Sample Emergency Medicine Questions & Critiques

The sample NCCPA items and item critiques are provided to help PAs better understand how exam questions are developed and should be answered for NCCPA's Emergency Medicine CAQ Exam.

Question #1

A 35-year-old man comes to the emergency department because he has severe, sharp abdominal pain that has been worsening over the past eight hours. Medical history includes duodenal ulcer disease. Temperature is 39.2°C (102.6°F), heart rate is 100/min, respirations are 20/min, and blood pressure is 148/90 mmHg. On physical examination, the abdomen is rigid with guarding and rebound tenderness. Bowel sounds are absent throughout. Which of the following tests is most likely to be effective in determining the diagnosis in this patient?

A. Barium swallow x-ray study

B. CT scan of the abdomen

C. Endoscopy

D. Kidney, ureter, and bladder x-ray study

E. Ultrasonography of the abdomen

Content Area: Gastrointestinal System/Nutrition (10%)

Critique

This question tests the examinee's ability to recognize the clinical presentation of a perforated duodenal ulcer and identify the effective diagnostic study. The correct answer is Option B, CT scan of the abdomen. The symptoms, history, and physical examination findings presented in the scenario are characteristic of a perforated duodenal ulcer. CT scan of the abdomen is effective for visualization of free intra-abdominal air below the diaphragm, the radiographic finding characteristic of a perforated ulcer.

Option A, barium swallow x-ray study, is incorrect because this imaging modality is used to diagnose disorders of the pharynx and esophagus, not of the abdomen, as described in the scenario. Option C, endoscopy, is incorrect because although this study is the definitive test for diagnosis of peptic ulcer disease, it is not appropriate for use in the emergency department to diagnose a perforated ulcer. Option D, kidney, ureter, and bladder x-ray study is incorrect because this study may miss small amounts of free air from a small perforation. Option E, ultrasonography of the abdomen, is incorrect because this imaging modality cannot detect small amounts of free air from a small perforation.

Question #2

A 17-year-old boy is brought to the emergency department of a rural hospital four hours after he had sudden onset of pain in his left testicle and lower inguinal region. The pain is severe and constant. The patient has no history of trauma or similar symptoms. On physical examination of the scrotum, the left testicle is high-riding and horizontally oriented. The cremasteric reflex is absent. Because ultrasonography is not available at the hospital and no urologist is on site, transfer to a tertiary center more than 90 miles away is planned. While awaiting this transfer, which of the following interventions is most appropriate?

A. Caudal distraction of the left testicle

B. Elevation of the left testicle

C. External rotation of the left testicle

D. Internal rotation and elevation of the left testicle

E. Internal rotation of the left testicle

Content Area: Genitourinary System -Male and Female (5%)

Critique

This question tests the examinee's ability to recognize testicular torsion and identify the appropriate maneuver for manual detorsion. The correct answer is Option C, external rotation of the left testicle. The scenario includes physical examination findings that are characteristic of testicular torsion: a high-riding and horizontally oriented testicle and absence of the cremasteric reflex. This abnormality results from twisting of the spermatic cord because the testicle is not attached to the tunica vaginalis. Most cases of testicular torsion involve medial rotation of the testicle. Therefore, external rotation of the testicle is appropriate for manual detorsion.

Option A, caudal distraction of the left testicle, is incorrect because this maneuver will not resolve the twisting of the spermatic cord that causes testicular torsion. Option B, elevation of the left testicle, is incorrect because this maneuver is used to determine the presence of epididymitis but is not effective for manual detorsion of a testicle. Option D, internal rotation and elevation of the left testicle, is incorrect because this maneuver would increase the medial rotation of the testicle instead of achieving detorsion. Option E, internal rotation of the left testicle, is incorrect because this maneuver is indicated for testicular torsion only if the rotation is lateral, but in most cases of testicular torsion, the rotation is medial.

Question #3

A 75-year-old woman comes to the emergency department because she has had fever and chills for the past four hours. Medical history includes lymphoma, for which the patient underwent chemotherapy two days ago. Temperature is 39.9°C (103.8°F), heart rate is 128/min and regular, respirations are 24/min, and blood pressure is 102/54 mmHg. Physical examination shows pale complexion. Breath sounds are clear, and the abdomen is soft and nontender. On neurologic examination, no focal neurologic deficits are noted. Complete blood cell count shows absolute neutrophil count of 1000/mm^3. Chest x-ray study shows no abnormalities. Urinalysis shows 2 to 5 white blood cells per high-power field. Administration of which of the following medications is the most appropriate initial management?

A. Intravenous cefepime

B. Intravenous clindamycin

C. Intravenous trimethoprim-sulfamethoxazole

D. Intravenous vancomycin

E. Oral ciprofloxacin

Content Area: Hematologic System (4%)

Critique

This question tests the examinee's ability to recognize chemotherapy-induced neutropenic fever and identify the appropriate initial pharmacotherapy. The correct answer is Option A, intravenous cefepime. On the basis of the symptoms and history, physical examination findings, and laboratory and imaging findings presented in the scenario, the patient is immunocompromised with fever of unknown cause, has an unknown site of infection, and is at high risk for complications. Intravenous administration of cefepime is the recommended initial management of the patient's condition because this broad-spectrum antibiotic covers the most commonly cultured organisms (gram-negative bacteria) and the most serious infection (Pseudomonas aeruginosa) in patients with fever and neutropenia.

Option B, intravenous clindamycin, is incorrect because gram-positive bacteria, which are the most commonly cultured organisms in patients with fever and neutropenia, as described in the scenario, have been shown to develop resistance to this monotherapy. Option C, intravenous trimethoprim-sulfamethoxazole, is incorrect because this antibiotic has no activity against Pseudomonas aeruginosa and has decreasing effectiveness against multiple bacterial species, both of which are common in patients with fever and neutropenia. Option D, intravenous vancomycin, is incorrect because vancomycin is not recommended as part of the standard initial antibiotic regimen for fever and neutropenia. Vancomycin and other agents active against aerobic gram-positive cocci should be considered for specific clinical indications, including suspected catheter-related infection, skin or soft-tissue infection, pneumonia, or hemodynamic instability,

but these are not described in the scenario. ***Option E, oral ciprofloxacin, is incorrect because although this antibiotic is known to have the best activity against Pseudomonas aeruginosa, the patient described in the scenario requires intravenous antibiotic therapy, not oral therapy, and meets inpatient admission criteria.***

Question #4

A 3-year-old boy is brought to the emergency department by his parents because he has been unable to walk for the past 12 hours. For the past two days, the patient has had pain in his knees, and two weeks ago, he had a viral upper respiratory tract infection. Temperature is 39.4°C (103.0°F), and heart rate is 120/min. Other vital signs are within normal limits. The patient appears ill. On physical examination, the right knee is warm to touch and a small effusion is noted. On initial laboratory studies, serum C-reactive protein level is 100 mg/L and white blood cell count is 20,000/mm^3. X-ray study of the knee shows no abnormalities. Which of the following is the most appropriate next step?

A. Bone scan

B. CT scan

C. MRI

D. Peripheral blood smear

E. Synovial fluid analysis

Content Area: Musculoskeletal System (9%)

Critique
This question tests the examinee's ability to recognize septic arthritis on the basis of a patient's history, the findings on physical examination, and laboratory findings, and to select the appropriate study to confirm the diagnosis. The correct answer is Option E, synovial fluid analysis. The scenario describes a classic presentation of septic arthritis. The definitive study to confirm this diagnosis is analysis of the synovial fluid.

Option A, bone scan, is incorrect because this imaging study cannot differentiate septic arthritis, which is caused by an infectious process, from arthritis caused by a sterile process. Option B, CT scan, is incorrect because this study is more sensitive for osteomyelitis, joint effusion, and periarticular abscess than for septic arthritis. Option C, MRI, is incorrect because although this study does offer superior imaging of soft tissues and bone structures, it is too costly to use in the early evaluation of septic arthritis, as noted in the scenario. Option D, peripheral blood smear, is incorrect because this test evaluates the size and morphology of red blood cells, white blood cells, and platelets, and provides nonspecific information relating to illness or disease. It is not indicated for the diagnosis of septic arthritis, as noted in the scenario.

Question #5

A 35-year-old woman comes to the emergency department because she has had pain and swelling of her left index finger for the past three days. The patient has not sustained trauma. Medical history includes intravenous drug use. Temperature is 37.1°C (98.8°F), heart rate is 99/min, respirations are 20/min, and blood pressure is 120/70 mmHg. Physical examination of the left hand shows symmetric swelling of the index finger and tenderness to palpation over the volar aspect. The index finger is held in a position of flexion. Passive extension of the index finger elicits intense pain. Which of the following is the most likely diagnosis?

A. Carpal tunnel syndrome

B. Erysipelas

C. Raynaud disease

D. Septic arthritis

E. Tenosynovitis

Content Area: Musculoskeletal System (9%)

Critique
This question tests the examinee's ability to recognize tenosynovitis on the basis of a patient's history and the findings on physical examination. The correct answer is Option E, tenosynovitis. The scenario describes a characteristic presentation of tenosynovitis: joint pain and swelling in a patient who has a history of illicit intravenous drug use. On physical examination of the index finger, the presence of Kanavel signs (finger held in flexion and intense pain elicited on passive extension of the finger) helps to distinguish the appropriate diagnosis and rule out other causes.

Option A, carpal tunnel syndrome, is incorrect because this condition is characterized by compression of the median nerve. The history and physical examination findings noted in the scenario are inconsistent with compression of the median nerve. Option B, erysipelas, is incorrect because this superficial infection does not affect subcutaneous tissues such as the flexor tendon and is characterized by redness and rash, which are not noted in the scenario. Option C, Raynaud disease, is incorrect because this condition is induced by stress or cold temperatures, and is characterized by variable, intermittent changes in skin color, which are not described in the scenario. Option D, septic arthritis, is incorrect because although the use of intravenous drugs as described in the scenario increases the risk for joint infection, septic arthritis typically affects large joints that, on physical examination, are usually guarded by the patient and held in a rigid position. These findings are not consistent with the scenario.

Question #6

A 45-year-old man comes to the emergency department because he has pleuritic chest pain, shortness of breath, and cough productive of yellow sputum that have been worsening over the past three days. During this time, he also has had low-grade fever. Medical history includes cholecystectomy six weeks ago. Temperature is 38.0°C (100.4°F), heart rate is 105/min, and respirations are 24/min. Oxygen saturation is 96% on room air. On physical examination, auscultation of the chest shows clear lung fields throughout. Examination of the lower extremities shows no edema or tenderness to palpation. According to the Wells criteria, which of the following is the greatest indicator of pulmonary embolism in this patient?

A. Heart rate of 105/min

B. Pleuritic chest pain

C. Productive cough

D. Recent history of cholecystectomy

E. Respirations of 24/min

Content Area: Pulmonary System (10%)

Critique

This question tests the examinee's knowledge of the use of the Wells criteria for risk stratification of venous thromboembolism. The correct answer is Option A, heart rate of 105/min, which is one of the seven clinical components scored within the Wells criteria for venous thromboembolism.

Option B, pleuritic chest pain, is incorrect, because this finding is nonspecific and can be seen in viral or inflammatory processes, as well as in other spontaneous events such as pneumothorax and aortic dissection. Option C, productive cough, is incorrect because this finding is not specific to the Wells criteria decision rule. Option D, recent history of cholecystectomy, is incorrect because the Wells criteria specify a history of surgery within the past four weeks; the patient described in the scenario underwent cholecystectomy six weeks ago. Option E, respirations of 24/min, is incorrect because although patients with pulmonary embolism sometimes have tachypnea, tachypnea alone is not evidence of a pathological cause.

Question #7

A 67-year-old man with end-stage renal disease comes to the emergency department because he missed his last two dialysis treatments. Initial laboratory findings include serum potassium level of 7.4 mEq/L. Which of the following findings on electrocardiography is most likely in this patient?

A. Peaked T waves

B. Presence of U waves

C. Prolonged Q-T interval

D. $S_1Q_3T_3$ pattern

E. ST-segment elevation

Content Area: Renal System (4%)

Critique

This question tests the examinee's ability to recognize findings on electrocardiography that are suggestive of life-threatening electrolyte abnormalities in patients with chronic kidney disease. The correct answer is Option A, peaked T waves. The scenario describes a patient who comes to the emergency department after missing two hemodialysis treatments and is found to have an elevated serum potassium level. On electrocardiography, peaked T waves are indictive of hyperkalemia-induced altered repolarization, which may lead to potentially lethal ventricular arrhythmias.

Option B, presence of U waves, is incorrect because although this finding is a normal electrocardiographic variant in some patients, U waves are typically associated with hypokalemia, whereas the patient described in the scenario has hyperkalemia. Option C, prolonged Q-T interval, is incorrect because this finding is typically consistent with electrolyte abnormalities such as hypokalemia, hypomagnesemia, and hypocalcemia. It is not characteristic of hyperkalemia, as noted in the scenario. Option D, $S_1Q_3T_3$ pattern, is incorrect, because this electrocardiographic finding is suggestive of cor pulmonale in patients with pulmonary embolus; it is not pertinent to the identification of hyperkalemia in patients with end-stage renal disease, as described in the scenario. Option E, ST-segment elevation, is incorrect because this finding is indicative of myocardial ischemia, not hyperkalemia, as noted in the scenario.

Question #8

A 25-year-old man is brought to the emergency department by ambulance after he sustained burns in a house fire. Physical examination shows third-degree burns over 30% of the total body surface area. Morphine (a total of 20 mg) has been administered intravenously over the past 30 minutes for pain relief. Suddenly, respiratory arrest develops and cessation of breathing is confirmed. Ventilation is initiated via a bag valve mask attached to 100% oxygen. Insertion of a laryngeal mask airway device is planned. The most appropriate intervention at this time is administration of which of the following?

A. Acetylcysteine

B. Activated charcoal

C. Disulfiram

D. Flumazenil

E. Naloxone

Content Area: Toxicologic Disorders (4%)

Critique
This question tests the examinee's ability to recognize the clinical presentation of opioid toxicity and to select the appropriate antidote. The correct answer is Option E, naloxone. The scenario describes a patient with third-degree burns who sustains respiratory arrest in the emergency department after morphine is administered intravenously for pain management. Administration of naloxone, an opioid receptor antagonist, reverses the effects of opioid toxicity, including respiratory arrest.

Option A, acetylcysteine, is incorrect, because this medication is used to prevent hepatoxicity in patients with acetaminophen overdose. It is not indicated for management of opioid toxicity, as noted in the scenario. Option B, activated charcoal, is incorrect because this agent is a gastrointestinal adsorbent used to limit systemic absorption of orally ingested substances. It is not recommended for management of opioid toxicity, as noted in the scenario. Option C, disulfiram, is incorrect because this medication, an aldehyde dehydrogenase inhibitor, is indicated for maintenance of abstinence from alcohol in patients who have a history of alcohol dependency. Option D, flumazenil, is incorrect because this compound is recommended for reversal of benzodiazepine toxicity, which is not described in the scenario.