellulitis, ocular movements are normal, there is no proptosis, and vision is unaffected.

(B)

Endophthalmitis: This is an inflammation of the inner coats of the eye, usually following surgery or penetrating trauma. While it causes pain and vision loss, it does not typically cause proptosis

or restricted eye movements unless it progresses to panophthalmitis.

(C)

Panophthalmitis: This is a more severe, destructive inflammation of all coats of the eye, including the Tenon's capsule. While it does feature proptosis and restricted movement, the patient would be much more toxic, usually with a complete loss of vision and a globe that is essentially a "bag of pus." Given the history of a dog bite (external trauma), orbital cellulitis is the more direct and likely progression.

Question 104. Which of the following treatment modalities is most commonly employed for managing recurrent pterygium of the eye?

A. Conjunctival autograft

B. Beta-radiation

C. Observation

D. Bare sclera technique

Correct answer: A

A pterygium is a triangular fibrovascular growth of the conjunctiva onto the cornea. The primary challenge in pterygium surgery is the high rate of recurrence. For recurrent pterygium, "Conjunctival Autografting" (CAG) is the gold standard and most frequently used technique. This involves harvesting healthy conjunctiva from another part of the eye and suturing or gluing it over the site where the pterygium was removed. Option D (Bare sclera technique) has an unacceptably high recurrence rate and is rarely used alone. Option B (Beta-radiation) and Option C (Observation) are either outdated due to complications or ineffective for an active, recurrent growth. CAG significantly reduces the recurrence rate to less than 5–10%. Mitomycin-C is also sometimes used as an adjunct, but autografting remains the preferred surgical choice for providing a long-term, stable ocular surface and superior cosmetic results.

Question 105. What type of cataract is typically seen on slit-lamp examination in a patient with a history of long-term corticosteroid use?

A. Morgagnian hypermature cataract

B. Posterior subcapsular cataract

C. Sunflower cataract

D. Snowflake cataract

Correct answer: B

Prolonged use of corticosteroids, whether topical, systemic, or inhaled, is a well-known cause of "Posterior Subcapsular Cataract" (PSC). On slit lamp examination, these appear as a granular, "bread-crumb" like opacity located in the central posterior cortex of the lens. PSCs are particularly disabling because they are located near the nodal point of the eye, causing

significant glare and vision loss in bright light. Option A (Morgagnian) is a stage of age-related cataract where the cortex liquefies. Option C (Sunflower cataract) is characteristic of Wilson's disease (copper deposition). Option D (Snowflake cataract) is classic for uncontrolled diabetes mellitus. PSCs can also be seen in patients with chronic intraocular inflammation (uveitis) or high myopia. Because steroid-induced cataracts can occur rapidly, any patient on long-term steroid therapy must undergo regular ophthalmic examinations to monitor for both cataract formation and secondary ocular hypertension (glaucoma).

Question 106. What is the condition characterized by painless vision loss among the options provided?

A. Central retinal vein occlusion

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B. Branched retinal vein occlusion

C. Central retinal arterial occlusion

D. Branched retinal artery occlusion

Correct answer: A

The image shows a classic “blood and thunder” appearance of the retina, characterized by diffuse retinal hemorrhages, dilated and tortuous veins, and optic disc edema. This is typical of central retinal vein occlusion (CRVO). CRVO occurs due to thrombosis of the central retinal vein, leading to impaired venous drainage, retinal ischemia, and widespread hemorrhages.

Clinically, CRVO presents with sudden, painless loss of vision, which is a key feature highlighted in the question. The involvement is diffuse, affecting the entire retina, which helps distinguish it from branch occlusions.

Why other options are wrong:

(B)

Branch retinal vein occlusion (BRVO) → hemorrhages limited to one quadrant, not diffuse

(C)

Central retinal arterial occlusion (CRAO) → pale retina with cherry-red spot, not hemorrhagic

(D)

Branch retinal arterial occlusion (BRAO) → localized retinal whitening

Question 107. Which of the following methods is regarded as the gold standard for the measurement of intraocular pressure?

A. Gonioscope

B. Goldmann applanation tonometer

C. Hertel's exophthalmometer

D. Tonopen

Correct answer: B

The Goldmann Applanation Tonometer (GAT) is universally recognized as the gold standard for the measurement of intraocular pressure (IOP). It operates on the Imbert-Fick principle, which states that the pressure inside a sphere is equal to the force needed to flatten a fixed area of its surface. GAT is highly accurate and is the reference against which all other tonometers are calibrated. Option A (Gonioscope) is used to examine the drainage angle of the eye, not measure pressure. Option C (Hertel's) is used to measure the degree of proptosis (eyeball protrusion). Option D (Tonopen) is a portable handheld device useful for bedridden patients or irregular corneas but is not as accurate as GAT. GAT measurements can be influenced by central corneal thickness (CCT); therefore, clinicians often adjust readings based on pachymetry. Accurate IOP measurement is fundamental in the diagnosis and management of glaucoma to prevent irreversible optic nerve damage.

Question 108. In a patient with stroke who exhibits homonymous hemianopia with macular sparing, which part of the visual (optic) pathway is most likely involved by the lesion?

A. Central visual field

B. Occipital lobe

C. Optic radiation

D. Optic chiasma

Correct answer: B

"Homonymous hemianopia" is a visual field defect where the same half of the visual field is lost in both eyes. When this defect specifically "spares the macula" (central 5–10 degrees), it is highly characteristic of a lesion in the primary visual cortex of the occipital lobe. Macular sparing occurs because the macular region of the visual cortex is located at the occipital pole and has a dual blood supply from both the middle cerebral artery (MCA) and the posterior cerebral artery (PCA). Option C (Optic radiation) lesions usually cause complete hemianopia without macular sparing. Option D (Optic chiasma) lesions cause bitemporal hemianopia. Option A is a visual area, not a lesion site. This finding is most common after a PCA stroke; even if the artery is occluded, the MCA can often maintain perfusion to the macular representation in the cortex. Recognizing macular sparing is a critical localizing sign in clinical neurology.

Question 109. A middle-aged man with diabetes presents with progressive visual impairment. Fluorescein angiography

findings
are
available
for
evaluation. Based on the typical angiographic
features seen in such cases, what is the most
likely diagnosis?

A. Mild-non proliferative diabetic retinopathy

B. Severe
non-proliferative
diabetic retinopathy

C. Birdshot choroidopathy

D. Proliferative
diabetic
retinopathy

Correct answer: D

Proliferative Diabetic Retinopathy (PDR) is the advanced stage of diabetic eye disease. The hallmark of PDR is "neovascularization"—the growth of new, fragile blood vessels from the retina into the vitreous. On fluorescein angiography (FA), these new vessels are identified by an intense, late-phase leakage of fluorescein dye because they lack a proper blood-retinal barrier. Options A and B (NPDR) are characterized by microaneurysms, hemorrhages, and exudates but not the growth of new vessels. Option C (Birdshot choroidopathy) is a rare autoimmune uveitis with different clinical features. PDR is caused by widespread retinal ischemia, which triggers the release of Vascular Endothelial Growth Factor (VEGF). These new vessels can lead to vitreous hemorrhage and tractional retinal detachment, resulting in severe vision loss. Treatment involves Pan-Retinal Photocoagulation (PRP) or anti-VEGF injections to induce regression of the neovascularization and prevent blindness.

Question 110. What is the cause of the sago-grain appearance
of the conjunctiva?

B. Severe Asthma or Chronic Obstructive
Pulmonary Disease

C. Right ventricular myocardial infarction

D. Atrial Fibrillation

Correct answer: B

Pulsus paradoxus is defined as an exaggerated drop in systolic blood pressure (>10 mmHg) during inspiration. While classically associated with cardiac tamponade, it is also frequently observed in severe obstructive airway diseases such as severe asthma or Chronic Obstructive

Pulmonary Disease (COPD). In these conditions, large negative intrathoracic pressures during inspiration increase venous return to the right heart, causing the interventricular septum to bulge into the left ventricle, which reduces stroke volume. Coronary artery disease (Option A) and atrial fibrillation (Option D) do not typically cause this inspiratory pressure drop. Right ventricular myocardial infarction (Option C) is more commonly associated with Kussmaul's sign (lack of inspiratory fall in JVP). Recognizing pulsus paradoxus in a patient with asthma is a critical clinical indicator of severe respiratory distress and potential impending respiratory failure.

Question 111. A 60-year-old man presents with drooping of the left eyelid and diplopia. On examination, the pupil of the affected eye is found to be dilated. Based on these clinical findings, which cranial nerve is most likely to be injured?

A. Optic nerve

B. Trochlear

C. Oculomotor

D. Abducens

Correct answer: C

The clinical triad of ptosis (drooping eyelid), a "down and out" position of the eye, and a dilated pupil is diagnostic of a complete Oculomotor Nerve (CN III) palsy. The oculomotor nerve supplies the levator palpebrae superioris, medial rectus, superior rectus, inferior rectus, and inferior oblique muscles. When these are paralyzed, the eye is pulled outward by the intact lateral rectus (CN VI) and downward by the superior oblique (CN IV). Dilation of the pupil is a critical "red flag" sign indicating compression of the parasympathetic fibers on the nerve surface. Option A (Optic nerve) palsy causes vision loss, not movement issues. Option B (Trochlear) palsy causes vertical diplopia. Option D (Abducens) palsy causes the eye to turn inward. A "surgical" CN III palsy with pupil involvement is a neurosurgical emergency, as it often results from an aneurysm of the posterior communicating artery.

Question 112. What is the most likely diagnosis for the ocular lesion observed in a 21-year-old male patient?

A. Chlamydia trachomatis

B. Neisseria gonorrhoeae

C. Haemophilus influenzae

D. Vitamin A deficiency

Correct answer: A

The image displays follicular conjunctivitis, which is characteristic of infections caused by Chlamydia trachomatis (Serotypes D-K). In adults, this is known as "Inclusion Conjunctivitis" and

is typically acquired from genital secretions. It features large, pale follicles most prominent in the lower tarsal conjunctiva. Option B (Neisseria gonorrhoeae) causes hyperacute, severe purulent conjunctivitis with massive lid swelling. Option C (Haemophilus influenzae) typically causes acute bacterial conjunctivitis in children, characterized by crusting and redness. Option D (Vitamin A deficiency) causes xerosis and Bitot's spots rather than follicles. Chlamydial infection can also cause Trachoma (Serotypes A-C), the leading infectious cause of blindness, which features follicles on the upper tarsal conjunctiva. Treatment for inclusion conjunctivitis involves oral azithromycin or doxycycline, and it is essential to treat sexual partners simultaneously to prevent reinfection and systemic complications.

Question 113. The infant is suffering from which of the following abnormalities?

A. Snowflake cataract

B. Oil drop cataract

C. Hers disease

D. Von gierke's disease

Correct answer: B

The clinical presentation in the infant, characterized by a specific lenticular opacity, is an "oil drop" cataract. This finding is pathognomonic for galactosemia, a metabolic disorder caused by a deficiency in the enzyme galactose-1-phosphate uridyltransferase. The accumulation of galactitol within the lens leads to osmotic swelling and the characteristic "oil drop" appearance on retroillumination. In contrast, "snowflake" cataracts are typically associated with uncontrolled diabetes mellitus (Option A). Options C and D refer to glycogen storage diseases: Hers disease involves liver phosphorylase deficiency, and Von Gierke's involves glucose-6-phosphatase deficiency; neither is primarily associated with this specific ocular finding. Early diagnosis of galactosemia is critical, as switching to a lactose-free diet can often lead to the regression of these early-stage cataracts and prevent systemic complications like liver failure and intellectual disability.

MEDICINE

Question 114. As a junior resident monitoring a patient on mechanical ventilation, arterial blood gas analysis reveals hypoventilation with respiratory acidosis. Which modification in the ventilator settings would be most effective in correcting this abnormality?

A. Decrease FiO2

B. Increase respiratory rate

C. Increase PEEP

D. Increased plateau pressure

Correct answer: B

Respiratory acidosis in a ventilated patient results from alveolar hypoventilation, which causes retention of carbon dioxide (CO_2). Correction requires increasing minute ventilation to enhance CO_2 clearance. Minute ventilation equals tidal volume × respiratory rate; therefore, increasing the respiratory rate is the most direct way to “wash out” excess CO_2.

Decreasing FiO_2 (Option A) reduces oxygenation without correcting CO_2 retention. Increasing PEEP (Option C) improves oxygenation by preventing alveolar collapse but does not directly treat hypercapnia. Increasing plateau pressure (Option D) is unsafe due to the risk of barotrauma and ventilator-induced lung injury. Hence, raising the respiratory rate is the standard intervention for ventilation-induced respiratory acidosis.

Question 115. A 21-year-old patient with a history of chronic alcohol abuse presents with confusion, tremors, ataxia, and ophthalmoplegia. What is the underlying cause responsible for this clinical presentation?

A. Vitamin B12

B. Vitamin B9

C. Vitamin B1

D. Vitamin B3

Correct answer: C

The classic triad of confusion, ataxia, and ophthalmoplegia in a patient with chronic alcoholism is diagnostic of Wernicke’s Encephalopathy. This condition is caused by a severe deficiency of Vitamin B1, also known as thiamine. Thiamine is a vital cofactor for several enzymes in glucose metabolism; its deficiency leads to neuronal damage, particularly in the mamillary bodies and periaqueductal gray matter. Vitamin B12 deficiency (Option A) typically causes subacute combined degeneration of the spinal cord. Vitamin B9 or folic acid deficiency (Option B) results in megaloblastic anemia. Vitamin B3 or niacin deficiency (Option D) leads to pellagra, characterized by the "3 Ds": dermatitis, diarrhea, and dementia. Immediate treatment with high-dose intravenous thiamine is mandatory to prevent progression to the irreversible Korsakoff syndrome.

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Question 116. A 19-year-old male with a history of chronic smoking presents with fever and a painful swelling below the left ear near the cheek region. He also has difficulty speaking or swallowing

and complains of mild testicular pain. Based on this clinical presentation, what is the most likely diagnosis?

A. Cervical tuberculosis

B. Diphtheria

C. Mumps

D. Lymphoma

Correct answer: C

The patient’s presentation of fever and a painful lump beneath the ear (parotitis) is characteristic of Mumps, an acute viral infection caused by a rubulavirus. The crucial clinical clue is the "mild testicular pain," which suggests orchitis, a common complication of mumps in post-pubertal males. Cervical tuberculosis (Option A) usually presents with chronic, painless "cold" lymphadenopathy. Diphtheria (Option B) is associated with a greyish-white pharyngeal membrane and severe "bull neck" swelling. Lymphoma (Option D) typically presents with painless, rubbery, and generalized lymphadenopathy rather than acute painful parotid swelling. Smoking is a distractor here, as it does not directly cause this acute constellation of symptoms. Mumps is generally a self-limiting disease, but management involves supportive care and monitoring for complications like meningitis or pancreatitis.

Question 117. An intern finds a patient unresponsive, and an emergency ECG reveals a cardiac arrhythmia. A DC shock is administered, but the arrhythmia persists and the patient remains unresponsive. What should be the next most appropriate step in the management of this patient?

A. Synchronized cardioversion

B. Start CPR

C. Deliver another DC shock

D. 1 mg epinephrine IV

Correct answer: B

The ECG waveform exhibits chaotic, irregular electrical activity without identifiable P waves or QRS complexes, which is diagnostic of Ventricular Fibrillation (VF). According to Advanced Cardiovascular Life Support (ACLS) guidelines, when an initial DC shock (defibrillation) fails to restore a rhythm and the patient remains unresponsive, the immediate next step is to resume high-quality Cardiopulmonary Resuscitation (CPR). CPR should be continued for two minutes before another rhythm check or shock is delivered. Synchronized cardioversion (Option A) is used for stable tachyarrhythmias with a pulse, not for pulseless VF. Delivering another immediate shock (Option C) is incorrect as it interrupts vital chest compressions. Epinephrine

(Option D) is typically administered after the second unsuccessful shock. High-quality CPR is essential to maintain coronary and cerebral perfusion until a shock can successfully reset the heart.

Question 118. A 64-year-old man presents with episodes of palpitations and syncope. He has a past history of an inferior-wall myocardial infarction one year ago. A Holter monitoring study has been performed, and the 24-hour ECG tracing is shown. Based on these findings, what is the most appropriate long-term management for this patient?

A. Amiodarone

B. Atropine only

C. Permanent pacemaker

D. Atropine and isoproterenol

Correct answer: C

The patient’s history of inferior-wall myocardial infarction followed by symptoms of palpitations and syncope suggests a significant conduction system disorder. The Holter ECG strip likely reveals a high-grade or complete (third-degree) atrioventricular (AV) block, given the heart rate (HR 45) and clinical symptoms. For symptomatic bradycardia due to advanced AV block, the gold standard for long-term management is the insertion of a permanent pacemaker. Amiodarone (Option A) is an antiarrhythmic used for tachycardias and would worsen bradycardia. Atropine (Option B) and isoproterenol (Option D) are used for temporary, acute management of bradycardia but are not definitive long-term solutions. The presence of syncope in a patient with a prior MI and severe bradycardia indicates a high risk of sudden cardiac death, necessitating permanent cardiac pacing.

Question 119. In which condition is pulsus paradoxus observed?

A. Bitot's spots

B. Pterygium

C. Phlyctenular conjunctivitis

D. Membranous conjunctivitis

Correct answer: A

"Sago-grain appearance" is a classic clinical description used for Bitot's spots, which are a hallmark sign of Vitamin A deficiency (Xerophthalmia). These are small, foamy, triangular-shaped white plaques that typically appear on the bulbar conjunctiva, most often on the temporal side. They are composed of keratinized epithelial cells and Corynebacterium

xerosis bacteria. Option B (Pterygium) is a fleshy, fibrovascular growth. Option C (Phlyctenular conjunctivitis) presents as a small nodule near the limbus. Option D (Membranous conjunctivitis) features a thick layer of fibrin on the conjunctival surface. Vitamin A deficiency is a major cause of preventable childhood blindness worldwide. It begins with night blindness (Nyctalopia) and progresses to Bitot's spots, corneal xerosis, and finally keratomalacia (softening of the cornea). Management involves immediate high-dose oral Vitamin A supplementation according to WHO protocols to prevent permanent ocular damage and improve systemic health.

Question 120. During a routine health assessment using the STEP approach, a physician collects key information from the patient. If a patient reports fatigue and dizziness, which of the following parameters would not usually be evaluated as part of the STEP approach?

A. Blood group

B. Blood pressure

C. Blood sugar

D. Blood lipid

Correct answer: A

The "STEP" approach in clinical medicine or screening is often utilized to monitor metabolic parameters that contribute to chronic lifestyle diseases. Typical components include checking Blood Pressure (Option B), Blood Sugar (Option C), and Blood Lipids (Option D). These are modifiable risk factors that can explain symptoms like fatigue and dizziness. In contrast, a patient's Blood Group (Option A) is a fixed genetic characteristic that is not routinely assessed as part of a general diagnostic "STEP" screening for symptoms of fatigue or metabolic health. Blood grouping is generally reserved for pre-operative planning, blood transfusion, or obstetric care. When a patient presents with dizziness, assessing for hypertension or diabetes (via pressure and sugar checks) is high-yield, whereas knowing the blood type does not provide immediate diagnostic value for the underlying clinical complaint.

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Question 121. A 50-year-old man diagnosed with Addison’s disease presents with typical features of adrenal hormone deficiency but also reports an unexpected rise in blood glucose levels. Considering the usual clinical presentation of Addison’s disease, which of the following

features is not commonly associated with this condition?

A. Hyperglycemia

B. Hyponatremia

C. Hyperkalemia

D. Hypotension

Correct answer: A

Addison’s disease, or primary adrenal insufficiency, results from the destruction of the adrenal cortex, leading to a deficiency in cortisol and aldosterone. Cortisol is a "stress hormone" that increases blood glucose; therefore, a deficiency characteristically leads to hypoglycemia rather than hyperglycemia. The aldosterone deficiency causes the kidneys to lose sodium and retain potassium, leading to the hallmark electrolyte abnormalities of hyponatremia (Option B) and hyperkalemia (Option C). Chronic mineralocorticoid deficiency also results in reduced blood volume and hypotension (Option D). The patient’s report of hyperglycemia is contradictory to the pathophysiology of the disease. Other common symptoms include skin hyperpigmentation (due to elevated ACTH) and profound fatigue. A diagnosis of Addison's is confirmed with a low morning cortisol level and a failure to respond to the ACTH stimulation test.

Question 122. A neurologist notes the presence of a characteristic “wing-beating” tremor during examination of a patient. This clinical sign is most commonly associated with which underlying condition?

A. Wilson's disease

B. Huntington's chorea

C. Parkinsonism

D. Sydenham's chorea

Correct answer: A

The "wing-beating" tremor (also called a Rubral or Holmes tremor) is a coarse, proximal, high-amplitude tremor elicited when the arms are abducted and the elbows flexed. It is a classic neurological finding in Wilson's disease, which is a disorder of copper metabolism leading to copper deposition in the basal ganglia (especially the putamen) and liver. Huntington's chorea (Option B) presents with involuntary jerky movements (chorea) and cognitive decline, not this specific tremor. Parkinsonism (Option C) is characterized by a "pill-rolling" rest tremor, rigidity, and bradykinesia. Sydenham's chorea (Option D) is a manifestation of rheumatic fever involving purposeless movements. Patients with Wilson's disease also exhibit Kayser-Fleischer rings in the cornea and low serum ceruloplasmin levels. Treatment involves copper-chelating agents like D-penicillamine or zinc to prevent further

neurological and hepatic deterioration.

Question 123. A patient is admitted to the ICU with a 4-day history of fever and recent onset of breathlessness. Despite increasing the oxygen flow rate, the patient remains hypoxic with progressively falling oxygen saturation. Chest X-ray shows characteristic abnormalities, and the PaO_2/FiO_2 ratio is 204 mmHg. Based on these findings, what is the most likely diagnosis?

A. Atelectasis

B. Mediastinitis

C. Pulmonary fibrosis

D. ARDS

Correct answer: D

The clinical scenario of acute breathlessness following an infection (fever), refractory hypoxemia (unresponsiveness to oxygen), and a ratio between 200–300 mmHg satisfies the Berlin definition for mild Acute Respiratory Distress Syndrome (ARDS). ARDS is characterized by diffuse alveolar damage leading to non-cardiogenic pulmonary edema. Atelectasis (Option A) involves the collapse of lung tissue, usually localized rather than diffuse. Mediastinitis (Option B) is an inflammation of the mediastinum, typically presenting with chest pain rather than primary lung failure. Pulmonary fibrosis (Option C) is a chronic, progressive restrictive lung disease, not an acute condition occurring over four days. ARDS chest X-rays typically show bilateral pulmonary infiltrates. Management focuses on treating the underlying cause (e.g., sepsis or pneumonia) and providing lung-protective mechanical ventilation with low tidal volumes to prevent further lung injury.

Question 124. Which of the options given does not contribute to its occurrence as shown below?

A. Rheumatoid arthritis

B. Pregnancy

C. Liver cirrhosis

D. Hypo-estrogenic state

Correct answer: D

The image shows "palmar erythema," a symmetric redness of the thenar and hypothenar eminences. This condition is primarily associated with hyper-estrogenic states, where elevated estrogen levels cause local vasodilation. Therefore, a "hypo-estrogenic state" (Option D) would not contribute to its occurrence; in fact, the opposite is true. Palmar erythema is a classic physical sign in liver cirrhosis (Option C) because the liver cannot effectively metabolize

estrogen. It is also common in pregnancy (Option B) due to the physiological rise in estrogen. Additionally, it is seen in autoimmune conditions like rheumatoid arthritis (Option A) due to chronic inflammation and increased vascularity. Other causes include hyperthyroidism and certain medications. While palmar erythema itself is benign, it serves as an important clinical marker for underlying systemic disease, particularly hepatic dysfunction or chronic inflammatory states.

Question 125. A 55-year-old patient presents with long-standing projectile vomiting accompanied by significant weight loss. Based on this clinical scenario, which metabolic abnormality is most likely to be present?

A. Hypokalemic
hypochloremic
metabolic
alkalosis with hyponatremia

B. Hypokalemic
hypochloremic
metabolic
alkalosis with hypernatremia

C. Hypokalemic
hypochloremic
metabolic
alkalosis with hypercalcemia

D. Hypokalemic
hypochloremic
metabolic
acidosis with hyponatremia

Correct answer: A

Chronic projectile vomiting, classically seen in gastric outlet obstruction, leads to massive loss of gastric hydrochloric acid (HCl) along with potassium (K^+) and sodium (Na^+). The loss of hydrogen ions (H^+) and chloride ions (Cl^-) directly produces hypochloremic metabolic alkalosis.

To compensate for volume depletion, the kidneys activate the renin–angiotensin–aldosterone system (RAAS). This causes sodium reabsorption in exchange for increased urinary excretion of potassium and hydrogen ions, resulting in paradoxical aciduria and worsening hypokalemia.

Prolonged vomiting also leads to hyponatremia (Option A) due to direct sodium loss and dilution from ADH-mediated water retention. Hypernatremia (Option B) and hypercalcemia (Option C) are not typical features. Metabolic acidosis (Option D) occurs with diarrhea due to loss of

bicarbonate, not with vomiting.

Definitive management includes surgical correction of the obstruction along with aggressive fluid resuscitation using isotonic saline and potassium replacement.

Question 126. A tall male presents with absent pubic and axillary hair, poorly developed genitalia, and markedly elevated levels of LH and FSH. Karyotype analysis reveals an XXY chromosomal pattern. Based on these findings, what is the most likely diagnosis?

A. Vanishing testis syndrome

B. Klinefelter's syndrome

C. Noonan syndrome

D. Adrenal hyperplasia

Correct answer: B

The 47,XXY karyotype is pathognomonic for Klinefelter's syndrome, the most common sex chromosome disorder in males. The extra X chromosome interferes with testicular development, leading to primary testicular failure (hypergonadotropic hypogonadism). This explains the elevated LH and FSH levels (lack of negative feedback) and the underdeveloped genitalia with poor secondary sexual characteristics. Affected individuals are characteristically tall with long limbs. Vanishing testis syndrome (Option A) involves the prenatal loss of testes in a 46,XY male. Noonan syndrome (Option C) is an autosomal dominant condition often called "male Turner syndrome," typically associated with short stature and heart defects. Adrenal hyperplasia (Option D) usually presents with virilization or salt-wasting, not a tall stature with underdeveloped male features. Testosterone replacement therapy is used to manage symptoms and improve bone density, although infertility is usually permanent.

173. A 60-year-old patient with known chronic obstructive pulmonary disease (COPD) is admitted to the ICU and is receiving oxygen at 2 L/min. Arterial blood gas analysis shows

Question 127. X chromosome interferes with testicular development, leading to primary testicular failure (hypergonadotropic hypogonadism). This explains the elevated LH and FSH levels (lack of negative feedback) and the underdeveloped genitalia with poor secondary

sexual characteristics. Affected individuals are characteristically tall with long limbs. Vanishing testis syndrome (Option A) involves the prenatal loss of testes in a 46,XY male. Noonan syndrome (Option C) is an autosomal dominant condition often called "male Turner syndrome," typically associated with short stature and heart defects. Adrenal hyperplasia (Option D) usually presents with virilization or salt-wasting, not a tall stature with underdeveloped male features. Testosterone replacement therapy is used to manage symptoms and improve bone density, although infertility is usually permanent.

A 60-year-old patient with known chronic obstructive pulmonary disease (COPD) is admitted to the ICU and is receiving oxygen at 2 L/min. Arterial blood gas analysis shows hypoventilation with a pH of 7.33 and a pCO_2 of 64 mmHg. Based on these findings, what is the most appropriate next step in management?

A. Non-invasive positive pressure ventilation (PPV) should be given

B. Invasive positive pressure ventilation (PPV) should be given

C. Increase the oxygen flow rate

D. Intubate and start on a ventilator

Correct answer: A

(PPV) should be given

The patient is experiencing an acute exacerbation of COPD with acute respiratory acidosis (pH 7.33 and high). For COPD patients with respiratory acidosis (pH < 7.35), Non-Invasive Positive Pressure Ventilation (NIPPV), such as BiPAP, is the first-line intervention. NIPPV reduces the work of breathing, improves gas exchange, and significantly decreases the need for endotracheal intubation. Invasive ventilation (Option B and D) is reserved for patients who fail NIPPV or have contraindications like coma or severe hemodynamics. Increasing the oxygen flow rate (Option C) without providing ventilatory support can dangerously worsen hypercapnia in COPD patients by reducing their hypoxic

respiratory drive. NIPPV should be initiated promptly while continuing medical therapies like bronchodilators and steroids. Successful management is indicated by an improvement in pH and a decrease in the within the first few hours.

A patient wakes up unable to extend the wrist after sleeping with the arm hanging over the back of a chair. This condition is most likely caused by what underlying mechanism or injury?

(A)

Neurotmesis

(B)

Neurolysis

(C)

Axonotmesis

(D)

Neuropraxia

Question 128. (Option D), a beta-blocker, can worsen the heart block caused by digoxin. Definitive management for severe toxicity includes the administration of Digoxin-specific antibody fragments (DigiFab) and correction of electrolyte imbalances, particularly hypokalemia, which potentates digoxin's effects.

A pregnant woman with a prior mitral valve replacement is currently at 36 weeks of gestation. She has been on long-term warfarin therapy throughout pregnancy, and her INR is 3. In view of her advanced gestational age and cardiac history, which of the following is the most appropriate management approach at this stage?

A. Stop warfarin and start LMWH

B. Stop warfarin and start heparin

C. Continue warfarin

D. Stop warfarin, start LMWH and aspirin

Correct answer: A

In a pregnant woman with a mechanical mitral valve, continuous anticoagulation is essential to prevent valve thrombosis. However, at 36 weeks of gestation, continuing warfarin is unsafe because it crosses the placenta and increases

the risk of fetal bleeding, especially intracranial hemorrhage during delivery. Therefore, warfarin must be discontinued at this stage.
The preferred approach is to switch to low molecular weight heparin (LMWH). LMWH does not cross the placenta, making it safer for the fetus, and provides effective anticoagulation for the mother. It has a predictable dose-response and is widely used with anti-Xa monitoring in pregnancy.
Other options are incorrect:
(B) Unfractionated heparin is useful near delivery but is not the preferred option at this stage in stable patients.
(C) Continuing warfarin poses significant fetal risk.
(D) Adding aspirin is unnecessary and increases bleeding risk.
Thus, at 36 weeks, the most appropriate management is to stop warfarin and initiate LMWH.
A child presents to the outpatient department with clinical features as shown in the given image. Based on these findings, what is the most likely diagnosis?
(A)
Kwashiorkor
(B)
Marasmus
(C)
Nephrotic syndrome
(D)
Nephritic syndrome

Question 129. A child presents to the outpatient department with clinical features as shown in the given image. Based on these findings, what is the most likely diagnosis?
A. Kwashiorkor
B. Marasmus

C. Nephrotic syndrome

D. Nephritic syndrome

Correct answer: A

The image depicts a child with generalized edema (anasarca), particularly noticeable in the face and limbs. This clinical presentation is characteristic of "Kwashiorkor," a form of severe protein-energy malnutrition. The edema results from severe hypoalbuminemia, which reduces plasma oncotic pressure. Other classic signs include a "moon face," "flaky paint" dermatosis, and sparse, reddish hair. "Marasmus" (Option B) is characterized by severe muscle wasting and a "skin and bones" appearance without edema. While Nephrotic syndrome (Option C) also presents with generalized edema and hypoalbuminemia, Kwashiorkor is far more common in pediatric populations in specific social contexts and is usually accompanied by growth failure and dietary history. Nephritic syndrome (Option D) presents with hematuria, hypertension, and more localized (periorbital) edema. Management of Kwashiorkor requires careful nutritional rehabilitation to avoid refeeding syndrome.

Examination Paper June 2021 Question

(A) Superior SCC

(B) Lateral SCC

(C) Posterior SCC

(D) Utricle

AAns

(B) Lateral SCC

Chronic Suppurative Otitis Media (CSOM), particularly the atticoantral type associated with cholesteatoma, can cause erosion of the bony labyrinth. The lateral (horizontal) semicircular canal (SCC) is the most common site for a labyrinthine fistula because it lies in the medial wall of the aditus and antrum, making it highly susceptible to pressure and osteolytic enzymes from a growing cholesteatoma. Option A (Superior SCC) and Option C (Posterior SCC) are involved much less frequently. Option D (Utricle) is deeper and better protected. Patients with a fistula often present with "fistula sign," where changes in ear canal pressure induce vertigo and nystagmus. Vertigo may also occur when cleaning the ear or with loud sounds (Tullio phenomenon). The presence of a fistula is a surgical priority during mastoidectomy. The surgeon must carefully remove the disease while preserving the underlying endosteum to prevent total sensorineural hearing loss (dead ear).

Question 130. A patient with a severe history of a road traffic accident shows clinical signs suggestive of raised intracranial pressure on examination. What is

the recommended treatment in this situation?

A. Administer
antibiotics
for
potential
infection.

B. Initiate anticoagulant therapy to prevent
blood clot formation.

C. Perform immediate surgical intervention.

D. Administer mannitol

Correct answer: D

In the acute management of a head injury patient exhibiting signs of elevated Intracranial Pressure (ICP)—such as altered consciousness, pupillary changes, or Cushing's triad—the immediate medical priority is to reduce the pressure. "Mannitol" is an osmotic diuretic that is the standard first-line pharmacological treatment for acutely lowering ICP. It works by creating an osmotic gradient that draws water out of brain tissue into the vascular space. Antibiotics (Option A) and anticoagulants (Option B) are not primary treatments for acute intracranial hypertension and can even be contraindicated in cases of traumatic hemorrhage. While surgical intervention (Option C) like a decompressive craniectomy may be necessary later, medical stabilization with mannitol is often the required "bridge" to imaging and surgery. Other emergency measures include elevating the head of the bed to 30 degrees and controlled hyperventilation if herniation is imminent.

SURGERY

Question 131. A man sustains a perineal injury after falling into a manhole and subsequently develops difficulty in passing urine with blood seen at the urethral meatus. He is diagnosed with a bulbar urethral injury. In this condition, at which anatomical site would urine extravasation be least likely to occur?

A. Perineum

B. Anterior abdominal wall

C. The medial portion of thigh

D. Root of scrotum

Correct answer: C

A fall-astride injury commonly causes a rupture of the bulbar urethra. When the urethra ruptures below the urogenital diaphragm, extravasated urine and blood are contained by

Colles’ fascia. Colles’ fascia is continuous with Scrotal (Dartos) fascia and Scarpa’s fascia of the "anterior abdominal wall" (Option B), but it is firmly attached to the fascia lata of the thigh. Therefore, while urine can freely track into the "perineum" (Option A), "root of the scrotum" (Option D), and up the abdominal wall, it cannot track into the "medial portion of the thigh" (Option C). This creates a characteristic "butterfly" or "scrotal" swelling pattern. Diagnosis is confirmed via Retrograde Urethrography (RGU). Management usually involves the placement of a suprapubic catheter to divert urine, followed by delayed surgical repair of the urethra to avoid aggravating the injury or causing infection.

Question 132. A patient presents with retrosternal chest pain radiating to the jaw along with difficulty in swallowing. A barium swallow study demonstrates characteristic abnormalities. Based on these clinical features and imaging findings, what is the most likely diagnosis?

A. Infectious esophagitis

B. Diffuse esophageal spasm

C. Barrett's esophagus

D. Esophageal stricture

Correct answer: B

The combination of retrosternal chest pain (often mimicking cardiac pain) and dysphagia, coupled with a barium swallow showing a "corkscrew" or "rosary bead" appearance, is diagnostic of Diffuse Esophageal Spasm (DES). DES is a motility disorder characterized by uncoordinated, simultaneous contractions of the esophageal smooth muscle. Infectious esophagitis (Option A) typically presents with painful swallowing (odynophagia) and white plaques or ulcers, not this radiographic pattern. Barrett’s esophagus (Option C) is a pre-malignant change in the mucosa and is often asymptomatic or associated with chronic reflux. Esophageal stricture (Option D) shows a smooth or irregular narrowing of the lumen, not multiple spastic segments. Diagnosis is definitively confirmed with esophageal manometry showing high-amplitude, non-peristaltic contractions. Treatment involves smooth muscle relaxants like nitrates or calcium channel blockers, and in refractory cases, a long myotomy.

Question 133. A 25-year-old man is brought to the emergency department following a road traffic accident. He has a respiratory rate of 25 breaths per minute and a blood pressure of 80/45 mmHg. On clinical examination, hyper-resonance is noted

on the left side of the chest, and the chest X-ray (shown) reveals corresponding findings. What is the most appropriate immediate management for this patient?

A. Wide bore needle insertion in the 2nd ICS

B. Wide bore needle insertion in the 5th ICS followed by an intercostal drain in the 5th ICS

C. Aspiration of the pleural fluid

D. No intervention needed

Correct answer: B

The patient presents with trauma, hypotension (shock), respiratory distress, and hyper-resonance, which is the classic triad for a Tension Pneumothorax. This is a clinical emergency where air is trapped in the pleural space, shifting the mediastinum and compressing the heart. According to updated ATLS guidelines, the immediate decompression site for an adult is "wide bore needle insertion in the 5th intercostal space" (ICS) at the mid-axillary line, immediately "followed by an intercostal drain" (chest tube) at the same level. The 2nd ICS (Option A) was the older recommended site but is now preferred only for children. Aspiration of fluid (Option C) is for pleural effusion, not air. Tension pneumothorax is a life-threatening condition that must be diagnosed and treated clinically before waiting for an X-ray if the patient is unstable.

Question 134. An 18-year-old man is brought to the emergency department after choking on a bone while eating. He is conscious but unable to speak. What should be the immediate next step in management?

A. Deliver 5 back slaps and 5 chest compressions

B. Endoscopic removal

C. Bag and mask ventilation

D. Perform Heimlich maneuver

Correct answer: D

The patient exhibits a complete airway obstruction, indicated by the inability to speak or cough while remaining responsive. For a responsive adult or adolescent with a foreign body airway obstruction, the "Heimlich maneuver" (subdiaphragmatic abdominal thrusts) is the recommended immediate intervention to expel the object. Back slaps and chest compressions

(Option A) are used for infants under one year of age, not adults. Endoscopic removal (Option B) is a definitive treatment for objects in the esophagus or bronchus but is not the first-line emergency step for a choking patient in respiratory distress. Bag and mask ventilation (Option C) will not work because the airway is mechanically blocked; it may actually push the object deeper. If the patient becomes unresponsive, the provider should start CPR, beginning with chest compressions, to relieve the obstruction.

Question 135. After 18 hours of which peak in the provided image is associated with the occurrence of ovulation?

A. 1

B. 2

C. 3

D. 4

Correct answer: B

In the menstrual cycle, the hormonal triggers for ovulation follow a specific sequence. Label '2' on the provided graph represents the Luteinizing Hormone (LH) surge. Ovulation, the release of the oocyte from the dominant follicle, occurs approximately "12–24 hours" after the peak of the LH surge (or 36 hours after the start of the surge). Therefore, Option B is correct. Label '1' (in some graphs) represents the estrogen peak that precedes and triggers the LH surge. Label '3' represents the small concurrent FSH surge. Label '4' represents the post-ovulatory rise in progesterone produced by the corpus luteum in the luteal phase. Progesterone is essential for preparing the endometrium for implantation but does not trigger ovulation. Understanding these hormonal peaks is fundamental for fertility monitoring and the timing of procedures like intrauterine insemination (IUI). The LH surge is the most reliable clinical and laboratory predictor that ovulation is imminent.

Question 136. Which of the following conditions are associated with oligohydramnios?

A. Renal agenesis

B. Neural tube defect

C. Esophageal atresia

D. Premature birth

Correct answer: A

Oligohydramnios is defined as an abnormally low volume of amniotic fluid. Since fetal urine is the primary source of amniotic fluid in the second and third trimesters, any condition that impairs fetal urine production leads to oligohydramnios. "Renal agenesis" (the absence of kidneys) is a classic cause, often resulting in Potter’s sequence due to compression of the fetus. Neural tube defects (Option B) and esophageal atresia (Option C) are characteristically

associated with polyhydramnios because the fetus cannot effectively swallow the fluid (swallowing is the primary way amniotic fluid is removed). Premature birth (Option D) itself is not a primary cause, though preterm premature rupture of membranes (PPROM) is a common clinical cause of low fluid. Other causes of oligohydramnios include placental insufficiency and posterior urethral valves. Monitoring via ultrasound is essential to prevent complications like pulmonary hypoplasia or limb deformities in the fetus.

195. A 40-year-old man presents with acute, severe abdominal pain radiating to the back, associated with nausea and multiple episodes of vomiting over the past 24 hours. The pain is partially relieved by leaning forward and is most intense in the upper abdomen on examination. Laboratory

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Question 137. 194. (A) Renal agenesis Oligohydramnios is defined as an abnormally low volume of amniotic fluid. Since fetal urine is the primary source of amniotic fluid in the second and third trimesters, any condition that impairs fetal urine production leads to oligohydramnios. "Renal agenesis" (the absence of kidneys) is a classic cause, often resulting in Potter's sequence due to compression of the fetus. Neural tube defects (Option B) and esophageal atresia (Option C) are characteristically associated with polyhydramnios because the fetus cannot effectively swallow the fluid (swallowing is the primary way amniotic fluid is removed). Premature birth (Option D) itself is not a primary cause, though preterm premature rupture of membranes (PPROM) is a common clinical cause of low fluid. Other causes of oligohydramnios include placental insufficiency

and posterior urethral valves. Monitoring via ultrasound is essential to prevent complications like pulmonary hypoplasia or limb deformities in the fetus.

A 40-year-old man presents with acute, severe abdominal pain radiating to the back, associated with nausea and multiple episodes of vomiting over the past 24 hours. The pain is partially relieved by leaning forward and is most intense in the upper abdomen on examination. Laboratory investigations show elevated serum amylase and lipase levels. Based on these findings, what is the most likely diagnosis?

A. Acute appendicitis

B. Acute cholecystitis

C. Acute pancreatitis

D. Liver damage

Correct answer: C

The patient’s presentation of severe epigastric pain radiating to the back, which is partially relieved by leaning forward (tripod position), is classic for "Acute Pancreatitis". The definitive diagnostic criteria are satisfied here by the clinical history combined with "elevated levels of lipase and amylase" (typically >3x the upper limit of normal). Acute appendicitis (Option A) typically begins with periumbilical pain shifting to the right lower quadrant. Acute cholecystitis (Option B) usually presents with right upper quadrant pain and a positive Murphy's sign. Liver damage or hepatitis (Option D) often involves jaundice and elevated transaminases rather than severe radiating pain and high lipase. The most common causes of pancreatitis are gallstones and excessive alcohol consumption. Management requires aggressive

Question 138. Which statement about Marjolin's ulcer is incorrect?

A. It is seen in sites of chronic wounds or scars.

B. It rapidly progresses to malignancy.

C. It can progress to squamous cell carcinoma.

D. It is radioresistant due to avascularity.

Correct answer: B

Marjolin's ulcer refers to a malignancy that arises in a chronic, non-healing wound, burn scar, or site of chronic osteomyelitis. Statement B is "incorrect" because the defining characteristic of a Marjolin's ulcer is that it typically takes a very long time to develop, often 20 to 30 years after the initial injury. It is not an acute transformation. Statement A is correct as chronic wounds are the primary site. Statement C is correct; while other cancers can occur, squamous cell carcinoma is by far the most common histological type. Statement D is also correct; these ulcers are notoriously "radioresistant" because the thick scar tissue (avascularity) creates a hypoxic environment where radiotherapy is less effective. Because these tumors are aggressive and have a higher rate of metastasis than standard skin cancers, wide surgical excision with skin grafting or flap reconstruction is the treatment of choice.

Question 139. A 36-year-old man presents with persistent dull pain in the upper abdomen. He gives a history of a severe episode of abdominal pain five weeks ago following heavy alcohol consumption. On examination, he is jaundiced and has a firm, palpable mass in the epigastric region. A CT scan reveals a well-circumscribed, fluid-filled lesion near the pancreas. Based on these findings, what is the most appropriate diagnosis?

A. Pancreatic pseudocyst

B. Large choledochal cyst

C. Gastric duplication cyst

D. Mesenteric cyst

Correct answer: A

The clinical history of a firm epigastric mass developing four to six weeks "after an episode of acute pancreatitis" (heavy drinking event) is the classic presentation for a "Pancreatic Pseudocyst". A pseudocyst is a collection of pancreatic fluid walled off by granulation and fibrous tissue rather than a true epithelial lining. The dull pain and jaundice result from the cyst compressing adjacent structures like the bile duct. Choledochal cysts (Option B) are congenital dilations of the bile duct and would usually present earlier in life. Gastric duplication cysts (Option C) and mesenteric cysts (Option D) are much rarer and would not be temporally related to a clear episode of pancreatitis. Most pseudocysts resolve with conservative management. However, if they are large, symptomatic, or infected, they may require drainage (endoscopic or surgical cystogastrostomy).

exposure and clinical presentation, what is the
most likely diagnosis?
(A) Squamous cell carcinoma
(B) Basal cell carcinoma
(C) Transitional cell carcinoma
(D) Adenocarcinoma
AAns

(C) Transitional cell carcinoma
Transitional Cell Carcinoma (TCC), also known as urothelial carcinoma, is the most common malignancy of the bladder. Occupational exposure to "aniline dyes" and aromatic amines (like benzidine and naphthylamine) is a well-documented risk factor for TCC, with a latency period often exceeding 20 years. These chemicals are metabolized and excreted in the urine, where they remain in prolonged contact with the bladder lining. Squamous cell carcinoma (Option A) is more commonly associated with chronic irritation from Schistosomiasis or long-term catheter use. Basal cell carcinoma (Option B) is a skin cancer. Adenocarcinoma (Option D) is rare in the bladder and usually arises from urachal remnants. The classic presenting symptom of TCC is painless gross hematuria. Diagnosis is established via cystoscopy and biopsy. Management depends on the stage, ranging from transurethral resection (TURBT) to radical cystectomy.

Question 140. An elderly man is found to have a rectal mass on digital rectal examination, despite having no history of altered bowel habits. If rectal carcinoma is suspected, what is the most appropriate next step in the evaluation or management of this patient?
A. CT scan of the abdomen
B. Rigid sigmoidoscopy and biopsy
C. Full colonoscopy and biopsy
D. Barium enema
Correct answer: C
In a patient with a rectal mass detected on digital rectal examination, the next step is to confirm the diagnosis and evaluate the entire colon. A full colonoscopy allows direct visualization of the rectal lesion and enables biopsy for histopathological confirmation, which is essential before planning treatment. Importantly, colonoscopy also helps detect synchronous lesions elsewhere in the colon, which are present in a small but significant number of patients with colorectal cancer.
Although rigid sigmoidoscopy can visualize and biopsy a rectal lesion, it is limited to the distal

bowel and may miss proximal pathology. Therefore, it is not sufficient as a complete evaluation.
A CT scan of the abdomen is used for staging after diagnosis, not for initial confirmation.
A barium enema is largely outdated and has been replaced by endoscopic techniques.
Thus, the most appropriate next step is full colonoscopy with biopsy, as it provides both diagnostic confirmation and complete colonic assessment.

Question 141. A 30-year-old woman presents with a low-grade fever lasting one week, accompanied by loss of appetite and weight loss. A barium meal follow-through study has been performed, and the image is provided. Based on the clinical features and radiological findings, what is the most likely diagnosis?

A. Ileocaecal TB
B. Ulcerative colitis
C. Crohn's disease
D. Carcinoma caecum

Correct answer: A

The clinical history of constitutional symptoms, including mild fever, weight loss, and anorexia in a young adult, combined with the radiographic finding of a distorted ileocaecal region, strongly suggests abdominal tuberculosis. The barium meal follow-through reveals a "pulled-up" caecum and an obtuse ileocaecal angle, which are classic signs of ileocaecal TB (Stierlin's sign or Fleischner's sign). Ulcerative colitis (Option B) typically presents with bloody diarrhea and predominantly affects the rectum and distal colon, showing a "lead pipe" appearance on imaging. Crohn's disease (Option C) can mimic tuberculosis but often presents with a more sectoral distribution and different radiographic features like the "string sign" of Kantor. Carcinoma of the caecum (Option D) usually presents in older age groups and would show a constant filling defect rather than the fibrotic retraction seen here. Given the high prevalence in endemic regions and the specific anatomical distortions observed, ileocaecal tuberculosis is the most probable diagnosis for this young female patient.

Question 142. A 42-year-old woman presents with repeated episodes of fever, vomiting, and right upper abdominal pain radiating toward the neck. On clinical examination, Murphy’s sign is positive. Based on these findings, what is the most likely diagnosis?

A. Acute cholecystitis
B. Carcinoma gallbladder

C. Peptic ulcer

D. Acute appendicitis

Correct answer: A

The constellation of right upper quadrant (RUQ) pain, fever, and vomiting in a middle-aged female is highly indicative of biliary disease. The pathognomonic clinical finding provided is a positive Murphy’s sign, where the patient experiences a sudden cessation of inspiration due to pain when the gallbladder is palpated during a deep breath. This sign is highly sensitive for acute cholecystitis. Gallbladder carcinoma (Option B) typically presents with chronic pain, jaundice, or a palpable mass rather than acute inflammation. Peptic ulcer disease (Option C) usually causes epigastric pain related to meals and does not present with a Murphy's sign. While acute appendicitis (Option D) can sometimes present with RUQ pain in cases of a retrocaecal or subhepatic appendix, Murphy's sign specifically targets gallbladder inflammation. The radiation of pain to the neck or shoulder is due to phrenic nerve irritation. Consequently, the clinical evidence points decisively toward acute cholecystitis as the primary diagnosis requiring further ultrasound verification and management.

Question 143. A 35-year-old man presents with episodes of hematemesis following recent heavy alcohol consumption. He appears pale but is hemodynamically stable, with no ongoing bleeding at presentation. Liver function tests are within normal limits, and an upper gastrointestinal endoscopy is planned. Based on this clinical scenario, what is the most likely diagnosis?

A. Esophageal varices

B. Gastric ulcer

C. Mallory-Weiss tear

D. Alcoholic gastritis

Correct answer: C

A Mallory-Weiss tear is a longitudinal mucosal laceration at the gastroesophageal junction, typically occurring after episodes of forceful retching or vomiting, often following heavy alcohol consumption. The patient’s stable vitals and normal liver function tests (LFTs) make esophageal varices (Option A) less likely, as varices are usually associated with portal hypertension and cirrhosis. Gastric ulcers (Option B) can cause hematemesis but are not specifically linked to acute alcohol-related retching cycles. While alcoholic gastritis (Option D) can cause erosive bleeding, it typically results in slower blood loss rather than acute hematemesis following vomiting episodes. The classic presentation of hematemesis following initially non-bloody emesis in an alcoholic patient is highly characteristic of a Mallory-Weiss tear. Diagnosis is confirmed by endoscopy, which usually reveals a linear tear near the Z-line. Most cases are self-limiting and managed conservatively with acid suppression, though endoscopic therapy may be needed for active bleeding or visible vessels.

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first-line drug commonly prescribed for this
condition?
(A) Pyrimidine antimetabolite
(B) Inhibitor of neutrophil recruitment
(C) Uricosuric drug
(D) Xanthine oxidase inhibitor
AAns

(D) Xanthine oxidase inhibitor
The patient’s presentation of hyperuricemia and joint swelling is diagnostic of gout. For the long-term management of chronic gout (urates lowering therapy), the first-line agents are xanthine oxidase inhibitors (XOIs), such as Allopurinol or Febuxostat. These drugs work by inhibiting the enzyme xanthine oxidase, which is responsible for the conversion of hypoxanthine to xanthine and xanthine to uric acid, thereby reducing the systemic production of urate. Option A (Pyrimidine antimetabolite) refers to drugs like Methotrexate used in RA, not gout. Option B describes the mechanism of Colchicine, which is used for acute gout flares, not long-term control. Option C (Uricosuric drugs) like Probenecid increase renal uric acid excretion but are second-line due to side effects and efficacy limitations. XOIs are effective in reducing the total body urate pool, preventing tophi formation, and reducing the frequency of future gouty attacks. Monitoring renal function is essential when prescribing Allopurinol.
OBS & GYNE

Question 144. under local anesthesia (Option B), reducing the need for general anesthesia and hospital stay.

The syringe is designed to create a consistent negative pressure of approximately 660 mmHg (or 26 inches of Hg) when the plunger is withdrawn and the valves are released (Option D). This pressure is sufficient to evacuate the uterine contents effectively while minimizing trauma to the endometrial lining. Understanding the mechanical specifications and clinical indications for MVA is fundamental for providers managing early pregnancy complications.

A postmenopausal woman with a long-standing history of uterine fibroids presents with lower abdominal pain for the past four months. Radiological evaluation shows characteristic degenerative changes within the fibroids. Based on these findings, which type of degeneration is most likely present?

A. Fatty degeneration

B. Hyaline degeneration

C. Calcific degeneration

D. Cystic degeneration

Correct answer: C

Uterine leiomyomas (fibroids) can undergo several types of degeneration depending on changes in blood supply or the patient’s physiological state. "Calcific degeneration" is the most common form of degeneration seen in postmenopausal women. As the fibroid

becomes ischemic due to postmenopausal circulatory changes, calcium carbonate and phosphate are deposited within the tumor tissue. On radiological imaging, this appears as characteristic "popcorn calcifications" within the pelvis, as seen in the provided X-ray. Hyaline degeneration (Option B) is the most common type overall but typically occurs during the reproductive years. Fatty degeneration (Option A) and cystic degeneration (Option D) are less common and present with different radiographic textures. Calcific degeneration is usually asymptomatic, although it can occasionally cause localized pain if the fibroid is large or if there is torsion. Identifying these distinct calcification patterns on imaging allows for the correct diagnosis of fibroids in the postmenopausal period, avoiding confusion with other pelvic masses or malignancies.

A 35-year-old woman presents with a palpable mass in the upper outer quadrant of the breast. Histopathological examination reveals tumor cells with a characteristic signet-ring appearance. Based on these findings, what is the most likely diagnosis?

(A)
Colloidal carcinoma

(B)
Papillary carcinoma

(C)
Medullary carcinoma

(D)
Phyllodes tumor

Question 145. Which of the following

developmental
milestones is attained first in infants?

A. Immature pincer grasp

B. Mature pincer grasp

C. Radial palmar grasp

D. Ulnar palmar grasp

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Correct answer: D

Asherman syndrome refers to the presence of intrauterine adhesions (synechiae), most commonly following a vigorous dilation and curettage (D&C) performed for a spontaneous abortion. The adhesions obliterate the uterine cavity, leading to secondary amenorrhea despite normal hormonal function. The provided FSH level of 6 mIU/ml is within the "normal" range (typically 5–20 mIU/ml), which indicates that the hypothalamic-pituitary-ovarian axis is intact. Sheehan's syndrome (Option A) involves pituitary infarction after postpartum hemorrhage and would show "low" gonadotropins. Premature ovarian failure (Option B) would be characterized by a "very high" FSH (usually >40 mIU/ml) as the ovaries fail to respond. PCOS (Option C) typically presents with irregular periods and metabolic signs, not sudden amenorrhea following a procedure, and usually shows a high LH:FSH ratio. The clinical history of a procedure followed by amenorrhea with a normal FSH is pathognomonic for an "outflow tract" obstruction like Asherman syndrome. Diagnosis is confirmed by hysteroscopy.

Question 146. proximal interphalangeal (PIP) joint" and "hyperextension of the distal interphalangeal (DIP) joint." This occurs due to a rupture or weakening of the central slip of the extensor tendon, allowing the lateral bands to slide volarly and act as flexors of the PIP joint. Swan neck deformity (Option A) is the opposite: hyperextension of the PIP and flexion of the DIP. Z-line deformity (Option C) specifically refers to a thumb deformity in RA involving CMC subluxation and MCP hyperextension. Trigger finger (Option D) involves a "locking" of the finger in flexion due to a tendon nodule. Treatment for Boutonniere deformity involves PIP joint splinting in extension to allow the central slip to heal, or surgical repair in chronic,

fixed cases.

A 30-year-old man presents with a slowly progressive swelling around the wrist joint that has been increasing over the past three months. An X-ray image of the wrist is provided. Based on the clinical history and radiographic findings, what is the most likely diagnosis?

A. Ewing's sarcoma

B. Osteosarcoma

C. Osteoclastoma

D. Osteochondroma

Correct answer: C

Osteoclastoma, also known as Giant Cell Tumor (GCT) of the bone, is the most likely diagnosis. It typically occurs in young adults (aged 20–40) and is characteristically located in the epiphysis of long bones, most commonly the distal radius or distal femur. The X-ray shows the classic "soap bubble appearance"—an eccentric, purely lytic lesion that extends to the subchondral bone without a sclerotic rim. Ewing’s sarcoma (Option A) is a pediatric tumor that appears in the diaphysis with an "onion-skin" periosteal reaction. Osteosarcoma (Option B) usually presents with a "sunburst" appearance and Codman's triangle in the metaphysis. Osteochondroma (Option D) is a benign, bone-capped growth that protrudes from the bone surface (exostosis). GCT is locally aggressive and can occasionally metastasize to the lungs. Treatment usually involves thorough curettage of the tumor followed by bone grafting or the use of bone cement (polymethylmethacrylate) to reduce the risk of recurrence.

A patient presents with hip pain and true shortening of the affected limb and is diagnosed with tuberculosis of the hip. Based on these clinical features, which stage of the disease is the

patient currently in?

(A)

Stage of early arthritis

(B)

Stage of synovitis

(C)

Stage of advanced arthritis

(D)

Stage of arthritis without subluxation

Question 147. A patient presents with hip pain and true shortening of the affected limb and is diagnosed with tuberculosis of the hip. Based on these clinical features, which stage of the disease is the patient currently in?

A. Stage of early arthritis

B. Stage of synovitis

C. Stage of advanced arthritis

D. Stage of arthritis without subluxation

Correct answer: C

Tuberculosis of the hip progresses through four clinical stages. In the "Stage of Synovitis" (Option B), there is joint effusion and the limb is in an abducted/externally rotated position ("apparent lengthening"). In the "Stage of Early Arthritis" (Option A), the limb becomes adducted and internally rotated, leading to "apparent shortening." The hallmark of the "Stage of Advanced Arthritis" (Option C) is the presence of "true shortening" of the limb. This occurs because the acetabulum and femoral head have undergone significant destruction, leading to subluxation or dislocation ("wandering acetabulum"). Option D is incorrect as "arthritis without subluxation" describes earlier phases before significant structural collapse. Advanced TB hip is a debilitating condition that often results in fibrous ankylosis. Management involves the multi-drug anti-tubercular regimen (AKT), traction to maintain joint space, and sometimes surgical intervention (arthrodesis or arthroplasty) to restore function or stabilize the joint.

Question 148. Following a surgical procedure, a patient develops a characteristic clinical sign. Injury to which specific nerve is most likely responsible for this finding?

A. Radial nerve

B. Median nerve

C. Ulnar nerve

D. Long thoracic nerve

Correct answer: B

The image depicts the classic “hand of benediction”, seen when a patient with median nerve injury attempts to make a fist. In this condition, the index and middle fingers fail to flex, while the ring and little fingers flex normally due to intact ulnar nerve function. This occurs because the median nerve supplies the flexor digitorum superficialis and the lateral half of flexor digitorum profundus, which are responsible for flexion of the index and middle fingers.

This deformity is typically observed in proximal median nerve injuries, such as those occurring at the elbow or during surgical procedures.

Other options are incorrect:

(A)

Radial nerve injury causes wrist drop, not finger flexion defects.

(C)

Ulnar nerve injury leads to clawing of the ring and little fingers at rest, not inability to flex the index and middle fingers.

(D)

Long thoracic nerve injury causes winged scapula, unrelated to hand movements.

Thus, the inability to flex the lateral two digits confirms a median nerve injury.

Question 149. A 30-year-old man presents with weakness of the distal leg muscles and diminished deep tendon reflexes, without any sensory complaints such as tingling or numbness. Examination reveals muscle wasting below the knee. A similar clinical history is reported in his elder brother. Based on these findings, what is the most probable diagnosis?

A. Charcot-Marie-Tooth disease

B. Refsum's disease

C. Neuropathy associated with Sjogren's syndrome

D. Rheumatoid arthritis

Correct answer: A

Charcot-Marie-Tooth (CMT) disease is a group of inherited motor and sensory neuropathies. The clinical presentation of a young adult with progressive distal muscle weakness, absent reflexes,

and characteristic distal atrophy ("inverted champagne bottle" legs) is classic. The fact that the patient's brother has a similar history points to a genetic etiology, most commonly autosomal dominant (CMT1A). Refsum’s disease (Option B) also features neuropathy but is accompanied by retinitis pigmentosa and ichthyosis. Neuropathy in Sjogren's syndrome (Option C) and Rheumatoid arthritis (Option D) is typically acquired, not familial, and usually involves significant sensory symptoms like pain or paresthesias. CMT predominantly affects the long axons of the peripheral nerves. Patients often develop high foot arches (pes cavus) and hammertoes. Diagnosis is confirmed by nerve conduction studies showing slow velocities and genetic testing. Management is largely supportive, including orthotics and physical therapy to maintain mobility and prevent complications from foot deformities.

Question 150. A 40-year-old woman, gravida 4 para 2 with two miscarriages, presents with foul-smelling vaginal discharge and vaginal bleeding. She is diagnosed with stage IIIB carcinoma of the cervix as per FIGO staging. What is the recommended first-line treatment for this stage of cervical cancer?

A. Chemoradiation

B. Radical hysterectomy

C. Simple total hysterectomy

D. Radical hysterectomy + pelvic lymph node dissection

Correct answer: A

In an elderly male presenting with back pain and sclerotic (osteoblastic) lesions on spinal imaging, metastatic prostate cancer must be the primary suspicion. While most cancers (like lung, breast, and kidney) cause lytic (bone-destroying) lesions, prostate cancer is unique in its tendency to produce dense, sclerotic bone metastases. Spinal tuberculosis (Pott's disease, Option B) usually causes lytic destruction of the vertebral bodies and disc space narrowing, often with a paravertebral abscess. Renal cell carcinoma (Option C) and colon cancer (Option D) typically cause lytic lesions when they metastasize to the bone. Sclerotic lesions in the spine are a common cause of pathological fractures and spinal cord compression in these patients. Diagnosis is supported by an elevated serum Prostate-Specific Antigen (PSA) level and confirmed by prostate biopsy. Bone scans are highly sensitive for detecting these osteoblastic areas throughout the skeleton, which represent the body's attempt at disorganized bone formation in response to tumor cells.

Question 151. In obstetric practice, which factor is most commonly responsible for the development

of consumptive coagulopathy, a condition characterized by rapid consumption of clotting factors exceeding their production?

A. Intrauterine death

B. Placental abruption

C. Sepsis

D. Amniotic fluid embolism

Correct answer: B

Consumptive coagulopathy, or Disseminated Intravascular Coagulation (DIC), is a severe complication in pregnancy where systemic activation of the coagulation cascade leads to the depletion of platelets and clotting factors. While all the listed options can cause DIC, "placental abruption" (Option B) is the "predominant" or most common obstetric cause. When the placenta separates prematurely, thromboplastin and other tissue factors are released into the maternal circulation, triggering widespread clotting. Intrauterine death (Option A) can cause DIC, but usually only if the dead fetus remains in utero for more than 4 weeks. Amniotic fluid embolism (Option D) and sepsis (Option C) cause extremely severe DIC, but they are much rarer occurrences compared to placental abruption. In abruption, the extent of the coagulopathy often correlates with the size of the retroplacental clot. Management involves rapid delivery and the replacement of blood products (fresh frozen plasma, cryoprecipitate, and platelets) to stabilize the patient's clotting capacity.

Question 152. A woman with a history of molar pregnancy six months ago now presents with persistent abdominal pain and distension. Her β-hCG levels remain elevated, and a chest X-ray reveals cannon-ball lesions. Based on these findings, what is the most likely diagnosis?

A. Gestational trophoblastic neoplasia

B. Endometriosis

C. Ovarian cyst

D. Asherman's syndrome

Correct answer: A

The patient’s history of a prior molar pregnancy combined with persistently elevated beta-hCG levels is highly suggestive of gestational trophoblastic neoplasia (GTN), specifically choriocarcinoma. Choriocarcinoma is a malignant form of gestational trophoblastic disease that characteristically metastasizes early via the hematogenous route. The finding of "cannon-ball foci" on a chest X-ray is pathognomonic for pulmonary metastases from this malignancy. Endometriosis (Option B) typically presents with cyclical pelvic pain and does not involve

elevated beta-hCG or lung nodules. Ovarian cysts (Option C) may cause distension but do not produce high hCG or metastatic lung patterns. Asherman’s syndrome (Option D) involves intrauterine adhesions leading to amenorrhea but is unrelated to trophoblastic tissue proliferation or hCG elevation. Therefore, given the specific history of molar gestation and the classic "cannon-ball" pulmonary metastases, the diagnosis is gestational trophoblastic neoplasia. Treatment usually involves chemotherapy, often methotrexate or multi-agent regimens, and has a generally good prognosis if identified promptly.

Question 153. During the management of labor, oxytocin may be administered as an intravenous bolus. What adverse effect is commonly associated with giving oxytocin by this route?

A. Hypotension

B. Hypertension

C. Hyperglycemia

D. Hypoglycemia

Correct answer: A

Oxytocin is a potent uterotonic agent used for labor induction and the prevention of postpartum hemorrhage. While it is vital for obstetric care, rapid intravenous bolus administration can lead to significant hemodynamic changes. Specifically, oxytocin has a direct relaxant effect on vascular smooth muscle, which can cause sudden, transient peripheral vasodilation. This results in acute maternal hypotension, often accompanied by tachycardia and increased cardiac output. Hypertension (Option B) is more commonly associated with other uterotonics like ergometrine. Neither hyperglycemia (Option C) nor hypoglycemia (Option D) are recognized side effects of oxytocin administration. To minimize the risk of cardiovascular collapse or profound hypotension, oxytocin is standardly administered as a slow intravenous infusion rather than a rapid bolus. Clinicians must be particularly cautious in patients with pre-existing cardiac disease or hypovolemia, as the rapid drop in blood pressure can compromise maternal safety and fetal perfusion. Monitoring of maternal vitals is essential during any oxytocin administration in the peripartum period.

Question 154. A 30-year-old pregnant woman at 18 weeks of gestation undergoes routine antenatal screening. Her random plasma glucose is elevated, subsequent fasting blood glucose is raised, and her HbA1c level is 7.6%. Based on these laboratory findings, what is the most likely diagnosis?

A. Maturity onset diabetes of the young

B. Overt diabetes

C. Gestational diabetes mellitus

D. Latent autoimmune diabetes in adults

Correct answer: B

The diagnosis of diabetes during pregnancy is categorized based on the timing and severity of hyperglycemia. "Overt diabetes" (or pre-gestational diabetes) is diagnosed when criteria for non-pregnant diabetes are met during the first prenatal visit or early pregnancy. The patient’s HbA1c of 7.6% and fasting glucose of clearly exceed the diagnostic thresholds (HbA1c 6.5% or fasting glucose). Gestational Diabetes Mellitus (GDM, Option C) is typically diagnosed between 24–28 weeks using less stringent thresholds and represents glucose intolerance that begins during pregnancy. Maturity Onset Diabetes of the Young (MODY, Option A) and Latent Autoimmune Diabetes in Adults (LADA, Option D) are specific types of diabetes defined by genetics or antibodies, but the immediate clinical classification for this pregnant woman is overt diabetes. Patients with overt diabetes have a higher risk of congenital anomalies and require intensive glycemic management throughout the pregnancy to ensure optimal maternal and neonatal outcomes.

Question 155. A 35-year-old woman presents with a palpable mass in the upper outer quadrant of the breast. Histopathological examination reveals tumor cells with a characteristic signet-ring appearance. Based on these findings, what is the most likely diagnosis?

A. Colloidal carcinoma

B. Papillary carcinoma

C. Medullary carcinoma

D. Phyllodes tumor

Correct answer: A

In breast pathology, "signet ring cells" are characterized by a large cytoplasmic vacuole containing mucin that displaces the nucleus to the periphery. While classically associated with lobular carcinoma, signet ring cells are also a prominent feature of "Colloidal" or mucinous carcinoma of the breast. Colloidal carcinoma typically occurs in slightly older women and has a relatively favorable prognosis compared to invasive ductal carcinoma. Papillary carcinoma (Option B) is characterized by finger-like projections and lacks mucinous signet ring cells. Medullary carcinoma (Option C) features a dense lymphocytic infiltrate and large pleomorphic cells, but not signet ring morphology. Phyllodes tumors (Option D) are fibroepithelial lesions characterized by leaf-like stromal growth rather than specialized signet ring adenocarcinoma cells. The identification of signet ring morphology is critical as it indicates mucin production.

Clinicians must distinguish whether these cells represent a primary breast malignancy or metastasis from the gastrointestinal tract, though given the options, colloidal carcinoma is the intended diagnosis.

Question 156. A 23-year-old primigravida at 25 weeks of gestation presents with right upper abdominal pain, nausea, vomiting, and generalized edema. Peripheral smear shows evidence of hemolysis. Her vital signs are stable, with a blood pressure of 104/72 mm Hg and pulse rate of 72/min. Laboratory investigations reveal leukocyte count of 10,500/mm³, platelet count of 62,000/mm³, hematocrit of 26%, and elevated AST levels (90 IU/L). Based on this clinical and laboratory profile, what is the most likely diagnosis?

A. HELLP syndrome

B. Hepatitis B

C. Acute fatty liver of pregnancy

D. Obstetric cholestasis

Correct answer: A

The diagnosis of HELLP syndrome is based on the laboratory triad of Hemolysis, Elevated Liver enzymes, and Low Platelets. This patient satisfies all criteria: "hemolysis" on peripheral smear (also suggested by low hematocrit), elevated AST (90 IU/L), and a significantly low platelet count (62,000/mm3). Although her blood pressure is currently 104/72 mm Hg, HELLP can occur in the absence of overt hypertension or proteinuria in up to 15-20% of cases. Hepatitis B (Option B) and obstetric cholestasis (Option D) do not cause hemolysis or severe thrombocytopenia. Acute Fatty Liver of Pregnancy (AFLP, Option C) is a close differential but typically presents later in the third trimester and is often associated with coagulopathy and hypoglycemia. The right upper quadrant pain is a classic symptom caused by Glisson’s capsule distension. HELLP syndrome is an obstetric emergency requiring stabilization and usually prompt delivery, as it carries high risks of maternal morbidity and fetal mortality.

Question 157. A primigravida at 37 weeks of gestation has been experiencing mild uterine contractions for the past 20 hours. On examination, the cervix is only 1 cm dilated with no effacement. What is the most appropriate management strategy in this situation?

A. Sedation and waiting

B. Augmentation with oxytocin

C. Cesarean section

D. Amniotomy

Correct answer: A

The clinical scenario describes a primigravida in the "latent phase" of labor. Prolonged latent phase is defined in primigravidas as lasting more than 20 hours without progression to active labor (defined as 4–6 cm dilation and effacement). The cervix remaining at 1 cm indicates she has not yet reached the active stage. The preferred first-line management for a prolonged latent phase is therapeutic rest, which typically involves "sedation and waiting". This allows the patient to rest, after which she will likely either wake up in active labor or the "false labor" pains will have ceased. Augmentation with oxytocin (Option B) or amniotomy (Option D) are generally reserved for the active phase of labor. A Cesarean section (Option C) is not indicated solely for a prolonged latent phase in the absence of maternal or fetal distress. Managing maternal exhaustion and providing reassurance are key components of care during this frustrating but often benign stage of labor.

Question 158. What hormonal mechanism is responsible for lactational amenorrhea, the temporary absence of menstruation during the postpartum period in breastfeeding women?

A. Increased progesterone

B. Increased GnRH secretion

C. Decreased prolactin secretion

D. Increased prolactin secretion

Correct answer: D

Lactational amenorrhea is a physiological state of infertility that occurs after childbirth while a woman is breastfeeding. The primary driver is "increased prolactin secretion" from the anterior pituitary in response to the infant's suckling stimulus. High levels of circulating prolactin exert a negative feedback effect on the hypothalamus, leading to the suppression of pulsatile Gonadotropin-Releasing Hormone (GnRH) secretion. In turn, this results in low levels of LH and FSH, preventing the development of ovarian follicles and ovulation. Increased GnRH (Option B) would lead to menstruation. Decreased prolactin (Option C) occurs when breastfeeding stops, leading to the return of menses. Increased progesterone (Option A) is characteristic of pregnancy or the luteal phase, not the lactational period. This mechanism is the basis for the Lactational Amenorrhea Method (LAM) of contraception. However, its effectiveness as a contraceptive depends on exclusive breastfeeding and the absence of any menstrual bleeding since delivery.

Question 159. A pregnant woman at 32 weeks of gestation

presents during a routine antenatal visit with sudden severe abdominal pain, vaginal bleeding, and reduced fetal movements. She also has a history of hypertension during the current pregnancy. Based on this clinical presentation, what is the most likely diagnosis?

A. Abruptio placenta

B. Placenta previa

C. Hydramnios

D. Preterm labor

Correct answer: A

The clinical triad of sudden onset "severe abdominal pain," "vaginal bleeding," and a "history of hypertension" in the third trimester is highly characteristic of abruptio placenta. Placental abruption involves the premature separation of a normally implanted placenta from the uterine wall. The pain results from the accumulation of blood behind the placenta (retroplacental hematoma) and uterine contractions. Placenta previa (Option B) classically presents with "painless" bright red vaginal bleeding. Hydramnios (Option C) refers to excessive amniotic fluid and causes generalized discomfort but not acute bleeding or severe pain. Preterm labor (Option D) typically presents with regular, rhythmic contractions rather than constant severe pain and significant hemorrhage. The decrease in fetal movements is a concerning sign of fetal distress or hypoxia due to compromised placental circulation. Abruptio placenta is an obstetric emergency that requires urgent assessment of maternal hemodynamic stability and fetal well-being, often necessitating emergency delivery.

Question 160. A 30-year-old lactating woman presents with breast pain, fever, localized redness and warmth, point tenderness, a positive fluctuation test, and mild unilateral axillary lymphadenopathy, while the opposite breast is normal. Based on these findings, what is the most likely diagnosis?

Examination Paper June 2021 Question

A. Right lower lobe

B. Right ventricle

C. Right middle lobe

D. Right atrium

Correct answer: C

The "silhouette sign" is a fundamental concept in chest radiology where the loss of a normal

anatomical interface indicates pathology in the adjacent lung tissue. The right cardiac border is anatomically adjacent to the "right middle lobe" (RML). Therefore, a consolidation or mass that "obliterates the right cardiac border" is located in the right middle lobe (Option C). Pathology in the right lower lobe (Option A) would obliterate the right diaphragmatic border but leave the cardiac silhouette sharp. The right ventricle (Option B) is not usually the border-forming structure on a PA chest X-ray, and the right atrium (Option D) is the border-forming structure, but its obliteration is caused by lung pathology sitting next to it. Understanding these relationships allows radiologists to localize lobar pneumonia or atelectasis on a single frontal projection. The RML is a common site for infection and its involvement is best confirmed on a lateral view showing an opacity between the major and minor fissures.

Question 161. A 35-year-old man presents with a painless scrotal enlargement. Laboratory evaluation shows raised lactate dehydrogenase (LDH) levels, while serum human chorionic gonadotropin (hCG) and alpha-fetoprotein (AFP) levels are normal. Histopathological examination findings are available. Based on this clinical and laboratory profile, what is the most likely diagnosis?

A. Teratoma of testis

B. Seminoma of testis

C. Choriocarcinoma

D. Yolk sac tumor

Correct answer: B

Testicular seminoma is the most common germ cell tumor in men aged 30–40. The laboratory profile described—elevated LDH with "normal HCG and normal AFP"—is classic for a pure seminoma. Seminomas are characteristically slow-growing and highly radiosensitive. Choriocarcinoma (Option C) would show extremely high HCG levels. Yolk sac tumors (Option D) are the most common testicular tumor in children and are associated with very high AFP levels. Teratomas (Option A) are non-seminomatous germ cell tumors that may show elevations in both AFP and HCG. Histologically, seminomas show large, uniform cells with clear cytoplasm and well-defined cell borders (fried-egg appearance) and a lymphocytic infiltrate in the stroma. LDH serves as a marker of tumor burden rather than a specific diagnostic marker. The absence

of elevated AFP is particularly important, as any elevation in AFP in a testicular mass excludes the diagnosis of a pure seminoma and categorizes the tumor as non-seminomatous.

Question 162. A woman develops postpartum hemorrhage after a normal delivery, and surgical ligation of an artery is performed to control the bleeding. Following the procedure, she complains of pain beneath the gluteal region. Which artery was most likely ligated during the management of her condition?

A. Uterine artery

B. Superior gluteal artery

C. Inferior gluteal artery

D. Internal iliac artery

Correct answer: D

Ligation of the internal iliac (hypogastric) artery is a life-saving surgical procedure used to control intractable postpartum hemorrhage (PPH) when other measures have failed. The internal iliac artery provides the primary blood supply to the pelvic organs, including the uterus. However, it also gives rise to several extrapelvic branches, including the "superior and inferior gluteal arteries". Ligation of the main internal iliac trunk significantly reduces the pulse pressure in the uterus but can also result in ischemia or reduced perfusion to the gluteal muscles. This explains the patient's subsequent complaint of "pain under her gluteus muscle". Ligation of the uterine artery (Option A) specifically targets the uterus and would not affect the gluteal region. Options B and C are distal branches; while their ligation would cause localized pain, they are not standardly ligated for PPH. Understanding the pelvic vascular anatomy is crucial for surgeons, as internal iliac ligation is effective due to the rich collateral circulation that eventually restores pelvic perfusion.

DERMATOLOGY

Question 163. A 22-year-old college student presents with multiple small depigmented skin lesions that have been present for over two years, as shown in the accompanying image. Based on this clinical presentation, what is the most likely diagnosis?

A. Melasma

B. Vitiligo

C. Psoriasis

D. Dermatitis herpetiformis

Correct answer: B

Vitiligo is a common acquired chronic depigmenting disorder characterized by the loss of functional melanocytes from the epidermis. This results in the "milky-white," well-demarcated macules and patches seen in the image. It often affects the hands, face, and genital areas. Melasma (Option A) presents as hyperpigmented (dark) brown patches, typically on the face, and is related to hormonal changes or UV exposure. Psoriasis (Option C) features erythematous plaques with silvery scales, not depigmentation. Dermatitis herpetiformis (Option D) presents with intensely itchy, grouped vesicles on an erythematous base, often associated with celiac disease. Vitiligo can have a significant psychological impact on young adults like this college student. Diagnosis is clinical, though Wood's lamp examination can help highlight the areas of depigmentation. Management options include topical corticosteroids, calcineurin inhibitors, and phototherapy (NB-UVB), aimed at inducing repigmentation and stabilizing the disease.

266. A farmer presents to the outpatient department with a swelling over the palm that developed several months after sustaining a thorn prick injury. Based on the clinical presentation shown in the image, what is the most likely diagnosis?

PAPER 2021 Answer

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Identify the anatomical structure indicated in the given image.

(A)

Genioglossus

(B)

Hyoglossus

(C)

Styloglossus

(D)

Palatoglossus

1.

(A) Genioglossus.

The anatomical feature highlighted in the sagittal section is the genioglossus muscle, often referred to as the "safety muscle" of the tongue. It is a fan-shaped extrinsic muscle that arises from the superior genial tubercle of the mandible and inserts into the tongue's substance and the hyoid bone body. Its primary function is the protrusion of the tongue. Clinically, paralysis of

the genioglossus allows the tongue to fall back and obstruct the airway, which is why it is vital in anesthesiology and airway management. Option B, the hyoglossus, is a quadrilateral muscle that depresses the tongue. Option C, the styloglossus, originates from the styloid process and retracts the tongue. Option D, the palatoglossus, is technically a muscle of the soft palate that elevates the tongue's posterior portion. Understanding these extrinsic muscles is essential for diagnosing hypoglossal nerve injuries, where the tongue deviates toward the paralyzed side upon protrusion.

Which label is incorrectly marked in the basal ganglia diagram?

(A)

Caudate nucleus

(B)

Globus pallidus

(C)

Putamen

(D)

External capsule

2.

(D) External capsule

The correct answer is (D) External capsule, as it is incorrectly marked in the diagram. The external capsule is a thin white matter tract located lateral to the putamen and medial to the claustrum. In the figure, label D does not point to this thin white band; instead, it appears to indicate a broader cortical or subcortical region, making the labeling incorrect.

Other options are correctly marked:

(A) Caudate nucleus is correctly identified. It lies adjacent to the lateral ventricle and appears as a curved gray matter structure along its margin, which matches the diagram.

(B) Globus pallidus is also correctly labeled. It is situated medial to the putamen and forms the medial part of the lentiform nucleus, usually shown as a lighter shaded region.
(C) Putamen is correctly marked as well. It lies lateral to the globus pallidus and is a major component of the basal ganglia, forming the outer part of the lentiform nucleus.
Thus, only the external capsule is mislabeled, while all other structures are accurately represented.
Which of the following statements regarding the thoracolumbar fascia is incorrect?
(A)
They contain nociceptive nerve endings
(B)
In the lumbar region, it is in 4 layers
(C)
In the thoracic region, it is attached medially to the vertebrae
(D)
The anterior, posterior, and middle layers join to form the aponeurotic origin of transversus abdominis
3.
(B) In the lumbar region, it is in 4 layers.
The thoracolumbar fascia is a critical structural complex in the back, but statement B is incorrect because it consists of three layers in the lumbar region, not four. These are the anterior, middle, and posterior layers which envelop the psoas major, quadratus lumborum, and erector spinae muscles. Statement A is correct; the fascia is highly innervated with nociceptive and proprioceptive nerve endings, playing a significant role in chronic low back pain. Statement C is correct, as the fascia in the thoracic region is a thin fibrous layer attached medially to the thoracic spines. Statement D is also correct, as the three layers fuse laterally to form the aponeurotic origin of the transversus

abdominis and internal oblique muscles. This fascia acts as a "nature's back brace," providing stability to the spine and facilitating load transfer between the upper and lower limbs. Understanding its trilaminar structure is essential for surgical approaches to the posterior abdominal wall.

Which labeling is not correctly matched in the below image?

(A)

Superior thoracic artery

(B)

Thoracoacromial artery

(C)

Subscapular artery

(D)

Posterior circumflex artery

Question 164. A 35-year-old man presents with complaints of hair loss. Based on the findings observed during clinical examination, what is the most likely diagnosis?

A. Tinea capitis

B. Kerion

C. Alopecia areata

D. Trichotillomania

Correct answer: C

Alopecia areata is an autoimmune condition characterized by non-scarring hair loss that typically presents as "well-demarcated, smooth, circular patches" on the scalp or body. The provided image shows the classic focal patch without inflammation, scaling, or scarring. A characteristic clinical finding at the margins of these patches is "exclamation mark hairs"—short hairs that are narrower at the base. Tinea capitis (Option A) is a fungal infection that usually features scaling, erythema, and "black dots" (broken hairs). Kerion (Option B) is a severe, inflammatory form of tinea capitis that presents as a boggy, pus-filled mass. Options C and D are identical in the source text, both correctly identifying the condition. Alopecia areata has an unpredictable course; while many patients experience spontaneous regrowth, others may progress to total scalp hair loss (alopecia totalis). First-line treatment often involves intralesional corticosteroid injections to suppress the localized immune response and encourage hair regrowth.

Question 165. A 30-year-old woman presents with lacy white lesions involving the oral cavity and genital region, along with an abnormal forward extension of the proximal nail fold onto the nail bed. Based on these clinical features, what is the most likely diagnosis?

A. Pityriasis rubra pilaris

B. Psoriasis

C. Pityriasis rosea

D. Lichen planus

Correct answer: D

Lichen planus (LP) is a chronic inflammatory condition that affects the skin, mucous membranes, and nails. The "lacy lesions" in the mouth are known as Wickham striae, a hallmark of oral LP. Genital involvement is also common. The "extension of the proximal nail fold onto the nail bed" describes a "dorsal pterygium," which is a classic and highly characteristic nail finding in lichen planus caused by scarring of the nail matrix. Psoriasis (Option B) typically presents with nail pitting, oil spots, and onycholysis, not pterygium. Pityriasis rosea (Option C) presents with a herald patch and a "Christmas tree" distribution of lesions, usually sparing the nails and mouth. Pityriasis rubra pilaris (Option A) involves follicular papules and orange-red plaques. The skin lesions of LP are classically described as the "6 Ps": planar (flat-topped), purple, polygonal, pruritic, papules, and plaques. Diagnosis is usually clinical but can be confirmed by biopsy showing a band-like lymphocytic infiltrate.

Question 166. A 65-year-old man presents with an itchy lesion on his face that is associated with episodes of bleeding. Based on this clinical presentation, what is the most likely diagnosis?

A. Dermatofibrosarcoma

B. Marjolin's ulcer

C. Basal cell carcinoma

D. Naevus

Correct answer: C

Basal cell carcinoma (BCC) is the most common skin cancer, particularly in elderly patients with a history of chronic sun exposure. It most frequently occurs on the face, above the line connecting the lobe of the ear to the angle of the mouth. BCC classically presents as a slow-growing, pearly papule with telangiectasia or as a "rodent ulcer" with rolled-out edges. Chronic itching and intermittent "bleeding" are common clinical complaints as the lesion undergoes central ulceration. Dermatofibrosarcoma (Option A) is a deeper, rare soft tissue

sarcoma. Marjolin's ulcer (Option B) is a squamous cell carcinoma arising in a pre-existing chronic scar or wound. A naevus (Option D) is a benign mole and would not typically bleed or itch in an elderly patient without concerning changes. BCC is locally invasive but very rarely metastasizes. The treatment of choice is surgical excision with clear margins or Mohs micrographic surgery, which offers excellent cure rates for facial lesions.

Question 167. Which of the following statements about trichotillomania is NOT accurate?

A. Impulse control disorder

B. The onset is typically in adolescence or early adulthood.

C. Associated with feelings of pleasure or relief after hair-pulling.

D. Caused by a bacterial infection of the scalp.

Correct answer: D

Trichotillomania is a psychiatric condition characterized by the recurrent, irresistible urge to pull out one's own hair, leading to noticeable hair loss. Statement D is "not accurate" because trichotillomania is a behavioral disorder, "not an infectious process" like a bacterial scalp infection. It is currently classified under Obsessive-Compulsive and Related Disorders (formerly an "impulse control disorder," Option A). The "onset is typically in adolescence" (Option B), though it can occur in children. Patients often report a "feeling of tension" before pulling and a "sense of pleasure, gratification, or relief" once the hair is pulled (Option C). Clinical examination reveals patches of hair loss with hairs of varying lengths, as the patient pulls hairs at different stages of growth. Management involves behavioral therapies, such as Habit Reversal Training (HRT), and sometimes pharmacotherapy with SSRIs. Differentiating this from alopecia areata is crucial to ensure the patient receives psychiatric rather than dermatological treatment alone.

272. Identify the given disorder?

Question 168. 271. (D) Caused by a bacterial infection of the scalp. Trichotillomania is a psychiatric condition characterized by the recurrent, irresistible urge to pull out one's own hair, leading to noticeable hair loss. Statement D is "not accurate" because trichotillomania is a behavioral disorder, "not an infectious process" like a bacterial scalp infection. It is currently classified under Obsessive-Compulsive and Related Disorders (formerly an "impulse control disorder," Option

A). The "onset is typically in adolescence" (Option B), though it can occur in children. Patients often report a "feeling of tension" before pulling and a "sense of pleasure, gratification, or relief" once the hair is pulled (Option C). Clinical examination reveals patches of hair loss with hairs of varying lengths, as the patient pulls hairs at different stages of growth. Management involves behavioral therapies, such as Habit Reversal Training (HRT), and sometimes pharmacotherapy with SSRIs. Differentiating this from alopecia areata is crucial to ensure the patient receives psychiatric rather than dermatological treatment alone.

Identify the given disorder?

A. Melanoma

B. Hyperpigmentation

C. Basal cell carcinoma

D. Squamous cell carcinoma

Correct answer: A

The image depicts a pigmented skin lesion that exhibits several "ABCDE" warning signs of melanoma: Asymmetry, Border irregularity, Color variegation (multiple shades), and a large Diameter. Melanoma is a highly aggressive skin cancer arising from melanocytes. Simple hyperpigmentation (Option B) would be more regular and uniform. Basal cell carcinoma (Option C) typically appears as a pearly papule with telangiectasia, though a pigmented variant

Question 169. Considering the disease depicted in the given image, which of the following specimens would not be expected to contain filarial worms?

A. Blood

B. Saliva

C. Urine

D. Hydrocele fluid

Correct answer: B

The image shows elephantiasis, the chronic stage of lymphatic filariasis caused by Wuchereria bancrofti or Brugia malayi. The adult worms live in the lymphatic system, and the female worms release microfilariae into the host's circulation. Microfilariae can be found in the "blood" (Option A), typically showing nocturnal periodicity. They can also be found in "urine" in patients with chyluria (Option C) or in "hydrocele fluid" (Option D), which is a common manifestation in males. Filarial worms are "not found in saliva" (Option B), as there is no anatomical or physiological mechanism for the worms or microfilariae to enter the salivary secretions. Diagnosis is often made by demonstrating microfilariae in a midnight blood smear or by detecting circulating filarial antigens. Elephantiasis results from chronic lymphatic obstruction and secondary fibrosis. Management involves mass drug administration with diethylcarbamazine (DEC) and albendazole, alongside meticulous local skin hygiene to prevent secondary bacterial infections that worsen the limb swelling.

ANAESTHESTA

Question 170. Which type of cylinder should be utilized to administer oxygen therapy to a COVID patient?

A. 1

B. 2

C. 3

D. 4

Correct answer: A

In medical gas cylinder color coding (commonly followed in India and many countries):

Oxygen cylinder is black with a white shoulder (top).

In the given image Cylinder 1 has a black body with a white top, which matches the standard color coding for oxygen.

Why others are incorrect:

1.

Cylinder 2 (blue) → Typically used for nitrous oxide (N_2O)

2.

Cylinder 3 (black) → May represent other gases depending on coding, but not standard oxygen without white shoulder

3.

Cylinder 4 (grey) → Not the standard oxygen color in medical settings

Question 171. During surgery under halothane anesthesia, a patient develops muscle rigidity along with a rapid increase in body temperature. Which ion is primarily responsible for causing these

symptoms?

A. Sodium

B. Calcium

C. Magnesium

D. Potassium

Correct answer: B

The patient is experiencing malignant hyperthermia (MH), a life-threatening pharmacogenetic disorder of skeletal muscle. MH is triggered by volatile anesthetic agents (such as halothane) or the depolarizing muscle relaxant succinylcholine.

The core pathophysiology is an uncontrolled release of calcium ions (Ca^{2+}) from the sarcoplasmic reticulum into the muscle cell cytoplasm due to a mutation in the ryanodine receptor (RyR1). The sudden rise in intracellular calcium causes sustained muscle contraction (rigidity) and a dramatic increase in metabolic activity, leading to hypercapnia, metabolic acidosis, and a rapid rise in body temperature.

Sodium (Option A) and magnesium (Option C) are not primary drivers of the crisis. Potassium (Option D) often increases secondarily due to rhabdomyolysis, but calcium dysregulation is the initiating event.

The definitive treatment is dantrolene, which directly inhibits calcium release from the sarcoplasmic reticulum. Immediate discontinuation of triggering agents, active cooling, correction of acidosis, and supportive ICU care are also essential.

Question 172. In patients with underlying cardiac disease who require general anesthesia, which inhalational anesthetic agent is preferred because of its minimal cardiovascular effects and greater hemodynamic stability?

A. Halothane

B. Isoflurane

C. Desflurane

D. Sevoflurane

Correct answer: C

Desflurane is considered the preferred inhalational anesthetic in this question because of its minimal myocardial depressant effect and ability to maintain cardiac output. It has very low blood-gas solubility, allowing rapid adjustment of anesthesia depth and better intraoperative control. These properties contribute to relatively stable hemodynamics in controlled settings, making it acceptable in patients with cardiac disease in many exam-based contexts.

However, clinically, desflurane may cause sympathetic stimulation, leading to transient tachycardia and hypertension, especially with rapid increases in concentration. Despite this,

some exam keys emphasize its minimal direct cardiac depression over these effects.

Other options:

(A)

Halothane causes significant myocardial depression and sensitizes the heart to catecholamines, increasing arrhythmia risk.

(B)

Isoflurane produces vasodilation and may cause reflex tachycardia, increasing myocardial oxygen demand.

(D)

Sevoflurane provides excellent cardiovascular stability and is widely preferred in practice, but may show mild myocardial depression.

Question 173. During the procedure of epidural anesthesia, which spinal structure is not traversed or penetrated by the needle?

A. Supraspinous ligament

B. Interspinous ligament

C. Ligamentum flavum

D. Dura

Correct answer: D

Epidural anesthesia involves the injection of local anesthetic into the epidural space, which lies just outside the dural sac. Therefore, the "Dura" (Option D) should "not be penetrated" by the needle. If the dura is punctured, it results in a "dural tap" or "wet tap," which can lead to a post-dural puncture headache. To reach the epidural space using a midline approach, the needle must pass through several structures in order: skin, subcutaneous tissue, the "supraspinous ligament" (Option A), the "interspinous ligament" (Option B), and the "ligamentum flavum" (Option C). The clinician identifies the epidural space using the "loss of resistance" technique once the needle passes through the dense ligamentum flavum. In contrast, spinal (subarachnoid) anesthesia requires the penetration of the dura and arachnoid mater to reach the cerebrospinal fluid. Precise knowledge of spinal anatomy is vital for the safe and successful performance of regional anesthesia techniques in obstetric and surgical patients.

Question 174. A young patient develops oxygen desaturation and bilateral basal crepitations soon after surgery performed under general anesthesia using oxygen, nitrous oxide, and desflurane. What is the most likely cause of these postoperative symptoms?

A. ARDS
(Acute
Respiratory
Distress
Syndrome)
B. Pleural effusion
C. Negative pressure pulmonary edema
D. Atelectasis

Correct answer: C

Negative Pressure Pulmonary Edema (NPPE), also known as post-obstructive pulmonary edema, is a classic post-anesthesia complication, especially in young, healthy patients. It typically occurs following an upper airway obstruction, such as "laryngospasm" during emergence from general anesthesia. As the patient makes forceful inspiratory efforts against a closed glottis, a high negative intrathoracic pressure is generated. This pressure draws fluid from the pulmonary capillaries into the alveoli, leading to rapid onset "desaturation and crepitations". ARDS (Option A) takes longer to develop and is associated with sepsis or major trauma. Pleural effusion (Option B) is a slower accumulation of fluid. Atelectasis (Option D) is common post-operatively but usually causes localized findings rather than diffuse acute pulmonary edema symptoms. NPPE is a medical emergency but usually resolves quickly with supplemental oxygen, CPAP, or brief mechanical ventilation once the airway obstruction is relieved. Clinicians must be vigilant for laryngospasm to prevent this sudden respiratory deterioration.

Question 175. What is the standard treatment for empyema thoracis?

A. Antibiotics alone
B. Chest tube drainage and antibiotics
C. Intercostal drain (ICD) alone
D. Wait and watch

Correct answer: B

Empyema thoracis is defined as the presence of pus in the pleural cavity, usually as a complication of pneumonia. The standard of care for managing empyema requires a two-pronged approach: "chest tube drainage" (intercostal drain) to evacuate the infected fluid and "systemic antibiotics" to treat the underlying infection. Antibiotics alone (Option A) are insufficient because they cannot penetrate the thick, acidic, and often loculated pus in the pleural space effectively. An ICD alone (Option C) removes the fluid but does not address the bacterial source. "Wait and watch" (Option D) is dangerous, as untreated empyema can lead to fibrothorax and lung entrapment, necessitating more invasive surgery like decortication. Management may also include intrapleural fibrinolytics or Video-Assisted Thoracoscopic Surgery

(VATS) if the empyema is complex or loculated. Early and aggressive drainage combined with appropriate antimicrobial therapy is essential to ensure resolution and prevent long-term respiratory impairment in these patients.

Question 176. Which of the following is not classified as a non-depolarizing muscle relaxant?

A. Pancuronium

B. Rocuronium

C. Suxamethonium

D. Vecuronium

Correct answer: C

Muscle relaxants (neuromuscular blocking agents) used in anesthesia are divided into two main categories based on their mechanism of action at the nicotinic acetylcholine receptor. "Suxamethonium" (Succinylcholine) is the only clinically used "depolarizing" muscle relaxant. It works by mimicking acetylcholine, causing persistent depolarization of the motor endplate, which is often visible as muscle fasciculations. Pancuronium (Option A), Rocuronium (Option B), and Vecuronium (Option D) are all "non-depolarizing" muscle relaxants. These act as competitive antagonists, blocking the receptor without triggering a response. Suxamethonium is favored for rapid sequence induction due to its very fast onset and short duration, but it is associated with side effects like hyperkalemia and malignant hyperthermia. Non-depolarizing agents are used for maintaining relaxation during surgery and their effects can be reversed with agents like neostigmine or sugammadex. Identifying the category is essential for managing the timing of intubation and the reversal of anesthesia.

on these findings, which type of degeneration is
most likely present?

(A) Fatty degeneration

(B) Hyaline degeneration

(C) Calcific degeneration

(D) Cystic degeneration

AAns

(C) Calcific degeneration

Uterine leiomyomas (fibroids) can undergo several types of degeneration depending on changes in blood supply or the patient’s physiological state. "Calcific degeneration" is the most common form of degeneration seen in postmenopausal women. As the fibroid becomes ischemic due to postmenopausal circulatory changes, calcium carbonate and phosphate are deposited within the tumor tissue. On radiological imaging, this appears as characteristic

"popcorn calcifications" within the pelvis, as seen in the provided X-ray. Hyaline degeneration (Option B) is the most common type overall but typically occurs during the reproductive years. Fatty degeneration (Option A) and cystic degeneration (Option D) are less common and present with different radiographic textures. Calcific degeneration is usually asymptomatic, although it can occasionally cause localized pain if the fibroid is large or if there is torsion. Identifying these distinct calcification patterns on imaging allows for the correct diagnosis of fibroids in the postmenopausal period, avoiding confusion with other pelvic masses or malignancies.

Question 177. A patient presents to the emergency department two hours after a road traffic accident with altered consciousness and a Glasgow Coma Scale (GCS) score of 10. A CT scan of the brain is shown below. Based on the clinical presentation and imaging findings, what is the most likely diagnosis?

A. Subdural hematoma

B. Intracerebral hemorrhage

C. Extradural hematoma

D. Hemorrhagic contusion

Correct answer: C

The CT scan demonstrates a "biconvex" (lenticular), sharply demarcated, hyperdense mass in the peripheral space, which is the pathognomonic radiological appearance of an Extradural Hematoma (EDH). EDH occurs between the skull and the dura mater and is most commonly caused by an arterial bleed from the middle meningeal artery following a temporal bone fracture. A Subdural Hematoma (SDH, Option A) appears as a "crescent-shaped" mass that crosses suture lines. Intracerebral hemorrhage (Option B) and hemorrhagic contusions (Option D) occur within the brain parenchyma itself rather than the extra-axial spaces. Clinically, EDH patients may exhibit a "lucid interval" followed by rapid neurological deterioration as the hematoma expands and causes midline shift or herniation. This is a neurosurgical emergency requiring prompt evacuation of the clot. The hyperdense (white) appearance indicates acute bleeding, consistent with the history of an accident occurring only two hours prior.

282. A 55-year-old woman presents with gradually progressive difficulty in swallowing both solids and liquids for the past six months. She also complains of intermittent regurgitation of undigested food and a feeling of food getting stuck in the chest after meals. A barium swallow study has been performed and is shown below.

Based on these features, what is the most likely
diagnosis?
(A) Achalasia cardia
(B) Diffuse esophageal spasm
(C) Nutcracker oesophagus
(D) Hypertensive lower
(A) Achalasia cardia
The barium swallow image displays the classic "bird's beak" sign—a dilated proximal esophagus with smooth, symmetric tapering at the lower esophageal sphincter (LES). This is diagnostic of "Achalasia Cardia," a motility disorder caused by the loss of inhibitory neurons in the myenteric plexus, leading to a failure of the LES to relax and an absence of esophageal peristalsis. The clinical history of "progressive dysphagia to both solids and liquids" is highly characteristic of achalasia, distinguishing it from mechanical obstructions like cancer which initially cause dysphagia only for solids. Diffuse esophageal spasm (Option B) shows a "corkscrew" appearance on barium swallow. Nutcracker esophagus (Option C) and hypertensive LES (Option D) typically require esophageal manometry for diagnosis and do not show this degree of proximal dilation and distal tapering. Treatment options for achalasia include pneumatic dilation, botulinum toxin injection, or surgical Heller myotomy.

Question 178. A 60-year-old man presents with intermittent lower abdominal pain and occasional constipation, without rectal bleeding or weight loss. A barium enema study reveals multiple small, rounded outpouchings arising from the sigmoid colon. Based on these radiological findings, what is the most likely diagnosis?

A. Multiple colonic polyps
B. Ulcerative colitis
C. Diverticulosis
D. Irritable bowel syndrome

Correct answer: C

The barium enema findings of multiple "outpouchings" from the colonic wall, particularly in the sigmoid region, are diagnostic of "Diverticulosis". These represent herniations of the mucosa and submucosa through the muscular layers of the colon at points of vascular entry. Colonic

polyps (Option A) appear as "filling defects" within the barium column (protruding inward), not outpouchings (protruding outward). Ulcerative colitis (Option B) typically presents with mucosal blurring, ulcers, and eventually a "lead pipe" (narrowed, featureless) colon rather than discrete outpouchings. Irritable Bowel Syndrome (IBS, Option D) is a functional disorder that does not show structural abnormalities on a barium enema. Diverticulosis is common in older patients and is often related to a low-fiber diet. While often asymptomatic, it can lead to complications such as diverticulitis (infection) or lower gastrointestinal bleeding. Management focuses on a high-fiber diet to reduce colonic pressure and prevent further diverticula formation.

284. On a chest X-ray, obliteration of the right cardiac border is observed. Which of the following structures is likely involved in this pathology?

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Question 179. 283. (C) Diverticulosis The barium enema findings of multiple "outpouchings" from the colonic wall, particularly in the sigmoid region, are diagnostic of "Diverticulosis". These represent herniations of the mucosa and submucosa through the muscular layers of the colon at points of vascular entry. Colonic polyps (Option A) appear as "filling defects" within the barium column (protruding inward), not outpouchings (protruding outward). Ulcerative colitis (Option B) typically presents with mucosal blurring, ulcers, and eventually a "lead pipe" (narrowed, featureless) colon

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complications such as diverticulitis (infection)
or lower gastrointestinal bleeding. Management
focuses on a high-fiber diet to reduce colonic
pressure
and
prevent
further
diverticula
formation.

On a chest X-ray, obliteration of the right cardiac border is observed. Which of the following structures is likely involved in this pathology?

A. Right lower lobe

B. Right ventricle

C. Right middle lobe

D. Right atrium

Correct answer: C

The "silhouette sign" is a fundamental concept in chest radiology where the loss of a normal anatomical interface indicates pathology in the adjacent lung tissue. The right cardiac border is anatomically adjacent to the "right middle

Question 180. In magnetic resonance imaging (MRI), which unit is used to express the strength of the magnetic field?

A. Tesla

B. HU (Hounsfield Units)

C. KHz (Kilohertz)

D. Hg (Mercury)

Correct answer: A

The "Tesla" (T) is the international unit used to measure the strength of a magnetic field. In clinical practice, most MRI scanners operate at magnetic field strengths of 1.5T or 3.0T. Higher field strengths generally provide a better signal-to-noise ratio, allowing for higher-resolution images and faster scan times. Hounsfield Units (Option B) are used in "CT scans" to represent tissue density (radio-density). Kilohertz (Option C) is a unit of frequency used in signal processing and radio waves. Hg or Mercury (Option D) is a unit used to measure "pressure," such as blood pressure or intracranial pressure. Understanding the strength of an MRI magnet is essential for safety protocols, as higher Tesla magnets create stronger attractive forces on ferromagnetic objects and can interact more intensely with implanted medical devices. The safety zone surrounding an MRI scanner is strictly maintained to prevent accidents related to this powerful magnetic field.

Question 181. Which tissue in the human body is most sensitive to the effects of radiation?

A. Skin

B. Muscles

C. Bone marrow

D. Nervous tissue

Correct answer: C

The radiosensitivity of a tissue is generally proportional to its rate of cell division and inversely proportional to its degree of specialization (Law of Bergonié and Tribondeau). The "bone marrow" (Option C) contains hematopoietic stem cells that are rapidly and continuously dividing, making it one of the "most radiation-sensitive" tissues in the body. Acute exposure to high doses of radiation can lead to bone marrow syndrome, characterized by severe pancytopenia and immune suppression. Skin (Option A) is also sensitive but less so than the bone marrow. Muscle tissue (Option B) and nervous tissue (Option D) are composed of highly specialized, non-dividing (permanent) cells, making them relatively "radioresistant". Understanding tissue sensitivity is crucial in clinical radiology and oncology for calculating safe diagnostic doses and for planning radiotherapy while minimizing collateral damage to vital organs. Protective measures, such as lead shielding, are specifically designed to protect the most sensitive areas from unnecessary exposure.

Question 182. A young man is brought to the emergency department after a road traffic accident while driving a car. On examination, the affected lower

limb appears shortened. A pelvic radiograph (shown below) demonstrates characteristic findings. In this condition, which nerve is most commonly injured?

A. Sciatic nerve

B. Posterior femoral cutaneous nerve

C. Inferior gluteal nerve

D. Superior gluteal nerve

Correct answer: A

The pelvis radiograph shows a "posterior hip dislocation," where the femoral head is displaced behind the acetabulum. This injury classically occurs in "dashboard accidents" where the knee strikes the dashboard, driving the femur backward. The "sciatic nerve" (Option A) passes directly posterior to the hip joint and is the "most commonly injured nerve" in this condition, occurring in about 10–20% of cases. Sciatic nerve palsy can lead to foot drop and sensory loss in the lower leg. The posterior femoral cutaneous nerve (Option B), inferior gluteal nerve (Option C), and superior gluteal nerve (Option D) are also located in the gluteal region but are much less frequently involved in clinical hip trauma. A posterior hip dislocation is an orthopedic emergency requiring urgent reduction to prevent avascular necrosis of the femoral head. A thorough neurological examination of the foot and leg is mandatory before and after reduction to assess for sciatic nerve integrity.

RADIOLOGY

Question 183. A 67-year-old patient with diabetes presents with knee swelling, restricted joint movement, and minimal pain. An X-ray of the knee is shown. Based on the clinical features and radiographic findings, what is the most likely diagnosis?

A. Rheumatoid arthropathy

B. Osteoarthritis

C. Charcot arthropathy

D. Psoriatic arthropathy

Correct answer: C

The clinical scenario of a diabetic patient with a "severely swollen joint" that is "painless" (out of proportion to its appearance) is the classic presentation of "Charcot arthropathy" or neuropathic joint. Chronic diabetic neuropathy leads to a loss of protective sensation, resulting in repetitive microtrauma and progressive, painless joint destruction. The provided X-ray shows

the "6 Ds" of Charcot joints: Distension, Density (sclerosis), Disorganization, Debris (fragmentation), Dislocation, and Destruction. Rheumatoid arthropathy (Option A) typically involves symmetric, painful, small joint inflammation. Osteoarthritis (Option B) involves asymmetric joint space narrowing and osteophytes but not massive bone destruction and fragmentation. Psoriatic arthropathy (Option D) is characterized by "pencil-in-cup" deformities and skin lesions. Charcot arthropathy is a debilitating condition that can lead to limb deformity and amputation if not managed early with strict offloading (e.g., total contact casting). Maintaining tight glycemic control is also essential to slow the progression of underlying neuropathy.

Question 184. Which radiographic view is considered best for optimal visualization of the maxillary sinus?

A. Water's view

B. Towne's view

C. Law's view

D. Stenvers view

Correct answer: A

The "Water’s view" (occipitomental projection) is the standard radiographic projection used for the "optimal visualization of the maxillary sinuses". By tilting the patient’s head back, the dense petrous ridges are projected below the maxillary antra, providing a clear view of any air-fluid levels or mucosal thickening. Towne’s view (Option B) is used primarily for the occipital bone and the foramen magnum. Law’s view (Option C) and Stenvers view (Option D) are specialized projections used for imaging the "mastoid air cells" and the "petrous temporal bone" (internal auditory canal), respectively. While CT scans have largely replaced plain films for detailed sinus evaluation, Water’s view remains a useful, cost-effective initial screening tool for acute sinusitis. Radiologists look for opacification of the normally air-filled sinuses to confirm the presence of inflammatory disease. Accurate positioning is essential to ensure the sinuses are not obscured by the skull base.

Question 185. Which of the following images accurately represents the medical condition described in the given scenario?

A. Diaphragmatic hernia

B. Intestinal obstruction

C. Pleural effusion

D. Pneumonia

Correct answer: A

The clinical scenario of a neonate with "respiratory distress" and a "scaphoid (sunken) abdomen" is highly characteristic of Congenital Diaphragmatic Hernia (CDH). The X-ray image

confirms this by showing "bowel loops within the thoracic cavity," usually on the left side, which displace the heart and lungs. This occurs due to a failure in the development of the pleuroperitoneal membrane, most commonly through the Bochdalek foramen. Intestinal obstruction (Option B) would show dilated loops within the abdomen and typically presents with abdominal distension, not a scaphoid abdomen. Pleural effusion (Option C) and pneumonia (Option D) present with fluid or consolidation in the chest, but they do not involve the migration of abdominal organs into the thorax. CDH is a neonatal emergency because the herniated organs cause pulmonary hypoplasia, leading to severe respiratory failure. Management involves immediate stabilization with intubation and a nasogastric tube to decompress the bowel, followed by surgical repair once the neonate is hemodynamically stable.

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(A) Lactational mastitis
(B) Breast carcinoma
(C) Breast abscess
(D) Fibroadenoma
AAns

(C) Breast abscess
A breast abscess is a localized collection of pus that typically arises as a complication of untreated or inadequately treated lactational mastitis. The clinical features of pain, fever, localized erythema, and warmth are shared with mastitis. However, the pathognomonic finding here is the "positive fluctuation test" and "point tenderness," which indicate the presence of a fluid-filled cavity (pus). Lactational mastitis (Option A) presents with diffuse inflammation without a focal, fluctuant mass. Breast carcinoma (Option B) usually presents as a painless, hard mass in older patients and does not typically cause acute fever or fluctuation. Fibroadenoma (Option D) is a benign, firm, "mouse in the breast" mass seen in younger women, lacking signs of infection. Axillary lymphadenopathy is a reactive finding to the nearby infection. Management of a breast abscess in a lactating mother requires incision and drainage or ultrasound-guided needle aspiration, along with appropriate antibiotics and encouragement to continue breastfeeding or pumping from the affected side to maintain drainage.

Question 186. Which radioisotope is most commonly used in PET scans?

A. 13C
B. 14C
C. 18F
D. All of the above

Correct answer: C

Positron Emission Tomography (PET) is a functional imaging technique that detects pairs of gamma rays emitted indirectly by a positron-emitting radioisotope. The most "commonly used radioisotope" in PET scans is "Fluorine-18" (18F). It is standardly incorporated into a glucose analogue called "Fludeoxyglucose" (-FDG). Because cancer cells have a high metabolic rate, they take up more FDG than normal cells, making -FDG an excellent tracer for oncology imaging. Carbon-13 (, Option A) is a stable isotope and not used for PET. Carbon-14 (, Option B) is a radioisotope used in carbon dating but not in clinical PET imaging due to its extremely long half-life and low-energy beta emission. is preferred because it has an ideal half-life of 110 minutes, providing enough time for imaging after tracer administration while minimizing the long-term radiation dose to the patient. PET is often combined with CT (PET-CT) to provide both metabolic and anatomical information.

Psychiatry

Question 187. A known alcoholic is brought to the emergency department in a confused and disoriented state, reporting visual hallucinations such as snakes and insects crawling over his body. What is the most appropriate treatment for this patient?

A. Haloperidol + thiamine

B. Lorazepam only

C. Lorazepam + thiamine

D. Haloperidol only

Correct answer: C

The patient is presenting with "Delirium Tremens" (DT), the most severe form of alcohol withdrawal, characterized by "disorientation and visual/tactile hallucinations" (e.g., zoopsia). The gold standard for managing alcohol withdrawal and preventing seizures is the administration of "benzodiazepines," such as "Lorazepam" or diazepam, which act to stabilize the overexcited nervous system. Additionally, all chronic alcoholics must receive "thiamine" (Option C) to prevent or treat Wernicke’s encephalopathy, as they are almost universally deficient. Haloperidol (Options A and D) is generally avoided as a first-line treatment because it can "lower the seizure threshold," which is dangerous during alcohol withdrawal. Lorazepam only (Option B) is insufficient because it does not address the nutritional deficiency. DT is a medical emergency with a high mortality rate if untreated. Proper management involves aggressive benzodiazepine titration, fluid resuscitation, and correction of electrolyte imbalances (such as hypomagnesemia) in an intensive care setting.

Question 188. Which of the following symptoms is least likely to be associated with a panic attack?

A. Palpitations

B. Fear of dying

C. Chest discomfort

D. Suicide attempt

Correct answer: D

A panic attack is a sudden episode of intense fear that triggers severe physical reactions when there is no real danger. Common physiological symptoms include "palpitations" (Option A), "chest discomfort" (Option C), sweating, and shortness of breath. Cognitive symptoms often include an intense "fear of losing control or dying" (Option B). While patients with chronic panic disorder may be at a higher risk for depression and suicidal ideation over time, a "suicide attempt" (Option D) is "least likely" to be a symptom of an acute panic attack itself. An attack is characteristically short-lived, usually peaking within 10 minutes, and the patient is typically paralyzed by the immediate somatic sensations of terror rather than engaging in deliberate self-harm during the event. Understanding these symptoms is vital because panic attacks often mimic medical emergencies, such as a myocardial infarction. Management includes reassurance, cognitive-behavioral therapy (CBT), and occasionally short-term benzodiazepines or long-term SSRIs to reduce the frequency of attacks.

Question 189. What is the initial indication of alcohol withdrawal?

A. Tremors

B. Delirium tremens

C. Hallucinations

D. Seizures

Correct answer: A

The clinical stages of alcohol withdrawal follow a predictable timeline after the cessation of chronic heavy drinking. The "initial indication" and most common symptom is "tremors" (Option A), which typically begins 6 to 12 hours after the last drink. This is often accompanied by anxiety, insomnia, and autonomic hyperactivity. Hallucinations (Option C), specifically alcoholic hallucinosis, usually occur between 12 and 48 hours. Withdrawal "seizures" (Option D) are also common in the first 24 to 48 hours. "Delirium Tremens" (Option B) is the most advanced stage and typically develops much later, between 48 and 96 hours af----------ter the last drink. Identifying tremors early is critical for clinicians because it serves as an early warning to begin prophylaxis with benzodiazepines to prevent the progression to life-threatening seizures or DT. Effective management requires monitoring with the CIWA-Ar scale to titrate medication doses based on the severity of the patient’s symptoms.

Question 190. In a female patient who has been recently diagnosed with mild depression, what is the

recommended initial treatment approach?

A. Cognitive behavioral therapy (CBT)

B. Cognitive
behavioral
therapy
and
antidepressants

C. Mild antidepressants

D. Vagus nerve stimulation

Correct answer: A

According to international clinical guidelines (such as NICE or APA), the "first-line treatment" for "mild depression" is psychological therapy, specifically "Cognitive Behavioral Therapy (CBT)" (Option A). CBT helps patients identify and change negative thought patterns and behaviors contributing to their low mood. Antidepressants (Options B and C) are generally "not recommended" as the primary treatment for mild depression, as their efficacy relative to placebo is much lower in mild cases than in moderate-to-severe depression. Combined therapy (Option B) is the gold standard for moderate-to-severe depression. Vagus nerve stimulation (Option D) is an invasive neuromodulation technique reserved only for treatment-resistant, severe chronic depression. For a recently diagnosed mild case, starting with non-pharmacological interventions like CBT, exercise, and sleep hygiene is the safest and most effective approach. If the patient’s condition fails to improve after an adequate trial of psychotherapy, the treatment plan should be reassessed for the potential addition of medication.

299. Which of the following combinations of seizure
types and their corresponding medications is
not accurate?

1. Generalized onset tonic-clonic: Lamotrigine
2. Focal seizures: Levetiracetam
3. Typical absence seizures: Topiramate

Question 191. therapy (Option B) is the gold standard
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For a recently diagnosed mild case, starting with non-pharmacological interventions like CBT, exercise, and sleep hygiene is the safest and most effective approach. If the patient's condition fails to improve after an adequate trial of psychotherapy, the treatment plan should be reassessed for the potential addition of medication.

Which of the following combinations of seizure types and their corresponding medications is not accurate?

1.

Generalized onset tonic-clonic: Lamotrigine

2.

Focal seizures: Levetiracetam

3.

Typical absence seizures: Topiramate

4.

Myoclonic: Valproic acid

A. 1

B. 2

C. 3

D. 4

Correct answer: C

The combination of "typical absence seizures with Topiramate" is "not accurate". Typical absence seizures (formerly petit mal) are standardly treated with "Ethosuximide" (the first-line agent) or Valproate. While Topiramate is broad-spectrum, it is not a primary or indicated treatment for absence seizures and can occasionally worsen them. Combination 1 is accurate: Lamotrigine is an effective first-line agent for "generalized onset tonic-clonic" seizures. Combination 2 is accurate: Levetiracetam is a first-line treatment for "focal (partial) seizures" due to its favorable side-effect profile (Option B). Combination 4 is accurate: Valproic acid remains the most effective "broad-

spectrum" anticonvulsant and is the drug of choice for "myoclonic seizures" (Option D). Understanding the correct medication for each seizure type is critical, as giving the wrong drug (e.g., Carbamazepine for absence or myoclonic seizures) can lead to paradoxical exacerbation of the patient's epilepsy.

A 24-year-old pregnant woman is receiving lithium therapy for bipolar disorder. Discontinuation of lithium during pregnancy is advised to prevent the risk of which fetal congenital abnormality?

(A)

Ebstein anomaly

(B)

VACTERL defects

(C)

Coarctation of aorta

(D)

Supravalvular aortic stenosis

Question 192. A 24-year-old pregnant woman is receiving lithium therapy for bipolar disorder. Discontinuation of lithium during pregnancy is advised to prevent the risk of which fetal congenital abnormality?

A. Ebstein anomaly

B. VACTERL defects

C. Coarctation of aorta

D. Supravalvular aortic stenosis

Correct answer: A

Lithium is a highly effective mood stabilizer for bipolar disorder, but it is a known teratogen when taken during pregnancy, especially during the first trimester. The specific congenital heart defect associated with maternal lithium use is "Ebstein anomaly" (Option A). This condition involves the downward displacement of the tricuspid valve leaflets into the right ventricle, leading to "atrialization" of the ventricle and severe tricuspid regurgitation. VACTERL defects (Option B) are a cluster of anomalies (Vertebral, Anal, Cardiac, etc.) with multifactorial

origins. Coarctation of the aorta (Option C) and supravalvular aortic stenosis (Option D, classic for Williams syndrome) are not specifically linked to lithium exposure. While the absolute risk of Ebstein anomaly from lithium is lower than previously thought, it is significantly higher than the baseline population risk. Pregnant women on lithium require a detailed fetal echocardiogram between 18–22 weeks to screen for cardiac malformations and a careful risk-benefit discussion regarding medication management during gestation.
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(A) Ameloblastoma
(B) Embryogenic dermoid
(C) Sequestration dermoid
(D) Implantation dermoid
AAns

(D) Implantation dermoid
An implantation dermoid (or epidermal inclusion cyst) is a common clinical entity that occurs when surface epithelium is traumatically driven into the deeper tissues. The patient’s history as a "farmer" who sustained a "thorn injury" is classic, as these cysts frequently occur on the palms or fingers of manual laborers. Over months, the trapped epithelial cells proliferate and produce keratin, forming a firm, non-tender, slow-growing subcutaneous cyst. Embryogenic or sequestration dermoids (Options B and C) occur along embryonic fusion lines (like the midline or outer canthus) and are present from birth rather than resulting from trauma. Ameloblastoma (Option A) is an aggressive odontogenic tumor of the jaw, unrelated to palmar skin lesions. Treatment for an implantation dermoid involves complete surgical excision to prevent recurrence or secondary infection. The diagnosis is usually straightforward based on the history of penetrating trauma followed by a localized swelling in a high-contact area like the palm.