

Question 1.1

A 30-year-old woman comes to the office because of a 3-day history of joint pain in her hands and a rash over her chest and arms that is slowly resolving. The joint pain in her hands has persisted and is exacerbated by writing or typing. She rates the pain as a 3 on a 10-point scale. The patient is a preschool teacher and reports that one of her students had a facial rash and fever 1 week prior to the development of her symptoms. The patient's medical history is unremarkable and her only medication is an oral contraceptive. She is in a monogamous relationship with her husband. She does not smoke cigarettes, drink alcoholic beverages, or use illicit drugs. BMI is 22 kg/m². Vital signs are temperature 38.1°C (100.5°F), pulse 94/min, respirations 18/min, and blood pressure 107/58 mm Hg. Physical examination discloses a blanching, erythematous, papular rash on the anterior chest and proximal upper extremities. The first and second metacarpophalangeal joints of both hands are tender and swollen. The wrist joints also are tender to palpation but there is minimal swelling. Which of the following microorganisms is most likely to have caused this patient's symptoms?

- (A) Adenovirus
- (B) *Borrelia burgdorferi*
- (C) Coxsackievirus
- (D) *Ehrlichia chaffeensis*
- (E) Parvovirus B₁₉

Correct Answer:

- (E) Parvovirus B₁₉

Neural Consult Response and Explanation:

Answer: E

Explanation: The patient's clinical presentation is classic for an acute Parvovirus B₁₉ infection, which often manifests differently in adults than in children. In children, Parvovirus B₁₉ typically causes erythema infectiosum (Fifth disease), characterized by a 'slapped-cheek' facial rash and a reticular body rash. In adults, particularly women, the virus frequently presents as an acute, symmetric polyarthritis that can mimic rheumatoid arthritis. The patient's symptoms—joint pain and swelling in the metacarpophalangeal (MCP) joints and wrists—align perfectly with this pattern. The epidemiological clue is crucial: she is a preschool teacher, and one of her students recently had a facial rash and fever, indicating exposure to a child with Fifth disease. The timing (symptoms appearing one week after exposure) and the presence of a resolving maculopapular rash on her chest and arms further support this diagnosis. Other options are less likely: Adenovirus (A) typically causes respiratory or conjunctival symptoms; *Borrelia burgdorferi* (B) causes Lyme disease, which usually presents with erythema migrans initially and later a monoarticular or oligoarticular arthritis of large joints (like the knee); Coxsackievirus (C) causes hand-foot-and-mouth disease, which involves vesicular lesions; and *Ehrlichia chaffeensis* (D) causes a tick-borne illness with high fever and cytopenias, not symmetric small-joint polyarthritis.

Question 2.1



A 34-year-old woman comes to the office because of a 1-month history of worsening right upper quadrant abdominal pain and discomfort. She describes the pain as a dull ache and says it is not affected by eating or defecating. She has not had nausea or changes in appetite or bowel habits. She feels the pain constantly while she is awake, but it rarely keeps her from sleeping. Acetaminophen provides occasional relief. She has been otherwise healthy. Medical history is unremarkable and her only other medication is an oral contraceptive. Vital signs are normal. Abdominal examination discloses hepatomegaly but no palpable masses or evidence of cirrhosis. Results of liver function tests and serum α -fetoprotein concentration are within the reference ranges. Serologic studies for hepatitis B and C are negative. Ultrasonography of the abdomen shows a 4x4-cm mass in the right lobe of the liver. Which of the following is the most likely diagnosis?

- (A) Hepatic adenoma
- (B) Hepatocellular cancer
- (C) Hydatid cyst
- (D) Metastatic ovarian cancer

Correct Answer:

- (A) Hepatic adenoma

Neural Consult Response and Explanation:

Answer: A

Explanation: The clinical presentation is highly characteristic of a hepatic adenoma. The patient is a young woman (34 years old) with a history of oral contraceptive (OCP) use, which is a well-established risk factor for the development of hepatic adenomas. These are benign epithelial liver tumors that often present with right upper quadrant pain or discomfort due to stretching of the liver capsule or internal hemorrhage. The laboratory findings, including normal liver function tests and a normal alpha-fetoprotein (AFP) level, along with negative hepatitis B and C serology, help rule out hepatocellular carcinoma (HCC), which typically occurs in the setting of chronic liver disease or cirrhosis. Hydatid cysts (caused by *Echinococcus*) usually present with characteristic cystic imaging findings (such as daughter cysts or calcifications) and often involve specific epidemiological exposures. Metastatic ovarian cancer is less likely in a young patient with no other symptoms and a solitary liver mass, as metastases are typically multiple and associated with a known primary or systemic symptoms. Therefore, hepatic adenoma is the most likely diagnosis given the patient's demographic, OCP use, and solitary liver mass.

Question 3.1

A 12-year-old girl is brought to the emergency department by her mother because of a 1-week history of worsening swelling in her legs. The patient also noticed blood in her urine yesterday. The bleeding has not recurred. She had an upper respiratory tract infection and sore throat 1 week ago that caused her to miss several days of school. Medical history is otherwise unremarkable and she takes no routine medications. Menarche has not yet occurred. BMI is 20 kg/m². Vital signs are temperature 37.0°C (98.6°F), pulse 78/min, respirations 12/min, and blood pressure 136/84 mm Hg. Pulse oximetry on room air shows an oxygen saturation of 100%. Physical examination discloses erythema



of the posterior pharynx, mild cervical lymphadenopathy, and 3+ pitting edema to both knees. Results of urinalysis are shown: Protein: 150 mg/dL

Blood: Positive

Leukocyte esterase: Positive

Nitrite: Negative

WBCs: 5–10/hpf RBCs: 10–25/hpf Casts: 1–2/lpf Results of which of the following laboratory studies are most likely to be abnormal in this patient?

- (A) Bleeding time
- (B) Erythrocyte count
- (C) Serum concentration of C_3
- (D) Serum IgA concentration
- (E) Serum rheumatoid factor assay

Correct Answer:

- (C) Serum concentration of C_3

Neural Consult Response and Explanation:

Answer: C

Explanation: The patient's presentation of edema, hypertension, and hematuria (nephritic syndrome) following a sore throat one week ago is highly suggestive of Poststreptococcal Glomerulonephritis (PSGN). PSGN typically occurs 1–3 weeks after a streptococcal pharyngeal infection. The underlying pathophysiology involves the deposition of immune complexes in the glomerular basement membrane, which triggers the alternative complement pathway. This process leads to the consumption of complement proteins, resulting in a characteristically low serum C_3 concentration. While IgA nephropathy also presents with hematuria after an upper respiratory infection, it is typically 'synpharyngitic' (occurring within 1–3 days of infection) and serum complement levels are usually normal. Other options like bleeding time, erythrocyte count, and rheumatoid factor are not diagnostic markers for PSGN, and serum IgA is not typically elevated in this condition.

Question 4.1

A 45-year-old woman comes to the office because she has noticed during the past several months that her fingernails have become white, increasingly brittle, and seem to lift off her nail beds easily. During this time, she also has had episodes of feeling warm and perspiring. Medical history is remarkable for intravenous drug use 25 years ago. The patient takes only a multivitamin. Last menstrual period was 3 weeks ago. She appears thin and mildly anxious. She is 170 cm (5 ft 7 in) tall and weighs 48.5 kg (107 lb); BMI is 17 kg/m^2 . Vital signs are temperature 37.0°C (98.6°F), pulse 106/min, respirations 20/min, and blood pressure 136/92 mm Hg. Physical examination of the hands shows a white discoloration of the nail beds. The remainder of the examination shows no abnormalities. Which of the following is the most likely diagnosis?

- (A) Chronic obstructive pulmonary disease



- (B) Diabetes mellitus
- (C) Endocarditis
- (D) Hyperthyroidism
- (E) Perimenopause

Correct Answer:

- (D) Hyperthyroidism

Neural Consult Response and Explanation:

Answer: D

Explanation: The patient's clinical presentation is highly characteristic of hyperthyroidism. The key diagnostic clue is the description of her fingernails 'lifting off her nail beds,' a condition known as onycholysis. When associated with hyperthyroidism, these are specifically referred to as Plummer's nails. This finding, combined with systemic symptoms of a hypermetabolic state—including heat intolerance, diaphoresis (feeling warm and perspiring), weight loss (BMI of 17), anxiety, and tachycardia (pulse 106/min)—strongly points to overactive thyroid function. While perimenopause (Option E) can cause hot flashes and anxiety, it does not account for onycholysis or the significant tachycardia and low BMI. Chronic obstructive pulmonary disease (Option A) is associated with nail clubbing, not onycholysis. Endocarditis (Option C) typically presents with fever and splinter hemorrhages rather than the separation of the nail plate. Diabetes mellitus (Option B) does not explain the specific constellation of tachycardia, heat intolerance, and Plummer's nails.

Question 6.1

A 48-year-old man comes to the clinic because of a 10-year history of recurrent, intrusive thoughts that his house will be broken into and damaged by criminals or accidentally destroyed by a fire when he is not home. These thoughts have worsened during the past 2 months. He reports now spending 4 hours daily checking that the doors and windows are closed and locked and that the stove and oven are turned off; he previously spent 2 hours daily doing these tasks. He says he cannot keep a job or leave the house very much because of the amount of time he spends checking these things. He has no other history of serious illness and takes no medications. Physical examination shows no abnormalities. On mental status examination, he has an anxious mood and a sad affect. He is fully oriented. He is not having hallucinations or delusions. The most effective pharmacotherapy for this patient is an agent that targets which of the following neurotransmitters?

- (A) γ -Aminobutyric acid
- (B) Dopamine
- (C) Glutamate
- (D) Norepinephrine
- (E) Serotonin

Correct Answer:



(E) Serotonin

Neural Consult Response and Explanation:

Answer: E

Explanation: The patient's clinical presentation is classic for Obsessive-Compulsive Disorder (OCD). He exhibits both obsessions (recurrent, intrusive thoughts about his house being destroyed or broken into) and compulsions (repetitive checking of locks and the stove). These symptoms are time-consuming (4 hours daily) and cause significant functional impairment (inability to maintain employment or leave the house), meeting the DSM-5 criteria for OCD. The first-line pharmacotherapy for OCD consists of Selective Serotonin Reuptake Inhibitors (SSRIs) such as fluoxetine, sertraline, or paroxetine. Alternatively, clomipramine (a tricyclic antidepressant with potent serotonergic activity) is also highly effective. Both of these first-line treatments primarily target the serotonin system by inhibiting its reuptake, thereby increasing serotonin levels in the synaptic cleft. While other neurotransmitters like dopamine (Option B) or glutamate (Option C) may be targeted in treatment-resistant cases using augmentation strategies, they are not the primary or most effective initial targets. GABA (Option A) is targeted by benzodiazepines, which may help with acute anxiety but do not treat the underlying pathology of OCD. Norepinephrine (Option D) is targeted by various antidepressants, but it is not the primary neurotransmitter involved in the management of OCD.

Question 7.1

Researchers from a large neurology center are conducting a study to examine the relationship between stress levels and fibromyalgia-related pain. Two hundred patients with fibromyalgia are randomly selected from the center for participation in the study. During recruitment, a baseline interview is conducted with each participant to obtain sociodemographic and personality data. Participants are given a study-provided portable digital device and asked to maintain a daily schedule of their fibromyalgia pain and stress levels for 30 days using two well-validated and reliable self-reporting scales. Results show a positive and statistically significant relationship between stress levels and fibromyalgia-related pain ($P < .05$). Similarly, statistically significant relationships were found between Type A personality participants and increased stress levels ($P < .01$), as well as increased levels of fibromyalgia-related pain ($P < .005$). Which of the following is the most appropriate method to control for the potential confounding effect of patients with a Type A personality?

- (A) Matching
- (B) Post hoc analysis
- (C) Randomization
- (D) Standardization
- (E) Stratification

Correct Answer:

(E) Stratification



Neural Consult Response and Explanation:

Answer: E

Explanation: In this observational study, Type A personality acts as a confounding variable because it is significantly associated with both the exposure (stress levels) and the outcome (fibromyalgia-related pain). To determine the true relationship between stress and pain, the effect of this confounder must be controlled. Methods for controlling confounding are categorized into the design phase (randomization, matching, and restriction) and the analysis phase (stratification and multivariate regression). Since this is an observational study where data has already been collected, stratification is the most appropriate method among the choices. Stratification involves dividing the participants into subgroups (strata) based on the confounder (e.g., Type A vs. non-Type A) and calculating the association between stress and pain within each group. If the association remains significant within the strata, the confounding effect has been addressed. Randomization (C) is used in experimental designs (RCTs) to distribute confounders equally, but it is not applicable to observational exposures like stress. Matching (A) occurs during the design phase, typically in case-control studies. Standardization (D) is primarily used to compare rates (like mortality) across different populations by adjusting for age or other demographic distributions. Post hoc analysis (B) is a general term for analyses conducted after data collection but is not a specific technique for controlling confounding.

Question 8.1

A 12-year-old boy with sickle cell disease and type 1 diabetes mellitus is brought to the office by his mother for an initial visit. The family recently moved to the area. Type 1 diabetes mellitus was diagnosed in the patient 6 years ago. Since that time, he has been treated with insulin and dietary management. His insulin regimen has not changed during the past year; however, his mother says he has been only marginally compliant with his insulin and dietary regimens. His diabetic diary shows home fingerstick blood glucose concentrations ranging from 140–200 mg/dL during the past 3 months. He admits to checking his glucose concentrations infrequently. Measurement of hemoglobin A_{1c} obtained last week was 5.4%. The patient's vital signs are temperature 36.8°C (98.2°F), pulse 72/min, respirations 24/min, and blood pressure 110/64 mm Hg. Physical examination shows no abnormalities. Which of the following is the most likely explanation for the discrepancy between the patient's home fingerstick blood glucose concentrations and his hemoglobin A_{1c}?

- (A) He has iron deficiency anemia
- (B) His daily glucose control is better than recorded
- (C) His glucometer is reading falsely high and should be replaced
- (D) His hemoglobin A_{1c} is likely a result of laboratory error and should be repeated
- (E) His sickle cell disease is affecting his hemoglobin A_{1c}

Correct Answer:

(E) His sickle cell disease is affecting his hemoglobin A_{1c}

Neural Consult Response and Explanation:



Answer: E

Explanation: The patient's hemoglobin A_{1c} (HbA_{1c}) of 5.4% is inconsistent with his fingerstick blood glucose readings of 140–200 mg/dL and his history of marginal compliance. HbA_{1c} measures the non-enzymatic glycation of hemoglobin, which is dependent on both the average blood glucose concentration and the lifespan of the red blood cell (RBC). In a healthy individual, the average RBC lifespan is approximately 120 days. However, in patients with sickle cell disease (SCD), chronic hemolysis significantly shortens the RBC lifespan (often to 10–20 days). Because the RBCs are destroyed and replaced much more rapidly, the hemoglobin has less time to become glycated, leading to a falsely low HbA_{1c} measurement that does not accurately reflect long-term glycemic control. In such patients, alternative markers like fructosamine (which measures glycated serum proteins and reflects control over 2–3 weeks) or frequent fingerstick monitoring are more reliable. Iron deficiency anemia (Option A) typically causes a falsely elevated HbA_{1c} due to decreased RBC turnover. Options B, C, and D are less likely given the known physiological impact of SCD on hemoglobin glycation.

Question 9.1

A 35-year-old man, who has been your patient for the past year, comes to the office to request that a copy of his medical records be sent to another physician in town. The patient has an overdue account balance of \$750, which he has not paid for several months. He signs an office form authorizing release of health information and provides the name and address of the other physician to whom he would like the records sent. It is most appropriate to inform this patient of which of the following regarding his request for release of his medical records?

- (A) They will be released to his new physician promptly
- (B) They will be released when he makes a payment on his account
- (C) They will be released when he pays his balance in full
- (D) They will be released when his new physician contacts your office and requests them

Correct Answer:

- (A) They will be released to his new physician promptly

Neural Consult Response and Explanation:



Answer: A

Explanation: Under the Health Insurance Portability and Accountability Act (HIPAA) Privacy Rule and ethical guidelines established by the American Medical Association (AMA), a physician cannot withhold medical records because of an unpaid balance for services rendered. Patients have a legal right to access their medical records and to have them transferred to another provider to ensure continuity of care. Withholding these records for debt collection purposes is considered unethical and is a violation of federal regulations. While a physician may charge a reasonable, cost-based fee for the actual copying and mailing of the records (though many states and ethical guidelines discourage this if it creates a barrier to care), they cannot condition the release of the records on the payment of the \$750 outstanding balance. Therefore, the records must be released promptly once the patient has provided valid authorization. Option B and C are incorrect because they suggest withholding records until payment is made. Option D is incorrect because the patient has already provided the necessary authorization and destination information, so requiring the new physician to initiate contact is an unnecessary delay.

Question 10.1

A 47-year-old man is admitted to the intensive care unit because of lower gastrointestinal bleeding. He has a history of alcohol-induced cirrhosis. Physical examination shows marked ascites and splenomegaly; the spleen tip is palpated 4 cm below the left costal margin. Results of laboratory studies are shown: Serum Blood Creatinine 1.5 mg/dL Hematocrit 29%
Hemoglobin 9.7 g/dL
Platelet count 105,000/mm³
PT 25 seconds INR 2.5

Which of the following mechanisms most increases this patient's risk for bleeding?

- (A) Decreased production of factor VII
- (B) Defective platelet aggregation
- (C) Deficiency of thrombopoietin
- (D) Inhibition of vitamin K epoxide reductase
- (E) Splenic sequestration

Correct Answer:

- (A) Decreased production of factor VII

Neural Consult Response and Explanation:



Answer: A

Explanation: The patient presents with alcohol-induced cirrhosis and active lower gastrointestinal bleeding. Laboratory findings reveal a significantly elevated Prothrombin Time (PT) of 25 seconds and an INR of 2.5, alongside mild thrombocytopenia ($105,000/\text{mm}^3$). The liver is the primary site for the synthesis of most coagulation factors, including factors I, II, V, VII, IX, X, XI, and XII. Factor VII has the shortest half-life (approximately 4–6 hours) of all the coagulation factors, making it the most sensitive marker of impaired hepatic synthetic function. A prolonged PT and elevated INR specifically reflect deficiencies in the extrinsic and common pathways, with Factor VII deficiency being the primary driver in early or significant liver dysfunction. While the patient has thrombocytopenia, a platelet count of $105,000/\text{mm}^3$ is generally considered sufficient for hemostasis (spontaneous bleeding risk typically increases significantly only when platelets fall below $50,000/\text{mm}^3$). Therefore, the severe coagulopathy indicated by an INR of 2.5, resulting from decreased production of Factor VII, is the mechanism that most increases this patient's risk for bleeding. Other options like splenic sequestration (E) and deficiency of thrombopoietin (C) contribute to the thrombocytopenia, but the degree of thrombocytopenia here is less clinically significant than the factor deficiency. Defective platelet aggregation (B) can occur but is not the primary driver, and inhibition of vitamin K epoxide reductase (D) is the mechanism of warfarin, not the primary pathology of cirrhosis.

Question 11.1

A 57-year-old woman comes to the office for a preoperative evaluation 2 weeks before undergoing scheduled laparoscopic cholecystectomy. Medical history is otherwise unremarkable and the patient takes no medications. Family history is significant for stable angina in her father and rheumatoid arthritis in her mother. The patient has a 102-year-old grandmother who resides in a nursing care facility and has Parkinson disease. The patient does not smoke cigarettes or drink alcoholic beverages. During the interview, her face is expressionless. She has a flexed posture and is unable to open her mouth wide. She is 173 cm (5 ft 8 in) tall and weighs 81 kg (179 lb); BMI is 27 kg/m². Vital signs are normal. Physical examination discloses thickening and hardening of the skin over the dorsum of the hands and forearms, as well as mild kyphosis. Strength testing shows no abnormalities; muscle tension is normal. Passive and active range of motion of the upper extremities is full. Gait is slow and deliberate. The remainder of the physical examination discloses no abnormalities. Prior to surgery, further evaluation is indicated for which of the following conditions in this patient?

- (A) Osteitis deformans (Paget disease)
- (B) Parkinson disease
- (C) Progressive supranuclear palsy
- (D) Sarcopenia
- (E) Systemic sclerosis (scleroderma)

Correct Answer:

- (E) Systemic sclerosis (scleroderma)



Neural Consult Response and Explanation:

Answer: E

Explanation: The patient's clinical presentation is highly suggestive of systemic sclerosis (scleroderma). The hallmark findings include thickening and hardening of the skin (scleroderma) over the dorsum of the hands and forearms, as well as microstomia (the inability to open the mouth wide) and an expressionless face (mask-like facies) caused by skin tightening rather than neurological impairment. While the expressionless face, flexed posture, and slow gait might initially suggest Parkinson disease (especially given the family history), the physical examination specifically notes normal muscle tension (absence of rigidity) and full range of motion, which argues against a primary movement disorder. In the context of a preoperative evaluation for a laparoscopic cholecystectomy, identifying systemic sclerosis is crucial because it carries significant anesthetic risks, including difficult intubation due to microstomia, increased risk of gastroesophageal reflux and aspiration due to esophageal dysmotility, and potential underlying pulmonary or cardiac involvement. The other options, such as Paget disease, Progressive supranuclear palsy, and Sarcopenia, do not account for the characteristic cutaneous findings observed in this patient.

Question 15.1

A 32-year-old man comes to the office because of a 10-day history of a red rash that has spread over his entire torso. He says the rash is not itchy or painful. He reports having a flu-like illness nearly 5 weeks ago, with associated headache, neck stiffness, muffled hearing, and a canker sore on his tongue. All of these symptoms have resolved without treatment. Additional medical history is unremarkable and he takes no medications. BMI is 18 kg/m². Vital signs are normal. Specific additional history should be obtained to determine whether which of the following has occurred during the past 6 months?

- (A) Blood transfusions
- (B) Exposure to toxic chemicals
- (C) International travel
- (D) Tobacco use
- (E) Unprotected sexual intercourse

Correct Answer:

(E) Unprotected sexual intercourse

Neural Consult Response and Explanation:



Answer: E

Explanation: The patient's clinical presentation is highly characteristic of syphilis, caused by the spirochete *Treponema pallidum*. The timeline and symptoms follow the classic progression of the disease: 1. Primary Syphilis: The 'canker sore' on the tongue 5 weeks ago likely represents a primary chancre, which is typically a painless, indurated ulcer that heals spontaneously. 2. Early Neurosyphilis: The headache, neck stiffness, and muffled hearing (suggestive of otosyphilis/cranial nerve VIII involvement) indicate early neurological involvement, which can occur during the primary or secondary stages. 3. Secondary Syphilis: The current 10-day history of a non-pruritic, non-painful red rash on the torso is the hallmark of secondary syphilis. Syphilis is primarily transmitted through direct contact with infectious lesions during sexual activity. Therefore, obtaining a history of unprotected sexual intercourse is the most appropriate next step to identify the risk and source of infection. Other options like blood transfusions (A) are extremely rare routes of transmission in modern medicine, and international travel (C), toxic chemicals (B), or tobacco use (D) do not explain this specific constellation of symptoms.

Question 16.1

The nurse at a local elementary school contacts you about 12 children he has seen in the past 2 weeks. All of the children had similar symptoms of nasal congestion, sneezing, nonproductive coughing, and eye irritation. None of the children had fevers. Several teachers and support staff have reported having the same symptoms. No similar outbreaks have been reported in the community. There was a fire in the school several weeks ago with significant smoke and water damage to classrooms, the cafeteria, and the school ventilation system. Repairs were quickly made and classes resumed. The most likely cause for the students' and teachers' symptoms is exposure to which of the following?

- (A) Asbestos
- (B) *Legionella pneumophila*
- (C) Mold spores
- (D) *Mycoplasma pneumoniae*
- (E) Respiratory syncytial virus

Correct Answer:

- (C) Mold spores

Neural Consult Response and Explanation:



Answer: C

Explanation: The clinical presentation described—nasal congestion, sneezing, nonproductive cough, and eye irritation in the absence of fever—is characteristic of an allergic or irritant response rather than an infectious process. The most significant clue is the history of water damage and smoke damage to the school's ventilation system and classrooms following a fire. Water damage in buildings, especially when it involves ventilation systems, frequently leads to the rapid growth of mold. When the school reopened, mold spores likely became airborne, causing a cluster of respiratory and ocular symptoms among the students and staff. This localized outbreak, confined to a single building with a known history of dampness, strongly points to mold spores. In contrast, *Legionella pneumophila* and *Mycoplasma pneumoniae* typically cause febrile illnesses (pneumonia or Pontiac fever). Respiratory syncytial virus (RSV) is a common cause of respiratory infections but would usually present with fever and be found in the wider community, not just one specific building. Asbestos exposure is associated with long-term complications like asbestosis or mesothelioma and does not cause acute, cluster-based allergic symptoms like those seen here.

Question 17.1

A 20-year-old man comes to the office at the request of his family for an examination 1 day after a motor vehicle accident for which he was at fault. The patient was arrested for the third time after police discovered he had been driving under the influence of alcohol. He has been your patient since early adolescence, and he has a history of truancy, shoplifting, and two attempts to run away from home. He dropped out of high school in his senior year. He was fired from his most recent job because he threatened a coworker with a hammer. He has been unemployed for the past 8 months, and as a result he has many unpaid debts. He seems unconcerned about his current difficulties and has no plans for seeking employment or paying his debts. Despite these facts, you find the patient charming and interactive, and he conveys a sincere intention to change his behavior. Which of the following is the most likely diagnosis?

- (A) Antisocial personality disorder
- (B) Borderline personality disorder
- (C) Conduct disorder
- (D) Narcissistic personality disorder
- (E) Schizotypal personality disorder

Correct Answer:

- (A) Antisocial personality disorder

Neural Consult Response and Explanation:



Answer: A

Explanation: The patient's clinical presentation is most consistent with Antisocial Personality Disorder (ASPD). To diagnose ASPD according to the DSM-5, the individual must be at least 18 years of age and have a documented history of Conduct Disorder (CD) with onset before age 15. This patient is 20 years old and his history of truancy, shoplifting, and running away from home during early adolescence satisfies the prerequisite for a history of Conduct Disorder. Furthermore, he demonstrates a pervasive pattern of disregard for and violation of the rights of others, evidenced by at least three of the following criteria: 1) Failure to conform to social norms with respect to lawful behaviors (multiple DUI arrests and a motor vehicle accident); 2) Deceitfulness (using superficial charm to convey a 'sincere' intention to change while remaining unconcerned and making no actual plans); 3) Impulsivity or failure to plan ahead (unemployment and lack of financial planning); 4) Irritability and aggressiveness (threatening a coworker with a hammer); 5) Reckless disregard for the safety of self or others (repeatedly driving under the influence); 6) Consistent irresponsibility (failure to maintain employment or honor financial obligations); and 7) Lack of remorse (indifference to his legal and financial difficulties). While Option C (Conduct Disorder) describes his childhood behavior, it is not the correct diagnosis for an individual over 18 who meets ASPD criteria. Options B, D, and E do not align with the patient's primary pattern of criminal behavior, lack of remorse, and childhood history of conduct problems.

Question 18.1

A 45-year-old man comes to the office for an initial appointment because he would like you to fill out and sign a legal document at the request of his attorney. The patient works as a limousine driver. He states that he is filing a lawsuit against the limousine company that employs him because he developed post-traumatic stress disorder following a motor vehicle collision. He appears irritable and tense as he provides his history. He relays his symptoms by reading them aloud from a written list. At this time, which of the following is the most appropriate approach toward confirming the underlying diagnosis of this patient?

- (A) Administer amobarbital and then interview the patient
- (B) Ask the patient to provide a narrative with detailed description of the incident and of his symptoms
- (C) Interview the patient under hypnosis
- (D) Interview the patient while paying close attention to his willingness to make eye contact
- (E) Tell the patient he is exhibiting behaviors that are suggestive of malingering and see how he responds

Correct Answer:

(B) Ask the patient to provide a narrative with detailed description of the incident and of his symptoms

Neural Consult Response and Explanation:



Answer: B

Explanation: The most appropriate approach to confirming a diagnosis of Post-Traumatic Stress Disorder (PTSD), particularly when there is a potential for secondary gain (such as a lawsuit), is to conduct a thorough clinical interview that includes a detailed narrative of the traumatic event and the subsequent symptoms. According to DSM-5 criteria, the diagnosis of PTSD requires exposure to a qualifying traumatic event and the presence of symptoms across four clusters: intrusion, avoidance, negative alterations in cognitions and mood, and alterations in arousal and reactivity. Asking the patient to provide a detailed narrative allows the clinician to evaluate the consistency, depth, and specific characteristics of these symptoms. While the patient's behavior (reading from a list, irritability) might raise suspicion of malingering, these can also be manifestations of the disorder itself (e.g., irritability is a known arousal symptom, and a list might be used due to anxiety or cognitive difficulties). A detailed narrative is more likely to reveal the nuanced, sensory-rich, and involuntary nature of genuine PTSD symptoms compared to the often stereotypical or vague descriptions provided by those malingering. Options A and C (amobarbital and hypnosis) are not standard diagnostic tools for PTSD. Option D (eye contact) is non-specific and not a diagnostic criterion. Option E (confronting the patient) is premature and counterproductive to establishing the rapport necessary for an accurate psychiatric assessment.

Question 19.1

A 39-year-old woman comes to the office because of gradually increasing shortness of breath while doing her usual household activities. She also reports fatigue, a feeling of heaviness in her chest with exertion, trouble sleeping, and the very recent onset of a rapid heart beat and fluttering in her chest. She says, "I was always sick as a child." She does not smoke cigarettes, and she is not currently taking any medications other than occasional aspirin. Her father died of a myocardial infarction at age 55 years. She is married and has two teenaged children. She did have some shortness of breath at the end of her second pregnancy. Physical examination today shows a thin woman with an irregular pulse of 130/min. Thyroid gland is normal to palpation. There is a prominent diastolic rumble heard best over the apical area of her heart. Lungs are clear; there is no hepatomegaly or pretibial edema. Which of the following is the most helpful diagnostic study at this time?

- (A) Chest x-ray
- (B) ECG
- (C) Serum anti-streptolysin O titer
- (D) Serum C-reactive protein concentration
- (E) Serum thyroid-stimulating hormone (TSH) concentration

Correct Answer:

(B) ECG

Neural Consult Response and Explanation:



Answer: B

Explanation: The clinical presentation is highly suggestive of mitral stenosis (MS) complicated by new-onset atrial fibrillation (AFib). The patient's history of being 'always sick as a child' is a classic indicator of childhood rheumatic fever, which is the leading cause of MS. Her symptoms of dyspnea, fatigue, and orthopnea (trouble sleeping), along with the exacerbation during pregnancy, are characteristic of MS. On physical examination, the 'prominent diastolic rumble' heard at the apex is pathognomonic for mitral stenosis. The recent onset of a rapid, fluttering heartbeat and an irregular pulse of 130/min strongly suggest that she has developed atrial fibrillation, a common complication of MS due to left atrial enlargement. Among the provided options, an ECG (B) is the most helpful diagnostic study at this time because it is the gold standard for confirming the heart rhythm (AFib) and can provide supportive evidence of the underlying structural disease, such as left atrial enlargement (P mitrale) or right ventricular hypertrophy. While a chest X-ray (A) might show left atrial enlargement or pulmonary congestion, it is less definitive for the acute management of a tachyarrhythmia. Serum ASO titer (C) and CRP (D) are markers of acute infection or inflammation and are not useful in diagnosing chronic rheumatic heart disease. TSH (E) is used to rule out hyperthyroidism as a cause of AFib, but the presence of a clear diastolic rumble points toward a structural valvular cause, making the ECG a more immediate and helpful diagnostic step.

Question 20.1

A 10-year-old boy with a traumatic brain injury sustained during infancy is examined in the nursing care facility where he resides because he has had no urine output during the past 24 hours. During the past 4 days, he has had decreasing urine output, intermittent fever, rhinorrhea, and cough. As a result of his brain injury, the patient has severe developmental delay and a seizure disorder. He is fed orally, but he is nonverbal and nonambulatory. Medications are levetiracetam, docusate, and multivitamins. The patient is 131 cm (4 ft 2 in; 10th percentile) tall and weighs 26 kg (57 lb; 10th percentile). BMI is 14 kg/m² (10th percentile). Vital signs are temperature 38.8°C (101.8°F), pulse 80/min, respirations 25/min, and blood pressure 110/80 mm Hg. Pulse oximetry on room air shows an oxygen saturation of 95%. The patient appears thin. He is awake and is not in apparent distress. He is responsive to touch. Auscultation of the lungs discloses scattered coarse crackles and rhonchi but good air entry and normal work of breathing. Results of laboratory studies are shown: Serum Blood Urea nitrogen 78 mg/dL

Creatinine 3.2 mg/dL

Na⁺ 131 mEq/L

K⁺ 5.6 mEq/L

Cl⁻ 88 mEq/L

HCO₃⁻ 16 mEq/L

Urine Specific gravity 1.030 (N=1.003–1.029) Creatinine 90 mg/dL

Na⁺ 8 mEq/L

Hematocrit 37%

Hemoglobin 12.5 g/dL

WBC 12,000/mm³ Neutrophils, segmented 60%

Lymphocytes 40%

Platelet count 250,000/mm³



Which of the following is the most likely cause of this patient's altered kidney function?

- (A) Acute tubular necrosis
- (B) Decreased intravascular volume
- (C) Medication-related interstitial nephritis
- (D) Neurogenic bladder
- (E) Pyelonephritis

Correct Answer:

- (B) Decreased intravascular volume

Neural Consult Response and Explanation:

Answer: B

Explanation: The patient's clinical presentation and laboratory findings are most consistent with prerenal acute kidney injury (AKI) due to decreased intravascular volume. The patient has a history of fever, rhinorrhea, and cough for four days, which likely led to increased insensible fluid losses and decreased oral intake. Given his severe developmental delay and nonverbal status, he is entirely dependent on caregivers for hydration and cannot communicate thirst, placing him at high risk for dehydration during illness. The laboratory studies confirm a prerenal state: 1) The BUN-to-creatinine ratio is approximately 24:1 (78/3.2), which is greater than the 20:1 threshold characteristic of prerenal azotemia. 2) The urine sodium is 8 mEq/L (less than 20 mEq/L), indicating that the kidneys are appropriately conserving sodium to expand intravascular volume. 3) The urine specific gravity is 1.030, indicating highly concentrated urine as the kidneys attempt to conserve water. 4) The fractional excretion of sodium (FeNa) is significantly less than 1% (calculated as $[8/131] / [90/3.2] * 100 \approx 0.22\%$). These findings collectively point to renal hypoperfusion rather than intrinsic or post-renal causes. Acute tubular necrosis (A) is less likely because it typically presents with a BUN/Cr ratio $< 15:1$, urine sodium > 40 mEq/L, and FeNa $> 2\%$. Medication-related interstitial nephritis (C) is unlikely as his current medications (levetiracetam, docusate) are not common triggers, and there are no signs like eosinophilia or rash. Neurogenic bladder (D) could cause post-renal obstruction, but the urine indices (low sodium, high concentration) specifically indicate a prerenal response. Pyelonephritis (E) would typically present with significant pyuria and would not explain the classic prerenal laboratory indices as effectively as dehydration.

Question 22.1

A 27-year-old man comes to the office with his wife because of a recent episode of loss of muscle control. He says, "I was at a reception, someone told a joke, and when I laughed, my legs collapsed!" His wife says that he recovered in a few seconds and he did not lose consciousness. He has a long history of sleepiness and he is able to go to sleep quickly. He usually awakens feeling refreshed after a short nap. He has no history of similar episodes or hallucinations. There is no family history of similar problems. Vital signs are normal. Physical examination shows no abnormalities. Which of the following is the most likely diagnosis?



- (A) Narcolepsy
- (B) Primary hypersomnia
- (C) A seizure disorder
- (D) Sleep paralysis
- (E) Vasovagal syndrome

Correct Answer:

- (A) Narcolepsy

Neural Consult Response and Explanation:

Answer: A

Explanation: The patient's presentation is classic for Narcolepsy Type 1, which is characterized by the tetrad of excessive daytime sleepiness (EDS), cataplexy, sleep paralysis, and hypnagogic hallucinations. This patient specifically demonstrates EDS (long history of sleepiness, falling asleep quickly, and feeling refreshed after short naps) and cataplexy. Cataplexy is a sudden, transient loss of muscle tone triggered by strong emotions—most characteristically laughter—while consciousness is fully preserved. The patient's description of his legs collapsing after a joke while remaining conscious is pathognomonic for cataplexy. Primary hypersomnia (Option B) involves EDS but lacks cataplexy, and naps are typically not refreshing. Seizure disorders (Option C) and Vasovagal syndrome (Option E) are unlikely because they generally involve a loss or alteration of consciousness. Sleep paralysis (Option D) is the inability to move during the transition between sleep and wakefulness, which does not match the patient's episode during a social reception.

Question 23.1

A study is being conducted to assess mesothelioma in shipyard workers. A large shipyard firm has provided the asbestos exposure records of all employees during the past 50 years. The health insurer for the workers has provided claims data that documents all chest x-rays and diagnoses of mesothelioma among current workers and retirees. The study enrolled shipyard workers who were diagnosed with mesothelioma and shipyard workers who were not diagnosed with mesothelioma. All subjects in the study had to have chest x-rays. Which of the following is the best rationale for selecting a comparison group that had chest x-rays?

- (A) Address confounding
- (B) Demonstrate causality
- (C) Minimize ascertainment bias
- (D) Reduce recall bias

Correct Answer:

- (C) Minimize ascertainment bias



Neural Consult Response and Explanation:

Answer: C

Explanation: The study design requires that both cases (shipyard workers with mesothelioma) and controls (shipyard workers without mesothelioma) have had chest x-rays. This is done to minimize ascertainment bias, also known as detection bias. Ascertainment bias occurs when the process of identifying or 'ascertaining' the disease status differs between groups, often because one group is more likely to be screened or tested than another. Since mesothelioma is typically diagnosed through imaging such as chest x-rays, ensuring that the control group also underwent this procedure ensures that they had the same opportunity for the disease to be detected. If the control group were not required to have x-rays, it is possible that some individuals with early or asymptomatic mesothelioma would be incorrectly classified as controls simply because they hadn't been screened. Furthermore, if asbestos exposure led to more frequent medical check-ups (surveillance), exposed workers would be more likely to receive x-rays and thus more likely to be diagnosed, creating a false association. By standardizing the diagnostic workup (chest x-rays) for both groups, the study ensures that the detection of the disease is consistent across the cohort. Confounding (A) is typically addressed through matching or statistical adjustment. Causality (B) is an inference drawn from the totality of evidence, not a single design choice. Recall bias (D) is minimized by using objective records (asbestos exposure logs and claims data) rather than participant interviews.

Question 24.1

An 88-year-old man with osteoarthritis is brought to the office by his daughter because of a 2-day history of severe low back pain and inability to walk. He says he has not fallen and does not recall any trauma to his back. Five years ago, he underwent bilateral hip replacement. His pain and mobility improved following the operation but have worsened during the past year. He now is most comfortable using a wheelchair for ambulation but is able to ambulate for short distances with a walker and assistance. One year ago, carcinoma of the prostate was diagnosed, but he declined therapy and said, "I'm an old man. When my time comes, I want to die. Just keep me as comfortable as you can." Vital signs today are temperature 36.6°C (97.9°F), pulse 88/min, respirations 16/min, and blood pressure 188/66 mm Hg. The patient is grimacing with pain and holding his lower back. Palpation discloses point tenderness over L₃ through L₄, and S₁. X-rays of the lumbosacral spine show lytic lesions and compression fracture. The patient refuses additional diagnostic studies. The daughter fears that her father will be "abandoned" if he is not evaluated for additional treatment. Which of the following is the most appropriate next step in response to the daughter's concern?

- (A) Explain the daughter's concerns to the patient and persuasively present the advantages of further evaluation
- (B) Explain to the daughter that no significant treatment will result from further testing and recommend having a home health nurse
- (C) Obtain consultation with an oncologist to assess the patient's need for further testing
- (D) Reassure the daughter and recommend hospice care consultation
- (E) Reassure the daughter and recommend transfer of the patient to an assisted living facility



Correct Answer:

(D) Reassure the daughter and recommend hospice care consultation

Neural Consult Response and Explanation:

Answer: D

Explanation: The patient is an 88-year-old man with metastatic prostate cancer (indicated by lytic lesions and a compression fracture on X-ray) who has clearly expressed his desire for comfort-oriented care and has refused further diagnostic testing or aggressive treatment. In medical ethics, the principle of autonomy dictates that a competent patient has the right to refuse medical interventions, even if those interventions are life-saving or standard of care. The daughter's concern about 'abandonment' is a common emotional response when transitioning from curative or diagnostic-focused care to palliative care. The most appropriate response is to reassure the daughter that the patient is not being abandoned, but rather that the focus of his care is shifting to prioritize his comfort and quality of life, as he requested. Hospice care is the ideal recommendation in this scenario because it provides a multidisciplinary team (nurses, physicians, social workers, and chaplains) dedicated to managing symptoms and providing emotional support to both the patient and the family, directly addressing the fear of abandonment. Options A and C violate the patient's autonomy by pushing for further evaluation he has already refused. Option B is less comprehensive than hospice and may sound dismissive to the daughter. Option E is inappropriate as assisted living facilities are not designed to provide the intensive end-of-life symptom management required for a patient with metastatic cancer and acute compression fractures.

Question 25.1

A 23-year-old man comes to the office because of a 7-day history of fever, crampy abdominal pain, and diarrhea. He says the abdominal pain worsens with oral intake. He has been having 8 to 10 episodes of diarrhea daily. He has not traveled recently and has had no sick contacts. Medical history is unremarkable and he takes no medications. He does not smoke cigarettes, drink alcoholic beverages, or use illicit drugs. He is not sexually active. Vital signs are temperature 38.3°C (101.0°F), pulse 118/min, respirations 18/min, and blood pressure 108/58 mm Hg. Bowel sounds are hyperactive. The abdomen is diffusely tender to palpation; no masses are palpated. Neither the liver edge nor the spleen can be palpated. Digital rectal examination shows grossly bloody stool. A stool culture is obtained, and empiric pharmacotherapy is initiated. Which of the following microorganisms is the most likely cause of this patient's condition?

- (A) *Campylobacter jejuni*
- (B) *Candida albicans*
- (C) Enterovirus
- (D) *Giardia lamblia*

Correct Answer:

(A) *Campylobacter jejuni*



Neural Consult Response and Explanation:

Answer: A

Explanation: The patient's clinical presentation is classic for inflammatory bacterial enteritis (dysentery), characterized by fever (38.3°C), severe crampy abdominal pain, and frequent, grossly bloody stools. Among the options provided, *Campylobacter jejuni* is the most likely cause. *Campylobacter* is one of the most common bacterial causes of gastroenteritis and typically presents with a prodrome of fever followed by crampy abdominal pain (which can be severe enough to mimic appendicitis) and diarrhea that often contains blood and leukocytes. The patient's 8-10 episodes of diarrhea daily and the presence of gross blood on digital rectal examination are highly suggestive of an invasive pathogen like *Campylobacter*. In contrast, *Candida albicans* does not cause bloody diarrhea in immunocompetent individuals. Enteroviruses typically cause watery, non-bloody diarrhea or other systemic symptoms (e.g., hand-foot-mouth disease). *Giardia lamblia* is a protozoan that causes malabsorptive, foul-smelling, greasy stools (steatorrhea) and is rarely associated with fever or bloody stools.

Question 26.1

A 23-year-old man comes to the office because of a 7-day history of fever, crampy abdominal pain, and diarrhea. He says the abdominal pain worsens with oral intake. He has been having 8 to 10 episodes of diarrhea daily. He has not traveled recently and has had no sick contacts. Medical history is unremarkable and he takes no medications. He does not smoke cigarettes, drink alcoholic beverages, or use illicit drugs. He is not sexually active. Vital signs are temperature 38.3°C (101.0°F), pulse 118/min, respirations 18/min, and blood pressure 108/58 mm Hg. Bowel sounds are hyperactive. The abdomen is diffusely tender to palpation; no masses are palpated. Neither the liver edge nor the spleen can be palpated. Digital rectal examination shows grossly bloody stool. A stool culture is obtained, and empiric pharmacotherapy is initiated. Results of the stool culture show growth of *Campylobacter jejuni*. The patient returns to the office 3 weeks later. He reports total resolution of his fever and gastrointestinal symptoms after completion of prescribed ciprofloxacin therapy, but he has had pain and swelling of his left knee during the past 3 days. The pain worsens with weight bearing. He rates the pain as a 6 on a 10-point scale. Vital signs are temperature 37.1°C (98.8°F), pulse 78/min, respirations 16/min, and blood pressure 112/58 mm Hg. Physical examination discloses erythema and warmth of the left knee with marked synovitis. Direct palpation and flexion of the knee elicit pain. Which of the following is the most appropriate diagnostic study to determine the cause of this patient's symptoms?

- (A) Blood cultures
- (B) CD₄ + T-lymphocyte count
- (C) Human leukocyte antigen-B₂₇ assay
- (D) Serum rheumatoid factor assay
- (E) Stool culture

Correct Answer:

(C) Human leukocyte antigen-B₂₇ assay



Neural Consult Response and Explanation:

Answer: C

Explanation: The patient's clinical presentation is classic for reactive arthritis (formerly known as Reiter's syndrome), which is a sterile, inflammatory arthritis that typically develops 1 to 4 weeks after a gastrointestinal (e.g., *Campylobacter*, *Salmonella*, *Shigella*, *Yersinia*) or genitourinary (e.g., *Chlamydia*) infection. This patient had a confirmed *Campylobacter jejuni* infection (bloody diarrhea, fever, positive stool culture) three weeks ago, which has since resolved, and now presents with acute monoarthritis of the knee. Reactive arthritis is one of the seronegative spondyloarthropathies, which are strongly associated with the human leukocyte antigen B₂₇ (HLA-B₂₇) allele. While the diagnosis of reactive arthritis is primarily clinical, testing for HLA-B₂₇ is the most appropriate study among the choices to support the diagnosis and determine the underlying cause (a genetic predisposition to this post-infectious sequela). Other options are less appropriate: (A) Blood cultures are typically negative as the arthritis is sterile and the systemic infection has resolved. (B) While HIV can be associated with reactive arthritis, a CD₄⁺ count is not the initial screening test for HIV, and the patient has no reported risk factors. (D) Rheumatoid factor is typically negative in reactive arthritis (hence 'seronegative'). (E) The stool culture was already performed and confirmed the trigger; repeating it after the resolution of gastrointestinal symptoms would not help determine the cause of the current joint symptoms.

Question 27.1

A 46-year-old woman, gravida 1, para 1, comes to the office because of a 2-week history of black discharge from her right nipple. The patient had mammography and ultrasonography of the breasts 2 months ago for evaluation of increased glandularity, palpated in the upper outer quadrant of the right breast, noted at her most recent annual examination. The studies showed likely benign findings with recommended follow-up in 6 months. Medical history is otherwise unremarkable and she takes no medications. BMI is 30 kg/m². Vital signs are normal. Palpation of the right breast discloses glandularity in the upper outer quadrant but no other masses. There is scant, black discharge from the right nipple. Which of the following is the most appropriate next step in diagnosis?

- (A) Ductography
- (B) Excisional biopsy of glandular tissue
- (C) Repeat mammography
- (D) Repeat ultrasonography of the right breast
- (E) No further workup is indicated

Correct Answer:

(A) Ductography

Neural Consult Response and Explanation:



Answer: A

Explanation: The patient presents with pathologic nipple discharge, which is defined as discharge that is spontaneous, unilateral, and/or bloody (including serosanguineous or dark/black discharge, which represents old blood). The most common cause of pathologic nipple discharge is an intraductal papilloma, but malignancy (such as ductal carcinoma in situ) must be ruled out. The standard initial diagnostic workup for pathologic nipple discharge includes mammography and ultrasonography. In this case, the patient had both studies performed two months ago, which were interpreted as 'likely benign' (BI-RADS 3) and did not identify a source for the discharge. According to clinical guidelines and the ACR Appropriateness Criteria, when standard imaging (mammography and ultrasound) is negative or does not explain the pathologic discharge, the next most appropriate diagnostic step is ductography (galactography). Ductography involves injecting radiopaque contrast into the discharging duct followed by mammographic imaging to identify filling defects or ductal abnormalities that may not be visible on conventional studies. This helps localize the lesion for subsequent surgical management (e.g., microdochectomy). Repeat mammography or ultrasound (Options C and D) are unlikely to provide new information so soon after the previous studies. Excisional biopsy of the glandular tissue (Option B) is inappropriate because the 'glandularity' was already evaluated as benign and does not necessarily correspond to the source of the intraductal discharge. Doing nothing (Option E) is incorrect because pathologic nipple discharge requires a definitive diagnosis to exclude malignancy.

Question 28.1

A physician is conducting a retrospective review of a trial involving the use of Drug X in patients with a specific disease. It is known that Drug X is associated with an increased probability of cancer in patients who use the drug. A total of 600 individuals with a specific disease were included in the trial. Of the participants, 200 individuals received Drug X and 400 individuals did not receive it. One hundred individuals who received Drug X died of a particular type of cancer and 100 individuals who did not receive the drug died of the same type of cancer. Based on these data, which of the following is the relative risk of death from this type of cancer in individuals who take Drug X as compared with individuals who do not take Drug X?

- (A) Individuals who take Drug X have an equal risk of dying from this type of cancer
- (B) Individuals who take Drug X have four times the risk of dying from this type of cancer
- (C) Individuals who take Drug X have three times the risk of dying from this type of cancer
- (D) Individuals who take Drug X have two times the risk of dying from this type of cancer
- (E) The risk for dying cannot be determined from the data

Correct Answer:

(D) Individuals who take Drug X have two times the risk of dying from this type of cancer

Neural Consult Response and Explanation:



Answer: D

Explanation: To calculate the relative risk (RR), we must first determine the incidence of the outcome (death from cancer) in both the exposed group (those who took Drug X) and the unexposed group (those who did not take Drug X). In the exposed group, there were 100 deaths out of 200 individuals, resulting in an incidence of $100/200 = 0.5$ (or 50%). In the unexposed group, there were 100 deaths out of 400 individuals, resulting in an incidence of $100/400 = 0.25$ (or 25%). The relative risk is calculated by dividing the incidence in the exposed group by the incidence in the unexposed group: $RR = 0.5 / 0.25 = 2$. Therefore, individuals who take Drug X have two times the risk of dying from this type of cancer compared to those who do not take the drug. Option A is incorrect because the risks are not equal (0.5 vs 0.25). Options B and C are mathematically incorrect based on the calculated RR. Option E is incorrect because the data provided is sufficient to calculate the incidence and the relative risk.

Question 29.1

A 23-year-old woman is brought to the emergency department by her friend because of headache, vomiting, and diarrhea that developed rapidly 6 hours ago. She also has had associated fever, chills, generalized muscle pain, and diffuse rash. The patient previously was healthy and has had no known exposure to anyone who has been ill. Medical history is unremarkable and her only medication is an oral contraceptive. She is currently menstruating. She does not smoke cigarettes or use illicit drugs. She drinks one to two alcoholic beverages weekly. She is disoriented to person, place, and time. Vital signs are temperature 39.2°C (102.6°F), pulse 114/min, respirations 26/min, and blood pressure 82/44 mm Hg. Pulse oximetry on oxygen at 2 L/min via nasal cannula shows an oxygen saturation of 90%. Examination of the skin shows diffuse macular erythema. Lungs are clear to auscultation. Cardiac examination discloses normal heart sounds and no murmur. Bowel sounds are hypoactive. Results of laboratory studies are shown:

Serum Blood ALT: 164 U/L

Hemoglobin: 16.4 g/dL

AST: 130 U/L

WBC 14,300/mm³ with left shift Urea nitrogen: 57 mg/dL

Platelet count 52,000/mm³ Creatinine 2.2 mg/dL

Can you provide me a diagnosis for this case? Given your diagnosis, a response to which of the following choices below is the most likely cause of this patient's condition?

- (A) Bacterial endotoxin
- (B) Bacterial exotoxin
- (C) Immunoglobulin E antibody
- (D) Immunoglobulin G antibody
- (E) Viral capsid
- (F) Viral coat

Correct Answer:



(B) Bacterial exotoxin

Neural Consult Response and Explanation:

Answer: B

Explanation: The patient's clinical presentation is classic for Staphylococcal Toxic Shock Syndrome (TSS). She meets the diagnostic criteria, which include fever (39.2°C), hypotension (82/44 mm Hg), a diffuse macular erythroderma (rash), and multisystem involvement (Gastrointestinal: vomiting/diarrhea; Renal: elevated BUN/creatinine; Hepatic: elevated ALT/AST; Hematologic: thrombocytopenia; and Central Nervous System: disorientation). The fact that she is currently menstruating is a significant risk factor, as menstrual TSS is strongly associated with the use of high-absorbency tampons, which facilitates the growth of *Staphylococcus aureus* and the production of toxins. The underlying pathophysiology of TSS involves the production of Toxic Shock Syndrome Toxin-1 (TSST-1), which is a bacterial exotoxin. Specifically, TSST-1 acts as a superantigen; it bypasses normal antigen processing by binding directly to the MHC class II molecules on antigen-presenting cells and the V β region of T-cell receptors. This leads to the massive, non-specific activation of T-cells and a subsequent 'cytokine storm' (massive release of IL-1, IL-2, TNF- α , and IFN- γ), which results in the clinical manifestations of shock and multi-organ failure. Bacterial endotoxins (Option A), such as Lipopolysaccharide (LPS), are components of the outer membrane of Gram-negative bacteria and are responsible for septic shock, but they do not cause the specific superantigen-mediated syndrome seen here. Immunoglobulins (Options C and D) and viral components (Options E and F) are not the causative agents of this bacterial toxin-mediated condition.

Question 30.1

A 68-year-old man comes to the office because of a 4-week history of increasing stiffness in his shoulders and upper arms. He is an avid golfer and has been unable to play in the morning because of the stiffness. He says that the stiffness is somewhat improved in the afternoon. He also has felt fatigued and sometimes "headachy and feverish." Medical history is significant for arthritis in his knees treated with acetaminophen, which has not relieved his shoulder and arm pain, and hyperlipidemia treated with pravastatin. He is a retired radiologist. Vital signs are temperature 37.7°C (99.8°F), pulse 76/min, respirations 18/min, and blood pressure 145/80 mm Hg. There is no tenderness in the shoulder girdle, and range of motion is normal bilaterally. The remainder of the physical examination discloses no abnormalities. Results of additional laboratory studies are shown:

Serum Blood Creatine kinase 88 U/L
Hematocrit 36%
Hemoglobin 12.0 g/dL
WBC 8600/mm³ ESR 88 mm/h

Which of the following is the most significant risk factor for the development of this patient's condition?

- (A) Age
- (B) Gender



- (C) History of osteoarthritis
- (D) Previous occupation
- (E) Use of pravastatin

Correct Answer:

- (A) Age

Neural Consult Response and Explanation:

Answer: A

Explanation: The patient's clinical presentation is highly characteristic of Polymyalgia Rheumatica (PMR). Key diagnostic features include his age (68 years), bilateral shoulder and upper arm stiffness that is worse in the morning (morning stiffness), systemic symptoms (fatigue, low-grade fever, and headache), and laboratory findings showing a markedly elevated erythrocyte sedimentation rate (ESR 88 mm/h) with a normal creatine kinase (CK 88 U/L). The normal CK level is crucial as it helps rule out inflammatory myopathies (like polymyositis) and statin-induced myopathy, while the high ESR confirms an underlying systemic inflammatory process. PMR is almost exclusively a disease of the elderly, with the most significant risk factor being age; it is virtually never diagnosed in individuals under the age of 50, and its incidence peaks between the ages of 70 and 80. While gender is a risk factor (the condition is more common in women), the patient is male, making age the most relevant risk factor provided. History of osteoarthritis (Choice C), previous occupation (Choice D), and the use of pravastatin (Choice E) are not established risk factors for the development of PMR. Statin use can cause muscle pain (myalgia), but it would not typically cause a markedly elevated ESR or follow this specific clinical pattern of morning stiffness in the shoulder girdle.

Question 31.1

A 16-month-old girl is brought to the emergency department by emergency medical technicians because of a generalized tonic-clonic seizure that began 25 minutes ago and has continued despite administration of 0.5 mg/kg rectal diazepam 10 minutes ago. The patient was at home at the time of the seizure. In the emergency department, she is given an additional 0.5 mg/kg dose of diazepam intravenously and the convulsion terminates. Within 2 minutes, her oxygen saturation drops to 75% and she appears cyanotic. Respirations are 10/min and shallow. She receives bag-valve-mask ventilation, followed by intubation and mechanical ventilation. Medical history is unremarkable. She takes no medications. Temperature is 39.1°C (102.5°F). Which of the following is the most likely underlying cause of the patient's respiratory insufficiency?

- (A) Airway occlusion
- (B) Encephalitis
- (C) Medication-induced suppression of central respiratory drive
- (D) Meningitis
- (E) Ongoing nonconvulsive seizure activity



Correct Answer:

(C) Medication-induced suppression of central respiratory drive

Neural Consult Response and Explanation:

Answer: C

Explanation: The patient is a 16-month-old girl presenting with febrile status epilepticus (a seizure lasting >30 minutes associated with fever). She received two doses of diazepam: 0.5 mg/kg rectally followed by 0.5 mg/kg intravenously. Benzodiazepines, such as diazepam, are first-line treatments for status epilepticus but are well-known to cause dose-dependent central nervous system depression, specifically suppressing the central respiratory drive. The clinical presentation of shallow respirations (10/min), cyanosis, and a rapid drop in oxygen saturation (75%) occurring within 2 minutes of the second dose of diazepam is highly characteristic of medication-induced respiratory depression. While infectious causes like meningitis (D) or encephalitis (B) could explain the fever and seizure, they would not typically cause an acute, sudden onset of respiratory failure immediately following benzodiazepine administration. Airway occlusion (A) usually presents with increased respiratory effort or stridor rather than shallow, slow respirations. Ongoing nonconvulsive seizure activity (E) typically presents as a failure to regain consciousness rather than primary respiratory suppression.

Question 32.1

A 32-year-old woman comes to the emergency department because of a 3-day history of fatigue and postural light-headedness. She also reports nausea with one episode of vomiting this morning and adds that her stools and urine have been

darker than usual lately. Medical history is significant for stage III-B Hodgkin lymphoma. She started the first cycle of chemotherapy 8 days ago. Additional medications include ferrous gluconate, hydrocodone, and prochlorperazine. She is currently receiving 0.9% saline at 75 mL/hr. Vital signs today are temperature 37.5°C (99.5°F), pulse 76/min supine and 80/min standing, respirations 16/min, and blood pressure 125/65 mm Hg supine and 120/60 mm Hg standing. Pulse oximetry on room air shows an oxygen saturation of 94%. Lungs are clear to auscultation. Cardiac examination discloses a soft systolic murmur at the left upper sternal border. There is no hepatosplenomegaly or tenderness on abdominal examination. Rectal examination discloses no masses. Stool is black and test for occult blood is negative. Results of laboratory studies are shown: Blood Urine Hematocrit 24% Specific gravity 1.032 (N=1.010–1.025) WBC 2400/mm³ Bilirubin Negative Platelet count 78,000/mm³ RBC Negative

Which of the following is the most likely explanation for the patient's current condition?

- (A) Adverse effect of medications
- (B) Bone marrow metastases
- (C) Gastrointestinal blood loss
- (D) Hemodilution
- (E) Hemolytic anemia



Correct Answer:

(A) Adverse effect of medications

Neural Consult Response and Explanation:

Answer: A

Explanation: The patient's presentation is most consistent with the adverse effects of her medications, specifically chemotherapy-induced myelosuppression and iron-induced stool changes. She exhibits pancytopenia (hematocrit 24%, WBC 2400/mm³, and platelets 78,000/mm³), which is a common and expected toxicity of cytotoxic chemotherapy. The timing (8 days after her first cycle) corresponds perfectly with the 'nadir,' the period (typically 7–14 days post-treatment) when blood cell counts reach their lowest point due to bone marrow suppression. Additionally, her black stools are explained by her use of ferrous gluconate (iron supplementation); the fact that the stool test for occult blood is negative confirms that the discoloration is not due to gastrointestinal bleeding (Option C). Her dark urine is likely a result of high concentration (specific gravity 1.032) rather than hematuria or bilirubinuria, as both RBCs and bilirubin were negative on urinalysis. Bone marrow metastases (Option B) can cause pancytopenia in Hodgkin lymphoma, but the acute onset exactly at the expected chemotherapy nadir makes medication effect the most likely cause. Hemodilution (Option D) would not cause a significant drop in WBCs or platelets and is contradicted by the high urine specific gravity. Hemolytic anemia (Option E) would not explain the leukopenia or thrombocytopenia.

Question 33.1

A male neonate, who was born at 36 weeks' gestation 2 hours ago in the labor and delivery unit of the hospital, now shows signs of respiratory difficulty. The mother, an 18-year-old primigravid woman, smoked one pack of cigarettes daily throughout her pregnancy. She received prenatal care during most of the pregnancy. One episode of chlamydial cervicitis was detected during the last trimester and treated with azithromycin. The neonate was born via cesarean delivery due to fetal heart rate decelerations. The amniotic fluid was stained with light particulate meconium. Apgar scores were 9 and 9 at 1 and 5 minutes, respectively. The patient is 50 cm (20 in; 50th percentile) long and weighs 3005 g (6 lb 10 oz; 50th percentile); head circumference is 35 cm (14 in; 50th percentile). The infant's vital signs now are temperature 36.6°C (97.8°F), pulse 150/min, and respirations 70/min. Pulse oximetry on room air shows an oxygen saturation of 95%. Physical examination discloses mild subcostal and intercostal retractions. Chest x-ray shows prominent pulmonary vascular markings and fluid in the intralobar fissures. Which of the following diagnoses is most likely and explain your rationale on each choice?

- (A) Chlamydial pneumonia
- (B) Group B streptococcal sepsis
- (C) Meconium aspiration syndrome
- (D) Respiratory distress syndrome
- (E) Transient tachypnea of newborn

Correct Answer:



(E) Transient tachypnea of newborn

Neural Consult Response and Explanation:

Answer: E

Explanation: The clinical presentation and radiographic findings are most consistent with Transient Tachypnea of the Newborn (TTN). TTN is caused by delayed clearance of fetal lung fluid and is most common in late preterm infants (34-37 weeks) and those born via cesarean delivery, as the lack of labor-induced hormonal changes and the mechanical 'squeeze' of the birth canal results in retained pulmonary fluid. This neonate was born at 36 weeks via C-section, fitting the classic profile. The chest X-ray findings of 'prominent pulmonary vascular markings' (perihilar streaking) and 'fluid in the intralobar fissures' are pathognomonic for TTN. (A) Chlamydial pneumonia typically presents between 4 and 12 weeks of age with a staccato cough and was likely prevented by the mother's azithromycin treatment. (B) Group B streptococcal sepsis usually presents with more severe systemic symptoms and a chest X-ray showing diffuse infiltrates similar to RDS. (C) Meconium aspiration syndrome (MAS) is less likely because, although light meconium was present, the classic X-ray for MAS shows coarse, patchy infiltrates and hyperinflation, not fluid in the fissures. (D) Respiratory distress syndrome (RDS) is primarily seen in more premature infants (typically <34 weeks) and presents on X-ray with diffuse 'ground-glass' opacities and air bronchograms, which are absent here.

Question 35.1

A 26-year-old woman comes to the office 1 day after she passed bloody mucus with her stool. She noticed mild abdominal cramping and some constipation preceding the episode; she has not had diarrhea or melanotic stools. She has not had any exposure to unusual or poorly kept food or to any known infectious agents. She says she has been under considerable stress because she is anticipating the defense phase of her PhD thesis soon. Her only medication is acetaminophen for occasional headaches. Her father had colon cancer and died at age 48 years from metastatic disease. She recalls being told that an aunt died of an unknown abdominal tumor. The patient's temperature is 37.6°C (99.6°F), pulse is 90/min, respirations are 18/min, and blood pressure is 110/74 mm Hg. Abdomen is mildly distended, nontympanitic, and tender to palpation only in the right lower quadrant. There is no rebound tenderness or guarding. Pelvic examination shows no masses or mucosal lesions. Rectal examination elicits pain and bloody mucus. Which of the following is the most appropriate diagnostic study?

- (A) Colonoscopy
- (B) Esophagogastroduodenoscopy
- (C) Lower gastrointestinal barium study
- (D) Ultrasonography of the appendix
- (E) Upper gastrointestinal barium study with small-bowel follow-through

Correct Answer:

- (A) Colonoscopy



Neural Consult Response and Explanation:

Answer: A

Explanation: The patient is a 26-year-old woman presenting with hematochezia (bloody mucus), right lower quadrant (RLQ) tenderness, and a significant family history of early-onset colorectal cancer (father died at 48, aunt died of an abdominal tumor). These findings are highly suggestive of a hereditary colorectal cancer syndrome, such as Lynch syndrome (Hereditary Non-Polyposis Colorectal Cancer, or HNPCC), which often presents with right-sided colonic lesions. Colonoscopy is the most appropriate diagnostic study because it allows for direct visualization of the entire colon, identification of the bleeding source, and the ability to perform biopsies of any suspicious masses or inflammatory lesions (such as those found in Inflammatory Bowel Disease, another differential diagnosis). While the RLQ pain might suggest appendicitis, the presence of bloody mucus and the strong family history of malignancy make a colonic process much more likely. Esophagogastroduodenoscopy (B) and upper GI studies (E) are inappropriate as the symptoms point to a lower GI source (hematochezia, not melena). Barium enemas (C) have largely been replaced by colonoscopy as the latter is more sensitive and allows for tissue sampling. Ultrasonography of the appendix (D) is less likely to be the primary diagnostic tool given the clinical presentation of rectal bleeding and the high risk for malignancy.

Question 36.1

A 15-year-old girl is brought to the office by her parents because of a 2-month history of progressively worsening gait disturbance. She has fallen several times, once striking her head and causing a brief loss of consciousness. Her parents state that she has had behavioral changes during this time. Medical history is remarkable for asthma treated with a corticosteroid inhaler as needed. Family history is remarkable for multiple sclerosis in a maternal aunt, parkinsonism in her paternal grandfather, and cancer in several paternal relatives, including a grandmother who died from a hemangioblastoma. Vital signs are normal. The patient is awake and alert, but she avoids eye contact and will not answer questions. Auscultation of the lungs discloses expiratory wheezing. Cardiac and abdominal examinations disclose no abnormalities. She has mild bilateral papilledema. Her stance and gait are wide-based, and she is unable to perform a tandem walk. Toxicology screening of the urine is positive for marijuana and cocaine metabolites. Which of the following is the most likely initial working diagnosis?

- (A) Cerebellar tumor
- (B) Drug-related ataxia
- (C) Epidural hematoma
- (D) Juvenile-onset parkinsonism
- (E) Multiple sclerosis

Correct Answer:

- (A) Cerebellar tumor



Neural Consult Response and Explanation:

Answer: A

Explanation: The patient's presentation of a 2-month history of progressively worsening gait disturbance, wide-based stance, and inability to perform a tandem walk indicates cerebellar ataxia. The presence of bilateral papilledema is a critical finding that signifies increased intracranial pressure (ICP), likely due to obstructive hydrocephalus from a mass in the posterior fossa. In an adolescent with these symptoms, a cerebellar tumor is the most likely diagnosis. This is strongly reinforced by the family history of a paternal grandmother who died from a hemangioblastoma, which is highly suggestive of Von Hippel-Lindau (VHL) disease. VHL is an autosomal dominant condition that frequently presents with cerebellar hemangioblastomas. While the urine toxicology is positive for marijuana and cocaine, drug use does not cause papilledema or a progressive 2-month neurological decline. Epidural hematoma (Option C) is an acute traumatic injury and does not explain a 2-month progressive course; the patient's fall was likely a consequence of her ataxia rather than the primary cause. Multiple sclerosis (Option E) and juvenile-onset parkinsonism (Option D) are inconsistent with the finding of papilledema and the specific family history of hemangioblastoma.

Question 37.1

A 70-year-old man is brought to the emergency department by his son because of a 2-day history of right upper quadrant abdominal pain, chills, and confusion. He has vomited twice during this time despite decreased food intake. The patient has hypertension controlled with hydrochlorothiazide. Medical and surgical history is otherwise unremarkable. Vital signs are temperature 40.2°C (104.4°F), pulse 110/min, respirations 18/min, and blood pressure 100/60 mm Hg. The patient appears seriously ill without evidence of jaundice. Abdominal examination discloses tenderness to palpation over the liver without guarding. Results of laboratory studies are shown:

Serum: Amylase 350 U/L
Bilirubin total 2.1 mg/dL

Blood: WBC 16,500/mm³ with prominent immature forms Neutrophils, segmented 42% total Neutrophils, bands 25%

Serum urea nitrogen and creatinine concentrations are within the reference ranges, as are results of liver function tests. Ultrasonography of the abdomen shows multiple stones in the gallbladder and a common bile duct measuring 9 mm in diameter. Intravenous fluids and a broad-spectrum antibiotic are administered. Which of the following is the most likely diagnosis?

- (A) Acute cholecystitis
- (B) Acute pancreatitis
- (C) Cholangitis
- (D) Hepatitis
- (E) Liver abscess



Correct Answer:

(C) Cholangitis

Neural Consult Response and Explanation:

Answer: C

Explanation: The patient presents with the classic Reynolds' Pentad, which is diagnostic of severe acute cholangitis. Reynolds' Pentad consists of Charcot's Triad (fever, right upper quadrant pain, and jaundice) plus hypotension and altered mental status. In this case, the patient has a high fever (40.2°C), RUQ pain, biochemical evidence of jaundice (total bilirubin 2.1 mg/dL), hypotension (100/60 mm Hg), and confusion. While the physical exam did not detect visual jaundice, bilirubin levels above 2.0 mg/dL are clinically significant in the context of biliary disease, and visual jaundice often requires levels >2.5-3.0 mg/dL to be apparent. The ultrasound findings of gallbladder stones and a dilated common bile duct (9 mm) further support an obstructive process leading to infection. Acute cholecystitis (A) typically does not cause a dilated CBD, significant hyperbilirubinemia, or the full Reynolds' Pentad. Acute pancreatitis (B) is less likely as the amylase (350 U/L) is not elevated to the typical threshold (3x upper limit of normal), and it does not explain the full clinical picture as well as cholangitis. Hepatitis (D) is ruled out by the normal liver function tests (AST/ALT). Liver abscess (E) is unlikely as the ultrasound specifically identified biliary stones and ductal dilation but no focal hepatic lesions.

Question 38.1

A 70-year-old woman comes to the office because of worsening tremor of her hands. The tremor has been present for most of her life and initially was mild and would occur only when she was tired or stressed. During the past month the shaking has become more noticeable and frequent. She is now embarrassed to eat with other people because of how obvious the tremor has become. The patient has been taking fluoxetine for the past 3 weeks to help her to cope with the death of her husband 2 months ago. Medical history is also remarkable for essential hypertension controlled with lisinopril and hyperlipidemia controlled with atorvastatin. Her only other medication is occasional ibuprofen for joint pain. She used to drink one to two alcoholic beverages monthly but now drinks one glass of wine daily because, she says, it reduces her tremor. She is 168 cm (5 ft 6 in) tall and weighs 70 kg (155 lb); BMI is 25 kg/m². Vital signs are temperature 36.4°C (97.6°F), pulse 80/min, respirations 18/min, and blood pressure 130/85 mm Hg. Physical examination shows a moderate tremor of both hands that is not present at rest. Complete blood count, serum chemistry profile, and serum thyroid function tests are ordered and results are pending. Which of the following is the most likely cause of the patient's worsening tremor?

- (A) Adverse effect of fluoxetine therapy
- (B) Bereavement reaction
- (C) Early Parkinson disease
- (D) Increase in alcohol consumption
- (E) Mini-strokes

Correct Answer:



(A) Adverse effect of fluoxetine therapy

Neural Consult Response and Explanation:

Answer: A

Explanation: The patient's clinical presentation is consistent with a long-standing Essential Tremor (ET) that has acutely worsened. ET is characterized by a bilateral postural or kinetic tremor (present during action, absent at rest) that often improves with alcohol consumption, as seen in this patient. The most likely cause of her recent worsening is the initiation of fluoxetine three weeks ago. Selective serotonin reuptake inhibitors (SSRIs) like fluoxetine are well-documented to cause or exacerbate tremors as a side effect. The temporal relationship between starting the medication and the worsening of her symptoms strongly supports this diagnosis. Other options are less likely: (B) while stress from bereavement can exacerbate ET, the pharmacological effect of the SSRI is a more direct cause; (C) Parkinson disease typically presents with a resting tremor that is asymmetric at onset, whereas this patient has a symmetric action tremor; (D) alcohol consumption actually improves ET, and the patient is using it as a form of self-medication; (E) mini-strokes (TIAs) or strokes typically present with acute, focal neurological deficits rather than a progressive, symmetric tremor.

Question 39.1

A 70-year-old woman comes to the office because of a 1-month history of gradually worsening shortness of breath. Medical history is significant for hypertension and hyperlipidemia. Routine medications are atorvastatin and lisinopril. The patient appears to be in respiratory distress. Vital signs are temperature 36.7°C (98.0°F), pulse 122/min and irregularly irregular, respirations 28/min, and blood pressure 144/88 mm Hg. Pulse oximetry on room air shows an oxygen saturation of 90%. Pulmonary examination discloses dullness to percussion three-quarters of the way up on the left. Results of laboratory studies are shown: Serum Blood Urea nitrogen 29 mg/dL Hematocrit 38% Creatinine 1.0 mg/dL Hemoglobin 12.9 g/dL Na⁺ 142 mEq/L WBC 7800/mm³ K⁺ 4.1 mEq/L Cl⁻ 99 mEq/L HCO₃⁻ 24 mEq/L Glucose 102 mg/dL ECG shows atrial fibrillation with a rapid ventricular response. Chest x-ray shows a large left pleural effusion. Which of the following is the most appropriate next step in evaluation?

- (A) Bone marrow biopsy
- (B) Pericardiocentesis
- (C) Pleurodesis
- (D) Thoracentesis
- (E) Video-assisted thoracoscopy

Correct Answer:

- (D) Thoracentesis



Neural Consult Response and Explanation:

Answer: D

Explanation: The patient presents with a large, unilateral (left-sided) pleural effusion and respiratory distress (tachypnea, hypoxia, and significant dullness to percussion). The most appropriate next step in the evaluation and management of a new, large, or unexplained pleural effusion is a thoracentesis. This procedure serves two primary purposes: diagnostic and therapeutic. Diagnostically, it allows for the analysis of pleural fluid to distinguish between a transudate (common in heart failure or cirrhosis) and an exudate (common in malignancy, infection, or pulmonary embolism) using Light's criteria. Although the patient has atrial fibrillation with a rapid ventricular response, which could suggest congestive heart failure, the effusion is notably unilateral and large, which is atypical for simple heart failure and warrants further investigation. Therapeutically, removing the fluid will help alleviate the patient's respiratory distress and improve oxygenation. Other options like bone marrow biopsy (A) or pericardiocentesis (B) are not indicated by the clinical presentation. Pleurodesis (C) is a treatment for recurrent effusions, not an initial diagnostic step. Video-assisted thoracoscopy (E) is a more invasive surgical procedure typically reserved for cases where thoracentesis and cytology fail to provide a diagnosis.

Question 40.1

A 67-year-old man, who has been recovering in the hospital following surgical repair of a contained ruptured abdominal aortic aneurysm 10 days ago, suddenly develops severe abdominal pain. He does not have chest pain or shortness of breath. The patient's postoperative course had been uncomplicated until 4 days ago, when he developed a low-grade fever. He has been unable to tolerate a full liquid diet during the past 4 days. Medical history is remarkable for hypertension, hypercholesterolemia, and a myocardial infarction 6 years ago. Regular medications include metoprolol, lovastatin, and an 81-mg aspirin daily. He has smoked one pack of cigarettes daily for the past 40 years, and he typically drinks three to five beers daily. Vital signs now are temperature 38.1°C (100.6°F), pulse 68/min and regular, respirations 16/min, and blood pressure 150/90 mm Hg. Physical examination shows bilateral cataracts. Auscultation of the chest discloses diffuse mild wheezes and a grade 1/6 soft systolic ejection murmur at the cardiac apex. Palpation of the abdomen discloses mild to moderate mid and right upper quadrant abdominal tenderness. There is no guarding, rebound, or palpable mass. Rectal examination shows no abnormalities. Peripheral pulses are normal. Neurologic examination discloses no abnormalities. Serum electrolyte concentrations are within the reference ranges. Leukocyte count is 15,800/mm³ with mild left shift. Urinalysis shows no abnormalities. ECG shows an old inferior myocardial infarction. Chest x-ray shows scarring at the left and right cardiac bases; no masses or infiltrates are present. Which of the following is the most appropriate additional diagnostic study?

- (A) Arteriography of the abdomen
- (B) Blood cultures
- (C) MRI of the abdomen
- (D) Ultrasonography of the abdomen
- (E) No additional studies are needed



Correct Answer:

(D) Ultrasonography of the abdomen

Neural Consult Response and Explanation:

Answer: D

Explanation: The clinical presentation of this 67-year-old man is highly suggestive of acute acalculous cholecystitis. Key features supporting this diagnosis include: 1) Recent major surgery (abdominal aortic aneurysm repair 10 days ago), 2) Prolonged fasting or NPO status (unable to tolerate a diet for 4 days), 3) Fever and leukocytosis with a left shift, and 4) Localized tenderness in the right upper quadrant (RUQ) and mid-abdomen. Acalculous cholecystitis is a well-recognized complication in critically ill or post-operative patients, often caused by gallbladder stasis and ischemia. While acute mesenteric ischemia (AMI) is a concern in patients with extensive vascular disease, it typically presents with diffuse, periumbilical pain rather than localized RUQ tenderness. Furthermore, the 4-day history of being NPO and low-grade fever strongly points toward a gallbladder etiology. Ultrasonography of the abdomen is the most appropriate initial diagnostic study for suspected acalculous cholecystitis, as it can identify gallbladder wall thickening, pericholecystic fluid, and the absence of gallstones. Arteriography (A) would be used to diagnose mesenteric ischemia but is more invasive and less likely to be the correct initial step given the localized RUQ findings. MRI (C) is not a first-line study for acute abdominal emergencies, and blood cultures (B) do not identify the anatomical source of the infection.

Question 42.1

A 31-year-old woman, gravida 3, para 2, who is at 32 weeks' gestation, is admitted to the hospital because of a 1-week history of progressive dyspnea and wheezing. She says her heart is "racing" and she is coughing up a small amount of blood-streaked sputum. Medical history is significant for hypothyroidism, for which she takes levothyroxine. An intravenous catheter is placed. Vital signs are temperature 36.9°C (98.4°F), pulse 132/min, respirations 32/min, and blood pressure 135/78 mm Hg. Pulse oximetry on 100% oxygen via nasal cannula shows an oxygen saturation of 92%. Auscultation of the lungs discloses decreased breath sounds at the bases with expiratory crackles bilaterally. Cardiac examination discloses an irregularly irregular rhythm, an indistinct point of maximal impulse, and a loud S₁. A grade 3/6, low-pitched, diastolic, rumbling murmur is audible at the apex; a distinct snapping sound precedes the murmur. Fetal heart rate is 144/min. Which of the following is the most likely cause of the findings in this patient?

- (A) Atrial septal defect with development of pulmonary hypertension
- (B) Chronic mitral regurgitation secondary to rheumatic heart disease
- (C) Coarctation of the aorta
- (D) Congenital aortic stenosis
- (E) Mitral stenosis complicated by atrial fibrillation

Correct Answer:

(E) Mitral stenosis complicated by atrial fibrillation



Neural Consult Response and Explanation:

Answer: E

Explanation: The patient's clinical presentation is classic for mitral stenosis (MS) exacerbated by the physiological changes of pregnancy and the development of atrial fibrillation. The cardiac examination provides pathognomonic findings for MS: a loud S_1 (caused by the forceful closure of the thickened mitral leaflets), a 'distinct snapping sound' (the opening snap, which occurs when the stenotic mitral valve reaches its maximum opening extent), and a low-pitched, diastolic, rumbling murmur heard best at the apex. The 'irregularly irregular rhythm' is the hallmark of atrial fibrillation, a common complication of MS due to left atrial enlargement and remodeling. Pregnancy significantly increases blood volume (by 30-50%) and heart rate. In MS, the narrowed valve orifice limits left ventricular filling; the increased heart rate further shortens diastolic filling time, leading to a dramatic rise in left atrial pressure. This pressure is transmitted backward into the pulmonary circulation, causing pulmonary congestion, expiratory crackles, and hemoptysis (from the rupture of bronchial veins). Option A (ASD) typically presents with a fixed split S_2 and a systolic murmur. Option B (Mitral Regurgitation) presents with a holosystolic murmur. Options C and D (Coarctation and Aortic Stenosis) involve the aorta/aortic valve and would present with systolic findings and different clinical signs.

Question 43.1

A 70-year-old man is admitted to the hospital through the emergency department because of a 12-hour history of severe nausea and four episodes of vomiting of undigested food. During the past week, he has had worsening nausea, heartburn following meals, and early satiety. Medical history is significant for type 2 diabetes mellitus diagnosed 20 years ago, hyperlipidemia, and hypertension. Medications are intermediate-acting insulin twice daily and insulin lispro before meals. He also takes enalapril and atorvastatin. On admission, the patient appears uncomfortable. Vital signs are temperature 36.2°C

(97.1°F), pulse 102/min, respirations 16/min, and blood pressure 105/78 mm Hg. Pulse oximetry on room air shows an oxygen saturation of 98%. Physical examination discloses mild epigastric tenderness to palpation. The remainder of the examination discloses no abnormalities. Results of laboratory studies ordered in the emergency department are shown: Serum Blood ALT 23 U/L
AST 26 U/L

Alkaline phosphatase 85 U/L

Amylase 104 U/L

Urea nitrogen 42 mg/dL

Creatinine 1.32 mg/dL

Hemoglobin A_{1c} 8.2%

X-rays of the chest and abdomen disclose no abnormalities. Which of the following will best explain the patient's condition?

- (A) Accumulation of calcium carbonate and hemoglobin breakdown products in the bile ducts
- (B) Decreased gastric myoelectrical activity
- (C) Decreased gastric pH
- (D) Increased cholecystokinin activity



Correct Answer:

(B) Decreased gastric myoelectrical activity

Neural Consult Response and Explanation:

Answer: B

Explanation: The patient's clinical presentation is highly suggestive of diabetic gastroparesis, a chronic complication of long-standing (20 years) and poorly controlled (HbA_{1c} 8.2%) type 2 diabetes mellitus. The classic symptoms include early satiety, nausea, and the vomiting of undigested food several hours after a meal. The absence of mechanical obstruction on abdominal X-rays and the presence of normal liver enzymes and amylase further support this diagnosis over other causes like gastric outlet obstruction, biliary disease, or pancreatitis. The pathophysiology of diabetic gastroparesis involves autonomic neuropathy (specifically damage to the vagus nerve) and, crucially, the loss of Interstitial Cells of Cajal (ICCs). ICCs serve as the electrical pacemakers of the gastrointestinal tract, generating the slow-wave myoelectrical activity that coordinates gastric smooth muscle contractions. A reduction in the number or function of these cells leads to decreased and disorganized gastric myoelectrical activity, resulting in impaired peristalsis and delayed gastric emptying. Option (A) describes pigment gallstones, which are inconsistent with the patient's normal liver function tests. Option (C) refers to gastric acidity, which is not the primary mechanism of gastroparesis. Option (D) mentions cholecystokinin (CCK), which normally inhibits gastric emptying, but the fundamental cause of diabetic gastroparesis is the intrinsic neuromuscular damage (decreased myoelectrical activity) rather than an overproduction of CCK.

Question 44.1

A 70-year-old woman comes to the office for an annual health maintenance examination. She describes a 1-year history of slowly progressive fatigue, diffuse muscle aches, and generalized pain. Medical history is significant for osteoporosis diagnosed 5 years ago. Medications include alendronate and calcium supplementation. Vital signs are normal. Physical examination is unremarkable for her age, with no point tenderness on palpation. Results of complete blood count, serum electrolyte and thyroid-stimulating hormone concentrations, liver function tests, and erythrocyte sedimentation rate are all within the reference ranges. Screening mammography and colonoscopy done 1 year ago disclosed no abnormalities. Which of the following is the most appropriate next step in evaluation?

- (A) DEXA scan
- (B) Electromyography and nerve conduction studies
- (C) MRI of the cervical spine
- (D) Serum antinuclear antibody assay
- (E) Serum 25-hydroxyvitamin D assay
- (F) No additional evaluation is indicated

Correct Answer:

(E) Serum 25-hydroxyvitamin D assay



Neural Consult Response and Explanation:

Answer: E

Explanation: The patient is a 70-year-old woman with a history of osteoporosis presenting with a one-year history of progressive fatigue, diffuse muscle aches, and generalized pain. Her physical examination is unremarkable, and initial laboratory investigations (CBC, ESR, TSH, LFTs, and electrolytes) are within normal limits. These results effectively rule out several common causes of her symptoms, such as anemia, thyroid dysfunction, liver disease, and systemic inflammatory conditions like polymyalgia rheumatica (which would typically present with an elevated ESR). In an elderly patient with osteoporosis and non-specific musculoskeletal pain, vitamin D deficiency is a highly likely diagnosis. Severe vitamin D deficiency can lead to osteomalacia, characterized by impaired bone mineralization, which presents clinically as diffuse bone pain, muscle weakness, and fatigue. Furthermore, vitamin D sufficiency is essential for the therapeutic efficacy of bisphosphonates like alendronate, which the patient is currently taking. While she is taking calcium supplements, there is no mention of vitamin D supplementation. Measuring the serum 25-hydroxyvitamin D level is the standard and most appropriate next step to evaluate for deficiency. Other options, such as ANA (D) or MRI (C), are less likely to yield a diagnosis given the lack of specific clinical findings for connective tissue disease or radiculopathy. A DEXA scan (A) is used for monitoring bone density but would not explain the patient's systemic symptoms of pain and fatigue.

Question 45.1

A 22-year-old man comes to the emergency department because of a 4-day history of cough productive of green sputum as well as fever, chills, and rigors. He also has had a 3-day history of progressive shortness of breath; he now has shortness of breath at rest. He was evaluated in an urgent care center 1 day ago and was prescribed azithromycin, but his symptoms have worsened. He is using accessory muscles of respiration. He is diaphoretic and is able to give only one- to two-word answers to questions. Vital signs are temperature 39.1°C (102.3°F), pulse 138/min, respirations 40/min, and blood pressure 103/56 mm Hg. Pulse oximetry on room air shows an oxygen saturation of 80%, and 100% oxygen is administered via nonrebreather face mask. Skin is mottled and there is cyanosis of the fingers and toes. Pupils measure 4 mm in diameter and are reactive to light. Mucous membranes are dry. Auscultation of the lungs discloses bilateral crackles. The remainder of the physical examination discloses no abnormalities. Laboratory studies are ordered; results of arterial blood gas analysis on 100% oxygen via nonrebreather face mask are shown:

PO_2 : 50 mm Hg

PCO_2 : 44 mm Hg

pH: 7.34 Oxygen saturation: 85%

Chest x-ray shows bilateral infiltrates with a normal cardiac silhouette and no effusions.

Which of the following is the most likely underlying cause of this patient's condition?

- (A) Abnormalities of diffusion of oxygen
- (B) Hypoventilation



- (C) Obstructive lung disease
- (D) Ventilation-perfusion mismatch and shunt

Correct Answer:

- (D) Ventilation-perfusion mismatch and shunt

Neural Consult Response and Explanation:

Answer: D

Explanation: The patient presents with severe community-acquired pneumonia likely progressing to Acute Respiratory Distress Syndrome (ARDS), characterized by bilateral infiltrates, severe respiratory distress, and profound hypoxemia. The most critical diagnostic clue is the arterial blood gas (ABG) result showing a PO_2 of only 50 mm Hg despite the administration of 100% supplemental oxygen via a nonrebreather mask. This phenomenon is known as refractory hypoxemia. Pathophysiologically, when alveoli are filled with inflammatory exudate (as in pneumonia) or proteinaceous fluid (as in ARDS), they become completely non-ventilated but remain perfused. This creates an intrapulmonary shunt (V/Q ratio of 0), where deoxygenated blood bypasses ventilated lung units and mixes with oxygenated blood, failing to respond significantly to increased FiO_2 . While simple V/Q mismatch (where V/Q is low but not zero) also contributes to hypoxemia in lung disease, it typically improves with supplemental oxygen. Hypoventilation (Option B) is excluded because the PCO_2 is not significantly elevated (though 44 mm Hg is inappropriately 'normal' for a respiratory rate of 40/min, indicating impending failure, it does not explain the refractory PO_2). Diffusion abnormalities (Option A) and obstructive disease (Option C) also typically show improvement in oxygenation with high-flow supplemental oxygen and do not match the clinical severity or the radiographic findings of bilateral infiltrates.

Question 46.1

A 33-year-old male physician reports for a shift in the emergency department. A nurse alerts you that he noticed a faint odor of alcohol near the physician. When approached, the physician appears tired and more disheveled than usual. There is an odor of alcohol on his breath. He is a skilled and talented physician with no known history of substance or alcohol use disorder. He is married with three children, and his wife is pregnant with twins. The physician was recently hired and has had no actions on his license by any state medical board. Which of the following is the most appropriate next step?

- (A) Ask the physician if he is sober, and if he says yes, allow him to complete his shift
- (B) Explain to the physician that you suspect he is intoxicated and ask him to submit to a blood sample to check his blood alcohol concentration
- (C) Relieve the physician of duty and alert the hospital's patient safety officer
- (D) Tell the physician that you can cover the remainder of the shift alone, so that he can sleep in his office



(E) Tell the physician you detect alcohol on his breath, and he needs to go home and should not return until he is sober

Correct Answer:

(C) Relieve the physician of duty and alert the hospital's patient safety officer

Neural Consult Response and Explanation:

Answer: C

Explanation: The primary responsibility of any healthcare professional when encountering a potentially impaired colleague is to ensure patient safety. In this scenario, the physician exhibits signs of acute alcohol intoxication (odor of alcohol, disheveled appearance) while on duty in the emergency department. The most appropriate immediate action is to remove the physician from clinical duties to prevent potential harm to patients. Following this, the incident must be reported to the appropriate institutional authority, such as the hospital's patient safety officer or the chief of staff. This ensures that the event is documented and that the physician can be referred to a Physician Health Program (PHP) for evaluation and support. Options A, D, and E are inappropriate because they either allow the physician to continue working or handle the situation informally without institutional oversight, which fails to address the professional and safety implications. Option B is incorrect because, while testing may be part of a subsequent investigation, the immediate priority is the cessation of patient care activities.

Question 47.1

A 60-year-old man comes to the office because of a 1-year history of progressive left groin pain. The pain is worse with exercise and is relieved with rest. He says the pain is beginning to affect his ability to carry out his daily activities. He says, "It even hurts when I'm turning over in bed." He does not recall any trauma to the area. He also has had generalized mild stiffness of his joints during the past 3 years. He takes atorvastatin for hyperlipidemia and lisinopril for hypertension. Medical history is otherwise unremarkable. He does not smoke cigarettes. He drinks one alcoholic cocktail daily. He is 178 cm (5 ft 10 in) tall and weighs 68 kg (150 lb); BMI is 22 kg/m². Vital signs are temperature 37.4°C (99.3°F), pulse 82/min, respirations 18/min, and blood pressure 120/78 mm Hg. The patient walks with a slight limp and has difficulty changing position. Abduction of the left hip elicits pain. Physical examination of the patient's other joints discloses no abnormalities. Which of the following is the most appropriate imaging study at this time?

- (A) CT scan of the hips
- (B) MRI of the hips
- (C) Radionuclide bone scan
- (D) Plain x-ray of the left hip
- (E) Skeletal survey

Correct Answer:



(D) Plain x-ray of the left hip

Neural Consult Response and Explanation:

Answer: D

Explanation: The patient is a 60-year-old man presenting with a 1-year history of progressive left groin pain that is exacerbated by activity and relieved by rest, with recent progression to pain at rest (turning over in bed). This clinical presentation is highly suggestive of hip osteoarthritis (OA), which is the most common cause of hip pain in patients over age 50. While the patient has some risk factors for avascular necrosis (AVN) of the femoral head (moderate alcohol use and hyperlipidemia), OA remains statistically more likely. In the evaluation of chronic hip pain, the most appropriate initial imaging study is plain radiography (X-ray) of the affected joint. Plain X-rays are highly effective at identifying the hallmark features of OA, such as joint space narrowing, osteophytes, subchondral sclerosis, and subchondral cysts. Furthermore, while MRI is the 'gold standard' for detecting early (pre-collapse) AVN, plain X-rays are still the recommended first step in the diagnostic algorithm for AVN as well, as they can identify more advanced stages (Stage II and beyond) and are significantly more cost-effective. If plain X-rays are negative or inconclusive and clinical suspicion for AVN, a labral tear, or an occult fracture remains high, then an MRI would be the appropriate next step. At this time, however, the most appropriate and standard-of-care initial study is a plain X-ray. CT scans (A) are less sensitive than MRI for early AVN and are not first-line for OA. Radionuclide bone scans (C) are sensitive but lack the specificity of MRI or the diagnostic utility of X-rays for OA. A skeletal survey (E) is used for systemic bone diseases like multiple myeloma and is not indicated for localized hip pain.

Question 48.1

A 2-stage screening program for ovarian cancer is being designed. Which of the following sets of sensitivity and specificity is most likely preferred for Stage 1 and Stage 2 of the program?

- (A) Stage 1: High Sensitivity, Low Specificity; Stage 2: High Sensitivity, Low Specificity
- (B) Stage 1: High Sensitivity, Low Specificity; Stage 2: Low Sensitivity, High Specificity
- (C) Stage 1: Low Sensitivity, High Specificity; Stage 2: High Sensitivity, Low Specificity
- (D) Stage 1: Low Sensitivity, High Specificity; Stage 2: Low Sensitivity, Low Specificity

Correct Answer:

(B) Stage 1: High Sensitivity, Low Specificity; Stage 2: Low Sensitivity, High Specificity

Neural Consult Response and Explanation:



Answer: B

Explanation: A 2-stage screening program is designed to optimize the identification of a disease while minimizing the risks and costs associated with false results. Stage 1 is the initial screening phase, which aims to identify as many individuals with the disease as possible from the general population. To ensure that very few cases are missed (minimizing false negatives), Stage 1 must have high sensitivity. Because there is often an inverse relationship between sensitivity and specificity, a highly sensitive test frequently has lower specificity, leading to a higher number of false positives. Stage 2 is the confirmatory phase, applied only to those who tested positive in Stage 1. The goal of Stage 2 is to rule out those false positives (minimizing false positives) before proceeding to invasive or expensive treatments. Therefore, Stage 2 must have high specificity. While it would be ideal for both tests to have high sensitivity and high specificity, in a practical 2-stage model, the priority shifts from sensitivity in the first stage to specificity in the second stage. Option (B) is the only choice that reflects this standard medical screening paradigm: High Sensitivity/Low Specificity followed by Low Sensitivity/High Specificity.

Question 49.1

A 35-year-old woman comes to the office for follow-up of chronic pelvic pain. The patient has had deep pelvic pain since undergoing total abdominal hysterectomy and radiation therapy for treatment of cervical cancer 5 years ago. She reports constant, severe aching pain; she rates the pain at its maximum as a 10 on a 10-point scale. The pain worsens during intercourse. All subsequent cancer follow-up has been negative. Medical history otherwise is unremarkable. The patient has taken oxycodone for her pain for 3 years, but she now reports that the oxycodone only partially relieves her pain. She requests either an increased dose of oxycodone or a change in her prescription to controlled-release morphine, which was recently given to her by a friend. She has smoked one pack of cigarettes daily for the past 15 years. She does not drink alcoholic beverages. BMI is 18 kg/m^2 . She appears lethargic. She is oriented to person, place, and time but speaks slowly with slurred speech. Vital signs are normal. Examination of the skin shows no abnormalities. Pupils are pinpoint and react sluggishly. Which of the following is the most appropriate next step in management?

- (A) Inform the patient that she must find a new physician
- (B) Maintain the dose of oxycodone and add naproxen
- (C) Order a urine toxicology screening
- (D) Report the patient's unauthorized drug use to the police
- (E) Switch oxycodone to sustained-release morphine

Correct Answer:

- (C) Order a urine toxicology screening

Neural Consult Response and Explanation:



Answer: C

Explanation: The patient presents with classic clinical signs of opioid intoxication, including lethargy, slurred speech, and pinpoint (miotic) pupils. Furthermore, she has admitted to taking controlled-release morphine that was not prescribed to her (obtained from a friend), which is a significant red flag for opioid misuse or Opioid Use Disorder (OUD). In the context of chronic pain management, when a patient demonstrates signs of intoxication, aberrant drug-related behavior, or requests dose escalations while appearing over-sedated, the most appropriate next step is to obtain objective data. A urine toxicology screening (UTS) is the standard clinical tool to confirm the presence of prescribed medications and detect the use of non-prescribed or illicit substances. This information is vital for the physician to safely manage the patient's care, address the potential overdose risk, and determine the future of her pain management or the need for addiction treatment. Option A is considered patient abandonment and is inappropriate. Option B and E are dangerous as they ignore the current signs of intoxication and could lead to fatal respiratory depression. Option D violates patient-physician confidentiality and is not the standard medical response to substance misuse.

Question 50.1

A 35-year-old woman comes to the office for follow-up of chronic pelvic pain. The patient has had deep pelvic pain since undergoing total abdominal hysterectomy and radiation therapy for treatment of cervical cancer 5 years ago. She reports constant, severe aching pain; she rates the pain at its maximum as a 10 on a 10-point scale. The pain worsens during intercourse. All subsequent cancer follow-up has been negative. Medical history otherwise is unremarkable. The patient has taken oxycodone for her pain for 3 years, but she now reports that the oxycodone only partially relieves her pain. She requests either an increased dose of oxycodone or a change in her prescription to controlled-release morphine, which was recently given to her by a friend. She has smoked one pack of cigarettes daily for the past 15 years. She does not drink alcoholic beverages. BMI is 18 kg/m². She appears lethargic. She is oriented to person, place, and time but speaks slowly with slurred speech. Vital signs are normal. Examination of the skin shows no abnormalities. Pupils are pinpoint and react sluggishly. Urine toxicology screening is positive for diazepam, methadone, and oxycodone. The patient returns to the office 1 week later to discuss these results. Which of the following is the most appropriate opening remark?

- (A) "I am concerned that you are abusing pain medicine. I would like for you to consider a substance use disorder treatment program."
- (B) "I cannot be your physician any longer because of your drug use disorder. I'm going to give you 30 days to find a new physician."
- (C) "I would like to know where you have been getting the methadone and diazepam that you are taking."
- (D) "The test showed that you take other drugs that I have not prescribed to you. I must report this to the police."



Correct Answer:

(A) "I am concerned that you are abusing pain medicine. I would like for you to consider a substance use disorder treatment program."

Neural Consult Response and Explanation:

Answer: A

Explanation: The patient presents with clear clinical signs of opioid intoxication (lethargy, slurred speech, pinpoint pupils) and objective evidence of a substance use disorder (requesting unprescribed morphine from a friend, positive toxicology for unprescribed methadone and diazepam). The combination of opioids and benzodiazepines (diazepam) is particularly dangerous due to synergistic respiratory depression. In this clinical scenario, the physician's primary responsibility is to address the patient's safety and the underlying substance use disorder in a non-judgmental, therapeutic manner. Option (A) is the most appropriate opening remark because it uses 'I' statements to express medical concern based on objective findings and immediately offers a constructive, evidence-based path for management (a treatment program). Option (B) is incorrect as it constitutes patient abandonment and fails to address the medical emergency of the patient's addiction. Option (C) is confrontational and accusatory as an opening remark, which is likely to destroy the therapeutic alliance and cause the patient to become defensive. Option (D) is incorrect because physicians are generally prohibited by patient confidentiality (HIPAA) from reporting personal drug use to the police, and doing so would be punitive rather than therapeutic.

Question 51.1

A 24-year-old woman, gravida 1, para 1, comes to the office because she and her husband have been trying to conceive for the past year without success. She gave birth to her first child at age 18 years by cesarean delivery following fetal distress. She then developed postpartum endometritis that resolved with intravenous antibiotic therapy. She used an intrauterine device (IUD) for 1 year following her first pregnancy but had the device removed because of intermenstrual bleeding. Medical history is also remarkable for chlamydial cervicitis treated with antibiotic therapy as an outpatient at age 21 years, and recurrent bacterial vaginosis that had been treated with metronidazole therapy during her pregnancy and on two other occasions. Vital signs today are within normal limits. Breast and pelvic examinations disclose no abnormalities. Hysterosalpingography shows bilateral hydrosalpinx. Which of the following factors in this patient's history most increased her risk for development of her condition?

- (A) Bacterial vaginosis
- (B) Cesarean delivery
- (C) Chlamydial cervicitis
- (D) Postpartum endometritis
- (E) Use of an IUD

Correct Answer:

(C) Chlamydial cervicitis



Neural Consult Response and Explanation:

Answer: C

Explanation: The patient presents with bilateral hydrosalpinx, which is a major cause of tubal factor infertility. Hydrosalpinx occurs when the distal end of the fallopian tube becomes occluded, leading to the accumulation of fluid and distension of the tube. The most common cause of this pathology is Pelvic Inflammatory Disease (PID), which results from an ascending infection of the upper female genital tract. Among the options provided, Chlamydial cervicitis (C) is the most significant risk factor. Chlamydia trachomatis is a primary pathogen in PID and is notorious for causing 'silent' or subclinical salpingitis. This inflammation leads to the destruction of the tubal cilia and scarring of the endosalpinx, eventually resulting in distal tubal blockage and hydrosalpinx. While postpartum endometritis (D) is an infection of the upper genital tract, it is typically polymicrobial and less frequently results in the specific tubal damage leading to hydrosalpinx compared to Chlamydia. Bacterial vaginosis (A) and IUD use (E) are risk factors that may predispose a patient to PID but are not the direct causative agents of the tubal damage itself. Cesarean delivery (B) can cause pelvic adhesions, but these are generally extrinsic and do not typically cause the internal tubal occlusion and fluid accumulation characteristic of hydrosalpinx.

Question 52.1

Patient Information Age: 62 years Gender: M, self-identified Ethnicity: white, self-identified Site of Care: office

History Reason for Visit/Chief Concern: "My legs hurt when I walk, and it's getting worse." History of Present Illness: 3-month history of worsening leg pain, pain exacerbated by walking; peak intensity after 1 block, pain resolves completely with rest, pain rated 4/10 at worst Past Medical History: hypertension, mild angina, type 2 diabetes mellitus Medications: lisinopril, metoprolol, furosemide, glyburide, lovastatin Allergies: no known drug allergies Psychosocial History: has smoked one-half pack of cigarettes daily for 44 years

Physical Examination Temp 36.0°C (96.8°F) Pulse 72/min
Resp 14/min
BP 140/90 mmHg
O₂Sat - Height 164 cm (5 ft 5 in) Weight 90 kg (198 lb) BMI 33 kg/m²

Appearance: no acute distress HEENT: fundoscopic shows grade 2/4 arteriovenous nicking Neck: no jugular venous distention Pulmonary: clear to auscultation; mildly diminished lung sounds Cardiac: no bruits; distant heart sounds Abdominal: obese; no tenderness, guarding, masses, bruits, or hepatosplenomegaly Extremities: no joint erythema, edema, or warmth; no hair on toes; no femoral bruits; dorsalis pedis, radial, and femoral pulses intact Neurologic: sensation to vibration intact Question: Which of the following is the most appropriate diagnostic study?

- (A) Ankle brachial index
- (B) Arteriography
- (C) ECG



- (D) Echocardiography
- (E) MUGA scan

Correct Answer:

- (A) Ankle brachial index

Neural Consult Response and Explanation:

Answer: A

Explanation: The patient presents with classic symptoms of intermittent claudication, which is the hallmark of Peripheral Arterial Disease (PAD). His symptoms—leg pain exacerbated by walking a consistent distance (one block) and completely relieved by rest—are highly characteristic. Furthermore, he possesses multiple major risk factors for PAD, including a significant smoking history (22 pack-years), type 2 diabetes mellitus, hypertension, and known coronary artery disease (mild angina). Physical examination findings such as the loss of hair on the toes further support a diagnosis of chronic limb ischemia. The most appropriate initial diagnostic study for PAD is the Ankle-Brachial Index (ABI). The ABI is a non-invasive, cost-effective, and highly sensitive/specific tool that compares systolic blood pressure in the ankles to that in the arms; a value of ≤ 0.90 is diagnostic of PAD. While the patient's pulses were noted as 'intact' on examination, this does not rule out PAD, and objective testing with ABI is required for confirmation. Arteriography (B) is an invasive procedure reserved for patients requiring surgical or endovascular intervention, not for initial diagnosis. ECG (C), Echocardiography (D), and MUGA scan (E) are cardiac evaluations; while relevant to his history of angina, they do not address the primary concern of exertional leg pain.

Question 53.1

In determining the usefulness of a D-dimer assay in ruling out pulmonary embolism as a diagnosis in a 27-year-old woman with pleuritic chest pain and nonproductive cough, a recent study in the medical literature is reviewed. The study evaluates the use of D-dimer assay in 1500 patients (705 female and 795 male) ranging in age from 19 years to 57 years (mean age is 36 years), whose examining physicians had a low clinical suspicion that the patients had pulmonary embolism. All patients in the study underwent a D-dimer assay, followed by CT angiography of the chest to confirm or exclude the diagnosis of pulmonary embolism. Study results are shown: D-Dimer Positive and CT Angiography Positive: 88 D-Dimer Negative and CT Angiography Positive: 0 D-Dimer Positive and CT Angiography Negative: 312 D-Dimer Negative and CT Angiography Negative: 1100 Total CT Angiography Positive: 88 Total CT Angiography Negative: 1412 Total D-Dimer Positive: 400 Total D-Dimer Negative: 1100 Which of the following is the most appropriate conclusion about this data in regard to patients with low clinical suspicion for pulmonary embolism?

- (A) D-Dimer assay results should be used to determine the need for ordering CT angiography for patients suspected of having a pulmonary embolism



- (B) False-negative D-dimer assay results are common in patients with confirmed pulmonary embolism
- (C) False-positive D-dimer assay results are rarely encountered
- (D) A negative D-dimer assay has a high negative predictive value for excluding the diagnosis of pulmonary embolism
- (E) A positive D-Dimer assay has a high positive predictive value for diagnosing pulmonary embolism

Correct Answer:

(D) A negative D-dimer assay has a high negative predictive value for excluding the diagnosis of pulmonary embolism

Neural Consult Response and Explanation:

Answer: D

Explanation: To determine the most appropriate conclusion from the study data, we must calculate the relevant diagnostic statistics:

1. **Negative Predictive Value (NPV):** This is the probability that a patient does not have the disease given a negative test result. It is calculated as True Negatives (TN) divided by the total number of negative test results (TN + False Negatives [FN]).

- TN = 1100 (D-dimer negative and CT Angio negative)

- FN = 0 (D-dimer negative and CT Angio positive)

- NPV = $1100 / (1100 + 0) = 1.0$ or 100%.

This indicates that a negative D-dimer is extremely reliable for ruling out pulmonary embolism (PE) in this low-suspicion population.

2. **Positive Predictive Value (PPV):** This is the probability that a patient has the disease given a positive test result. It is calculated as True Positives (TP) divided by the total number of positive test results (TP + False Positives [FP]).

- TP = 88 (D-dimer positive and CT Angio positive)

- FP = 312 (D-dimer positive and CT Angio negative)

- PPV = $88 / (88 + 312) = 88 / 400 = 0.22$ or 22%.

This is a low PPV, meaning a positive test is not a strong indicator of disease.

3. **False Negatives and False Positives:** The data shows 0 false negatives, making option (B) incorrect. It shows 312 false positives out of 400 positive tests (78%), making option (C) incorrect.

Option (A) describes a clinical management strategy, but option (D) is the most direct and accurate statistical conclusion derived from the provided data. In patients with low clinical suspicion, the primary utility of the D-dimer assay is its high NPV, allowing clinicians to safely exclude PE without further imaging when the result is negative.

Question 54.1



A 45-year-old man is admitted to the hospital because of a 6-hour history of bilateral vision loss. He is otherwise asymptomatic. He has no history of serious illness and takes no medications. Vital signs are within normal limits. Physical examination findings are consistent with psychogenic blindness. A medical student on the patient's treatment team suggests to the attending physician that they administer a placebo 0.9% saline injection to the patient but tell the patient it is a new medication that will "confirm a diagnosis of blindness by temporarily recovering your vision." Which of the following best describes the appropriateness of the medical student's suggestion?

- (A) It is appropriate because it can prove that the patient is not blind
- (B) It is appropriate because the medical student's intent is to help the patient
- (C) It is inappropriate because it is invasive and could be painful
- (D) It is inappropriate because the physician would not be stating the truth
- (E) It is inappropriate without the approval of the hospital ethics committee

Correct Answer:

- (D) It is inappropriate because the physician would not be stating the truth

Neural Consult Response and Explanation:

Answer: D

Explanation: The medical student's suggestion is inappropriate because it involves a direct violation of the ethical principle of veracity (truth-telling). In modern medical practice, the physician-patient relationship is built on trust, honesty, and informed consent. Administering a placebo (0.9% saline) while explicitly misrepresenting it as a 'new medication' is a deceptive practice that undermines this trust. Furthermore, psychogenic blindness (now classified under Functional Neurological Symptom Disorder or Conversion Disorder) involves symptoms that are genuine and involuntary to the patient; they are not 'faking' or malingering. Attempting to 'prove' the patient is not blind through deception is confrontational, counter-therapeutic, and fails to address the underlying psychological distress. While the student's intent may be to help (B), ethical standards dictate that the ends do not justify deceptive means. Option (C) is a minor concern compared to the ethical breach, and option (E) is incorrect because the action is fundamentally unethical regardless of committee approval.

Question 55.1

A 5-week-old infant is brought to the office by his mother for an initial well-child visit. He was born at 37 weeks' gestation via cesarean delivery because of chorioamnionitis. The infant had fetal distress that was documented by fetal monitoring during labor. The mother became jaundiced in the immediate postpartum period and was found to have hepatitis C (HCV) and HIV infection. She is unaware of her hepatitis B (HBV) status but knows that her son received the hepatitis B vaccination on the second day of life. The infant's weight today is 3912 g (8 lb 10 oz); physical examination shows no abnormalities. The mother wants to know what chance her child has of having contracted HIV or HCV infection from her. The risk for vertical transmission of HIV is approximately 20%. The mother is advised and appropriate management is planned for the infant regarding HIV. To determine the risk of HCV transmission, a recently published



study of risk factors for perinatal transmission of HCV in 155 mothers coinfecting with HIV and HCV is reviewed. Results of the study are shown:

Association of Gestational and Infant Factors With Mother-to-Infant HCV Transmission 155 Mothers with HIV and HCV Infection
Factor: Gestational Age <37 weeks - HCV Transmission 8.4%, RR 1.0, 95% CI - Factor: Gestational Age ≥37 weeks - HCV Transmission 8.3%, RR 0.99, 95% CI 0.32 to 3.06, p Value 0.99
Factor: No Cesarean Delivery - HCV Transmission 6.0%, RR 1.0, 95% CI - Factor: With Cesarean Delivery - HCV Transmission 13.3%, RR 2.21, 95% CI 0.69 to 7.06, p Value 0.24
Factor: No Chorioamnionitis - HCV Transmission 7.0%, RR 1.0, 95% CI - Factor: With Chorioamnionitis - HCV Transmission 33.3%, RR 4.77, 95% CI 0.86 to 26.3, p Value 0.21
Factor: Did not use Fetal Electrode - HCV Transmission 7.0%, RR 1.0, 95% CI — Factor: Used of Fetal Electrode - HCV Transmission 3.3%, RR 0.66, 95% CI 0.09 to 4.89, p Value 0.99
Factor: Infant Not HIV-infected - HCV Transmission 5.4%, RR 1.0 95% CI — Factor: Infant HIV-infected - HCV Transmission 17.1%, RR 3.19, 95% CI 1.14 to 8.93, p Value 0.04
RR=relative risk; CI=confidence interval

Based on these data, which of the following is the most appropriate conclusion regarding the five potential risk factors for transmission of HCV?

- (A) All factors appeared to have an effect on HCV transmission
- (B) Fetal electrode monitoring was protective against HCV
- (C) Infant HIV infection was the only significantly associated factor
- (D) Maternal chorioamnionitis was the most significantly associated factor
- (E) No factor was significantly associated

Correct Answer:

(C) Infant HIV infection was the only significantly associated factor

Neural Consult Response and Explanation:



Answer: C

Explanation: To determine which risk factor is significantly associated with mother-to-infant HCV transmission based on the provided study data, we must evaluate the statistical significance of each factor. Statistical significance is typically defined by a p-value of less than 0.05 and a 95% confidence interval (CI) for the relative risk (RR) that does not include the null value of 1.0.

Analyzing the factors provided:

1. Gestational Age ≥ 37 weeks: RR 0.99, 95% CI 0.32 to 3.06, $p=0.99$. The CI includes 1.0 and the p-value is >0.05 , so it is not significant.
2. Cesarean Delivery: RR 2.21, 95% CI 0.69 to 7.06, $p=0.24$. The CI includes 1.0 and the p-value is >0.05 , so it is not significant.
3. Chorioamnionitis: RR 4.77, 95% CI 0.86 to 26.3, $p=0.21$. Although the RR is high, the CI includes 1.0 and the p-value is >0.05 , so it is not significant.
4. Fetal Electrode: RR 0.66, 95% CI 0.09 to 4.89, $p=0.99$. The CI includes 1.0 and the p-value is >0.05 , so it is not significant.
5. Infant HIV-infected: RR 3.19, 95% CI 1.14 to 8.93, $p=0.04$. The CI (1.14 to 8.93) does not include 1.0 and the p-value is less than 0.05.

Based on this analysis, infant HIV infection is the only factor that is statistically significantly associated with HCV transmission in this study. Therefore, option (C) is the correct conclusion. Option (D) is incorrect because 'most significantly associated' refers to statistical significance (p-value), not the magnitude of the relative risk (RR), and chorioamnionitis failed to reach statistical significance.

Question 56.1

A 45-year-old man comes to the community health center because of a 1-week history of fever, chills, sweating, mild shortness of breath, and nonproductive cough. Medical history is remarkable for AIDS and pneumonia 3 years ago that required hospitalization. Today, he says that he lost his job 6 months ago and cannot afford to buy his antiretroviral medications. Vital signs are temperature 38.6°C (101.5°F), pulse 82/min, respirations 20/min, and blood pressure 116/72 mmHg. Pulse oximetry on room air shows an oxygen saturation of 97%. The health center is very busy with several patients waiting to be evaluated. Which of the following is the most appropriate next step?

- (A) Arrange a direct admission to the hospital for this patient
- (B) Continue with obtaining a thorough history and examining this patient
- (C) Place masks on the patient and yourself and then continue to evaluate him
- (D) Send this patient for chest x-rays, and while they are being obtained examine the next patient

Correct Answer:

- (C) Place masks on the patient and yourself and then continue to evaluate him

Neural Consult Response and Explanation:



Answer: C

Explanation: The patient presents with symptoms (fever, cough, sweating) and a medical history (AIDS, non-adherence to antiretroviral therapy) that are highly suggestive of pulmonary tuberculosis (TB) or other opportunistic infections. In a patient with advanced HIV/AIDS, TB is a primary concern due to its high prevalence and airborne transmission. Given the setting of a busy community health center, the most appropriate next step is to implement infection control measures immediately to prevent the spread of potential airborne pathogens to healthcare workers and other patients. Placing a mask on the patient (source control) and the physician (personal protection) is the standard of care when TB is suspected. Option A is premature as the patient is currently hemodynamically stable and has normal oxygen saturation. Option B is necessary but should only be performed after infection control measures are in place. Option D ignores the immediate risk of transmission and delays the clinical evaluation of a potentially seriously ill patient.

Question 57.1

A 45-year-old man comes to the office for a follow-up examination 2 days after he was seen in the emergency department for a generalized tonic-clonic seizure. He was prescribed clordiazepoxide upon being discharged but did not fill the prescription. The patient says that this was his third seizure in the past 2 years; prior to that he had no history of seizures. Medical history is also remarkable for a 10-year history of daily ingestion of two six-packs of beer. He has not had any alcoholic beverages for the past 5 days. He takes no medications. The patient says that his seizures usually occur after he abstains from alcohol for a period of time. Vital signs are normal. Physical examination shows scattered spider angiomas on his chest and abdomen. Liver is enlarged, smooth, and nontender. CT scan of the head with contrast done in the emergency department 2 days ago showed no abnormalities. Which of the following is the most appropriate next step?

- (A) Lumbar puncture for examination of cerebrospinal fluid
- (B) MRI of the brain
- (C) Repeat CT scan of the head in 1 week
- (D) Sleep-deprived electroencephalography
- (E) No further evaluation is necessary

Correct Answer:

(E) No further evaluation is necessary

Neural Consult Response and Explanation:



Answer: E

Explanation: The patient's presentation is classic for alcohol withdrawal seizures. These seizures typically occur 6 to 48 hours after the last drink (though they can occur up to 72-96 hours later), are generalized tonic-clonic in nature, and occur in the context of chronic heavy alcohol use. This patient has a 10-year history of heavy drinking, and his seizures consistently occur during periods of abstinence, confirming they are provoked by withdrawal rather than being unprovoked (epilepsy). In a patient with a typical history of alcohol withdrawal seizures, a normal neurological examination, and a normal head CT scan (which rules out major structural abnormalities like hemorrhage, large tumors, or abscesses), no further diagnostic evaluation—such as an MRI, EEG, or lumbar puncture—is necessary. The CT scan with contrast already performed is particularly sensitive for detecting structural lesions like tumors. Therefore, the most appropriate next step is to manage his alcohol use disorder and provide supportive care, as no further neurological workup is indicated.

Question 58.1

A case-control study is conducted to assess risk factors predicting inpatient mortality among geriatric patients with community-acquired pneumonia. Results of the study include the odds ratios shown below, which were calculated from a multivariable logistic regression equation: Predictor Variables: Hypotension (systolic blood pressure ≤ 100 mm Hg) - Odds Ratio: 3.32, 95% CI (1.65 to 5.11) Hypoxemia ($PO_2 \leq 50$ mm Hg) - Odds Ratio: 2.43, 95% CI (1.55 to 3.32) Lung infiltrate present on chest x-ray at time of admission - Odds Ratio: 1.35, 95% CI (0.76 to 2.24)

When the other covariates are controlled, which of the following is the most appropriate conclusion regarding these data?

- (A) The risk for inpatient mortality is greater for patients with hypotension than for those without hypotension
- (B) The risk for inpatient mortality is increased more by hypoxemia than by hypotension
- (C) The risk for inpatient mortality is increased when there is a pulmonary infiltrate present on chest x-ray at the time of admission
- (D) The risk for inpatient mortality is significantly affected by all of these predictor variables

Correct Answer:

(A) The risk for inpatient mortality is greater for patients with hypotension than for those without hypotension

Neural Consult Response and Explanation:



Answer: A

Explanation: To determine the most appropriate conclusion from the study results, we must analyze the odds ratios (OR) and their corresponding 95% confidence intervals (CI). An OR greater than 1 indicates an increased risk of the outcome (inpatient mortality), but this association is only considered statistically significant if the 95% CI does not include the null value of 1.0.

1. Hypotension (OR 3.32, 95% CI 1.65 to 5.11): The OR is 3.32, and the CI does not include 1.0. This indicates a statistically significant increase in the risk of mortality for patients with hypotension compared to those without it.
2. Hypoxemia (OR 2.43, 95% CI 1.55 to 3.32): The OR is 2.43, and the CI does not include 1.0. This also indicates a statistically significant increase in mortality risk.
3. Lung infiltrate (OR 1.35, 95% CI 0.76 to 2.24): While the OR is 1.35, the CI includes 1.0 (0.76 to 2.24). This means the association is not statistically significant, and we cannot conclude that a lung infiltrate independently increases mortality risk based on these data.

Evaluating the options:

- (A) is correct because the data shows a statistically significant increased risk for patients with hypotension (OR 3.32, CI > 1).
- (B) is incorrect because the OR for hypotension (3.32) is higher than the OR for hypoxemia (2.43), meaning hypotension is associated with a greater increase in risk.
- (C) is incorrect because the CI for lung infiltrates includes 1.0, making the result statistically insignificant.
- (D) is incorrect because only hypotension and hypoxemia were statistically significant predictors; lung infiltrate was not.

Question 59.1

A 38-year-old man comes to the office because of a 2-month history of intermittent episodes of hot flushes, chest discomfort, and excessive sweating, with associated panic. The episodes have been increasing in frequency and now are occurring daily. The patient says there is no specific precipitating cause of the episodes, but he has noticed that the episodes occur most frequently in the afternoon. He does not have any new stressors in his life. Medical history is significant for hypertension and type 2 diabetes mellitus. Medications are lisinopril and metformin. Family history is significant for hyperparathyroidism in an aunt and the death of an uncle from medullary thyroid cancer. The patient's BMI is 33 kg/m². Vital signs are temperature 36.9°C (98.4°F), pulse 74/min, respirations 18/min, and blood pressure 138/92 mm Hg. Physical examination discloses no abnormalities. Results of serum laboratory studies are shown: Calcium 9.8 mg/dL

Urea nitrogen 15 mg/dL

Creatinine 1.0 mg/dL

Na⁺ 140 mEq/L

K⁺ 3.8 mEq/L

Cl⁻ 102 mEq/L

HCO₃⁻ 28 mEq/L

ECG shows no abnormalities. Which of the following is the most appropriate diagnostic study at this time?



- (A) Plasma renin activity
- (B) Serum aldosterone concentration
- (C) Serum free metanephrine concentration
- (D) Serum parathyroid hormone concentration
- (E) No study is indicated

Correct Answer:

- (C) Serum free metanephrine concentration

Neural Consult Response and Explanation:

Answer: C

Explanation: The patient's clinical presentation and family history are highly suggestive of a pheochromocytoma occurring in the context of Multiple Endocrine Neoplasia type 2A (MEN₂A). The patient exhibits the classic paroxysmal symptoms of pheochromocytoma: intermittent episodes of hot flushes, chest discomfort, excessive sweating, and panic. His family history is particularly revealing, as an uncle died of medullary thyroid cancer and an aunt has hyperparathyroidism. These three conditions—medullary thyroid cancer, hyperparathyroidism, and pheochromocytoma—constitute the classic triad of MEN₂A. Given the high clinical suspicion for pheochromocytoma, the most appropriate initial diagnostic step is the measurement of plasma free metanephrines or 24-hour urinary fractionated metanephrines. Plasma metanephrines have high sensitivity, making them an excellent screening tool, especially in high-risk patients with genetic predispositions. (A) and (B) are used to evaluate for primary aldosteronism, which typically presents with hypertension and hypokalemia but does not explain the paroxysmal symptoms. (D) Serum parathyroid hormone concentration would be used to evaluate for hyperparathyroidism; however, the patient's serum calcium is currently normal (9.8 mg/dL), and hyperparathyroidism would not account for his acute paroxysmal episodes. (E) is incorrect because the patient's symptoms and family history necessitate a diagnostic workup for a potentially life-threatening condition.

Question 60.1

A 19-year-old woman is referred to the office by her counselor for evaluation of possible depression. The counselor describes the patient as polite, conscientious, cooperative, open to therapy, and always present and on time for her weekly sessions. The patient's relationship with her high school boyfriend ended 6 months ago. She had dated him through high school, and he had "looked out for her as a friend" since the 6th grade. She says, "I feel helpless and don't know what to do without him." She admits that she often cannot make decisions, such as whether to go to college. She says, "I always mess things up." She is still sad and often tearful about her ex-boyfriend, but she has not had alterations in her sleep habits, appetite, weight, or energy level. She has not had any thoughts about death. Medical history is unremarkable and she takes no medications. BMI is 24 kg/m². Vital signs are normal and physical examination discloses no abnormalities. Which of the following is the most appropriate initial response to this patient's self-deprecating description?



- (A) "College is full of many great once-in-a-lifetime opportunities. You should go."
- (B) "Everyone makes mistakes. In your case, though, that doesn't mean you always mess things up."
- (C) "If you find yourself needing some guidance, call me."
- (D) "You're overreacting. You just need to give it a little more time."

Correct Answer:

- (B) "Everyone makes mistakes. In your case, though, that doesn't mean you always mess things up."

Neural Consult Response and Explanation:

Answer: B

Explanation: The patient is a 19-year-old woman presenting with symptoms of sadness and helplessness following the end of a long-term relationship. Her description of herself—"I always mess things up"—is a classic example of a cognitive distortion known as overgeneralization. In the context of patient-centered communication and therapeutic interviewing, the most appropriate response is one that validates the patient's feelings while gently challenging the absolute nature of her negative self-perception. Option (B) accomplishes this by normalizing the experience of making mistakes ('Everyone makes mistakes') and then providing a supportive reframe ('that doesn't mean you always mess things up'). This response is empathetic and helps build a therapeutic alliance. In contrast, Option (A) is overly prescriptive and ignores the patient's underlying emotional struggle with autonomy; Option (C) is too passive and fails to address the immediate self-deprecating comment; and Option (D) is dismissive and invalidating, which can damage the physician-patient relationship. The patient's lack of vegetative symptoms (sleep, appetite, weight, or energy changes) and absence of suicidal ideation suggest she is experiencing a normal grief reaction or adjustment disorder rather than major depressive disorder, making supportive communication the priority.

Question 61.1

A 35-year-old man comes to the office because of 1-week history of mid low back pain that radiates down his right leg. The pain began after the patient lifted a heavy box onto his truck. He rates his current pain as an 8 on a 10-point scale. He has been unable to find a comfortable position and has been sleeping in a recliner. Medical history is unremarkable and he takes no medications. He has smoked one pack of cigarettes daily for the past 25 years, and he drinks a six-pack of beer on Friday and Saturday nights. BMI is 27 kg/m². He appears uncomfortable and stands during the physical examination. Vital signs are normal. Straight-leg raise test is positive on the right, with loss of right ankle reflex. The remainder of the physical examination discloses no abnormalities. Which of the following is the most likely explanation for this patient's symptoms?

- (A) Displacement of the nucleus pulposus
- (B) Hypertrophy of the facet joints
- (C) Osteophyte formation
- (D) Spondylolisthesis
- (E) Thickening of ligamentum flavum



Correct Answer:

(A) Displacement of the nucleus pulposus

Neural Consult Response and Explanation:

Answer: A

Explanation: The patient's presentation is classic for acute lumbar radiculopathy, specifically involving the S₁ nerve root. The key features supporting this diagnosis include the acute onset of low back pain radiating down the leg (sciatica) immediately following a heavy lifting event, the patient's age (35, which is the peak demographic for disc herniation), a positive straight-leg raise test (indicating nerve root irritation), and the loss of the right ankle reflex (a specific finding for S₁ nerve root compression). The most common cause of acute radiculopathy in this setting is a herniated intervertebral disc, which occurs when the nucleus pulposus is displaced through a tear in the annulus fibrosus. Options B, C, and E (hypertrophy of facet joints, osteophyte formation, and thickening of the ligamentum flavum) are degenerative changes typically associated with spinal stenosis, which usually presents in older patients with insidious onset and neurogenic claudication (pain relieved by leaning forward). Option D (spondylolisthesis) involves the displacement of one vertebra over another; while it can cause radiculopathy, it is less likely to present acutely after a single lifting incident in a young patient without prior symptoms.

Question 62.1

A 71-year-old woman is brought to the emergency department by her daughter for evaluation of her mental status. The daughter says, "I visited mom today for the first time in 6 months; her memory has worsened, her bills are unpaid, and her house is unusually messy." The patient says, "I'm perfectly healthy." Medical history is significant for hypertension diagnosed more than 25 years ago, and two small strokes occurring 3 years and 7 months ago. The daughter gives you three empty medicine bottles from her mother's home: metoprolol, hydrochlorothiazide, and aspirin. The patient is 165 cm (5 ft 5 in) tall and weighs 59 kg (130 lb); BMI is 22 kg/m². Vital signs are temperature 36.4°C (97.6°F), pulse 76/min, respirations 16/min, and blood pressure 196/112 mm Hg. Pulse oximetry on room air shows an oxygen saturation of 93%. Muscle strength in her left hand is 1/5. Strength in the right extremities is 4/5. The patient is oriented only to self; she does not know the day of the week or today's date. She recalls 0 of 3 words at 5 minutes, and she is unable to name 2 objects, correctly draw interlocking pentagons, or count backwards by serial sevens. Complete blood count, renal function studies, liver function studies, and urinalysis are all within the reference ranges. ECG shows no abnormalities. Which of the following is the most likely underlying cause of the patient's symptoms?

- (A) Alzheimer disease
- (B) Amyotrophic lateral sclerosis
- (C) Cortical basal ganglionic degeneration
- (D) Neurosyphilis
- (E) Vascular dementia

Correct Answer:



(E) Vascular dementia

Neural Consult Response and Explanation:

Answer: E

Explanation: The patient's clinical presentation is most consistent with vascular dementia. This diagnosis is supported by several key factors: 1) A significant history of vascular risk factors, specifically long-standing (25+ years) hypertension and evidence of medication non-adherence (empty bottles of metoprolol and HCTZ) leading to a current blood pressure of 196/112 mm Hg. 2) A history of cerebrovascular events (two strokes within the last 3 years). 3) Focal neurological deficits, specifically the 1/5 muscle strength in the left hand and 4/5 strength in the right extremities, which indicate localized brain injury rather than a global neurodegenerative process. 4) Significant cognitive impairment across multiple domains (memory, executive function, visuospatial skills) that interferes with her activities of daily living (unpaid bills, messy house). While Alzheimer disease (A) is the most common cause of dementia, it typically presents with an insidious onset and lacks the focal motor deficits seen here. Amyotrophic lateral sclerosis (B) is a motor neuron disease that does not primarily present with this pattern of cognitive decline. Cortical basal ganglionic degeneration (C) is a rare movement disorder, and neurosyphilis (D) is less likely given the clear history of strokes and uncontrolled hypertension. The 'stepwise' or progressive decline following vascular insults is the hallmark of vascular dementia.

Question 64.1

A 45-year-old woman with a history of seizure disorder comes to the office because she has had seizures daily for the past 3 weeks, despite adhering to her medication regimen. Medical history is also significant for borderline hypertension for the past year and alcohol use disorder. She admits that she has been drinking two beers daily since she lost her job 3 weeks ago. Medications include phenobarbital. Family history is significant for type 2 diabetes mellitus and hypertension in both parents and in all of her grandparents, heart disease in her sister, and death of her paternal grandfather of complications from alcohol use disorder. The patient smoked one pack of cigarettes daily for 20 years but quit smoking 1 year ago. Since losing her job, the patient has been earning money by driving her neighbors' children to school and driving another neighbor to hospital appointments. BMI is 22 kg/m². Vital signs are temperature 37.1°C (98.8°F), pulse 80/min, respirations 16/min, and blood pressure 138/86 mm Hg. Physical examination discloses no abnormalities. Serum phenobarbital concentration is obtained and results are pending. Which of the following is the priority in management at today's visit?

- (A) Discussing a new treatment regimen for the patient's seizure disorders
- (B) Evaluating the patient for depressive disorder
- (C) Evaluating the patient's ability/desire to stop drinking alcoholic beverages
- (D) Instructing the patient to stop driving

Correct Answer:

- (D) Instructing the patient to stop driving



Neural Consult Response and Explanation:

Answer: D

Explanation: The priority in management for any patient with active, uncontrolled seizures is to ensure the immediate safety of the patient and the public. This patient is experiencing daily seizures and is currently driving children to school, which presents an imminent and life-threatening danger to herself, the children, and others on the road. According to clinical standards and medical ethics, the physician's first responsibility is to instruct the patient to stop driving immediately until her seizures are well-controlled and she meets the legal requirements for driving in her jurisdiction. While evaluating the patient's alcohol use (Choice C) is the most important next step to determine the underlying cause of her breakthrough seizures—as chronic alcohol use can induce the metabolism of phenobarbital (lowering its serum concentration) and alcohol withdrawal can lower the seizure threshold—it does not take precedence over the immediate need to prevent a catastrophic accident. Discussing a new treatment regimen (Choice A) is premature until her serum phenobarbital levels are returned and the precipitating trigger (alcohol) is addressed. Evaluating for depressive disorder (Choice B) is appropriate given her recent job loss and increased alcohol use, but it is not the immediate priority at today's visit compared to the risk posed by her daily seizures and driving.

Question 65.1

A randomized controlled trial is conducted to assess the effectiveness of a new combination-drug antihypertensive therapy (Drug X) compared with a standard antihypertensive single-drug therapy. Study participants include 140 women (70%) and 60 men (30%) ages 30 to 60 years, with baseline blood pressure measurements of 150/95 mm Hg or higher. The investigators defined antihypertensive therapy as effective if the treatment resulted in a blood pressure measurement below 140/90 mm Hg. When designing the study, the investigators set the probability of wrongly finding that Drug X is more effective than the standard therapy as 1%; they set the probability of wrongly finding that the effectiveness of the two drugs is the same as 10%. Which of the following is the most accurate estimate of the statistical power in this study?

- (A) 1%
- (B) 10%
- (C) 40%
- (D) 90%
- (E) 99%

Correct Answer:

(D) 90%

Neural Consult Response and Explanation:



Answer: D

Explanation: Statistical power is defined as the probability of correctly rejecting the null hypothesis when it is false (i.e., the probability of detecting a true difference between groups). It is mathematically represented as $1 - \beta$, where β is the probability of a Type II error. A Type II error occurs when investigators wrongly conclude there is no difference between groups when a difference actually exists. In this study, the investigators set the probability of a Type II error (wrongly finding that the effectiveness of the two drugs is the same) at 10% (0.10). Therefore, the statistical power is $1 - 0.10 = 0.90$, or 90%. The probability of a Type I error (α), which is wrongly finding that Drug X is more effective than the standard therapy when it is not, was set at 1% (0.01), but this value is used to determine the significance level, not the power.

Question 66.1

Essepro™ (lesystolol) Reduces Blood Pressure Significantly No significant interactions with commonly used medications were observed. No significant interactions with hydrochlorothiazide, furosemide, losartan orlisinopril. No significant interactions with digoxin, warfarin or simvastatin. Drugs that inhibit CYP_{2C9} can increase plasma levels of Essepro. Patients on Essepro who are also treated with drugs that inhibit or induce this enzyme should be monitored closely, and dosage of Essepro may need to be adjusted based on blood pressure response. Important Safety Information Patients treated with Essepro should be advised against sudden discontinuation of therapy. When discontinuing therapy, dosage should be gradually tapered over 2 weeks. Essepro is contraindicated in patients with bradycardia, heart block greater than first degree, cardiogenic shock, decompensated cardiac failure, severe hepatic impairment, and in patients who are hypersensitive to any component of this product. Essepro should be used with caution in patients with peripheral vascular disease, renal impairment or thyrotoxicoses. Caution should be used in diabetics, as beta blockers may mask some manifestations of hypoglycemia. In general, patients with bronchospastic disease should not receive beta blockers. A 65-year-old woman comes to the office for blood pressure medication management. Medical history is significant for poorly controlled hypertension, psoriasis, and psoriatic arthritis previously treated with methotrexate. Additional medical history is significant for alcohol use disorder and elevated liver function tests. Medications include enalapril, spironolactone, and topical corticosteroids. Vital signs are normal except for a blood pressure of 160/104 mm Hg. Physical examination discloses thick, scaly plaques on the scalp, buttocks, and upper and lower extremities. There are several spider angiomas on the chest and abdomen. The abdomen is distended and a fluid wave is noted. She has 2+ lower extremity edema. The patient says she would like to try a new drug called Essepro to treat her hypertension because she can get a 3-month supply of the medication for free. 66. Which of the following is the most appropriate response to the patient's request for the medication?

- (A) Essepro should be prescribed because she can get it for free
- (B) Essepro should not be prescribed because it can worsen her psoriasis
- (C) Essepro should not be prescribed because it is similar to her other medications
- (D) Essepro should not be prescribed because the patient has severe liver disease
- (E) Essepro should only be used for hypertensive emergencies



Correct Answer:

(D) Essepro should not be prescribed because the patient has severe liver disease

Neural Consult Response and Explanation:

Answer: D

Explanation: The patient presents with clinical signs of decompensated cirrhosis, including spider angiomas, ascites (distended abdomen and fluid wave), and lower extremity edema, in the context of a history of alcohol use disorder and elevated liver function tests. According to the provided safety information for Essepro (lesystolol), the drug is explicitly contraindicated in patients with 'severe hepatic impairment.' Decompensated cirrhosis is a form of severe hepatic impairment. While beta-blockers can sometimes exacerbate psoriasis (Option B), this is not mentioned in the provided drug information, nor is it an absolute contraindication compared to the severe liver disease present here. Option A is incorrect because financial incentives do not override medical contraindications. Option C is incorrect because Essepro (a beta-blocker) belongs to a different drug class than the patient's current medications (enalapril, an ACE inhibitor, and spironolactone, a diuretic). Option E is incorrect as the drug is indicated for general blood pressure reduction, not exclusively for hypertensive emergencies.

Question 68.1

A 19-year-old woman comes to her university's health center because of a 1-week history of nasal stuffiness, occasional clear rhinorrhea, and a mild sore throat. Two days ago, she began to feel hot, but she has not taken her temperature. Medical history is unremarkable and her only medication is an oral contraceptive. She has no history of allergies. She does not smoke cigarettes. BMI is 22 kg/m². Vital signs are temperature 38.1°C (100.6°F), pulse 88/min, respirations 16/min, and blood pressure 116/74 mm Hg. Physical examination discloses tenderness over the left maxillary sinus without purulent drainage. There is clear fluid behind the left tympanic membrane, enlarged tonsils bilaterally, and pain with tapping of the left upper incisors. The left frontal sinus does not transilluminate. Cardiopulmonary examination discloses no abnormalities. Which of the following is the most likely underlying mechanism of this patient's sinusitis?

- (A) Eustachian tube dysfunction
- (B) Mucosal edema
- (C) Nasal polyps
- (D) Oral contraceptive use
- (E) Tonsillar hyperplasia

Correct Answer:

(B) Mucosal edema

Neural Consult Response and Explanation:



Answer: B

Explanation: The patient presents with signs and symptoms of acute rhinosinusitis (ARS), including nasal congestion, clear rhinorrhea, fever, maxillary sinus tenderness, and impaired transillumination of the frontal sinus. The underlying mechanism for ARS in the setting of a viral upper respiratory infection (URI) is mucosal edema. Viral infections trigger an inflammatory cascade, releasing cytokines and mediators that cause vasodilation and increased vascular permeability. This leads to swelling (edema) of the nasal mucosa, particularly within the narrow ostiomeatal complex. When the sinus ostia become obstructed by this edema, normal mucociliary clearance is impaired, leading to the accumulation of secretions and the clinical manifestations of sinusitis. While the patient also has evidence of Eustachian tube dysfunction (clear fluid behind the tympanic membrane), this is a concurrent result of the same mucosal inflammation and not the mechanism of the sinusitis itself. Nasal polyps (C) are associated with chronic rather than acute rhinosinusitis. Oral contraceptive use (D) can occasionally cause hormonal rhinitis but is not a primary mechanism for acute febrile sinusitis. Tonsillar hyperplasia (E) does not cause obstruction of the paranasal sinus ostia.

Question 69.1

A 40-year-old woman comes to the office because of a 2-month history of fatigue, and generalized aching and weakness of the proximal muscles of all four extremities. The patient initially noticed the weakness only while she was getting in and out of her car, but during the past 2 weeks, the weakness has progressed, so that she now has difficulty combing her hair. Since the symptoms began, she also has had aching of the joints in her hands that has responded partially to ibuprofen. She was adopted and family history is unknown. She has two teenaged children who are well. She appears uncomfortable. She is 170 cm (5 ft 7 in) tall and weighs 68 kg (150 lb); BMI is 24 kg/m². Vital signs are temperature 37.7°C (99.8°F), pulse 90/min, respirations 20/min, and blood pressure 110/70 mm Hg. The patient is alert and fully oriented. Physical examination discloses cracking of the skin of both hands that involves the tips and lateral sides of several fingers. The muscles of the upper arms and legs are somewhat tender to pressure. Results of serum laboratory studies show a creatine kinase concentration of 600 U/L and a lactate dehydrogenase concentration of 800 U/L. Results of complete blood count are within the reference ranges. Which of the following is the most likely diagnosis?

- (A) Fibromyalgia
- (B) Myasthenia gravis
- (C) Polymyositis
- (D) Scleroderma

Correct Answer:

(C) Polymyositis

Neural Consult Response and Explanation:



Answer: C

Explanation: The patient's clinical presentation is highly characteristic of an idiopathic inflammatory myopathy, specifically polymyositis. The hallmark of this condition is progressive, symmetric proximal muscle weakness, evidenced here by the patient's difficulty getting out of a car and combing her hair (tasks involving the pelvic and shoulder girdles). The presence of muscle tenderness and significantly elevated muscle enzymes (creatinine kinase at 600 U/L and lactate dehydrogenase at 800 U/L) confirms objective muscle injury and inflammation. Furthermore, the physical exam finding of 'cracking of the skin of both hands that involves the tips and lateral sides of several fingers' is the classic description of 'mechanic's hands,' a cutaneous sign strongly associated with anti-synthetase syndrome, which falls under the umbrella of inflammatory myopathies like polymyositis. The low-grade fever and joint aching (inflammatory polyarthritis) are also common systemic manifestations of this group of disorders. (A) Fibromyalgia is incorrect because it causes widespread pain and fatigue but does not present with objective muscle weakness, muscle tenderness, or elevated muscle enzymes. (B) Myasthenia gravis presents with fatigable weakness (often with ocular or bulbar involvement) but does not cause muscle tenderness or elevated CK levels. (D) Scleroderma (systemic sclerosis) primarily presents with skin thickening (sclerodactyly) and Raynaud's phenomenon; while it can overlap with myositis, the primary presentation of proximal weakness, elevated enzymes, and 'mechanic's hands' points more directly to polymyositis.

Question 70.1

A new diagnostic test for HIV infection is developed. The new serum biomarker concentration is measured in 711 men and women, ages 25 to 65 years. Of these individuals, 336 were previously determined to have HIV and 375 do not have HIV. Stratified results of the new serum biomarker test are shown:

Serum Biomarker Concentration >100 U/mL	Positive for HIV	120	Negative for HIV	10	
Serum Biomarker Concentration 76–100 U/mL	Positive for HIV	100	Negative for HIV	130	
Serum Biomarker Concentration 51–75 U/mL	Positive for HIV	75	Negative for HIV	75	
Serum Biomarker Concentration 26–50 U/mL	Positive for HIV	30	Negative for HIV	60	
Serum Biomarker Concentration 0–25 U/mL	Positive for HIV	11	Negative for HIV	200	
Total Number of Positive for HIV =		336	Total Number of Negative for HIV =		375

Which of the following is the likelihood ratio that is associated with a serum biomarker concentration greater than 100 U/mL?

- (A) 2
- (B) 8
- (C) 13
- (D) 25
- (E) 33

Correct Answer:

- (C) 13



Neural Consult Response and Explanation:

Answer: C

Explanation: The likelihood ratio (LR) for a specific test result is defined as the probability of that result occurring in individuals with the disease divided by the probability of that same result occurring in individuals without the disease. In this scenario, we are calculating the LR for a serum biomarker concentration greater than 100 U/mL.

1. First, determine the probability of the result in the diseased (HIV-positive) group:

- Number of HIV-positive individuals with a concentration >100 U/mL = 120
- Total number of HIV-positive individuals = 336
- Probability (Diseased) = $120 / 336 \approx 0.3571$

2. Next, determine the probability of the result in the non-diseased (HIV-negative) group:

- Number of HIV-negative individuals with a concentration >100 U/mL = 10
- Total number of HIV-negative individuals = 375
- Probability (Non-diseased) = $10 / 375 \approx 0.0267$

3. Calculate the Likelihood Ratio:

- LR = Probability (Diseased) / Probability (Non-diseased)
- LR = $(120 / 336) / (10 / 375)$
- LR = $(120 / 336) * (375 / 10)$
- LR = $(120 * 375) / (336 * 10)$
- LR = $45,000 / 3,360$
- LR ≈ 13.39

Comparing this result to the given options, 13.39 is closest to 13. Therefore, the likelihood ratio associated with a biomarker concentration >100 U/mL is approximately 13. Options A (2), B (8), D (25), and E (33) are mathematically incorrect based on the provided data.

Question 71.1

A 40-year-old man comes to the office for a preemployment physical examination. The patient has been generally healthy. Medical history is unremarkable and he takes no routine medications. Vital signs are normal. Physical examination shows a palpable nodule in the right lobe of the thyroid gland. Serum thyroid-stimulating hormone concentration is within the reference range. Ultrasonography of the thyroid gland confirms a solid, 1-cm nodule. Which of the following is the most appropriate next step in evaluation?

- (A) CT scan of the neck
- (B) Fine-needle aspiration of the nodule
- (C) Radionuclide thyroid scan
- (D) Thyroidectomy
- (E) Observation only



Correct Answer:

(B) Fine-needle aspiration of the nodule

Neural Consult Response and Explanation:

Answer: B

Explanation: The evaluation of a thyroid nodule follows a well-defined diagnostic algorithm. The first step is checking the serum thyroid-stimulating hormone (TSH) level. If the TSH is low, the next step is a radionuclide thyroid scan to determine if the nodule is 'hot' (hyperfunctioning), which significantly reduces the risk of malignancy. In this patient, the TSH is within the reference range (normal), which means a radionuclide scan (Option C) is not indicated. For patients with a normal or elevated TSH, the next step is a thyroid ultrasound to characterize the nodule's features and size. This patient's ultrasound has already been performed, revealing a solid, 1-cm nodule. According to clinical guidelines (such as those from the American Thyroid Association), a solid nodule ≥ 1 cm warrants further investigation with fine-needle aspiration (FNA) to rule out malignancy, as FNA is the gold standard for cytological diagnosis. CT scans (Option A) are not used for the initial evaluation of thyroid nodules. Thyroidectomy (Option D) is a treatment modality and would only be considered after FNA results suggest malignancy or if the nodule causes compressive symptoms. Observation (Option E) is only appropriate for nodules that do not meet the size or sonographic criteria for biopsy or those that have already been confirmed as benign via FNA.

Question 72.1

A 35-year-old man was admitted to the hospital 3 days ago because of pneumonia, but he has shown no clinical improvement despite ceftriaxone and azithromycin therapy. Upon admission, the patient exhibited blood-streaked sputum and chest x-ray showed hilar adenopathy. Medical history is otherwise unremarkable. The patient is a construction worker and he returned home 1 week ago from the southwest United States, where he had been temporarily employed. He does not smoke cigarettes. BMI is 20 kg/m^2 . Vital signs today are temperature 38.5°C (101.3°F), pulse 106/min, respirations 22/min, and blood pressure 110/70 mm Hg. Pulse oximetry on room air shows an oxygen saturation of 95%. PPD skin test is nonreactive. Acid-fast smears of three sputum samples were all negative. Complete blood count at the time of admission showed a normal leukocyte count with 15% eosinophils. Results of blood culture have been negative since admission. Which of the following is most likely to provide a diagnosis?

- (A) Bacterial culture of sputum
- (B) CT scan of the chest
- (C) Fungal culture of the blood
- (D) Serologic study for *Coccidioides immitis*
- (E) Sputum cytologic study
- (F) Urine assay for *Legionella* antigen

Correct Answer:

(D) Serologic study for *Coccidioides immitis*



Neural Consult Response and Explanation:

Answer: D

Explanation: The patient's clinical presentation and history are highly suggestive of primary pulmonary coccidioidomycosis (Valley Fever). Key factors include: 1) Geographic exposure: Recent travel to the Southwest United States, where *Coccidioides* species are endemic. 2) Occupational risk: Employment in construction, which involves soil disturbance and inhalation of aerosolized arthroconidia. 3) Clinical findings: Pneumonia with hilar adenopathy and blood-streaked sputum that has failed to respond to standard community-acquired pneumonia treatment (ceftriaxone and azithromycin). 4) Laboratory clues: Peripheral eosinophilia (15%) is a classic finding in coccidioidomycosis. 5) Exclusion of other causes: Negative PPD and acid-fast smears make tuberculosis unlikely, and negative blood cultures/antibiotic failure argue against common bacterial pathogens. The most common and appropriate method for diagnosing coccidioidomycosis is serologic testing for IgM and IgG antibodies. While fungal culture (Option C) or microscopic visualization (Option E) are possible, serology is the standard initial diagnostic step. *Legionella* (Option F) does not typically present with hilar adenopathy or significant eosinophilia.

Question 73.1

A 25-year-old man is brought to the office by his parents. The patient has Down syndrome and mild intellectual developmental disorder. He is their only child, and they are concerned that his current lifestyle is increasing his risk for coronary artery disease and stroke. The patient has a systolic murmur and also underwent surgical repair of an atrial septal defect at 1 year of age. He has smoked one pack of cigarettes daily for 5 years. He lives in a group home and works about 25 hours each week in a fast-food restaurant. He has a few friends and is romantically involved with a woman from his church group. The patient is 157 cm (5 ft 2 in) tall and weighs 91 kg (200 lb); BMI is 36 kg/m². Vital signs are normal. A grade 2/6 systolic murmur is heard best at the apex. The parents would like him to stop smoking and follow a healthier diet, and they feel the only way to monitor and control his behavior is for him to move back into their home. They request your assistance in obtaining legal guardianship of their son. Which of the following is the most appropriate initial recommendation?

- (A) Advise the parents not to influence their son's decision in this matter
- (B) Arrange for evaluation of their son's competency
- (C) Enroll their son in a smoking cessation program
- (D) Initiate a family meeting to discuss the parents' concerns with their son
- (E) Obtain legal advice regarding guardianship

Correct Answer:

(D) Initiate a family meeting to discuss the parents' concerns with their son

Neural Consult Response and Explanation:



Answer: D

Explanation: The patient is a 25-year-old adult who, despite having Down syndrome and mild intellectual developmental disorder (IDD), demonstrates a high level of adaptive functioning. He lives in a group home, works 25 hours a week, and maintains social and romantic relationships. In medical ethics, all adult patients are presumed to have the decision-making capacity to manage their own lives and health unless proven otherwise. The parents' concerns regarding his smoking and BMI are valid health issues, but disagreement with a patient's lifestyle choices does not constitute a lack of capacity. Legal guardianship is a highly restrictive measure that strips an individual of their autonomy. Therefore, the most appropriate initial recommendation is to facilitate a family meeting (Option D). This approach respects the patient's autonomy while allowing the parents to express their concerns directly. It also provides the physician an opportunity to informally assess the patient's understanding of his health risks and his goals. Option B is premature; a formal evaluation of competency (a legal term) or capacity (a clinical term) should only be pursued if there is clear evidence that the patient cannot understand the risks and benefits of his decisions. Option A is dismissive of the parents' role, Option C ignores the patient's right to consent to treatment, and Option E is outside the physician's primary clinical role.

Question 74.1

A 45-year-old woman comes to the office because of a 3-day history of nasal congestion, headache, sore throat, and general malaise. She has developed a cough during the past 24 hours that is mildly productive of clear sputum. Except for occasional seasonal allergies, she has no previous history of medical problems. She takes no medications on a regular basis but during the past 3 days she has been taking an over-the-counter oral cold medication. She follows a strict low-fat vegetarian diet and she drinks three to four glasses of wine per week. She jogs 3 miles a day when she is not sick. Vital signs today are temperature 37.5°C (99.5°F), pulse 90/min, and blood pressure 140/94 mm Hg. Height is 170 cm (5 ft 7 in); weight is 54 kg (120 lb); BMI is 19 kg/m². On physical examination she appears slightly anxious. Nasal mucosa is erythematous and swollen, and sinuses are nontender. Posterior pharynx is also erythematous but there are no exudates. Lungs are clear on auscultation and cardiac examination is normal. Repeat blood pressure measurement at the end of the examination is 142/96 mm Hg in the left arm and 138/94 mm Hg in the right arm. Which of the following is the most likely cause of her elevated blood pressure?

- (A) Acute viral illness
- (B) Chronic sinusitis
- (C) Essential hypertension
- (D) Her alcohol intake
- (E) Over-the-counter cold medication

Correct Answer:

- (E) Over-the-counter cold medication

Neural Consult Response and Explanation:



Answer: E

Explanation: The most likely cause of this patient's elevated blood pressure is her use of over-the-counter (OTC) cold medication. Most oral OTC cold and sinus medications contain sympathomimetic agents, such as pseudoephedrine or phenylephrine. These drugs function as alpha-1 adrenergic agonists to induce vasoconstriction of the nasal mucosa, thereby relieving congestion. However, their systemic absorption leads to generalized vasoconstriction and can increase heart rate, resulting in elevated systolic and diastolic blood pressure. This patient has no prior history of hypertension, a healthy BMI (19 kg/m²), a regular exercise routine, and low alcohol consumption, making essential hypertension (Option C) or alcohol-induced hypertension (Option D) less likely. While acute pain or stress from a viral illness (Option A) can mildly elevate blood pressure, the pharmacological effect of a sympathomimetic is a more direct and potent cause of the readings observed (140/94 and 142/96 mm Hg). Chronic sinusitis (Option B) is not supported by the 3-day history of symptoms and is not a recognized cause of hypertension.

Question 75.1

A 41-year-old woman comes to the emergency department because of a 3-day history of fever and a 2-day history of worsening flank pain with frequent and painful urination. She describes the pain as constant and says it worsens when she coughs or lies on her right side. She rates the pain as a 5 on a 10-point scale; ibuprofen has provided moderate relief of her pain. She also reports intermittent nausea but has not had vomiting or change in bowel habits. Medical history is significant for several uncomplicated urinary tract infections, most recently 8 months ago. Each infection resolved with antibiotic therapy. She currently takes no medications aside from her recent use of ibuprofen. She is sexually active with one male partner and uses condoms regularly. Vital signs are temperature 39.4°C (103.0°F), pulse 76/min, respirations 20/min, and blood pressure 128/74 mm Hg. Auscultation of the chest discloses normal S₁ and S₂. Abdomen is soft with normal bowel sounds. There is guarding on the right lateral side and tenderness to compression over the right costophrenic angle. Results of laboratory studies are shown: Serum: Urea nitrogen 18 mg/dL
Creatinine 0.9 mg/dL

Blood: Hemoglobin 12.8 g/dL
WBC 20,000/mm³ Neutrophils, segmented 80%
Lymphocytes 15%
Eosinophils 2%
Monocytes 3%

Urine: Specific gravity 1.015 (N=1.003–1.029) Protein Negative
Occult blood Negative
Leukocyte esterase Positive
WBC Too numerous to count Casts Occasional

Urine and blood cultures are obtained and sent for analysis. Antibiotic therapy is initiated. Which of the following is the most appropriate next step?



- (A) Cystoscopy
- (B) Echocardiography
- (C) MRI of the abdomen
- (D) Renal ultrasonography
- (E) No additional study is indicated

Correct Answer:

- (E) No additional study is indicated

Neural Consult Response and Explanation:

Answer: E

Explanation: The patient presents with classic symptoms of acute pyelonephritis, including fever, flank pain, costovertebral angle (CVA) tenderness, and significant pyuria (WBC too numerous to count and positive leukocyte esterase). In a healthy, premenopausal, non-pregnant woman who is hemodynamically stable (BP 128/74, Pulse 76), this is classified as uncomplicated pyelonephritis. According to standard clinical guidelines, imaging (such as renal ultrasonography or CT) is not routinely indicated for the initial management of uncomplicated pyelonephritis. Imaging is reserved for patients who: 1) are severely ill or hemodynamically unstable (e.g., sepsis, shock); 2) have suspected urinary tract obstruction (e.g., history of nephrolithiasis, renal colic); 3) are at high risk for complications (e.g., diabetes mellitus, immunosuppression, or structural renal abnormalities); or 4) fail to show clinical improvement after 48–72 hours of appropriate antibiotic therapy. Although this patient has a high fever (39.4°C) and significant leukocytosis (WBC 20,000/mm³), these are common findings in pyelonephritis and do not necessitate immediate imaging in an otherwise stable patient. Her history of 'several uncomplicated urinary tract infections' that resolved with antibiotics does not qualify as a complication requiring immediate workup. Therefore, the most appropriate next step after initiating antibiotics and obtaining cultures is to monitor her clinical response.

Question 76.1

A 41-year-old woman is brought to the emergency department by her husband because of nausea and dizziness that began suddenly 4 hours ago. She says she feels like the room is spinning. She has not vomited. She recalls receiving a blow to the left side of her neck 1 week ago when her dog jumped on her, but she has had no ill effects from that incident. Medical history is unremarkable. She takes no medications. Vital signs are normal. Physical examination shows mild ptosis of the left eyelid. The right pupil measures 4 mm in diameter and the left pupil measures 2 mm in diameter. Both pupils are reactive to light. Ocular motility is full. Nystagmus is present in both eyes on left lateral gaze. Left corneal reflex is diminished. Sensation to pinprick and cold is reduced over the left side of the face, right side of the chest, abdomen, and right upper and lower extremities. Which of the following pathophysiologic processes most accurately explains this patient's left-sided ptosis and decreased pupil size?

- (A) Parasympathetic overactivity



- (B) Parasympathetic underactivity
- (C) Postsynaptic neuromuscular junction defect
- (D) Presynaptic neuromuscular junction defect
- (E) Sympathetic overactivity
- (F) Sympathetic underactivity

Correct Answer:

- (F) Sympathetic underactivity

Neural Consult Response and Explanation:

Answer: F

Explanation: The patient's clinical presentation is consistent with Lateral Medullary Syndrome (Wallenberg syndrome), likely caused by a left vertebral artery dissection following the neck trauma she experienced one week ago. The key findings supporting this diagnosis include vertigo (dizziness, nausea, nystagmus), ipsilateral facial sensory loss (diminished corneal reflex and sensation to pinprick/cold on the left face), and contralateral body sensory loss (reduced sensation on the right side of the chest, abdomen, and extremities). The left-sided mild ptosis and miosis (2 mm left pupil vs. 4 mm right pupil) constitute Horner syndrome. Horner syndrome occurs due to the disruption of the sympathetic pathway, which in this case involves the descending sympathetic fibers located in the lateral medulla. Because the sympathetic nervous system is responsible for pupillary dilation (via the dilator pupillae muscle) and assisting in eyelid elevation (via the superior tarsal or Müller's muscle), a disruption or lesion in this pathway leads to sympathetic underactivity. This results in an inability to dilate the pupil (leading to miosis from unopposed parasympathetic activity) and a drooping eyelid (ptosis). Therefore, sympathetic underactivity is the pathophysiologic process explaining these specific ocular findings.

Question 77.1

A 34-year-old woman comes to the office because of a 3- to 4-week history of swelling of her legs and a 9-kg (20-lb) weight gain. Medical history is significant for sickle cell trait and mild anemia. She has been taking 800 mg of ibuprofen three times daily for Achilles tendinitis diagnosed 1 month ago. She has smoked five cigarettes daily for the past 15 years, and she drinks one to five beers on weekends. She experimented with cocaine briefly 16 years ago, but she has never used intravenous drugs. She has been in a monogamous sexual relationship for the past 12 years. Today, vital signs are temperature 37.2°C (99.0°F), pulse 88/min, respirations 16/min, and blood pressure 145/95 mm Hg. Physical examination discloses periorbital edema but no jugular venous distention. Lungs are clear to auscultation. Cardiac examination discloses an S₁ and S₂ without murmurs or gallops. Abdominal examination discloses bulging flanks and shifting dullness to percussion. Examination of the lower extremities shows pitting edema from the mid thigh to the ankles bilaterally. Results of which of the following studies are most likely to be abnormal in this patient?

- (A) Echocardiography
- (B) HIV antibody study



- (C) Serum B-type natriuretic peptide concentration
- (D) Toxicology screening of the urine
- (E) Urine protein concentration

Correct Answer:

- (E) Urine protein concentration

Neural Consult Response and Explanation:

Answer: E

Explanation: The patient presents with a classic clinical picture of nephrotic syndrome, characterized by generalized edema (periorbital edema, ascites as evidenced by shifting dullness, and pitting edema of the lower extremities) and significant weight gain (9 kg). The most likely trigger in this case is her high-dose, daily use of ibuprofen (2400 mg/day for 4 weeks). Nonsteroidal anti-inflammatory drugs (NSAIDs) are a well-documented cause of drug-induced nephrotic syndrome, most commonly manifesting as minimal change disease (MCD), often occurring simultaneously with acute interstitial nephritis (AIN). The hallmark of nephrotic syndrome is heavy proteinuria (typically >3.5 g/24 hours), making urine protein concentration the most likely study to be abnormal. While other conditions can cause edema, the physical examination (clear lungs, no jugular venous distention, normal heart sounds) makes heart failure (Options A and C) unlikely. Her remote history of cocaine use (16 years ago) and monogamous relationship make HIV-associated nephropathy (Option B) or current drug-induced renal issues (Option D) less probable than the direct temporal link to high-dose NSAID use.

Question 79.1

A 25-year-old man, who was admitted to the hospital 5 hours ago because of nausea, light-headedness, and muscle aches that began after he completed a marathon, now reports worsening pain in his right leg. On admission, the patient reported only mild muscle aching, but he now rates the pain in his right lower extremity as a 9 on a 10-point scale. Laboratory studies on admission were notable for a serum creatine kinase concentration of 10,000 U/L and a serum creatinine concentration of 1.7 mg/dL. Since admission the patient has received 5 L of 0.9% saline and his nausea and light-headedness have resolved. He is alert and fully oriented. Vital signs are temperature 36.9°C (98.5°F), pulse 88/min, respirations 16/min, and blood pressure 126/82 mmHg. Pulse oximetry on room air shows an oxygen saturation of 97%. Cardiopulmonary and abdominal examinations disclose no abnormalities. Passive flexion of the toes elicits pain over the anterior portion of the right lower extremity below the knee. Distal pulses are present in the lower extremities bilaterally. The remainder of the physical examination discloses no abnormalities. Results of laboratory studies obtained 1 hour ago are shown: Serum: Urea nitrogen 12 mg/dL

Creatinine 1.2 mg/dL

Na⁺ 140 mEq/L

K⁺ 4.0 mEq/L

Cl⁻ 100 mEq/L

HCO₃⁻ 24 mEq/L



Blood: Hemoglobin 14.0 g/dL
WBC 14,000/mm³ Neutrophils, segmented 60%

Which of the following is the most appropriate next step in management?

- (A) Application of ice to the right lower extremity
- (B) Cyclobenzaprine therapy
- (C) Measurement of lower extremity compartment pressures
- (D) MRI of the right lower extremity
- (E) Nonsteroidal anti-inflammatory drug therapy

Correct Answer:

(C) Measurement of lower extremity compartment pressures

Neural Consult Response and Explanation:

Answer: C

Explanation: The patient's clinical presentation is highly suggestive of acute compartment syndrome (ACS), a surgical emergency. The key indicators include severe pain out of proportion to the initial injury (rating 9/10 despite clinical improvement in other areas), and most importantly, exquisite pain elicited by passive flexion of the toes, which stretches the muscles within the anterior compartment of the leg. ACS in this context likely developed as a complication of exertional rhabdomyolysis (evidenced by the marathon history and admission CK of 10,000 U/L), where muscle swelling within the non-compliant fascial compartments increases intracompartmental pressure, leading to ischemia. While the diagnosis of ACS can be made clinically, the most appropriate next step to confirm the diagnosis and provide objective data for surgical intervention (fasciotomy) is the measurement of intracompartmental pressures. A delta pressure (diastolic blood pressure minus intracompartmental pressure) of ≤ 30 mmHg is generally indicative of ACS requiring surgical decompression. Other options are incorrect: (A) Ice can worsen ischemia; (B) Cyclobenzaprine is a muscle relaxant that does not address the underlying pressure; (D) MRI is time-consuming and unnecessary for this emergency; (E) NSAIDs are inappropriate due to the patient's recent acute kidney injury and their inability to treat the mechanical pressure of ACS. Note that the presence of distal pulses does not rule out ACS, as pulselessness is a very late and often irreversible sign.

Question 80.1

A 9-year-old boy is brought to the office by his parents to establish care after recently moving to the area. The patient has not been evaluated by a physician in 4 years. He has been generally healthy. Medical history is significant for pneumonia at age 3 years. He takes no medications. He is at the 25th percentile for height, weight, and BMI. Vital signs are temperature 37.0°C (98.6°F), pulse 82/min, respirations 20/min, and blood pressure 112/74 mm Hg. Cardiac examination discloses a grade 3/6 systolic murmur audible along the left sternal border at the third and fourth intercostal



spaces. Femoral pulses are weak and brachial pulses are strong; there is a radiofemoral delay. Chest x-ray discloses mild cardiomegaly with left ventricular prominence. ECG shows left ventricular hypertrophy. This patient is at greatest risk for which of the following complications?

- (A) Atrial fibrillation
- (B) Cor pulmonale
- (C) Systemic hypertension
- (D) Tricuspid valve regurgitation

Correct Answer:

- (C) Systemic hypertension

Neural Consult Response and Explanation:

Answer: C

Explanation: The clinical presentation is classic for Coarctation of the Aorta (CoA). Key diagnostic features include the radiofemoral pulse delay (weak femoral pulses compared to strong brachial pulses), a systolic murmur heard over the left sternal border (often radiating to the back/interscapular area), and evidence of left ventricular pressure overload, such as left ventricular hypertrophy (LVH) on ECG and left ventricular prominence on chest X-ray. In CoA, the narrowing of the aorta (typically distal to the left subclavian artery) creates a significant pressure gradient. This results in upper-body hypertension and lower-body hypoperfusion. Even after surgical or endovascular repair, systemic hypertension remains the most common long-term complication, occurring in a majority of patients. This persistent hypertension is a major driver of further morbidity, including premature coronary artery disease, heart failure, and stroke. While other complications like atrial fibrillation (A) can occur due to long-standing LVH and left atrial enlargement, they are less common than persistent hypertension. Cor pulmonale (B) and tricuspid regurgitation (D) are right-sided heart issues and are not primary complications of the left-sided pressure overload seen in aortic coarctation.

Question 81.1

A 25-year-old woman comes to the office because of a 2-day history of right lower quadrant abdominal pain and vaginal spotting. She describes the abdominal pain as cramping and rates it as a 4 on a 10-point scale. Medical history is unremarkable and the patient takes no medications. Menses are typically irregular but she thinks her last menstrual period was approximately 5 weeks ago. She is sexually active with one male partner and they use condoms occasionally. Vital signs are temperature 37.2°C (99.0°F), pulse 90/min, respirations 16/min, and blood pressure 110/65 mm Hg. Abdominal examination discloses tenderness to palpation of the right lower quadrant. Pelvic examination discloses dark blood in the vaginal vault. Hematocrit is 36%. Urine pregnancy test is positive. Pelvic ultrasonography shows a thickened endometrial lining and no adnexal masses. Which of the following is the most appropriate next step in management?

- (A) Admission to the hospital for observation



- (B) Diagnostic laparoscopy
- (C) Dilatation and curettage
- (D) Follow-up pelvic ultrasonography in 1 week
- (E) Serial serum β -hCG concentrations

Correct Answer:

- (E) Serial serum β -hCG concentrations

Neural Consult Response and Explanation:

Answer: E

Explanation: The patient presents with a classic triad for suspected ectopic pregnancy: amenorrhea (LMP 5 weeks ago), vaginal spotting, and lower abdominal pain. Given her positive urine pregnancy test and the transvaginal ultrasound (TVUS) findings showing a thickened endometrial lining but no intrauterine pregnancy (IUP) or adnexal masses, she is classified as having a Pregnancy of Unknown Location (PUL). In a hemodynamically stable patient with a PUL, the most appropriate next step is to obtain serial serum β -hCG concentrations. This allows the clinician to monitor the trend of the hormone levels. In a normal early IUP, β -hCG levels should approximately double every 48–72 hours. An abnormal rise (less than 35% in 48 hours), a plateau, or a slow decline suggests an ectopic pregnancy or a non-viable IUP. If the β -hCG level is above the 'discriminatory zone' (typically 1,500–3,500 mIU/mL) and no IUP is seen on TVUS, the suspicion for ectopic pregnancy is significantly increased. Admission (A) and diagnostic laparoscopy (B) are reserved for hemodynamically unstable patients or those with definitive evidence of a ruptured ectopic pregnancy. Dilatation and curettage (C) is used to differentiate between a non-viable IUP and an ectopic pregnancy only after the pregnancy is confirmed to be non-viable (e.g., via abnormal β -hCG trends). Waiting one week for a repeat ultrasound (D) is inappropriate as an ectopic pregnancy could rupture in that timeframe.

Question 82.1

A 32-year-old woman, gravida 4, para 4, comes to the office 1 week after an uncomplicated vaginal delivery of a 3020-g (6-lb 11-oz) term female newborn. She has been breast-feeding her daughter since birth. The patient says that she cries frequently for no reason, is irritable, and is worried about her infant's long-term health. The patient reports having no appetite. She says that her husband and mother say that she is depressed and think she is anorexic. She has not had auditory hallucinations, confusion, or disorientation. She denies suicidal or homicidal ideation. She has a history of postpartum psychosis following the birth of her first child; she had no similar symptoms after the births of her second and third children. Which of the following factors in this patient's history most strongly indicates a poor prognosis?

- (A) Anorexia
- (B) Depressed mood
- (C) History of psychosis



(D) Multiparity

Correct Answer:

(C) History of psychosis

Neural Consult Response and Explanation:

Answer: C

Explanation: The patient's history of postpartum psychosis is the most significant factor indicating a poor prognosis for her future mental health. Postpartum psychosis is a severe psychiatric emergency that carries a high risk of recurrence in subsequent pregnancies (estimated between 30% and 50%). Furthermore, a history of postpartum psychosis is strongly associated with the eventual diagnosis of bipolar disorder or other chronic psychotic illnesses. While the patient is currently presenting with symptoms consistent with postpartum blues or postpartum depression (crying, irritability, worry, and decreased appetite), her history of a psychotic episode marks her as being at much higher risk for severe psychiatric morbidity compared to individuals without such a history. (A) Anorexia and (B) Depressed mood are current symptoms of her present condition; while they are clinically significant, they do not carry the same long-term prognostic weight as a history of psychosis. (D) Multiparity is not a recognized risk factor for a poor prognosis in postpartum psychiatric disorders; in fact, some studies suggest that primiparity (first-time motherhood) may be a higher risk period for the initial onset of postpartum psychosis.

Question 83.1

A 47-year-old man comes to the office to establish care. He recently moved to the area and has not been evaluated by a physician for more than 3 years. He reports a 1-year history of bilateral knee pain that worsens after prolonged standing, but he otherwise has felt well. Medical history is unremarkable and his only medication is acetaminophen as needed for his knee pain. Family history is significant for hypothyroidism in his mother and myocardial infarction in a paternal uncle at age 55 years. The patient drinks five to six beers weekly and does not smoke cigarettes. BMI is 32 kg/m². Vital signs are temperature 36.1°C (97.0°F), pulse 78/min, respirations 12/min, and blood pressure 138/89 mm Hg. The patient is not in distress. Physical examination discloses no abnormalities. Results of fasting serum lipid studies obtained in preparation for today's visit are shown:

Cholesterol Total 264 mg/dL
HDL 54 mg/dL
LDL 170 mg/dL
Triglycerides 200 mg/dL

Which of the following is the most appropriate next step in management regarding the patient's laboratory study results?

(A) Prescribe atorvastatin



- (B) Prescribe cholestyramine
- (C) Recommend diet and low-impact exercise
- (D) Refer the patient to a cardiologist
- (E) Repeat fasting laboratory studies in 1 month

Correct Answer:

- (C) Recommend diet and low-impact exercise

Neural Consult Response and Explanation:

Answer: C

Explanation: The patient is a 47-year-old male with several cardiovascular risk factors, including obesity (BMI 32 kg/m²), Stage 1 hypertension (BP 138/89 mm Hg), and dyslipidemia (LDL 170 mg/dL, triglycerides 200 mg/dL). To determine the most appropriate next step in management for his hyperlipidemia, we must calculate his 10-year atherosclerotic cardiovascular disease (ASCVD) risk using the pooled cohort equations. Based on his age (47), sex (male), total cholesterol (264), HDL (54), systolic blood pressure (138), and non-smoking/non-diabetic status, his 10-year ASCVD risk is approximately 4.4%. According to the 2018 AHA/ACC cholesterol guidelines, patients aged 40-75 with an LDL-C of 70-189 mg/dL and a 10-year ASCVD risk <5% (low risk) should be managed with lifestyle modifications (diet and exercise) rather than pharmacotherapy. Even if his risk were borderline (5% to <7.5%), lifestyle changes would still be the foundational first step. Furthermore, his bilateral knee pain, which is likely osteoarthritis exacerbated by his obesity, makes 'low-impact' exercise (such as swimming or cycling) particularly appropriate to minimize joint stress while promoting weight loss and cardiovascular health. Atorvastatin (A) is not yet indicated as his LDL is <190 mg/dL and his ASCVD risk is <7.5%. Cholestyramine (B) is inappropriate because it can paradoxically increase triglyceride levels, which are already elevated in this patient. Referral to a cardiologist (D) is unnecessary for routine primary prevention, and repeating laboratory studies (E) is not indicated as the current results were obtained while fasting and clearly warrant intervention through lifestyle changes.

Question 84.1

A 37-year-old man comes to the emergency department because he has felt nauseated and light-headed for the past hour. Medical history is significant for esophageal varices secondary to alcohol-related cirrhosis and ascites treated with spironolactone. He drinks eight to ten alcoholic beverages daily. While you are obtaining additional history, the patient vomits a large volume of bright red blood and becomes difficult to arouse. Vital signs are temperature 36.0°C (96.8°F), pulse 110/min, respirations 12/min, and blood pressure 90/50 mm Hg. Following initiation of intravenous fluids, which of the following is the most appropriate immediate management?

- (A) Arrange for transjugular intrahepatic portal vein shunting
- (B) Begin intravenous vasopressin therapy
- (C) Do endotracheal intubation
- (D) Do upper endoscopy



(E) Insert an esophageal tube for balloon tamponade

Correct Answer:

(C) Do endotracheal intubation

Neural Consult Response and Explanation:

Answer: C

Explanation: The patient is presenting with a massive upper gastrointestinal bleed, likely due to esophageal varices, and is in hypovolemic shock (hypotension of 90/50 mm Hg and tachycardia of 110/min). A critical detail in the presentation is that the patient has become 'difficult to arouse' and is actively vomiting large volumes of blood. In the management of any unstable patient, the ABCs (Airway, Breathing, and Circulation) take priority. A patient who is difficult to arouse (suggesting a Glasgow Coma Scale score of 8 or less) and actively vomiting blood is at extremely high risk for aspiration, which can lead to life-threatening respiratory failure. Therefore, the most appropriate immediate management after initiating fluid resuscitation is endotracheal intubation to protect the airway. While intravenous vasoactive therapy (like octreotide) and upper endoscopy are essential steps in the management of variceal bleeding, they should be performed after the airway is secured. Transjugular intrahepatic portal vein shunting (TIPS) and balloon tamponade are rescue therapies used when initial medical and endoscopic treatments fail to control the bleeding.

Question 85.1

A 25-year-old man was admitted to the hospital yesterday with a massive hemothorax sustained as a result of a stab wound. Left lateral thoracotomy was done because more than 2 L of blood returned following chest tube placement. The thoracotomy disclosed a bleeding intercostal vessel that was repaired by suture ligation. Vital signs now are temperature 36.0°C (96.8°F), pulse 100/min, respirations 18/min, and blood pressure 120/78 mm Hg. Pulse oximetry on 5 L/min of oxygen via nasal cannula shows an oxygen saturation of 95%. Physical examination discloses a well-approximated staple line at the incision site and mild erythema. Decreased respiratory excursion is noted on the left side. The chest tube is draining a small amount of serosanguineous fluid; no air leak is noted. Which of the following is the most appropriate next step in management? Why not the other choices?

- (A) Administration of broad-spectrum antibiotics
- (B) Initiation of tube feedings
- (C) Pain reduction
- (D) Physical therapy
- (E) Psychological evaluation for post-traumatic stress disorder

Correct Answer:

(C) Pain reduction



Neural Consult Response and Explanation:

Answer: C

Explanation: The patient is a 25-year-old male who is one day post-operative following a left lateral thoracotomy for a massive hemothorax. The key clinical finding is 'decreased respiratory excursion' on the left side, accompanied by a requirement for 5 L/min of oxygen to maintain a saturation of 95%. In the setting of a recent major thoracic incision, which is known to be one of the most painful surgical procedures, these findings are highly suggestive of 'splinting.' Splinting occurs when a patient takes shallow breaths to avoid the sharp pain associated with chest wall movement. This leads to atelectasis (alveolar collapse), which impairs gas exchange and increases the risk of post-operative pneumonia. While physical therapy (Option D), including incentive spirometry and mobilization, is essential for treating atelectasis, it cannot be effectively performed if the patient's pain is not adequately controlled. Therefore, pain reduction is the most appropriate next step to allow the patient to take deep breaths, cough effectively, and participate in pulmonary toilet. (A) is incorrect as there are no signs of infection (fever or purulence). (B) is not indicated as there is no evidence of nutritional deficiency or inability to tolerate oral intake. (D) is a secondary step that requires pain control to be successful. (E) is incorrect because a diagnosis of PTSD requires symptoms to persist for at least one month; it is too early for such an evaluation.

Question 86.1

A 45-year-old man returns to the office for ongoing treatment of tuberculous pericarditis. Pericardiocentesis 9 weeks ago showed a serosanguineous effusion; culture of the effusion was positive for *Mycobacterium tuberculosis*, and therapy with isoniazid, rifampin, and ethambutol was initiated. During the past 2 weeks, he has had increasing shortness of breath on minimal exertion, cough, pain in the right upper quadrant, and swelling of the lower extremities. BMI is 26 kg/m². Vital signs today are temperature 37.0°C (98.6°F), pulse 100/min, respirations 22/min, and blood pressure 105/65 mm Hg. Physical examination discloses 10 cm of jugular venous distention. Lungs are clear to auscultation and percussion. Cardiac examination discloses distant but normal heart sounds. The liver is tender and is palpated 3 cm below the right costal margin. There is 2+ to 3+ pitting edema from the knees distally. HIV antibody test is negative. ECG shows nonspecific ST-T changes. Chest x-ray today is unchanged from the x-ray obtained at the time of diagnosis, which showed resolution of apical and perihilar infiltrates and a normal-sized heart. Which of the following is the most appropriate next step in management?

- (A) Add furosemide therapy and reevaluate in 4 weeks
- (B) Add prednisone therapy
- (C) Add streptomycin and cycloserine therapy
- (D) Order bronchoscopy for brushings and cytology
- (E) Order echocardiography

Correct Answer:

- (E) Order echocardiography



Neural Consult Response and Explanation:

Answer: E

Explanation: The patient's clinical presentation is highly suggestive of constrictive pericarditis, a known and serious complication of tuberculous pericarditis. Despite receiving 9 weeks of appropriate anti-tuberculous therapy (isoniazid, rifampin, and ethambutol), he has developed progressive signs of right-sided heart failure, including jugular venous distention (10 cm), tender hepatomegaly, and significant peripheral edema, while his lungs remain clear. This clinical picture—right heart failure symptoms in the setting of previous pericardial inflammation—points toward the pericardium becoming fibrotic and rigid, which limits diastolic filling. Echocardiography is the most appropriate next step in management as it is the initial imaging modality of choice to confirm the diagnosis. It can identify characteristic hemodynamic features such as a 'septal bounce' (paradoxical septal motion), respiratory variation in ventricular filling, and a dilated inferior vena cava. While furosemide (A) could help manage the fluid overload, it does not address the underlying diagnosis and must be used cautiously in constrictive disease. Prednisone (B) is sometimes used early in the course of tuberculous pericarditis to prevent the development of constriction, but its benefit is controversial and it is not the primary diagnostic step when constriction is already clinically manifest. Adding second-line anti-tuberculous drugs (C) is not indicated as there is no evidence of drug-resistant infection; the current issue is a mechanical complication of the initial disease. Bronchoscopy (D) is not indicated because the lungs are clear and the diagnosis of tuberculosis has already been confirmed via culture.

Question 87.1

A 40-year-old woman, gravida 2 para 2, comes to the office because of bulging veins in her legs that have slowly become more visible since she first noticed them 2 years ago. She says they seem to worsen when she stands for long periods of time, but she reports no associated pain. She is concerned that this problem may be life-threatening. Medical history is otherwise unremarkable and she takes no medications. Both of her pregnancies resulted in uncomplicated vaginal deliveries at 40 weeks' gestation. BMI is 23 kg/m². Vital signs are normal. Physical examination discloses compressible veins in both lower extremities below the knees that are worse on the left. The remainder of the examination discloses no abnormalities. Which of the following is the most appropriate next step?

- (A) Compression stockings
- (B) Surgical ligation of the largest veins
- (C) Venography
- (D) Venous duplex ultrasonography
- (E) Warfarin therapy

Correct Answer:

- (A) Compression stockings

Neural Consult Response and Explanation:



Answer: A

Explanation: The patient presents with classic signs of varicose veins (CEAP C₂), which are dilated, tortuous superficial veins. Her symptoms are mild (visible bulging that worsens with standing, but no pain or complications like skin changes or ulceration), and her physical exam is consistent with simple varicose veins. In such cases, the diagnosis is clinical and does not require immediate imaging. The most appropriate next step in management is conservative therapy, which includes lifestyle modifications (e.g., leg elevation, exercise) and graduated compression stockings. Compression stockings help by providing external pressure to assist the calf muscle pump and reduce venous reflux, directly addressing her symptom of veins worsening with prolonged standing. Venous duplex ultrasonography (D) is the gold standard for evaluating venous reflux but is generally reserved for patients with severe symptoms, complications, or those being considered for interventional procedures (like ablation or surgery). Surgical ligation (B) is an invasive treatment and is not first-line, especially in an asymptomatic patient. Venography (C) is an invasive, historical diagnostic tool and is rarely used today. Warfarin therapy (E) is used for deep vein thrombosis or high-risk superficial vein thrombosis, neither of which is suggested by this patient's history or physical examination.

Question 89.1

A 39-year-old woman, gravida 2, para 2, comes to the community-based health center because of a 6-month history of a copious, foul-smelling vaginal discharge. She also reports spotting that began 6 months ago and has progressed to heavy bleeding during the past 3 weeks. Medical history is significant for an abnormal Pap smear in her 20s; her most recent Pap smear was done 12 years ago during her second pregnancy, and she recalls the results as being normal. She takes no medications. The patient was married for 16 years; her husband died 4 years ago and had undergone vasectomy after the birth of their last child. The patient has not had any new sexual partners since her husband's death. BMI is 32 kg/m². Vital signs are temperature 37.2°C (99.0°F), pulse 90/min, respirations 14/min, and blood pressure 155/96 mm Hg. Speculum examination discloses normal vaginal mucosa. The cervix is friable with a 1-cm exophytic mass lateral to the cervical os at the nine o'clock position. Which of the following is the most critical factor in formulating a management plan for this patient?

- (A) Future fertility plans
- (B) Hypertension
- (C) Obesity
- (D) Patient age
- (E) Stage of disease

Correct Answer:

- (E) Stage of disease

Neural Consult Response and Explanation:



Answer: E

Explanation: The clinical presentation—copious foul-smelling discharge, heavy vaginal bleeding, and a friable 1-cm exophytic cervical mass—is highly suggestive of invasive cervical cancer. In the management of cervical cancer, the most critical factor for formulating a treatment plan is the stage of the disease. Cervical cancer is staged according to the FIGO (International Federation of Gynecology and Obstetrics) system. The stage determines the primary treatment modality: early-stage disease (typically FIGO stages IA to IB₂) is often managed with radical surgery (e.g., radical hysterectomy), whereas locally advanced disease (stages IB₃ to IVA) is primarily treated with concurrent chemoradiation. While other factors such as future fertility plans (A), hypertension (B), obesity (C), and patient age (D) are important considerations for surgical risk assessment and personalized care, they do not dictate the fundamental treatment algorithm as definitively as the stage of the disease does.

Question 90.1

A 28-year-old man comes to the office for an annual health maintenance examination. He says he has been generally healthy. Three months ago he began walking three times weekly for at least 30 minutes, and he has eliminated salt from his diet after a blood pressure measurement at a local pharmacy was 160/96 mm Hg. Medical history is unremarkable and he takes no medications. Family history is remarkable for hyperlipidemia, hypertension, type 2 diabetes mellitus, and coronary artery disease. The patient is 188 cm (6 ft 2 in) tall and weighs 135 kg (298 lb); BMI is 38 kg/m². Vital signs are temperature 36.8°C (98.2°F), pulse 102/min, respirations 18/min, and blood pressure 156/98 mm Hg. The abdomen is protuberant with no masses. The remainder of the physical examination discloses no abnormalities. Results of fasting laboratory studies are shown:

Serum Cholesterol Total - 202 mg/dL

HDL - 33 mg/dL

LDL - 137 mg/dL

Triglycerides - 158 mg/dL

Glucose - 104 mg/dL

Blood Hematocrit - 46%

Hemoglobin - 15.6 g/dL

WBC - 9800/mm³

Pharmacotherapy should be directed toward which of the following?

- (A) Aiding with metabolism of glucose
- (B) Decreasing pulse rate
- (C) Decreasing serum LDL-cholesterol concentration
- (D) Lowering blood pressure
- (E) Suppressing appetite

Correct Answer:



(D) Lowering blood pressure

Neural Consult Response and Explanation:

Answer: D

Explanation: The patient presents with a blood pressure of 156/98 mm Hg, which classifies as Stage 2 Hypertension (defined as $\geq 140/90$ mm Hg) according to current clinical guidelines (ACC/AHA 2017). He has already attempted lifestyle modifications, including walking and salt restriction, for three months without achieving his target blood pressure. For patients with Stage 2 hypertension, guidelines recommend the initiation of pharmacotherapy in addition to continued lifestyle changes. While the patient also has Class II obesity (BMI 38 kg/m^2), prediabetes (fasting glucose 104 mg/dL), and dyslipidemia (low HDL, slightly elevated LDL), the most immediate and strongly indicated target for pharmacotherapy in this clinical scenario is his blood pressure. Pharmacotherapy for prediabetes (e.g., metformin) is a consideration for those with a BMI ≥ 35 and age < 60 , but it is generally secondary to lifestyle intervention and is not as urgently mandated as antihypertensive therapy for Stage 2 hypertension. Similarly, while weight loss is essential, pharmacotherapy for obesity (e.g., appetite suppressants) is typically reserved for those who fail to lose weight through intensive lifestyle changes alone. Statin therapy (C) is not indicated for this 28-year-old patient with an LDL of 137 mg/dL, as he does not meet the threshold for primary prevention at his age (typically LDL ≥ 190 mg/dL or presence of diabetes). Tachycardia (B) is likely secondary to his deconditioning and obesity and is not the primary target for initial pharmacotherapy.

Question 91.1

A 22-year-old man comes to the office for evaluation 3 days after his girlfriend was diagnosed with trichomoniasis vaginalis. The patient has not had urethral discharge, dysuria, testicular pain, or genital skin lesions. He has been monogamous with his girlfriend and has been dating her for the past 6 months. He previously had one sexual partner at age 20 years. The patient has not consistently used condoms. He has never had any sexually transmitted diseases. Medical history is unremarkable and he takes no medications. Vital signs are normal. Genitourinary examination discloses no lesions or urethral discharge. Testes are symmetrical without tenderness or masses. There are shotty inguinal lymph nodes. In addition to recommending condom use, which of the following is the most appropriate next step?

- (A) Obtain a urethral swab for potassium hydroxide preparation
- (B) Order urinalysis and urine culture
- (C) Prescribe ceftriaxone and doxycycline therapy
- (D) Prescribe metronidazole therapy
- (E) Reassure the patient that no treatment is necessary

Correct Answer:

(D) Prescribe metronidazole therapy

Neural Consult Response and Explanation:



Answer: D

Explanation: The patient has been exposed to *Trichomonas vaginalis*, a protozoan sexually transmitted infection (STI), through his girlfriend. In the management of trichomoniasis, it is a standard clinical guideline that all sexual partners of the infected individual must be treated simultaneously, regardless of whether they are experiencing symptoms. This is necessary to prevent reinfection of the index patient (the 'ping-pong' effect) and to curb further transmission. Men are frequently asymptomatic carriers of *T. vaginalis*, as seen in this patient, but they can still transmit the parasite. The first-line treatment for trichomoniasis is a nitroimidazole antibiotic, most commonly metronidazole (either as a single 2g dose or a 7-day course). Option (A) is incorrect because KOH preparation is used for fungal elements or bacterial vaginosis, not *Trichomonas*. Option (B) is for urinary tract infections. Option (C) treats gonorrhea and chlamydia, but not trichomoniasis. Option (E) is incorrect because failure to treat the partner leads to high rates of reinfection for the girlfriend and continued spread of the STI.

Question 92.1

A 25-year-old man comes to the office because he has had a "coating" on his tongue during the past 2 weeks and has had an unintentional 4.5-kg (10-lb) weight loss during the past 6 months. He has not had oral pain or difficulty swallowing. Medical history is unremarkable and he takes no medications. He has smoked one pack of cigarettes daily for the past 5 years and he drinks two to three beers weekly. He is sexually active with two male partners and does not consistently use condoms. BMI is 25kg/m². Vital signs are temperature 37.1°C (98.8°F), pulse 83/min, respirations 16/min, and blood pressure 114/74 mm Hg. Oral examination shows a white plaque on the lateral aspect of the tongue bilaterally; an attempt to scrape the lesion from the tongue is unsuccessful. Anterior and posterior cervical lymph nodes are enlarged bilaterally but are mobile and not tender to palpation. The remainder of the physical examination discloses no abnormalities. A rapid HIV test is positive. Results of other laboratory studies are shown:

Blood CD₄ + T-lymphocyte count - 128/mm³

Hematocrit - 36%

Hemoglobin - 12.0 g/dL

WBC - 1400/mm³

Neutrophils, segmented - 79%

Eosinophils - 3%

Lymphocytes - 11%

Monocytes - 7%

Platelet count - 124,000/mm³

Which of the following is the most appropriate clinical intervention at this time?

- (A) Antiretroviral therapy
- (B) Liquid nitrogen therapy applied to the tongue lesions
- (C) Micafungin therapy
- (D) Surgical excision of the tongue lesions
- (E) Systemic chemotherapy with liposomal doxorubicin



Correct Answer:

(A) Antiretroviral therapy

Neural Consult Response and Explanation:

Answer: A

Explanation: The patient presents with a positive rapid HIV test, a CD₄⁺ T-lymphocyte count of 128/mm³ (defining AIDS), and a white plaque on the lateral aspect of the tongue that cannot be scraped off. This clinical presentation is classic for Oral Hairy Leukoplakia (OHL). OHL is a benign condition caused by the Epstein-Barr virus (EBV) and is a common opportunistic manifestation in patients with significant immunosuppression, particularly those with HIV. The most appropriate clinical intervention for this patient is the initiation of antiretroviral therapy (ART). ART is recommended for all individuals with HIV regardless of CD₄ count to reduce morbidity, mortality, and transmission. In the case of OHL, the lesion itself is benign and typically asymptomatic, requiring no specific local treatment; it often resolves spontaneously once immune function is restored via ART. Option (B) and (D) are incorrect because OHL is benign and does not require destructive or surgical intervention. Option (C), micafungin, is an antifungal used for conditions like esophageal candidiasis; however, oral candidiasis (thrush) typically presents as plaques that *can* be scraped off, unlike the lesion described here. Option (E), liposomal doxorubicin, is used for AIDS-related Kaposi sarcoma, which presents as violaceous (purple) macules or nodules, not white plaques.

Question 93.1

A 24-year-old recent college graduate comes to the office because of a 3-year history of increased frequency of urination and occasional incontinence whenever she travels. She says the urinary symptoms typically begin a few days before she is going to fly and they stop the day after she arrives at her destination. She says she is anxious about flying. She reports having had similar but milder symptoms prior to examinations before graduating. Medical history is otherwise unremarkable. Her only medication is an oral contraceptive. Vital signs are normal. Physical examination discloses no abnormalities. Urinalysis and urine culture are normal. Which of the following is the most appropriate next step?

- (A) Recommend behavioral therapy
- (B) Recommend psychoanalytic psychotherapy
- (C) Recommend that the patient avoid any stressful activities that cause the problem
- (D) Review the patient's sexual history
- (E) Reassure the patient that her symptoms will resolve in time

Correct Answer:

(A) Recommend behavioral therapy

Neural Consult Response and Explanation:



Answer: A

Explanation: The patient's clinical presentation is consistent with a specific phobia (situational type, fear of flying) manifesting as anticipatory anxiety and somatic symptoms (urinary frequency and incontinence). Her symptoms are strictly tied to specific stressors—flying and previously examinations—and resolve once the stressor is removed. The physical examination, urinalysis, and urine culture are normal, which effectively rules out organic causes such as urinary tract infection or structural abnormalities. For specific phobias, the most effective and first-line treatment is behavioral therapy, specifically cognitive-behavioral therapy (CBT) incorporating exposure therapy. This approach helps the patient desensitize to the feared stimulus. Psychoanalytic psychotherapy (B) is not the standard of care for specific phobias. Recommending avoidance (C) is counterproductive, as avoidance reinforces the phobic cycle. Reviewing sexual history (D) is not indicated by the patient's history of situational anxiety. Reassurance (E) is inappropriate because specific phobias are typically chronic and unlikely to resolve without targeted intervention.

Question 94.1

A 22-year-old woman comes to the emergency department because of a 5-day history of sore throat and fever. During the past 3 days, she also has noticed a change in her voice and has had increased pain with swallowing. She has been taking acetaminophen since her symptoms began. Medical history is unremarkable and she takes no routine medications. Vital signs are temperature 40.0°C (104.0°F), pulse 130/min, respirations 18/min, and blood pressure 102/66 mm Hg. Pulse oximetry on room air shows an oxygen saturation of 97%. Examination of the oropharynx shows erythema, edema, and anterior displacement of the right side of the soft palate. The uvula is deviated to the left. There is a white exudate on the right tonsil. Trismus is noted. Palpation of the neck discloses enlarged, tender, mobile anterior cervical lymph nodes. In addition to antibiotic therapy, which of the following is the most appropriate management?

- (A) Incision and drainage
- (B) Intravenous methylprednisolone therapy
- (C) Oral nystatin therapy
- (D) Salt water gargle
- (E) Tonsillectomy

Correct Answer:

- (A) Incision and drainage

Neural Consult Response and Explanation:



Answer: A

Explanation: The patient's clinical presentation is classic for a peritonsillar abscess (PTA), also known as quinsy. Key diagnostic features include a severe sore throat, high fever (40.0°C), 'hot potato' voice (implied by the change in voice), odynophagia (pain with swallowing), and trismus (difficulty opening the mouth due to irritation of the pterygoid muscles). The physical examination findings of anterior displacement of the soft palate and contralateral deviation of the uvula (to the left, away from the right-sided swelling) are pathognomonic for PTA. The management of a peritonsillar abscess requires two main components: appropriate antibiotic therapy and drainage of the purulent collection. While antibiotics address the underlying infection, they are often insufficient on their own to penetrate a mature abscess. Therefore, incision and drainage (or needle aspiration) is the most appropriate next step to evacuate the pus and provide rapid symptomatic relief. Intravenous methylprednisolone (B) may be used as an adjunctive therapy to reduce inflammation and speed recovery, but it is not the primary treatment for the abscess itself. Oral nystatin (C) is an antifungal used for candidiasis, which is not the etiology here. Salt water gargles (D) are supportive measures for simple pharyngitis but are inadequate for an abscess. Tonsillectomy (E), specifically 'quinsy tonsillectomy,' is generally reserved for patients with recurrent abscesses, chronic tonsillitis, or those who fail to respond to less invasive drainage methods.

Question 95.1

A 26-year-old man, who is admitted to the hospital to undergo cholecystectomy, bleeds excessively during the procedure and then develops a large wound hematoma. Medical history discloses that he has always tended to bruise excessively with trauma. His wounds oozed blood for 3 days following a dental extraction, which was his only previous surgical procedure. He says that his maternal grandfather and uncle were "bleeders." Initial coagulation studies show a normal platelet count, bleeding time, and prothrombin time. The partial thromboplastin time is moderately prolonged. Which of the following is the most appropriate statement to this patient and his wife regarding their children?

- (A) There is no evidence of a familial coagulation defect
- (B) Half of their daughters will have a clinically evident coagulation disorder
- (C) The sons of their daughters will be at risk for a clinically evident coagulation disorder
- (D) Their sons will be at risk for a clinically evident coagulation disorder
- (E) Their sons and daughters will be at risk for a significant coagulation disorder

Correct Answer:

(C) The sons of their daughters will be at risk for a clinically evident coagulation disorder

Neural Consult Response and Explanation:



Answer: C

Explanation: The patient's clinical presentation (excessive surgical bleeding, bruising, and hematoma) combined with laboratory findings (normal platelet count, normal bleeding time, normal prothrombin time (PT), and a prolonged partial thromboplastin time (PTT)) is classic for a deficiency in the intrinsic pathway of coagulation, most likely Hemophilia A (Factor VIII deficiency) or Hemophilia B (Factor IX deficiency). The family history of 'bleeders' on the maternal side (grandfather and uncle) strongly supports an X-linked recessive inheritance pattern. In X-linked recessive disorders, an affected male (X^hY) passes his Y chromosome to all of his sons and his affected X chromosome (X^h) to all of his daughters. Therefore, all of his sons will be unaffected (inheriting the Y from him and a normal X from their mother), and all of his daughters will be obligate carriers (inheriting the X^h from him and a normal X from their mother). While carrier daughters are typically asymptomatic, they have a 50% chance of passing the affected X chromosome to their own children. Consequently, the sons of these daughters (the patient's grandsons) have a 50% risk of inheriting the disorder and being clinically affected. Option (A) is incorrect because the history and labs strongly suggest a defect. Option (B) is incorrect because daughters will be carriers, not clinically affected (barring rare lyonization). Option (D) is incorrect because sons inherit the Y chromosome from the father. Option (E) is incorrect because sons are not at risk and daughters are generally asymptomatic carriers.

Question 97.1

A 29-year-old woman, gravida 3, para 3, comes to the office because of a 1-year history of recurrent low back pain. Rest and analgesics typically resolve the pain within 2 weeks. However, the pain recurs every 2 to 3 months. Medical history is remarkable for gestational diabetes during her pregnancies. She takes no medications except for an oral contraceptive. She walks 3 miles daily for exercise and works as a sales representative for a computer software company. She is 165 cm (5 ft 5 in) tall and weighs 100 kg (220 lb); BMI is 37 kg/m². Vital signs are normal, and physical examination discloses no abnormalities. Which of the following is the most appropriate next step?

- (A) Administer an epidural injection of methylprednisolone
- (B) Order MRI of the lumbosacral spine
- (C) Order x-rays of the lumbosacral spine
- (D) Recommend beginning a weight loss program
- (E) Recommend decreasing physical activity

Correct Answer:

- (D) Recommend beginning a weight loss program

Neural Consult Response and Explanation:



Answer: D

Explanation: The patient presents with recurrent, non-specific mechanical low back pain that resolves with conservative management (rest and analgesics) and lacks any 'red flag' symptoms or neurological deficits on physical examination. In such cases, clinical guidelines recommend against routine imaging (MRI or X-ray) as it does not improve outcomes and may lead to unnecessary interventions. The patient's BMI of 37 kg/m² (Obesity Class II) is a significant modifiable risk factor that increases mechanical stress on the lumbosacral spine, contributing to the recurrence of her symptoms. Therefore, the most appropriate next step is to address this underlying factor by recommending a weight loss program. Epidural injections (A) are indicated for radiculopathy or spinal stenosis, which are not suggested by her normal exam. Decreasing physical activity (E) is counterproductive, as current guidelines encourage patients with mechanical back pain to remain active, and activity is essential for weight management.

Question 98.1

A 46-year-old woman comes to the office because of a 4-month history of irregular vaginal bleeding that occurs every 2 weeks and lasts 3 to 5 days. Until 5 months ago when she missed a period, her periods had occurred at regular 30-day intervals and lasted for 5 days. She has not had vaginal pain or discharge, headache, dizziness, chest pain, or shortness of breath. Medical history is unremarkable. She takes no medications. Vital signs are temperature 37.0°C (98.6°F), pulse 80/min, respirations 16/min, and blood pressure 120/60 mm Hg. Pelvic examination discloses normal external female genitalia. There is a small amount of blood in the cervical os. Uterus is 10 cm, mobile, anteverted, nontender, and irregular in shape. Adnexa are without masses or tenderness. Hemoglobin concentration is 10.2 g/dL. Which of the following is the most appropriate next step in evaluation?

- (A) Determination of serum thyroid-stimulating hormone and prolactin concentrations
- (B) CT scan of the pelvis
- (C) Endometrial biopsy
- (D) Hysteroscopy with dilatation and curettage
- (E) Trial of hormone replacement therapy

Correct Answer:

(C) Endometrial biopsy

Neural Consult Response and Explanation:



Answer: C

Explanation: The patient is a 46-year-old woman presenting with new-onset abnormal uterine bleeding (AUB) and mild anemia (Hb 10.2 g/dL). In any woman aged 45 years or older who presents with AUB, the primary clinical objective is to rule out endometrial hyperplasia or malignancy. Clinical guidelines specify that endometrial sampling (typically via office endometrial biopsy) is the mandatory first-line diagnostic step in this age group, regardless of other findings. While the physical examination reveals an enlarged (10 cm) and irregularly shaped uterus—findings highly suggestive of leiomyomata (uterine fibroids)—the presence of fibroids does not eliminate the risk of concurrent endometrial pathology. Therefore, a biopsy must be performed before attributing the bleeding solely to fibroids or initiating medical management. Option (A) (TSH and prolactin) may be part of a broader workup for ovulatory dysfunction but is secondary to ruling out cancer. Option (B) (CT scan) is not the preferred imaging modality for the uterus; transvaginal ultrasound would be the initial choice if imaging were prioritized, but it cannot replace tissue sampling. Option (D) (Hysteroscopy with D&C) is more invasive and is generally reserved for cases where an office biopsy is non-diagnostic or symptoms persist despite a negative biopsy. Option (E) (Hormone replacement therapy) is contraindicated until malignancy has been definitively excluded.

Question 99.1

A 36-year-old woman is referred to the office for evaluation of a fasting serum total cholesterol concentration of 249 mg/dL. She has a family history of early coronary artery disease (CAD) and her father died suddenly at age 46 years of myocardial infarction. She tells you that she has never had chest pain. She is not currently sexually active and has no children. The patient works as an advertising executive. She claims that her high-stress lifestyle makes it impossible for her to eat regular meals or to follow a special diet, and she usually eats fast food. She exercises two or three times a week for about 20 minutes on a treadmill. She has smoked one pack of cigarettes daily for the past 20 years. Her only medication is acetaminophen for tension headaches. She is 165 cm (5 ft 5 in) tall and weighs 76 kg (167 lb); BMI is 28 kg/m². Vital signs today are normal. Physical examination discloses no abnormalities except for mild obesity. Institution of which of the following is the most essential step in the prevention of CAD in this patient?

- (A) Biofeedback-based stress reduction program
- (B) More rigorous and consistent exercise program
- (C) Smoking cessation program
- (D) Strict low-calorie diet
- (E) Strict low-fat diet

Correct Answer:

(C) Smoking cessation program

Neural Consult Response and Explanation:



Answer: C

Explanation: The patient presents with multiple modifiable and non-modifiable risk factors for coronary artery disease (CAD), including a significant family history (father died at 46), hypercholesterolemia (249 mg/dL), a 20-pack-year smoking history, a sedentary lifestyle, and a BMI of 28 (overweight). Among the options provided, smoking cessation is the most essential step in preventing CAD. Smoking is a potent, independent risk factor that accelerates atherosclerosis, promotes coronary vasospasm, and increases the risk of thrombosis. Clinical studies consistently demonstrate that smoking cessation provides a more rapid and substantial reduction in the risk of myocardial infarction and cardiovascular mortality than any other single lifestyle modification. While improving diet (D and E), increasing exercise (B), and managing stress (A) are all beneficial components of cardiovascular health, the magnitude of risk reduction achieved by quitting smoking is unparalleled in this clinical scenario.

Question 100.1

A 57-year-old man was admitted to the intensive care unit from the emergency department 3 hours ago for treatment of an acute exacerbation of chronic obstructive pulmonary disease. He was brought to the emergency department by ambulance following a 2-hour history of severe shortness of breath and non-productive cough. Chest x-ray obtained on arrival showed significant air-trapping but no infiltrate. The patient was intubated in the emergency department, but now his ventilator pressure alarm is sounding and his blood pressure is dropping. Medical history is otherwise unremarkable. Medications include ipratropium and prednisone. He has smoked 1 1/2 packs of cigarettes daily for about 40 years. Vital signs are temperature 37.7°C (99.9°F), pulse 106/min, respirations 12/min on intermittent mandatory ventilation, and blood pressure 72/46 mm Hg. Pulse oximetry on 40% FIO₂ shows an oxygen saturation of 91%. He appears obtunded and is poorly responsive. Physical examination shows jugular venous distention in the supine position; trachea is midline. Auscultation of the lungs discloses decreased breath sounds bilaterally with inspiratory and expiratory wheezing and a prolonged expiratory phase. Examination of the upper extremities shows 2+ digital clubbing bilaterally. There is no cyanosis or edema. Which of the following is the most appropriate management?

- (A) Adjustment of the ventilator settings
- (B) Insertion of bilateral chest tubes
- (C) Intravenous dopamine
- (D) Intravenous low-molecular-weight heparin
- (E) 1-L bolus of intravenous 0.9% saline
- (F) Needle decompression

Correct Answer:

- (A) Adjustment of the ventilator settings

Neural Consult Response and Explanation:



Answer: A

Explanation: The patient is presenting with a classic case of dynamic hyperinflation, also known as auto-PEEP, leading to obstructive shock. This occurs in patients with severe airflow obstruction (like COPD) when the expiratory time provided by the mechanical ventilator is insufficient to allow for complete exhalation. This leads to progressive air trapping, which increases intrathoracic pressure. The elevated pressure is transmitted to the mediastinum, compressing the vena cava and decreasing venous return (preload), which results in hypotension, tachycardia, and jugular venous distention (JVD). The high ventilator pressure alarm is triggered by the increased resistance and decreased lung compliance associated with hyperinflation. The physical exam findings of bilateral decreased breath sounds, wheezing, and a midline trachea support this diagnosis over a tension pneumothorax, which would typically present with unilateral absent breath sounds and tracheal deviation. The most appropriate immediate management is to address the ventilator settings to increase expiratory time (e.g., by decreasing the respiratory rate, decreasing the tidal volume, or increasing the inspiratory flow rate). While disconnecting the patient from the ventilator is a common immediate bedside maneuver to confirm auto-PEEP, 'Adjustment of the ventilator settings' is the most appropriate long-term management option provided. Other options like needle decompression (F) or chest tubes (B) would be indicated for tension pneumothorax, and fluid boluses (E) or vasopressors (C) would not address the underlying mechanical cause of the obstructive shock.

Question 101.1

A 32-year-old woman comes to the office because of a 2-week history of burning rectal pain and bleeding. She says, "The pain is like being burned with a hot poker." The pain is at its worst when she has a bowel movement and for approximately 20 minutes after defecation. She rates the pain at its worst as an 8 on a 10-point scale. She has noticed small amounts of bright red blood on the toilet paper when wiping, as well as drops of blood on her underwear. Medical history is unremarkable and she takes no medications. BMI is 28 kg/m². Vital signs are normal. Abdominal examination discloses no abnormalities. The patient has pain during rectal examination. Anoscopy shows a small tear in the anal mucosa. Test of the stool for occult blood is positive. Which of the following is the most appropriate next step in management?

- (A) Colonoscopy
- (B) Excision and drainage
- (C) Internal banding
- (D) Oral docusate
- (E) Sclerotherapy

Correct Answer:

- (D) Oral docusate

Neural Consult Response and Explanation:



Answer: D

Explanation: The patient's clinical presentation is classic for an acute anal fissure. Key features include severe, sharp, 'burning' pain during and after defecation (often described as 'passing shards of glass' or a 'hot poker'), small amounts of bright red blood on the toilet paper, and the visualization of a small tear in the anal mucosa on anoscopy. The duration of two weeks classifies this as an acute fissure (typically defined as lasting less than 6–8 weeks). The primary goal of management for an acute anal fissure is to break the cycle of pain, internal anal sphincter spasm, and ischemia that prevents healing. This is achieved through conservative measures aimed at producing soft, effortless bowel movements. First-line therapy includes increased dietary fiber, increased fluid intake, sitz baths, and the use of stool softeners such as oral docusate (Option D). Docusate is a surfactant that lowers the surface tension of the stool, allowing water to enter more easily, thereby softening the stool and reducing trauma to the anal canal during defecation. Regarding the other options: (A) Colonoscopy is generally not indicated in a young patient (32 years old) with a clear, benign source of rectal bleeding and no 'red flag' symptoms like weight loss, family history of colorectal cancer, or iron deficiency anemia. (B) Excision and drainage is the treatment for a perianal or perirectal abscess, which would present with constant, throbbing pain and a fluctuant mass on exam, rather than pain specifically associated with defecation. (C) Internal banding (rubber band ligation) and (E) Sclerotherapy are procedures used to treat internal hemorrhoids, not anal fissures. While hemorrhoids can also cause bright red rectal bleeding, they are typically painless unless they become thrombosed or prolapsed, and they would not present with a mucosal tear.

Question 103.1

A 16-year-old girl is brought to the office by her mother because she is concerned that she may have contracted meningitis from her soccer teammate, who was diagnosed with meningococcal meningitis and admitted to the hospital yesterday. The patient's soccer team traveled to a neighboring state to participate in a tournament 1 week ago and she shared a hotel room with the girl who was hospitalized. The patient feels well but is concerned she may have "caught the same bug." Medical history is remarkable for asthma. Medications include inhaled albuterol. Vital signs are temperature 37.2°C (98.9°F), pulse 64/min, respirations 16/min, and blood pressure 107/58 mm Hg. Physical examination shows no abnormalities. Which of the following is the most appropriate intervention for this patient at this time?

- (A) Administer the meningococcal vaccine
- (B) Prescribe doxycycline
- (C) Prescribe penicillin
- (D) Prescribe rifampin
- (E) Assure the patient that no anti-infective prophylaxis is necessary

Correct Answer:

- (D) Prescribe rifampin

Neural Consult Response and Explanation:



Answer: D

Explanation: The patient is a close contact of an individual with meningococcal meningitis. Close contacts are defined as those who have had prolonged (>8 hours) exposure to the index case in close proximity (e.g., household members, roommates, or those sharing a hotel room) or direct exposure to respiratory secretions (e.g., kissing, sharing utensils) within the 7 days preceding the onset of the index case's symptoms. In this scenario, the patient shared a hotel room with the teammate 1 week ago, meeting the criteria for a close contact. Chemoprophylaxis is indicated to eradicate nasopharyngeal carriage of *Neisseria meningitidis* and prevent secondary disease. The recommendation is to administer prophylaxis as soon as possible, ideally within 24 hours of diagnosis, but it remains beneficial if given within 14 days of the last exposure. Rifampin (600 mg every 12 hours for 2 days) is a standard first-line agent for chemoprophylaxis. Other options like ciprofloxacin (single dose), ceftriaxone (single IM dose), or azithromycin (single dose) are also effective alternatives, but rifampin is the classic choice provided in the options. (A) The meningococcal vaccine is a routine preventive measure but does not provide immediate protection or eradicate carriage after exposure. (B) Doxycycline and (C) Penicillin are not recommended for meningococcal post-exposure prophylaxis; penicillin is used for treatment but does not reliably clear the carrier state. (E) No prophylaxis is incorrect because the patient's exposure (sharing a room) carries a significantly increased risk of transmission.

Question 104.1

A 27-year-old nulligravid woman comes to the office because of a 1-month history of daily vaginal bleeding associated with lower abdominal pain and, more recently, shortness of breath. Three days ago, she also developed aching pain of her sternum, which she rates as a 10 on a 10-point scale. During the 6 months prior to her current symptoms, the patient's menstrual periods occurred regularly but were heavy in flow. Her current bleeding has required changing her sanitary pad every 2 hours. Medical history is significant for sickle cell anemia. Medications include hydroxyurea (500 mg daily). The patient appears younger than her stated age. She is 162 cm (5 ft 4 in) tall and weighs 54 kg (120 lb); BMI is 21 kg/m². Vital signs are temperature 37.7°C (99.8°F), pulse 99/min, respirations 19/min, and blood pressure 129/79 mm Hg. Auscultation of the chest discloses coarse breath sounds in both lung bases and a grade 2/6 systolic murmur heard best at the second left intercostal space. Results of laboratory studies are shown:

Blood Hematocrit - 18.0%

Hemoglobin - 5.7 g/dL

RBC - 3.8 million/mm³

WBC - 3000/mm³

Reticulocyte count - <0.4% of red cells

Which of the following is the most appropriate management of this patient's sternal pain?

- (A) Exchange transfusion
- (B) Increased dose of hydroxyurea
- (C) Initiation of erythropoietin therapy
- (D) Iron supplementation



(E) Transfusion of packed red blood cells

Correct Answer:

(E) Transfusion of packed red blood cells

Neural Consult Response and Explanation:

Answer: E

Explanation: The patient presents with sickle cell anemia (SCA) and severe symptomatic anemia, characterized by a hemoglobin level of 5.7 g/dL, shortness of breath, and severe sternal pain (10/10). The laboratory findings are particularly notable for a profoundly low reticulocyte count (<0.4%) and leukopenia (WBC 3000/mm³). In a patient with SCA, the reticulocyte count is typically elevated (5–15%) to compensate for chronic hemolysis; a low reticulocyte count in the setting of falling hemoglobin indicates an aplastic crisis (often due to Parvovirus B₁₉) or bone marrow suppression (likely from hydroxyurea toxicity in this case, given the low WBC). The patient's sternal pain and shortness of breath, combined with a systolic flow murmur and coarse breath sounds, suggest acute cardiac decompensation (high-output heart failure) or myocardial ischemia due to the critically low oxygen-carrying capacity. The most appropriate immediate management for symptomatic anemia with a hemoglobin <7 g/dL in the context of an aplastic crisis or bone marrow suppression is the transfusion of packed red blood cells (PRBCs) to restore oxygen delivery. Exchange transfusion (A) is reserved for specific complications like stroke or severe acute chest syndrome and is not indicated for simple aplastic crisis. Increasing hydroxyurea (B) is contraindicated as the patient already shows signs of myelosuppression. Erythropoietin (C) and iron (D) are inappropriate for the acute management of life-threatening symptomatic anemia.

Question 105.1

A 67-year-old man with Parkinson disease is admitted to the hospital for treatment of pneumonia. The patient's daughter, who is visiting the patient, says he has had increased lethargy for the past day and decreased ambulation during the past 6 months. She also says that there are times during the day when his tremors increase in severity, although he continues to care for himself at home. Medical history is also remarkable for hypertension. Medications include hydrochlorothiazide, atenolol, levodopa, and carbidopa. He is 168 cm (5 ft 6 in) tall and weighs 78 kg (172 lb); BMI is 28 kg/m². Vital signs are temperature 38.9°C (102.0°F), pulse 60/min supine and 68/min standing, respirations 22/min, and blood pressure 100/60 mm Hg supine and 80/50 mm Hg standing. The patient appears ill and older than his stated age. He is fully oriented but lethargic. Auscultation of the chest discloses rhonchi in the right mid lung field. Abdominal examination discloses no abnormalities. Neurologic examination discloses masked facies, bradykinesia, and cogwheel rigidity; gait was not assessed on admission. Chest x-ray shows a right lower lobe infiltrate. ECG shows no abnormalities. Appropriate intravenous antibiotic therapy is initiated. Prior to discharge, which of the following is the most appropriate step?

- (A) Obtain CT scan of the chest
- (B) Obtain a swallowing evaluation



- (C) Place a percutaneous endoscopic gastrostomy (PEG) tube
- (D) Prescribe fludrocortisone
- (E) Prescribe prophylactic levofloxacin

Correct Answer:

- (B) Obtain a swallowing evaluation

Neural Consult Response and Explanation:

Answer: B

Explanation: The patient is a 67-year-old man with Parkinson disease (PD) who was admitted for pneumonia, specifically presenting with a right lower lobe infiltrate. In patients with PD, oropharyngeal dysphagia is a common but often under-recognized complication due to impaired coordination of the swallowing muscles. This significantly increases the risk of aspiration pneumonia, which is a leading cause of morbidity and mortality in this population. The clinical presentation—a right lower lobe infiltrate in a patient with neurologic impairment—is highly suggestive of aspiration. Therefore, the most appropriate step prior to discharge is to obtain a formal swallowing evaluation (usually performed by a speech-language pathologist) to assess the safety of oral intake, determine the need for dietary modifications (e.g., thickened liquids, softened foods), and implement compensatory strategies to prevent recurrent aspiration events. While the patient does exhibit orthostatic hypotension (Option D), the first-line management would involve adjusting his current medications (atenolol and hydrochlorothiazide) and ensuring adequate hydration rather than immediately starting fludrocortisone. A PEG tube (Option C) is premature and only considered if a swallowing evaluation demonstrates severe, intractable dysphagia that cannot be managed with less invasive measures. Prophylactic antibiotics (Option E) are not indicated for the prevention of aspiration pneumonia and contribute to antibiotic resistance. A CT scan (Option A) is unnecessary as the diagnosis of pneumonia has already been confirmed by chest x-ray and clinical findings.

Question 106.1

A 47-year-old man is admitted to the hospital through the emergency department because of the sudden onset of palpitations, left-sided chest pain, light-headedness, and shortness of breath that began while he was watching television 2 hours ago. Medical history is remarkable for paroxysmal atrial fibrillation. The patient is 180 cm (5 ft 11 in) tall and weighs 82 kg (180 lb); BMI is 25 kg/m². ECG obtained in the emergency department showed atrial fibrillation with narrow QRS complex. Pulse was 146/min. Physical examination was remarkable for rapid heart rate. The patient was given oxygen via nasal cannula and intravenous metoprolol 5 mg every 5 minutes for a total of 15 mg. His pulse slowed to 90/min. Two hours after admission, he is pain free but his pulse is now 160/min. Blood pressure is 122/78 mm Hg. In order to decrease the patient's pulse, which of the following should be administered intravenously?

- (A) Adenosine
- (B) Digoxin



- (C) Enalapril
- (D) Lidocaine
- (E) Metoprolol

Correct Answer:

- (E) Metoprolol

Neural Consult Response and Explanation:

Answer: E

Explanation: The patient is presenting with atrial fibrillation (AFib) with rapid ventricular response (RVR), characterized by a pulse of 160/min and a narrow QRS complex on ECG. The primary goal in the acute management of stable AFib with RVR is rate control. First-line pharmacological agents for rate control include beta-blockers (such as metoprolol) and non-dihydropyridine calcium channel blockers (such as diltiazem or verapamil). These medications work by slowing conduction through the atrioventricular (AV) node. This patient initially responded to 15 mg of intravenous metoprolol (pulse decreased to 90/min), but the effect was transient as his pulse re-accelerated to 160/min two hours later. Given his stable blood pressure (122/78 mm Hg) and previous positive response to metoprolol, administering additional intravenous metoprolol is the most appropriate next step to achieve sustained rate control. (A) Adenosine is used for the acute termination of paroxysmal supraventricular tachycardias (PSVT) like AVNRT but is not used for rate control in AFib. (B) Digoxin is a second-line agent for rate control; it has a slow onset of action and is less effective in high-adrenergic states (like acute symptomatic AFib). (C) Enalapril is an ACE inhibitor used for hypertension and heart failure, not for heart rate control. (D) Lidocaine is a Class IB antiarrhythmic used for ventricular arrhythmias, not for atrial fibrillation.

Question 107.1

A 23-year-old man comes to the clinic to establish care after moving to the area for his first job since graduating from college. He has felt well. Medical history is remarkable for Hodgkin lymphoma diagnosed 10 years ago, which was treated with radiation therapy and a chemotherapy regimen of vinblastine, doxorubicin, methotrexate, and prednisone. BMI is 20 kg/m². Vital signs are within normal limits. The patient appears well. Physical examination discloses no abnormalities. Which of the following screening studies is most appropriate to include in this patient's annual examinations?

- (A) Bone marrow aspiration and complete blood count
- (B) CT scan of the chest, abdomen, and pelvis
- (C) Echocardiography
- (D) Fine-needle aspiration biopsy of the thyroid gland
- (E) Nerve conduction studies

Correct Answer:

- (C) Echocardiography



Neural Consult Response and Explanation:

Answer: C

Explanation: The patient is a long-term survivor of Hodgkin lymphoma treated with a combination of radiation therapy and doxorubicin (an anthracycline). Both chest radiation and anthracyclines are well-documented causes of late-onset cardiotoxicity, including cardiomyopathy, heart failure, valvular disease, and coronary artery disease. Doxorubicin causes dose-dependent, cumulative damage to the myocardium that may not manifest clinically until many years after the completion of therapy. Current clinical guidelines for cancer survivors recommend periodic screening with echocardiography to monitor left ventricular ejection fraction (LVEF) and detect subclinical heart failure in patients who received these treatments. (A) is incorrect because bone marrow aspiration is an invasive diagnostic procedure, not a screening tool; while the risk of secondary leukemia is increased, it is monitored via CBC, not routine aspiration. (B) is incorrect because annual CT scans of the chest, abdomen, and pelvis are not recommended for routine screening due to the high cumulative radiation dose and lack of evidence for mortality benefit in asymptomatic survivors. (D) is incorrect because fine-needle aspiration (FNA) is a diagnostic tool used to evaluate suspicious thyroid nodules found on physical exam or ultrasound; it is not a primary screening modality itself. (E) is incorrect because nerve conduction studies are used to evaluate symptomatic peripheral neuropathy, not as a routine screening tool for asymptomatic patients, even those previously treated with vinca alkaloids like vinblastine.

Question 108.1

A 5-year-old boy returns to the office with his mother to discuss results of studies done to evaluate his behavior of eating dirt. The patient sits quietly while his mother answers questions about his health. She says her son seems healthy, although he does not seem to be as active as other children his age. He has said his head hurts three or four times during the past 2 weeks. He has not had fever, sweats, or chills. She says he has a good appetite but has had a habit of eating sand and dirt since age 3 years. She says, "I don't know where he gets that habit. I used to eat dirt, but I stopped years ago. I try to stop him from eating dirt, but I'm not around much since I work two jobs." The patient takes no medications. Vaccinations are up-to-date. Height, weight, and BMI are at the 50th percentile. Vital signs are normal. Physical examination discloses no abnormalities except for symmetrical nontender cervical adenopathy. Results of laboratory studies, including serum zinc, lead, and iron concentrations, are within the reference ranges. Serologic testing confirms toxoplasmosis. In addition to prescribing pyrimethamine and sulfadiazine therapy, which of the following is the most appropriate next step in management?

- (A) Prescribe fluoxetine
- (B) Prescribe methylphenidate
- (C) Prescribe risperidone
- (D) Refer the patient to a child psychiatrist
- (E) Refer the patient to a dietician

Correct Answer:

- (D) Refer the patient to a child psychiatrist



Neural Consult Response and Explanation:

Answer: D

Explanation: The patient is a 5-year-old boy presenting with pica (the persistent consumption of non-nutritive, non-food substances), which has resulted in a secondary infection with toxoplasmosis. In children, pica is often associated with nutritional deficiencies (specifically iron and zinc deficiency) or lead poisoning. However, the laboratory results provided indicate that his serum zinc, lead, and iron concentrations are within the reference ranges, effectively ruling out these common medical etiologies. Pica is classified as a Feeding and Eating Disorder in the DSM-5. When medical causes are excluded, the management of pica must focus on behavioral, developmental, and psychosocial factors. The patient's history—specifically his mother's history of pica, her limited presence due to working two jobs, and the child's decreased activity level and quiet demeanor—suggests that a comprehensive psychiatric and developmental evaluation is necessary. A child psychiatrist is the most appropriate specialist to assess for underlying developmental disorders (such as intellectual disability or autism spectrum disorder) and to implement behavioral modification strategies. Options A, B, and C (fluoxetine, methylphenidate, and risperidone) are pharmacological treatments for specific psychiatric conditions (depression/anxiety, ADHD, and irritability in autism, respectively) that have not been diagnosed in this patient. Option E (dietician) is less appropriate because the patient's nutritional markers are normal, indicating the behavior is not driven by a primary nutritional deficit.

Question 109.1

A 55-year-old woman is brought to the office by her husband because of increasingly severe pain in her mid back for the past week. She says the pain is especially severe with walking. Her husband says she has been favoring her right leg for the past 3 days. Ibuprofen no longer controls the pain. She enjoys gardening but had to discontinue it 1 week ago because of the pain. She has not had bowel or bladder dysfunction. She underwent a right mastectomy 3 years ago for carcinoma and has been taking tamoxifen since that time. She is 173 cm (5 ft 8 in) tall and weighs 66 kg (145 lb); BMI is 22 kg/m². Vital signs are temperature 38.0°C (100.4°F), pulse 90/min, respirations 15/min, and blood pressure 118/72 mm Hg. Strength is 3/5 in all muscle groups of the right lower extremity and 5/5 in the left lower extremity. Achilles and patellar reflexes are hyperactive on the right and normal on the left. Sensation to pinprick and temperature is decreased in the left lower extremity to the level of the inguinal ligament. Sensation to vibration is decreased in the right lower extremity. Reflexes and sensation are otherwise intact. Rectal sphincter tone is normal. Which of the following is the most appropriate next step?

- (A) Acetaminophen-oxycodone therapy and referral for physical therapy
- (B) Admission to the hospital for pain control
- (C) Electromyography and nerve conduction studies
- (D) MRI of the thoracic spine
- (E) Technetium 99m scan

Correct Answer:

- (D) MRI of the thoracic spine



Neural Consult Response and Explanation:

Answer: D

Explanation: The patient presents with several 'red flags' for metastatic spinal cord compression (MSCC), an oncologic emergency. Her history of breast cancer (status post mastectomy and currently on tamoxifen) significantly increases the suspicion of spinal metastases. The clinical findings are highly suggestive of a hemicord lesion (Brown-Séquard syndrome) in the thoracic spine: ipsilateral (right-sided) motor weakness and loss of vibration sensation, combined with contralateral (left-sided) loss of pain and temperature sensation. The hyperactive reflexes on the right side are indicative of an upper motor neuron lesion below the level of compression. The sensory level for pain and temperature on the left (inguinal ligament, L₁) suggests a lesion several segments higher in the thoracic spine, which correlates with her reported mid-back pain. MRI of the spine is the gold standard and most appropriate next step because it provides the highest sensitivity and specificity for visualizing the spinal cord, identifying the level of compression, and evaluating the extent of metastatic involvement. While a Technetium 99m bone scan (Option E) can identify areas of increased bone turnover, it cannot visualize the spinal cord or provide the anatomical detail necessary to diagnose cord compression. Options A and B are inappropriate as they focus on symptomatic management rather than addressing the underlying emergency, and Option C is used for peripheral nerve disorders, not central cord compression.

Question 110.1

A 7-year-old boy with sickle cell disease is brought to the office by his father because of fever and bone pain. The father says that his son was discharged 5 days ago after a 3-day hospitalization for the same symptoms. The patient had been admitted with a diagnosis of vaso-occlusive crisis with bone infarct, with resolution of symptoms after treatment with intravenous fluids, narcotics, and antibiotic therapy for 3 days. Blood cultures were negative. The patient's back pain and fever recurred 2 days ago and seem more severe than prior to the hospitalization. His medical chart shows that he had one other uncomplicated hospital admission at age 4 years for a vaso-occlusive crisis with lower extremity bone pain. Vital signs today are temperature 39.2°C (102.5°F), pulse 110/min, respirations 24/min, and blood pressure 115/60 mm Hg. The patient is uncomfortable but does not appear toxic. Cardiac examination discloses a grade 2/6 systolic ejection murmur at the left lower sternal border. Spleen is not palpated. There is considerable tenderness over the L₁–L₃ region of the back without fluctuation. There is diffuse pain in both thighs without localization, but range of motion is normal. Which of the following studies is most likely to establish the diagnosis at this time?

- (A) Blood culture
- (B) CT scan of the spine
- (C) MRI of the lumbar spine
- (D) Ultrasonography of the spine
- (E) X-ray of the spine

Correct Answer:

(C) MRI of the lumbar spine



Neural Consult Response and Explanation:

Answer: C

Explanation: The clinical presentation of this 7-year-old boy with sickle cell disease (SCD) is highly suspicious for osteomyelitis. Key features include a high fever (39.2°C), localized bone tenderness over the L₁–L₃ vertebrae, and the recurrence of symptoms shortly after a brief 3-day course of antibiotics and discharge for a presumed vaso-occlusive crisis (VOC). While VOC and bone infarction are common in SCD, the severity of the fever and the specific localization to the spine after a partially treated episode strongly point toward an infectious process like osteomyelitis, commonly caused by *Salmonella* or *Staphylococcus aureus* in this population. MRI of the lumbar spine is the most sensitive and specific imaging modality for diagnosing osteomyelitis, particularly in the vertebral column. It is superior to other imaging because it can detect early bone marrow edema and soft tissue involvement long before changes appear on plain X-rays (which can take 10–14 days). While blood cultures (A) are an essential part of the workup, they are only positive in approximately 50% of osteomyelitis cases and were previously negative in this patient. CT scans (B) are better for evaluating cortical bone destruction but are less sensitive than MRI for early marrow changes. Ultrasonography (D) has limited utility in the spine, and X-rays (E) are likely to be normal in the early stages of the disease. Therefore, MRI is the study most likely to establish the diagnosis.

Question 111.1

A 7-year-old boy with sickle cell disease is brought to the office by his father because of fever and bone pain. The father says that his son was discharged 5 days ago after a 3-day hospitalization for the same symptoms. The patient had been admitted with a diagnosis of vaso-occlusive crisis with bone infarct, with resolution of symptoms after treatment with intravenous fluids, narcotics, and antibiotic therapy for 3 days. Blood cultures were negative. The patient's back pain and fever recurred 2 days ago and seem more severe than prior to the hospitalization. His medical chart shows that he had one other uncomplicated hospital admission at age 4 years for a vaso-occlusive crisis with lower extremity bone pain. Vital signs today are temperature 39.2°C (102.5°F), pulse 110/min, respirations 24/min, and blood pressure 115/60 mm Hg. The patient is uncomfortable but does not appear toxic. Cardiac examination discloses a grade 2/6 systolic ejection murmur at the left lower sternal border. Spleen is not palpated. There is considerable tenderness over the L₁–L₃ region of the back without fluctuation. There is diffuse pain in both thighs without localization, but range of motion is normal.

MRI of the spine confirms the diagnosis. Which of the following is the most appropriate initial intravenous pharmacotherapy?

- (A) Ceftriaxone
- (B) Cephalothin and clarithromycin
- (C) Clindamycin and gentamicin
- (D) Nafcillin
- (E) Vancomycin and cefotaxime

Correct Answer:



(E) Vancomycin and cefotaxime

Neural Consult Response and Explanation:

Answer: E

Explanation: The clinical presentation of a child with sickle cell disease (SCD) presenting with fever, localized bone pain (L_1-L_3), and a recurrence of symptoms after a brief hospitalization strongly suggests osteomyelitis. In patients with SCD, the most common causative organisms for osteomyelitis are *Salmonella* species and *Staphylococcus aureus*. Unlike the general population where *S. aureus* is the predominant pathogen, SCD patients have a uniquely high susceptibility to *Salmonella* osteomyelitis, likely due to functional asplenia and microinfarcts in the bowel that allow for bacterial translocation. Given the patient's recent hospitalization and the failure of previous (unspecified) antibiotic therapy, empiric treatment must be broad enough to cover both *Salmonella* and *S. aureus*, including methicillin-resistant *S. aureus* (MRSA). Vancomycin is the preferred agent for empiric MRSA coverage in the setting of osteomyelitis. Cefotaxime (or ceftriaxone) is a third-generation cephalosporin that provides excellent coverage against *Salmonella* and other Gram-negative bacilli. Therefore, the combination of Vancomycin and Cefotaxime (Option E) provides the most appropriate initial coverage. Other options are insufficient: Ceftriaxone alone (A) and Nafcillin (D) do not cover MRSA; Cephalothin and Clarithromycin (B) do not provide adequate coverage for *Salmonella* or MRSA; and while Clindamycin and Gentamicin (C) could potentially cover these organisms, Gentamicin is less preferred in children due to its side-effect profile (nephrotoxicity/ototoxicity) when safer alternatives like third-generation cephalosporins are available.

Question 112.1

A 24-year-old man comes to the emergency department because of right lower quadrant abdominal pain and nausea that began suddenly 6 hours ago. He rates the pain as a 6 on a 10-point scale and asks for pain medication. Medical history is unremarkable. He takes only a multivitamin. Vital signs on arrival are temperature 38.7°C (101.6°F), pulse 105/min, respirations 16/min, and blood pressure 110/85 mm Hg. Physical examination discloses exquisite tenderness in the right lower quadrant of the abdomen. The remainder of the examination discloses no abnormalities. The surgical consultant cannot evaluate the patient for 2 hours. Which of the following is the most appropriate next step?

- (A) Administer acetaminophen
- (B) Administer gabapentin
- (C) Administer lorazepam
- (D) Administer morphine
- (E) Explain to the patient that analgesics would interfere with the surgical examination

Correct Answer:

- (D) Administer morphine

Neural Consult Response and Explanation:



Answer: D

Explanation: The patient presents with classic signs and symptoms of acute appendicitis, including sudden-onset right lower quadrant (RLQ) pain, nausea, fever (38.7°C), tachycardia (105/min), and exquisite RLQ tenderness. He is reporting significant pain (6/10) and requesting medication. Historically, it was believed that administering analgesics to patients with an acute abdomen would 'mask' physical findings and lead to a delay in diagnosis or surgical errors. However, modern clinical guidelines and multiple studies have debunked this myth. Providing prompt pain relief with opioids, such as morphine, does not interfere with the clinical examination or the ability of a surgeon to diagnose acute abdominal conditions; in some cases, it may even facilitate a better examination by reducing voluntary guarding. Morphine is a standard and appropriate agent for managing severe acute pain in the emergency department. Acetaminophen (A) is likely insufficient for the level of pain described. Gabapentin (B) is used for neuropathic or chronic pain, and lorazepam (C) is an anxiolytic, not an analgesic. Option (E) is incorrect because it relies on an outdated clinical practice that is no longer supported by evidence.

Question 114.1

A 74-year-old man who had a stroke 2 years ago is admitted to the hospital from the nursing care facility because of a 4-day history of reduced urinary output, and worsening abdominal pain, nausea, and lethargy. The stroke had resulted in right-sided hemiparesis and difficulties with speech and swallowing. Medical history is also significant for hypertension. The patient has been hospitalized twice during the past 3 months for pneumonias that did not respond to oral antibiotic therapy in the nursing facility. He underwent bladder catheterization during each of the recent hospitalizations for a total of 6 days to monitor urine output. The catheter was removed prior to each discharge. Bladder catheterization attempts during the past several days in response to his current symptoms have been unsuccessful. Now on admission, the patient appears agitated and confused. Vital signs are temperature 36.9°C (98.4°F), pulse 110/min, respirations 24/min, and blood pressure 160/100 mm Hg. Physical examination discloses jugular venous distention, 8 cm at 45 degrees. Lungs are clear to auscultation. Auscultation of the heart discloses regular tachycardia with no gallops. There is fullness and tenderness to palpation of the low central abdomen but no rebound or guarding. Examination of the extremities shows 1+ pedal edema bilaterally. The prostate is normal in size and has no palpable nodules or tenderness. Results of laboratory studies are shown:

Serum Urea nitrogen - 73 mg/dL

Creatinine - 4.2 mg/dL

Calcium - 8.6 mg/dL

Na⁺ - 134 mEq/L

K⁺ - 5.6 mEq/L

Cl⁻ - 100 mEq/L

HCO₃⁻ - 20 mEq/L

Mg₂⁺ - 2.0 mEq/L

Glucose - 126 mg/dL

Phosphorus - 4.8 mEq/L

Blood Hematocrit - 32%



Hemoglobin - 10.6 g/dL
WBC - 8200/mm³
Platelet count - 359,000/mm³

Ultrasonography shows distention of the bladder and bilateral hydronephrosis. ECG shows sinus tachycardia. Which of the following is the most appropriate next step?

- (A) Administration of bethanechol
- (B) Administration of prazosin
- (C) Hemodialysis
- (D) Placement of a suprapubic catheter
- (E) Ultrafiltration

Correct Answer:

- (D) Placement of a suprapubic catheter

Neural Consult Response and Explanation:

Answer: D

Explanation: The patient presents with acute-on-chronic post-renal acute kidney injury (AKI) caused by bladder outlet obstruction. This is evidenced by the 4-day history of reduced urinary output, suprapubic fullness/tenderness, and ultrasound findings of a distended bladder and bilateral hydronephrosis. The patient's agitation, confusion, and elevated BUN (73 mg/dL) suggest uremic encephalopathy, while the JVD and pedal edema indicate fluid overload. The most critical next step in managing post-renal AKI is the immediate relief of the obstruction to allow for urinary decompression. The clinical history reveals that multiple attempts at urethral catheterization have failed. In the setting of bladder outlet obstruction where a transurethral catheter cannot be passed—often due to urethral strictures (a common complication of previous catheterizations, which this patient had during recent hospitalizations)—the most appropriate next step is the placement of a suprapubic catheter. Relieving the obstruction is likely to initiate post-obstructive diuresis, which can rapidly improve the patient's hyperkalemia (5.6 mEq/L), fluid overload, and uremic symptoms. While the patient has indications that might eventually require hemodialysis (Option C) or ultrafiltration (Option E), such as uremia and fluid overload, these are secondary to the obstruction. Decompression is the primary treatment and should be attempted first. Bethanechol (Option A) is contraindicated in mechanical obstruction, and Prazosin (Option B) is insufficient for an acute, complete obstruction where catheterization has already failed.

Question 115.1

A 47-year-old man comes to the emergency department because of a 3-day history of increasing pain, tenderness, and swelling near the fingernail of his right index finger. He rates the pain as an 8 on a 10-point scale. He has not had fever or chills, and he has not sustained any trauma to the finger. Medical history is unremarkable and the patient takes no medications. He appears generally well and is not in distress. Vital signs are temperature 37.1°C (98.8°F), pulse 72/min, respirations 14/min, and



blood pressure 120/80 mm Hg. Physical examination of the right hand discloses swelling, erythema, warmth, and tenderness of the periungual region of the right index finger. There is a mildly fluctuant area near the nail edge. The remainder of the physical examination discloses no abnormalities. Which of the following is the most appropriate next step in management?

- (A) Incision and drainage
- (B) Oral cefazolin therapy
- (C) Topical neomycin therapy
- (D) Warm-water soaks

Correct Answer:

- (A) Incision and drainage

Neural Consult Response and Explanation:

Answer: A

Explanation: The patient presents with classic signs of acute paronychia, which is an infection of the periungual tissues of the finger. The key physical examination finding is a 'mildly fluctuant area near the nail edge.' Fluctuance indicates the presence of a localized collection of pus, or an abscess. The standard of care for any cutaneous abscess, including a paronychia with abscess formation, is incision and drainage (I&D). While early paronychia without fluctuance can be managed with conservative measures such as warm-water soaks (Choice D) and topical or oral antibiotics, the development of fluctuance necessitates physical drainage to resolve the infection and provide pain relief. Oral cefazolin (Choice B) is typically administered intravenously, and even if an oral cephalosporin were used, it would be adjunctive to, not a replacement for, drainage in the setting of an abscess. Topical neomycin (Choice C) is insufficient for treating a deep-seated infection of this nature. Therefore, incision and drainage is the most appropriate next step.

Question 116.1

A 12-year-old girl with type 1 diabetes mellitus is brought to the emergency department by her parents because of a 2-day history of nausea, vomiting, and decreased oral intake. Medications are insulin glargine and insulin aspart. She decreased her insulin dose at the onset of symptoms but her condition has since worsened and she now is unable to consume solids or liquids without subsequent vomiting. She reports feeling dizzy on standing. Medical history is otherwise unremarkable. She is at the 50th percentile for height, weight, and BMI. Vital signs are temperature 37.8°C (100.1°F), pulse 118/min, respirations 27/min, and blood pressure 85/47 mm Hg. Pulse oximetry on room air shows an oxygen saturation of 99%. Physical examination discloses dry mucous membranes, delayed capillary refill time, and poor skin turgor. Palpation of the abdomen discloses diffuse tenderness with no rebound or guarding. The remainder of the physical examination discloses no abnormalities. Results of laboratory studies obtained on arrival are shown:

Serum Urea nitrogen - 28 mg/dL

Creatinine - 1.2 mg/dL



Na⁺ - 126 mEq/L
K⁺ - 4.3 mEq/L
Cl⁻ - 95 mEq/L
HCO₃⁻ - 9 mEq/L
Glucose - 563 mg/dL

Arterial blood gas values on room air HCO₃⁻ 10 mEq/L
Partial Pressure of Oxygen - 98 mm Hg
Partial Pressure of Carbon Dioxide - 22 mm Hg
pH - 7.20

Boluses of intravenous 0.9% saline are administered and an infusion of insulin is initiated. Three hours later the patient becomes somnolent and develops a headache. She has had one episode of emesis and one episode of incontinence. Her urine output has been 30 mL/h. Results of follow-up serum laboratory studies are shown:

Urea nitrogen - 24 mg/dL
Creatinine - 1.1 mg/dL
Na⁺ - 127 mEq/L
K⁺ - 3.7 mEq/L
Cl⁻ - 98 mEq/L
HCO₃⁻ - 11 mEq/L
Glucose - 287 mg/dL

Which of the following is the most appropriate intravenous pharmacotherapy?

- (A) Bicarbonate
- (B) Dexamethasone
- (C) 50% Dextrose
- (D) Furosemide
- (E) Mannitol

Correct Answer:

(E) Mannitol

Neural Consult Response and Explanation:



Answer: E

Explanation: The clinical presentation is highly diagnostic of cerebral edema, the most serious complication of diabetic ketoacidosis (DKA) treatment in children and adolescents. This 12-year-old girl presented with severe DKA (hyperglycemia, metabolic acidosis, and clinical dehydration). After three hours of appropriate fluid resuscitation and insulin therapy, she developed classic signs of increased intracranial pressure (ICP): headache, somnolence, vomiting, and incontinence. Risk factors for cerebral edema in this patient include her young age, the severity of her initial acidosis (pH 7.20, HCO_3^- 9), and a significant drop in blood glucose (from 563 to 287 mg/dL). Furthermore, her corrected sodium failed to rise as the glucose level fell (Initial corrected Na \approx 133.4 mEq/L; Follow-up corrected Na \approx 130 mEq/L), which is a known warning sign for cerebral edema. The management of DKA-associated cerebral edema must be initiated immediately upon clinical suspicion and involves osmotic therapy. Mannitol (Option E) is a first-line osmotic agent used to reduce ICP by creating an osmotic gradient that draws water out of the brain parenchyma. Hypertonic saline (3%) is an alternative. (A) Bicarbonate is not indicated as her pH is above 6.9 and its use is actually associated with an increased risk of cerebral edema. (B) Dexamethasone is used for vasogenic edema (e.g., tumors) but is not effective for the edema seen in DKA. (C) 50% Dextrose is used for hypoglycemia, but the patient's glucose is still 287 mg/dL. (D) Furosemide is a loop diuretic that would worsen the patient's volume status and is not a treatment for ICP in this context.

Question 117.1

A 54-year-old woman, gravida 2, para 2, comes to the office because of a 4-month history of hot flushes that awaken her from sleep on most nights. She also reports increased irritability during this time. She has not had fever, shortness of breath, or cough. She says her appetite has been good and her weight has been stable. Medical history is remarkable for hysterectomy done 5 years ago for symptomatic leiomyomata uteri. The patient takes calcium and vitamin D supplements. She has never smoked cigarettes. She drinks one glass of wine 1 night weekly. She is 165 cm (5 ft 5 in) tall and weighs 48 kg (106 lb); BMI is 18 kg/m^2 . Vital signs are temperature 37.0°C (98.6°F), pulse 66/min, respirations 12/min, and blood pressure 108/64 mm Hg. Physical examination discloses no abnormalities. Screening PPD skin test shows 15 mm of induration. Chest x-ray shows densities consistent with granulomata. Which of the following pharmacotherapies is most likely to alleviate this patient's symptoms?

- (A) Clonidine
- (B) Conjugated estrogen
- (C) Fluoxetine
- (D) Isoniazid and rifampin
- (E) Raloxifene

Correct Answer:

- (B) Conjugated estrogen

Neural Consult Response and Explanation:



Answer: B

Explanation: The patient is a 54-year-old woman presenting with classic vasomotor symptoms (hot flushes awakening her from sleep) and mood changes (irritability), which are hallmarks of the menopausal transition. The most effective treatment for moderate-to-severe vasomotor symptoms (VMS) is Menopausal Hormone Therapy (MHT). Because the patient has previously undergone a hysterectomy, she can safely receive estrogen-only therapy (e.g., conjugated estrogen) without the need for a progestogen to protect against endometrial hyperplasia. While the patient's PPD skin test (15 mm induration) and chest X-ray (granulomata) suggest latent tuberculosis (LTBI), her lack of fever, stable weight, and absence of cough indicate that her 'night sweats' are more likely menopausal hot flushes rather than constitutional symptoms of active tuberculosis. Therefore, isoniazid and rifampin (Option D) would treat the latent infection but would not alleviate her current symptoms. Fluoxetine (Option C) and clonidine (Option A) are non-hormonal alternatives for VMS but are significantly less effective than estrogen. Raloxifene (Option E), a selective estrogen receptor modulator used for osteoporosis, is known to actually worsen vasomotor symptoms and is therefore contraindicated for this patient's primary complaint.

Question 119.1

A 55-year-old woman, gravida 1, para 1, comes to the office because she is concerned that she has continued to have regular menses while her friends of the same age have gone through menopause. She reports having her usual premenstrual breast tenderness and menstrual cramping. She has not had change in flow, intermenstrual spotting, hot flushes, or night sweats. Medical history is unremarkable. She takes no medications. She does not smoke cigarettes. She drinks one glass of wine each evening. Her last menstrual period occurred 3 weeks ago. Screening mammogram obtained 1 year ago and all previous Pap smears, including her most recent Pap smear 2 years ago, have shown no abnormalities. Her 50-year-old sister also has not gone through menopause. The patient does not exercise. She is 157 cm (5 ft 2 in) tall and weighs 80 kg (176 lb); BMI is 32 kg/m². Vital signs are normal. Physical examination discloses adiposity of the abdomen. Pelvic examination discloses pink and rugose vaginal walls and a small uterus. The remainder of the physical examination discloses no abnormalities. Which of the following is the most appropriate next step to address the patient's continued menstruation?

- (A) Order fine-needle biopsy of the endometrium
- (B) Order pelvic ultrasonography
- (C) Order serum estradiol and follicle-stimulating hormone concentrations
- (D) Provide reassurance that she is simply still premenopausal
- (E) Recommend losing weight to help facilitate the onset of menopause
- (F) Recommend monthly leuprolide acetate injections for a 3-month duration
- (G) Refer the patient to an endocrinologist

Correct Answer:

- (D) Provide reassurance that she is simply still premenopausal



Neural Consult Response and Explanation:

Answer: D

Explanation: The patient is a 55-year-old woman who is concerned about her continued regular menstruation. The average age of menopause is 51, with a normal range typically between 45 and 55 years. Although she is at the upper limit of this range, her cycles remain regular and are accompanied by menses (premenstrual breast tenderness and menstrual cramping), which are strong indicators of ovulatory cycles. In ovulatory cycles, the production of progesterone during the luteal phase helps protect the endometrium from the proliferative effects of estrogen, significantly reducing the risk of endometrial hyperplasia and cancer compared to states of unopposed estrogen. While obesity (BMI 32) and late menopause are risk factors for endometrial cancer, the standard clinical guideline (e.g., from ACOG) for performing an endometrial biopsy in women over age 45 is the presence of abnormal uterine bleeding (AUB). AUB is defined as bleeding that is abnormal in frequency, regularity, duration, or volume. This patient's menses are described as regular, with no change in flow or intermenstrual spotting, and her physical examination (small uterus, rugose vaginal walls) is normal. Therefore, she does not meet the criteria for AUB, and the most appropriate next step is to provide reassurance that she is still within the normal (though late) physiological range for menopause.

Question 120.1

A 25-year-old man comes to the emergency department because he developed chest pain and shortness of breath 1 hour ago, shortly after snorting cocaine for the first time. He rates the chest pain as a 7 on a 10-point scale and notes that the pain is radiating down his left arm. Medical history is unremarkable and the patient takes no medications or any other illicit drugs. He is 178 cm (5 ft 10 in) tall and weighs 70 kg (154 lb); BMI is 22 kg/m². The patient is diaphoretic. Vital signs are temperature 37.5°C (99.5°F), pulse 110/min, respirations 16/min, and blood pressure 200/100 mm Hg. Pulse oximetry on room air shows an oxygen saturation of 95%. Pupils are equal, round, and reactive to light and accommodation. Lungs are clear to auscultation and percussion. Auscultation of the heart discloses an audible S₁ and S₂. There is no edema, cyanosis, or clubbing of the digits. The patient is fully oriented. He is treated with supplemental oxygen, a 325-mg aspirin tablet, and intravenous nitroglycerin and lorazepam. Despite therapy, he continues to have chest pain and shortness of breath. ECG shows sinus tachycardia with no ST-segment or T-wave abnormalities. Which of the following is the most appropriate additional pharmacotherapy to initiate at this time?

- (A) Carvedilol
- (B) Furosemide
- (C) Metoprolol
- (D) Phentolamine
- (E) Streptokinase

Correct Answer:

- (D) Phentolamine



Neural Consult Response and Explanation:

Answer: D

Explanation: The patient is presenting with cocaine-induced chest pain and a hypertensive emergency (BP 200/100 mmHg). Cocaine acts by blocking the presynaptic reuptake of norepinephrine, dopamine, and serotonin, leading to an excess of these catecholamines in the synaptic cleft. This results in intense stimulation of both alpha- and beta-adrenergic receptors. Alpha-1 receptor stimulation causes profound peripheral and coronary vasoconstriction, leading to hypertension and myocardial ischemia. Initial management of cocaine-induced cardiovascular toxicity includes benzodiazepines (like lorazepam) to reduce central sympathetic outflow and nitroglycerin to promote vasodilation. This patient has received both, as well as aspirin, but remains symptomatic with persistent chest pain and severe hypertension. In cases of cocaine-induced hypertension or chest pain that is refractory to benzodiazepines and nitrates, phentolamine is the most appropriate next step. Phentolamine is a non-selective alpha-adrenergic antagonist that directly reverses the alpha-mediated vasoconstriction caused by cocaine. (A) and (C) are incorrect because beta-blockers (even mixed alpha/beta-blockers like carvedilol) are traditionally avoided in the acute phase of cocaine toxicity due to the risk of 'unopposed alpha-stimulation,' which can worsen vasoconstriction and hypertension. (B) Furosemide is indicated for volume overload, which is not present here (lungs are clear). (E) Streptokinase is a thrombolytic used for ST-elevation myocardial infarction (STEMI); this patient's ECG is normal, and thrombolytics are not indicated.

Question 121.1

A 70-year-old man, who was admitted to the hospital 3 days ago for treatment of pneumonia, has now developed diarrhea and severe lower abdominal cramping. The patient has passed watery and yellow stools every 2 hours for the past 12 hours. Since admission, the patient has been treated with intravenous levofloxacin therapy and albuterol/ipratropium nebulizers every 4 hours, with only mild improvement of his respiratory symptoms. Medical history is also significant for hypertension, type 2 diabetes mellitus, and hyperlipidemia. Routine medications include rosiglitazone, amlodipine, and atorvastatin. He has smoked one pack of cigarettes daily for the past 50 years. BMI is 20 kg/m². Vital signs are temperature 36.7°C (98.0°F), pulse 102/min, respirations 16/min, and blood pressure 100/50 mm Hg. Pulse oximetry on room air shows an oxygen saturation of 93%. Physical examination discloses dry mucous membranes and cracked lips. Lungs are clear to auscultation bilaterally. Cardiac examination discloses a tachycardic but regular rhythm. Abdomen is diffusely tender to palpation with no distention, rebound, or guarding. Test of the stool for occult blood is negative. Results of serum laboratory studies are shown:

Urea nitrogen - 30 mg/dL

Creatinine - 1.5 mg/dL

Calcium - 8.2 mg/dL

Na⁺ - 150 mEq/L

K⁺ - 3.7 mEq/L

Cl⁻ - 115 mEq/L

HCO₃⁻ - 22 mEq/L

Glucose - 120 mg/dL



Stool culture is obtained. Intravenous infusion of which of the following substances is the most appropriate next step?

- (A) Bicarbonate
- (B) Calcium gluconate
- (C) 5% Dextrose in water
- (D) 0.9% Saline

Correct Answer:

- (D) 0.9% Saline

Neural Consult Response and Explanation:

Answer: D

Explanation: The patient presents with clinical signs of severe hypovolemia and potential hypovolemic shock, likely due to *Clostridioides difficile* infection (suggested by watery diarrhea and recent levofloxacin use). Key indicators of hemodynamic instability include hypotension (100/50 mm Hg), tachycardia (102/min), and physical signs of dehydration (dry mucous membranes, cracked lips). Laboratory findings support this with a BUN/creatinine ratio of 20:1 (30 mg/dL / 1.5 mg/dL), which is characteristic of pre-renal azotemia. While the patient is hypernatremic (Na^+ 150 mEq/L), the immediate priority in a hypotensive patient is the restoration of intravascular volume to maintain organ perfusion. Isotonic crystalloids, such as 0.9% saline, are the first-line treatment for rapid volume expansion. Although 0.9% saline has a sodium concentration of 154 mEq/L (slightly higher than the patient's current level), it is the most effective choice among the options provided to stabilize blood pressure. 5% Dextrose in water (Option C) is hypotonic and would rapidly distribute into the intracellular space, making it ineffective for emergency volume resuscitation; it is used only after hemodynamic stability is achieved to correct a free water deficit. Bicarbonate (Option A) is not indicated as the bicarbonate level is within the normal range (22 mEq/L). Calcium gluconate (Option B) is used for hyperkalemia or hypocalcemia, neither of which is present (K^+ 3.7 mEq/L, Ca_2^+ 8.2 mg/dL).

Question 122.1

A 3-week-old male infant is brought to the office by his mother because of a 2-day history of white lesions in the mouth. The infant was born at term via uncomplicated spontaneous vaginal delivery; he has been breast-feeding well and is urinating and having bowel movements normally. At birth, he weighed 3289 g (7 lb 4 oz; 30th percentile). Today, he weighs 3629 kg (8 lb; 25th percentile). He appears adequately hydrated. Vital signs are normal. Physical examination discloses white patches on the tongue and buccal mucosa that do not come off when gently scraped with a tongue blade. Which of the following is the most appropriate pharmacotherapy?

- (A) Acyclovir
- (B) Fluconazole



- (C) Nystatin
- (D) Valacyclovir
- (E) No pharmacotherapy is necessary

Correct Answer:

- (C) Nystatin

Neural Consult Response and Explanation:

Answer: C

Explanation: The clinical presentation of white, curd-like patches on the tongue and buccal mucosa that cannot be scraped off with a tongue blade is classic for oropharyngeal candidiasis, commonly known as oral thrush. This condition is frequently seen in infants and is caused by an overgrowth of *Candida albicans*. In a healthy, thriving infant who is feeding well and shows no signs of systemic illness, the first-line treatment is a topical antifungal agent. Nystatin oral suspension is the standard initial pharmacotherapy; it is applied directly to the oral mucosa and works through local contact with the fungal cell walls, with minimal systemic absorption. Acyclovir (A) and Valacyclovir (D) are antiviral medications used for conditions like herpes simplex virus, which would typically present with painful vesicles or ulcers rather than white plaques. Fluconazole (B) is a systemic antifungal medication that is generally reserved for more severe, extensive, or refractory cases of candidiasis. While some very mild cases of thrush may resolve without intervention, pharmacotherapy (E) is indicated in this patient to prevent discomfort and ensure continued successful breastfeeding.

Question 123.1

A 55-year-old man is brought to the emergency department by his wife because he told her he did not want to live anymore. During the past 6 weeks, he has experienced fatigue, loss of interest in usual activities, a 7-kg (15-lb) weight loss, and insomnia. He has no history of serious medical or psychiatric illness. Vital signs are temperature 37.0°C (98.6°F), pulse 80/min, respirations 16/min, and blood pressure 140/82 mm Hg. Physical examination discloses no abnormalities. Beck Depression Inventory score is 35 (severely depressed). He says he feels guilty that his investments have not done well and that he has ruined his family finances. He reports he hears voices at night telling him he has sinned. In addition to olanzapine, which of the following is the best treatment option for this patient?

- (A) Divalproex
- (B) Fluoxetine
- (C) Lamotrigine
- (D) Lithium carbonate
- (E) No other therapy is necessary

Correct Answer:



(B) Fluoxetine

Neural Consult Response and Explanation:

Answer: B

Explanation: The patient presents with symptoms of Major Depressive Disorder (MDD), including fatigue, anhedonia, significant weight loss, insomnia, and suicidal ideation lasting for 6 weeks. Furthermore, he exhibits psychotic features, specifically mood-congruent delusions (guilt over finances) and auditory hallucinations (voices telling him he has sinned). This clinical picture confirms a diagnosis of Major Depressive Disorder with Psychotic Features. The standard of care for MDD with psychotic features is either electroconvulsive therapy (ECT) or the combination of an antidepressant and an antipsychotic. Antipsychotic monotherapy or antidepressant monotherapy is significantly less effective than combination therapy. Since the patient is already being treated with olanzapine (an atypical antipsychotic), the best next step is to add an antidepressant. Fluoxetine, a Selective Serotonin Reuptake Inhibitor (SSRI), is a first-line antidepressant choice for this combination. Divalproex (A), Lamotrigine (C), and Lithium (D) are mood stabilizers primarily used in the management of bipolar disorder or as augmentation strategies in treatment-resistant non-psychotic depression, but they are not the first-line addition for psychotic depression.

Question 124.1

A 78-year-old man, who underwent coronary angiography with stent placement 8 years ago, comes to the office for a routine health maintenance examination. The patient reports no new symptoms except for shortness of breath and fatigue during exercise that began 3 months ago when he tried to increase the distance of his daily walk from 1 mile to 3 miles. He has not had orthopnea, paroxysmal nocturnal dyspnea, or chest pain. Additional medical history is significant for hypertension, coronary artery disease, dyslipidemia, and polymyalgia rheumatica. The patient also has a heart murmur that was discovered at an armed forces screening physical examination at age 18 years, but it did not prevent him from serving in the military. Medications are metoprolol, atorvastatin, lisinopril, omeprazole, and a low dose of prednisone every other day. The patient is active and manages a small farm. BMI is 26 kg/m². Vital signs are temperature 37.0°C (98.6°F), pulse 60/min, respirations 18/min, and blood pressure 124/61 mm Hg. Cardiac examination discloses a normal S₁, pronounced S₂, and a grade 2/6 late systolic murmur heard at the right upper parasternal border. Pulses are normal in contour. Results of laboratory studies are within the reference ranges. ECG shows no abnormalities. Which of the following is the most appropriate next step in management?

- (A) Decrease the dose of metoprolol
- (B) Increase the dose of prednisone
- (C) Obtain serum vitamin D concentration
- (D) Order a transthoracic echocardiography

Correct Answer:

- (D) Order a transthoracic echocardiography



Neural Consult Response and Explanation:

Answer: D

Explanation: The patient's clinical presentation is highly suggestive of symptomatic aortic stenosis (AS). Key indicators include his age (78), new-onset exertional dyspnea and fatigue (cardinal symptoms of AS), and a history of a heart murmur since age 18, which strongly suggests a congenital bicuspid aortic valve. Bicuspid valves are prone to premature calcification and the development of stenosis later in life. The physical examination finding of a grade 2/6 late systolic murmur at the right upper parasternal border (the aortic area) further supports this diagnosis. In valvular heart disease, the timing of the murmur's peak is a clue to severity; a later peak often correlates with more significant obstruction. While the pulses are described as normal in contour (lacking the classic pulsus parvus et tardus) and S_2 is pronounced, the development of new exertional symptoms in a patient with a known or suspected valvular lesion necessitates definitive evaluation. Transthoracic echocardiography (TTE) is the most appropriate next step as it is the gold standard for non-invasive diagnosis, quantification of stenosis severity, and assessment of left ventricular function. Decreasing metoprolol (A) might be considered if fatigue were the only symptom and clearly drug-related, but it does not address the murmur or the dyspnea. Increasing prednisone (B) is for polymyalgia rheumatica flares, which typically present with proximal muscle pain and stiffness, not exertional dyspnea. Vitamin D concentration (C) is irrelevant to the acute cardiac presentation.

Question 126.1

A 25-year-old woman comes to the office because of a 24-hour history of right-sided facial weakness. Two days ago she developed mild aching behind the right ear, which resolved spontaneously. This morning, however, the entire right side of her face was drooping and she was unable to close her right eye. When she tried to drink coffee this morning, the liquid ran out the right side of her mouth. She has been otherwise healthy and she takes no medications. Vital signs are normal. Examination of the ears and oral mucosa shows no abnormalities. Cranial nerve examination shows moderate weakness of the right orbicularis oculi and oris, frontalis, buccinator, and platysma muscles. Sound is perceived as louder in the right ear. The remainder of the neurologic examination shows no abnormalities. Which of the following is the most accurate statement regarding this patient's prognosis for neurologic recovery?

- (A) Prognosis cannot be determined without results of cerebral angiography
- (B) Prognosis cannot be determined without results of MRI of the brain and cerebrospinal fluid analysis
- (C) She has an 80% chance of complete recovery within the next 12 months without treatment
- (D) With oral corticosteroid therapy she has a 20% chance of complete recovery within the next 12 months
- (E) It is unlikely that the patient will achieve functional recovery from this condition regardless of therapy

Correct Answer:

(C) She has an 80% chance of complete recovery within the next 12 months without treatment



Neural Consult Response and Explanation:

Answer: C

Explanation: The patient's clinical presentation is classic for Bell palsy, an idiopathic, acute peripheral facial nerve (CN VII) palsy. Key diagnostic features include the rapid onset (24 hours) of unilateral facial weakness involving both the upper and lower face (orbicularis oculi, oris, frontalis, buccinator, and platysma), which distinguishes it from a central (upper motor neuron) lesion like a stroke where the forehead is typically spared. The presence of hyperacusis (sound perceived as louder) indicates involvement of the nerve to the stapedius muscle, and the preceding postauricular pain is a common prodromal symptom. The prognosis for Bell palsy is generally excellent. Clinical studies and medical literature indicate that approximately 70% to 80% of patients will achieve complete recovery within 6 to 12 months even without medical intervention. While oral corticosteroids (like prednisone) are the standard of care to further improve recovery rates (increasing the chance of complete recovery to over 90%), the statement that she has an 80% chance of complete recovery without treatment is the most accurate prognostic statement among the choices. Options A and B are incorrect because Bell palsy is a clinical diagnosis and does not require angiography, MRI, or CSF analysis in typical presentations. Option D is incorrect because corticosteroids significantly increase the chance of recovery rather than lowering it to 20%. Option E is incorrect because the vast majority of patients achieve functional recovery.

Question 127.1

A 20-year-old woman comes to the office because of a 2-day history of nasal congestion, runny nose, and nonproductive cough that has made it difficult for her to sleep. She has not had fever. Her brother with whom she resides also has similar symptoms. The patient's medical history is significant for mild persistent asthma for which she takes inhaled fluticasone- salmeterol twice daily and albuterol as needed. She has been using her albuterol more frequently during the past 2 days without much effect. During this time, her peak expiratory flow rates have been 70% to 80% of her baseline. Vital signs today are temperature 37.2°C (99.0°F), pulse 70/min, respirations 20/min, and blood pressure 110/70 mm Hg. Physical examination discloses inflamed nasal mucosa with clear discharge. The posterior oral pharynx is erythematous. Auscultation of the lungs discloses rare expiratory wheezes. Which of the following is the most appropriate pharmacotherapy for this patient's cough?

- (A) Codeine
- (B) Diphenhydramine
- (C) Guaifenesin
- (D) Ipratropium bromide
- (E) Prednisone

Correct Answer:

(E) Prednisone

Neural Consult Response and Explanation:



Answer: E

Explanation: The patient is presenting with a 2-day history of symptoms (nasal congestion, runny nose, nonproductive cough) consistent with a viral upper respiratory infection (URTI), which has triggered an acute asthma exacerbation. Evidence for the exacerbation includes her increased cough, the presence of rare expiratory wheezes on physical examination, a decrease in her peak expiratory flow rate (PEFR) to 70-80% of her baseline, and a poor response to her rescue albuterol inhaler over the past 2 days. In patients with asthma, a viral URTI is a common trigger for an exacerbation, where the cough is a direct result of airway inflammation and bronchoconstriction. According to standard asthma management guidelines (such as GINA or NAEPP), when a patient already on maintenance therapy (like this patient's fluticasone-salmeterol) experiences an exacerbation that does not respond promptly to a short-acting beta-agonist (SABA), the most appropriate next step is a short course of oral systemic corticosteroids, such as prednisone. Prednisone addresses the underlying airway inflammation, which will alleviate the cough and other respiratory symptoms. Other options are less appropriate: (A) Codeine is an opioid antitussive generally avoided in asthma due to the risk of respiratory suppression; (B) Diphenhydramine may help with cold symptoms but does not treat the underlying asthma exacerbation; (C) Guaifenesin is an expectorant for productive coughs and is not indicated here; (D) Ipratropium bromide can be used for the cough of the common cold in non-asthmatics or as an adjunct in severe asthma exacerbations in the emergency department, but it is not the primary treatment for this patient's asthma-driven cough.

Question 128.1

A 34-year-old woman, gravida 2, para 1, comes to the office at 26 weeks' gestation to establish prenatal care after obtaining health insurance coverage. She has gained 14 kg (31 lb) during this pregnancy. Her last pregnancy 4 years ago resulted in delivery of a 4564-g (10-lb 1-oz) male newborn. Today, the patient is 162 cm (5 ft 4 in) tall and weighs 99 kg (218 lb). Vital signs are normal. Physical examination discloses a fundal height of 30 cm. Fetal heart rate is 146/min. Prenatal laboratory studies and ultrasonography are ordered. This patient is most at risk for which of the following?

- (A) Gestational diabetes
- (B) Multiple gestation
- (C) Placenta previa
- (D) Polyhydramnios
- (E) Preeclampsia

Correct Answer:

- (A) Gestational diabetes

Neural Consult Response and Explanation:



Answer: A

Explanation: The patient presents with several significant risk factors that place her at high risk for gestational diabetes mellitus (GDM). These include: 1) Maternal Obesity: Her BMI is approximately 37.7 kg/m² (99 kg / 1.62 m²), which classifies her as Obese Class II. Obesity is a primary risk factor for the development of insulin resistance and GDM. 2) History of Fetal Macrosomia: Her previous delivery of a 4564-g (10-lb 1-oz) infant is a major clinical indicator. A history of a macrosomic infant (defined as >4000 g or >4500 g) is one of the strongest predictors for GDM in subsequent pregnancies. 3) Excessive Gestational Weight Gain: She has gained 14 kg (31 lb) by 26 weeks, which already exceeds the total recommended weight gain (5-9 kg or 11-20 lb) for an obese woman for an entire pregnancy. 4) Fundal Height Discrepancy: Her fundal height of 30 cm at 26 weeks (a 4-cm discrepancy) suggests either fetal macrosomia or polyhydramnios, both of which are common complications of poorly controlled GDM. While obesity also increases the risk for preeclampsia (Option E), the specific history of a prior macrosomic infant and the current fundal height discrepancy point more directly toward GDM as the most likely underlying risk. Multiple gestation (Option B) could explain the fundal height but not the history of macrosomia. Polyhydramnios (Option D) is often a result of GDM rather than a primary risk factor itself. Placenta previa (Option C) is not strongly associated with the patient's current presentation.

Question 129.1

A 39-year-old woman, gravida 6, para 5, is admitted to the hospital at 39 weeks' gestation for a scheduled induction of labor for delivery of twins. Her prior pregnancies were uncomplicated. Her current pregnancy has been complicated by well-controlled gestational diabetes. Vital signs are temperature 36.7°C (98.1°F), pulse 80/min, respirations 16/min, and blood pressure 134/84 mm Hg. Uterine size is consistent with a 36-week gestation. The fetuses are estimated to weigh 1814 g (4 lb) each. The patient delivers healthy twins. After the delivery of the placenta, examination discloses decreased uterine tone, increased bleeding, and increased hypotension. Which of the following is the most appropriate initial pharmacotherapy?

- (A) Ergonovine
- (B) Intramuscular vitamin K
- (C) 15-Methylprostaglandin F₂α
- (D) Misoprostol
- (E) Oxytocin

Correct Answer:

- (E) Oxytocin

Neural Consult Response and Explanation:



Answer: E

Explanation: The clinical presentation describes a patient with postpartum hemorrhage (PPH) secondary to uterine atony, characterized by decreased uterine tone and increased bleeding following the delivery of twins. Risk factors in this patient include multiparity and uterine overdistention from a twin gestation. The standard of care and most appropriate initial pharmacotherapy for uterine atony is oxytocin. Oxytocin acts as a powerful stimulator of myometrial contractions, which constrict the spiral arteries at the placental site to stop bleeding. While other options like ergonovine (A), 15-methylprostaglandin $F_{2\alpha}$ (C), and misoprostol (D) are also uterotonic agents used in the management of PPH, they are considered second-line therapies to be used if oxytocin and uterine massage fail to control the hemorrhage. Vitamin K (B) is involved in the coagulation cascade but does not address the mechanical issue of uterine atony.

Question 131.1

A 32-year-old woman comes to the emergency department because of a 3-day history of worsening fever, dry cough, and shortness of breath. She also has had abdominal discomfort, diarrhea, and nausea, but she has not vomited. She returned home from a business trip to a midwestern city 2 days ago. She has had no known contact with any ill individuals. She had been generally healthy and medical history is unremarkable. She takes no medications. Her last menstrual period was 6 weeks ago and she thinks she might be pregnant. She does not smoke cigarettes, drink alcoholic beverages, or use illicit drugs. She is married and uses no contraception. She appears well developed and well nourished but is short of breath and lethargic. Vital signs are temperature 38.3°C (101.0°F), pulse 104/min, respirations 28/min, and blood pressure 100/60 mm Hg. Pulse oximetry on room air shows an oxygen saturation of 92%. Auscultation of the chest discloses crackles at the right lung base, tachycardia, a normal S₁ and S₂, and no other abnormalities. Abdominal examination discloses no abnormalities. Petechiae are present over both lower extremities. Results of laboratory studies are shown:

Serum ALT - 80 U/L

AST - 63 U/L

Urea nitrogen - 14 mg/dL

Creatinine - 1.7 mg/dL

Na⁺ - 130 mEq/L

K⁺ - 3.9 mEq/L

Cl⁻ - 104 mEq/L

HCO₃⁻ - 16 mEq/L

Iron, total - 18 µg/dL

Iron binding capacity, total - 428 µg/dL (N=250–350) Iron saturation - 5% (N=20–50) β-hCG - Positive

Blood Hematocrit - 30.3%

Hemoglobin - 10.2 g/dL

WBC - 11,300/mm³

MCV - 76 µm³ Platelet count - 104,000/mm³

Red cell distribution width - 16% (N=11.5–14.5)



Which of the following is the most appropriate intravenous pharmacotherapy at this time?

- (A) Cefuroxime alone
- (B) Cefuroxime and azithromycin
- (C) Levofloxacin alone
- (D) Levofloxacin and ticarcillin
- (E) Piperacillin-tazobactam

Correct Answer:

- (B) Cefuroxime and azithromycin

Neural Consult Response and Explanation:

Answer: B

Explanation: The patient presents with severe community-acquired pneumonia (CAP), characterized by fever, dry cough, shortness of breath, hypoxia (92% on room air), and signs of multi-organ involvement (lethargy, acute kidney injury with a creatinine of 1.7 mg/dL, elevated liver enzymes, and thrombocytopenia). The clinical constellation of pneumonia combined with prominent gastrointestinal symptoms (diarrhea, nausea, abdominal discomfort), hyponatremia (130 mEq/L), and recent travel to a city (suggesting potential exposure to a common water source) is highly classic for *Legionella pneumophila*. The patient is also pregnant (positive β -hCG). For severe CAP, empiric therapy must cover both typical pathogens (like *Streptococcus pneumoniae*) and atypical pathogens (like *Legionella*). Standard treatment involves a combination of a beta-lactam and either a macrolide or a respiratory fluoroquinolone. However, fluoroquinolones (such as levofloxacin, options C and D) are generally avoided in pregnancy due to potential risks to fetal cartilage development. Macrolides (such as azithromycin) and beta-lactams (such as cefuroxime) are considered safe in pregnancy. Cefuroxime provides coverage for typical bacterial pathogens, while azithromycin is the preferred agent for *Legionella* in a pregnant patient. Piperacillin-tazobactam (option E) and cefuroxime alone (option A) are inappropriate because they do not provide coverage for atypical pathogens like *Legionella*, which are intracellular and lack a cell wall susceptible to beta-lactams. Therefore, the combination of cefuroxime and azithromycin is the most appropriate and safest choice for this patient.

Question 132.1

A 72-year-old man is admitted to the intensive care unit for pain management and observation of ventricular ectopy 4 hours after undergoing uncomplicated left total knee replacement. He is receiving fentanyl via systemic patient-controlled analgesic pump for pain management. Medical history is remarkable for coronary artery disease, for which he takes atorvastatin, furosemide, carvedilol, lisinopril, and 81-mg aspirin. Baseline echocardiogram showed an ejection fraction of 0.20. Vital signs now are temperature 38.0°C (100.4°F), pulse 90/min, respirations 16/min, and blood pressure 130/90 mm Hg. Pulse oximetry on room air shows an oxygen saturation of 96%. Physical examination discloses no unexpected abnormalities. Which of the following regimens for prophylaxis of deep venous thrombosis will likely be most beneficial in this patient?



- (A) Continuous application of bilateral lower extremity pneumatic compression devices
- (B) Continuous intravenous infusion of heparin titrated to a PTT of 1.5 to 2.0 times the control value
- (C) Oral warfarin
- (D) Subcutaneous enoxaparin
- (E) Subcutaneous heparin

Correct Answer:

- (D) Subcutaneous enoxaparin

Neural Consult Response and Explanation:

Answer: D

Explanation: The patient is at extremely high risk for venous thromboembolism (VTE) due to several factors: advanced age (72), recent major orthopedic surgery (total knee replacement), and significant heart failure (ejection fraction of 0.20). For patients undergoing major orthopedic surgery such as total knee replacement (TKR), pharmacologic prophylaxis is the standard of care unless contraindicated by a high risk of bleeding. Among the options provided, subcutaneous enoxaparin (a low molecular weight heparin, LMWH) is the most beneficial. Clinical guidelines, including those from the American College of Chest Physicians (ACCP), recommend LMWH over unfractionated heparin (UFH) or mechanical prophylaxis alone for TKR because LMWH has demonstrated superior efficacy in preventing deep venous thrombosis (DVT) and a more predictable pharmacokinetic profile. (A) Mechanical prophylaxis (pneumatic compression) is less effective than pharmacologic methods and is typically reserved as an adjunct or for patients with a high bleeding risk. (B) Continuous intravenous heparin titrated to PTT is a therapeutic regimen used for treating established VTE, not for prophylaxis, and would carry an unacceptably high risk of postoperative bleeding. (C) Warfarin is an option but is less preferred due to its slow onset, the need for frequent monitoring, and a higher risk of complications compared to LMWH. (E) Subcutaneous unfractionated heparin (UFH) is used for prophylaxis but is generally considered less effective than LMWH in the specific setting of major orthopedic surgery and carries a higher risk of heparin-induced thrombocytopenia (HIT).

Question 133.1

A 45-year-old man comes to the emergency department because of a 1-month history of fatigue, generalized muscle weakness, and a 4-kg (8-lb) weight loss. He also reports a loss of appetite and nausea without vomiting during the past 2 weeks. Medical history is unremarkable and he takes no medications. He does not smoke cigarettes or drink alcoholic beverages. He is 180 cm (5 ft 11 in) tall and weighs 70 kg (155 lb); BMI is 22 kg/m². Vital signs are temperature 36.4°C (97.5°F), pulse 100/min, respirations 20/min, and blood pressure 88/50 mm Hg. Physical examination shows bronze darkening of the elbows, on the creases of his hands, and around the areolae of his nipples. Muscle strength is 4.5/5 in all extremities. The remainder of the physical examination shows no abnormalities. Results of laboratory studies are shown:



Serum Na⁺ 128 mEq/L
K⁺ 5.2 mEq/L
Cl⁻ 95 mEq/L
HCO₃⁻ 20 mEq/L

Blood Hemoglobin 12 g/dL
WBC 3500/mm³

In addition to administering intravenous fluids, which of the following is the most appropriate pharmacotherapy?

- (A) Calcitonin
- (B) Dehydroepiandrosterone
- (C) Hydrocortisone
- (D) Levothyroxine
- (E) Mitotane

Correct Answer:

(C) Hydrocortisone

Neural Consult Response and Explanation:

Answer: C

Explanation: The patient's clinical presentation is classic for primary adrenal insufficiency (Addison disease). Key findings include a 1-month history of fatigue, weight loss, and weakness, combined with physical signs of hyperpigmentation (bronze darkening of the elbows, hand creases, and areolae) and hypotension (88/50 mm Hg). Laboratory studies reveal the hallmark electrolyte triad of primary adrenal insufficiency: hyponatremia (128 mEq/L), hyperkalemia (5.2 mEq/L), and a non-anion gap metabolic acidosis (low bicarbonate of 20 mEq/L). These abnormalities occur because the destruction of the adrenal cortex leads to a deficiency in both cortisol and aldosterone. The hyperpigmentation is caused by increased secretion of adrenocorticotropic hormone (ACTH) and its precursor, pro-opiomelanocortin (POMC), which contains melanocyte-stimulating hormone (MSH). The patient's severe hypotension and nausea suggest he is in or approaching an acute adrenal crisis, which is a life-threatening emergency. The immediate management of adrenal crisis requires aggressive fluid resuscitation and the administration of intravenous glucocorticoids. Hydrocortisone is the preferred choice because, at high doses, it provides both necessary glucocorticoid replacement and sufficient mineralocorticoid activity to stabilize the patient's blood pressure and electrolyte imbalances. (A) Calcitonin is used for hypercalcemia. (B) DHEA is sometimes used for mood/libido in women with Addison disease but is not for acute management. (D) Levothyroxine is for hypothyroidism; giving it before steroids in a patient with adrenal insufficiency can actually worsen the crisis. (E) Mitotane is an adrenolytic agent that would exacerbate the condition.

Question 134.1



A 45-year-old man comes to the office because of severe pain of the right foot that awoke him from sleep last night. He says the pain kept him awake for the rest of the night. Walking has been difficult due to the pain, which he rates as a 9 on a 10- point scale. He reports no recent trauma. Medical history is remarkable for hypertension, type 2 diabetes mellitus, and asthma. Medications include hydrochlorothiazide, metformin, atorvastatin, and an albuterol inhaler. He is allergic to penicillin. He does not smoke cigarettes, but he has drunk three to four glasses of red wine daily for the past 5 years. Family history is significant for arthritis in his father. He is 168 cm (5 ft 6 in) tall and weighs 111 kg (245 lb); BMI is 40 kg/m². Vital signs are temperature 37.9°C (100.2°F), pulse 100/min, respirations 16/min, and blood pressure 160/100 mm Hg. Examination of the right foot discloses erythema and increased warmth over the first toe extending over the dorsum of the foot. The involved area is very tender and the patient resists movement of his toes. There is moderate swelling of the first metatarsophalangeal joint. The remainder of the physical examination discloses no abnormalities. Results of laboratory studies are shown:

Serum Urea nitrogen - 15 mg/dL
Creatinine - 1.0 mg/dL

Blood Hemoglobin - 16 mg/dL
WBC - 12,500/mm³

Examination of joint aspirate shows a leukocyte count of 50,000/mm³; no organisms are seen on Gram stain. Which of the following is the most appropriate pharmacotherapy to treat this patient's acute condition?

- (A) Acetaminophen
- (B) Allopurinol
- (C) Ceftriaxone
- (D) Indomethacin
- (E) Vancomycin

Correct Answer:

(D) Indomethacin

Neural Consult Response and Explanation:



Answer: D

Explanation: The patient's clinical presentation is classic for an acute gouty arthritis flare (podagra). Key diagnostic features include the sudden onset of severe pain (9/10), awakening from sleep, involvement of the first metatarsophalangeal (MTP) joint, and physical findings of erythema, warmth, and swelling. The patient has several significant risk factors for gout: obesity (BMI 40), regular alcohol consumption (red wine), and the use of a thiazide diuretic (hydrochlorothiazide), which decreases renal urate excretion. The joint aspirate shows a leukocyte count of $50,000/\text{mm}^3$, which is consistent with an inflammatory process (typically $2,000\text{--}75,000/\text{mm}^3$), and the negative Gram stain makes septic arthritis less likely. The most appropriate treatment for an acute gout flare is an anti-inflammatory agent. First-line options include nonsteroidal anti-inflammatory drugs (NSAIDs), colchicine, or corticosteroids. Indomethacin (Option D) is a potent NSAID and a standard first-line treatment for acute gout. The patient's renal function (Creatinine 1.0 mg/dL) is normal, making NSAIDs safe to use. Acetaminophen (Option A) lacks sufficient anti-inflammatory properties. Allopurinol (Option B) is used for long-term urate-lowering therapy and should not be initiated during an acute flare as it can worsen the attack. Ceftriaxone (Option C) and Vancomycin (Option E) are antibiotics used for septic arthritis, which is unlikely given the negative Gram stain and classic presentation of podagra.

Question 135.1

A 2-year-old boy is brought to the emergency department by his babysitter because of a 30-minute history of respiratory distress. The babysitter reports that she has cared for the patient on numerous occasions during the past year. The child's parents are currently out of town for business but will return later tonight. The babysitter says, "He has had a runny nose since I started babysitting yesterday, but this afternoon he awoke from a nap with a barking sound and he was breathing real heavy." She does not know the child's prior health history, nor does she know if the boy takes any medications on a regular basis. The child looks tired and sits upright on the babysitter's lap. He is obviously comfortable with his caregiver. Vital signs are temperature 38.7°C (101.7°F), pulse 110/min, respirations 28/min and labored, and blood pressure 85/50 mm Hg. Pulse oximetry on room air shows an oxygen saturation of 89%. Physical examination discloses inspiratory stridor. Neck is supple, tympanic membranes are normal, and there is a profuse nasal discharge. Examination of the pharynx discloses no abnormalities. Auscultation of the chest discloses equal air entry on both sides and no crackles. The remainder of the examination shows no abnormalities. Treatment with 40% oxygen via venturi mask and intravenous fluids is initiated. Despite continued supplemental oxygen and hydration, the child remains tachypneic and stridorous at rest. Oxygen saturation is now 93%. In addition to administering racemic epinephrine by nebulizer, which of the following is the most appropriate next step?

- (A) Intravenous aminophylline therapy
- (B) Intravenous antibiotic therapy
- (C) Intubation
- (D) Oral dexamethasone therapy
- (E) Rectal acetaminophen therapy

Correct Answer:



(D) Oral dexamethasone therapy

Neural Consult Response and Explanation:

Answer: D

Explanation: The clinical presentation of a 2-year-old with a barking cough, inspiratory stridor, low-grade fever, and preceding upper respiratory symptoms is classic for croup (acute viral laryngotracheitis). The presence of stridor at rest and respiratory distress (tachypnea, labored breathing, and initial hypoxemia) classifies this as moderate-to-severe croup. The standard of care for moderate-to-severe croup involves both nebulized racemic epinephrine for rapid, temporary relief of subglottic edema and corticosteroids for sustained reduction of airway inflammation. Dexamethasone is the preferred corticosteroid due to its long half-life and proven efficacy in reducing the severity of symptoms and the need for hospitalization or intubation. Oral administration is preferred as it is less invasive and equally effective compared to intramuscular or intravenous routes in most patients. Intravenous aminophylline (A) is used for lower airway bronchospasm (e.g., asthma), not upper airway obstruction. Antibiotics (B) are not indicated for viral croup. Intubation (C) is reserved for impending respiratory failure, which is not yet indicated as the child is stable and has not yet received maximal medical therapy. Acetaminophen (E) treats fever but does not address the life-threatening airway obstruction.

Question 136.1

A 30-year-old man comes to the office because of an itchy and painful facial rash that has worsened since he first noticed it 1 day ago. He has no other symptoms and says he otherwise has been generally healthy. Medical history is unremarkable and he takes no medications. He does not use any substances. He is unmarried and is not currently in a romantic relationship but has been sexually active with multiple female partners during the past year. Vital signs are within normal limits. Physical examination shows an erythematous macular rash with several 1- to 2-mm raised vesicles that do not cross the midline over the left forehead and periorbital area. There are no other abnormalities. Acyclovir therapy is initiated. Which of the following is the most appropriate next step?

- (A) Referral to a dermatologist
- (B) Serum HIV antibody test
- (C) Skin biopsy
- (D) Tzanck test

Correct Answer:

(B) Serum HIV antibody test

Neural Consult Response and Explanation:



Answer: B

Explanation: The clinical presentation describes a 30-year-old man with a unilateral, vesicular rash in the V₁ (ophthalmic) distribution of the trigeminal nerve that does not cross the midline, which is pathognomonic for herpes zoster (shingles). While herpes zoster is common in adults over the age of 50 due to the natural waning of cell-mediated immunity, its occurrence in a young, otherwise healthy individual (under age 50) is an indication to screen for underlying immunodeficiency. Human Immunodeficiency Virus (HIV) is a well-known risk factor for the reactivation of the varicella-zoster virus in younger populations. This patient's social history of being sexually active with multiple partners further increases his risk for HIV. Therefore, a serum HIV antibody test (specifically the modern 4th generation antigen/antibody immunoassay) is the most appropriate next step in management. Option (A) is incorrect because the diagnosis is clinical and treatment has already been initiated; a dermatologist is not required for standard management. Option (C) and (D) are incorrect because the diagnosis of herpes zoster is typically made clinically. While a Tzanck test or biopsy can show herpesvirus-associated changes (like multinucleated giant cells), they are less sensitive than PCR and do not address the underlying reason why a 30-year-old developed zoster.

Question 137.1

A 31-year-old man with a 5-year history of HIV infection comes to the office because of anal pain, particularly on defecation, for the past 4 months. He says he has seen spots of blood on the toilet tissue but has not had any other noticeable bleeding. He reports no change in bowel habits and has not had recent fever, chills, or rectal drainage. He says he and his partner engage in anal-receptive intercourse. His most recent CD₄ + T-lymphocyte count 2 months ago was 350/mm³; HIV viral load at that time was undetectable. He currently is being treated with antiretroviral therapy. He has had no opportunistic infections. Medical history is also significant for syphilis and genital herpes treated with penicillin and acyclovir, respectively. He does not smoke cigarettes or drink alcoholic beverages. Vital signs are normal. Physical examination shows small bilateral inguinal lymph nodes, but respiratory, cardiac, and abdominal examinations disclose no abnormalities. There are several tender fleshy lesions around the perianal area. Rectal examination produces tenderness, but there is no rectal discharge. Test of the stool for occult blood is trace positive. Which of the following is the most appropriate pharmacotherapy at this time?

- (A) Acyclovir
- (B) Imiquimod
- (C) Levofloxacin
- (D) Metronidazole
- (E) Penicillin

Correct Answer:

- (B) Imiquimod

Neural Consult Response and Explanation:



Answer: B

Explanation: The patient's clinical presentation is highly suggestive of condylomata acuminata (anogenital warts), caused by human papillomavirus (HPV). The key findings are the 'several tender fleshy lesions around the perianal area' in a patient with significant risk factors, including HIV infection and anal-receptive intercourse. In the context of HIV, HPV-related lesions are often more numerous, larger, and more symptomatic. While condylomata acuminata are frequently painless, perianal lesions can become tender and bleed due to friction or trauma during defecation. Imiquimod is a topical immunomodulator that stimulates the local immune response (via toll-like receptor 7) and is a first-line, patient-applied treatment for external anogenital warts. (A) Acyclovir is used for herpes simplex virus (HSV), which typically presents as painful, grouped vesicles on an erythematous base or 'punched-out' ulcers, not fleshy lesions. (C) Levofloxacin and (D) Metronidazole are antibiotics used for bacterial infections; there is no evidence of bacterial proctitis (e.g., purulent discharge or fever) in this patient. (E) Penicillin is the treatment for syphilis. While secondary syphilis can cause condyloma lata, these are typically described as flat, moist, grey-white papules rather than 'fleshy' exophytic lesions, and the patient has already been treated for syphilis.

