

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

An 18-year-old man is brought to the emergency department by his parents because he has had continuous pain in the right lower quadrant of the abdomen for the past 18 hours. Temperature is 37.8°C (100.0°F), pulse rate is 80/min, and blood pressure is 100/60 mmHg. On physical examination, the abdomen is soft, but tenderness to palpation and rebound tenderness are noted in the right lower quadrant. No other abnormalities are noted. On laboratory studies, white blood cell count is 7900/mm³. Which of the following is the most appropriate next step?

- (A) CT scan of the abdomen and pelvis
- (B) Duplex ultrasonography of the scrotal contents
- (C) Exploratory laparotomy
- (D) HIDA radionuclide scan
- (E) Plain-film x-ray study of the abdomen

Content Area: Gastrointestinal System/Nutrition (10%)

Critique

This question tests the examinee's ability to recognize the clinical presentation of acute appendicitis and select the appropriate study to establish the diagnosis and rule out other causes. The correct answer is Option (A), CT scan of the abdomen and pelvis. On the basis of the history, physical examination, and laboratory findings presented, appendicitis is suspected. CT scan of the abdomen and pelvis is the most effective imaging study to confirm this suspected diagnosis and exclude other causes of abdominal pain.

Option (B), duplex ultrasonography of the scrotal contents, is incorrect because no additional abnormalities were noted during physical examination of the patient. This study would be correct if signs of right testicular torsion had been noted on physical examination, because this condition can cause pain radiating into the right lower abdomen. Option (C), exploratory laparotomy, is incorrect because although it is the appropriate therapy for acute appendicitis, it is not the most appropriate next step because it is an invasive procedure and the diagnosis of appendicitis cannot be confirmed based on the findings presented. Option (D), HIDA radionuclide scan, is incorrect because it is a biliary tract study, which does not aid in evaluation of suspected acute appendicitis. The patient's age, location of pain, and physical examination findings do not support the diagnosis of biliary tract disease. Option (E), plain-film x-ray study of the abdomen, is incorrect because this study does not provide sufficient information to establish a diagnosis, even if an appendolith is present.

Question #2

A 54-year-old woman comes to the emergency department three days after she had onset of worsening pain in the left lower quadrant of the abdomen that extends across the suprapubic region. She also has had night sweats, anorexia, and constipation. Temperature is 39.3°C (102.7°F), pulse rate is 72/min, respirations are 20/min, and blood pressure is 120/90 mmHg. On laboratory studies, white blood cell count is 19,000/mm³. CT scan of the abdomen and pelvis shows sigmoid diverticulitis with microperforation. The most appropriate therapy for this patient is intravenous administration of which of the following medications?

- (A) Ampicillin/sulbactam
- (B) Cefazolin
- (C) Ceftriaxone
- (D) Clindamycin
- (E) Metronidazole

Content Area: Gastrointestinal System/Nutrition (10%)

Critique

This question tests the examinee's ability to determine the most appropriate antibiotic therapy for a patient with complicated diverticulitis. The correct answer is Option (A), ampicillin/sulbactam. On the basis of fever, increased white blood cell count, and the CT scan findings, broad-spectrum antibiotic therapy is indicated to cover Enterococcus species, gram-negative enteric bacteria, and enteric anaerobic bacteria. Ampicillin/sulbactam is the only therapy included in the option set that provides excellent coverage for the typical organisms involved in this infection.

Option (B), cefazolin, is incorrect because it does not provide adequate coverage of gram-negative and anaerobic bacteria. Option (C), ceftriaxone, and Option (D), clindamycin, are incorrect because these medications do not provide adequate coverage against anaerobes and Enterococcus. Option (E), metronidazole, does not cover gram-positive or gram-negative bacteria.

Question #3

A 28-year-old man with Wolff-Parkinson-White syndrome comes to the emergency department because he has had palpitations and racing heartbeat for the past 12 hours. Temperature is 37.0°C (98.6°F), pulse rate is 140/min, respirations are 20/min, and blood pressure is 110/60 mmHg. Oxygen saturation is 96% on room air. Electrocardiography shows atrial fibrillation with a rapid ventricular response of 140/min. Administration of which of the following medications is most likely to be effective in relieving this patient's symptoms?

- (A) Adenosine
- (B) Amiodarone
- (C) Digoxin
- (D) Diltiazem
- (E) Metoprolol

Content Area: Cardiovascular System (10%)

Critique

This question evaluates the examinee's ability to determine the appropriate therapy for management of accelerated heart rate and atrial fibrillation in a patient with Wolff-Parkinson-White syndrome. The correct answer is Option (B), amiodarone. Amiodarone therapy can successfully slow and potentially convert atrial fibrillation in patients with an accessory pathway, as seen in Wolff-Parkinson-White syndrome. Procainamide is an appropriate alternative to amiodarone in this case.

Option (A), adenosine, is incorrect because this drug has little effect on the management of atrial fibrillation, except for momentary slowing. Option (C), digoxin, is incorrect because this medication is one of the cardiac glycosides, which block conduction through the atrioventricular node. Cardiac glycosides are contraindicated in Wolff-Parkinson-White syndrome because they may enhance conduction down the accessory pathway, causing ventricular tachycardia. Also, digoxin works too slowly to be of value in this patient. Option (D), diltiazem, is incorrect because this medication also blocks conduction through the atrioventricular node and is indicated for patients who do not have Wolff-Parkinson-White syndrome. Option (E), metoprolol, is incorrect because although this drug may create slowing of the heart rate, it rarely causes conversion to normal sinus rhythm and is relatively contraindicated in patients with borderline hypotension. In addition, both diltiazem and metoprolol may enhance conduction down the accessory pathway, causing ventricular tachycardia.

Question #4

A 23-year-old man comes to the emergency department because he has had a diffuse pruritic rash for the past week. Vital signs are within normal limits. Physical examination shows papules and vesicles along thread-like tracks in the groin, interdigital web spaces, and axillae. Which of the following is the most likely diagnosis?

- (A) Bedbug bites
- (B) Creeping eruption
- (C) Dyshidrotic eczema
- (D) Scabies
- (E) Systemic fungal infection

Content Area: Dermatologic System (4%)

Critique

This question evaluates the examinee's ability to differentiate dermatologic conditions on the basis of the history and physical examination findings. The correct answer is Option (D), scabies. The findings of papules and linear, threadlike tracks localized to the groin, interdigital web spaces, and axillae, combined with pruritus, are characteristic of scabies.

Option (A), bedbug bites, is incorrect because although these lesions are usually pruritic and occur randomly, they do not present as tracks or vesicles. Option (B), creeping eruption (also known as cutaneous larvae migrans), is incorrect because although it is pruritic and characterized by threadlike tracks and vesicles, the distribution of lesions is usually randomly scattered, unlike scabies, which has a predilection for the groin, interdigital web spaces, and axillae. Option (C), dyshidrotic eczema, is incorrect because eczema has a plaquelike morphology, without vesicles and tracks, and is not often seen in the groin, interdigital web spaces, and axillae. Option (E), systemic fungal infection, is incorrect because this condition presents with a diffuse rash pattern and is not characterized by triplex threads of papules and vesicles.

Question #5

A 22-year-old man comes to the emergency department because he has had fever, elevated blood glucose level, and confusion during the past three hours. Pulse rate is 140/min, respirations are 30/min, and blood pressure is 80/50 mmHg. Physical examination shows dry mucous membranes and delayed capillary refill. Laboratory studies show serum potassium level of 3.2 mEq/L and serum glucose level of 580 mg/dL. Arterial blood gas analysis shows pH of 7.0. Infusion of which of the following fluids is the most appropriate initial management?

- (A) 2.5% Dextrose in normal saline
- (B) Lactated Ringer solution
- (C) 0.45% Normal saline
- (D) 0.9% Normal saline
- (E) 3% Normal saline

Content Area: Endocrine System (3%)

Critique

This question tests the examinee's ability to recognize diabetic ketoacidosis and determine the most appropriate initial management. The correct answer is Option (D), 0.9% normal saline. The diagnosis of diabetic ketoacidosis is established by the presence of hyperglycemia, increased heart rate, dry mucous membranes, delayed capillary refill, and presence of acidosis on arterial blood gas analysis. Infusion of 0.9% normal saline is the most appropriate initial therapy for resuscitation of dehydration and hyperglycemia associated with diabetic ketoacidosis.

Option (A), 2.5% dextrose in normal saline, is incorrect because although infusion of this agent will provide the appropriate concentration of saline to provide hydration and blood pressure support, addition of dextrose (or glucose) is undesirable in a patient with hyperglycemia. Option (B), lactated Ringer solution, is incorrect because even though this fluid does provide blood pressure support and supplementation of potassium, the presence of lactate is undesirable in a patient with profound acidosis. Option (C), 0.45% normal saline (also known as half normal saline), is incorrect because this agent is hypotonic and, therefore, provides less blood pressure support and fails to correct dehydration. Option (E), 3% normal saline (also known as hypertonic saline), is incorrect because even though it provides blood pressure support, hypertonic saline creates an osmotic shift from intracellular water into the intravascular space, therefore exacerbating dehydration.

Question #6

A 22-year-old man is brought to the emergency department by ambulance 15 minutes after he had sudden onset of confusion and decreased level of consciousness while running a marathon on a hot day. According to the first responders at the scene, the patient began staggering as he neared the finish line and was escorted to the first aid tent by onlookers. At that time, the patient's temperature was 40.4°C (104.8°F). He is otherwise healthy, takes no medications, and has no history of trauma. Currently, temperature is 40.4°C (104.8°F), pulse rate is 105/min, respirations are 22/min, and blood pressure is 135/65 mmHg. Oxygen saturation is 98% on room

air. On physical examination, the patient is flushed, diaphoretic, semiconscious, and mumbling, and he responds to painful stimuli. No other abnormalities are noted. Which of the following is the most appropriate initial step in management of this patient's condition?

- (A) Administration of hypertonic saline
- (B) Emergent hemodialysis
- (C) Generalized cooling measures
- (D) Immediate endotracheal intubation
- (E) Volume resuscitation with isotonic saline

Content Area: Environmental Disorders (2%)

Critique

This question tests the examinee's ability to recognize heatstroke and determine the appropriate initial management. The correct answer is Option (C), generalized cooling measures. The scenario describes the classic signs of heatstroke, defined by the setting of exertion in a hot climate, the physical finding of flushing, and the presence of mental status changes. This condition differs from heat exhaustion, in which mental status changes are absent. In this medical emergency situation, elevated temperature indicates the need for immediate cooling.

Option (A), administration of hypertonic saline, is incorrect because this intervention is indicated primarily for volume resuscitation. Although the patient described may be hyponatremic, administration of hypertonic saline is not recommended because of the patient's stable heart rate and blood pressure. Option (B), emergent hemodialysis, is incorrect because this therapy plays no role in management of heatstroke and is never an appropriate initial step. Option (D), immediate endotracheal intubation, is incorrect because this intervention is not the appropriate initial step in treating a patient who is ventilating and oxygenating normally. Option (E), volume resuscitation with isotonic saline, is plausible because this intervention may be needed, but it is incorrect because it is not the appropriate initial step in management of heatstroke.

Question #7

A 7-year-old boy is brought to the urgent care center by his parents because he has had difficulty breathing and fever for the past 12 hours. He was delivered at term with no complications. He has had only two episodes of common cold, which the parents attribute to natural immunity because they chose not to have him vaccinated. Temperature is 39.4°C (103.0°F), pulse rate is 120/min, respirations are 30/min, and blood pressure is 100/60 mmHg. Oxygen saturation is 99% on room air. On physical examination, drooling is noted as well as stridor with minimal activity. Which of the following is the most appropriate next step?

- (A) Chest x-ray study
- (B) Immunization with primary vaccine series and immunoglobulin gamma
- (C) Intramuscular administration of a corticosteroid
- (D) Lateral x-ray studies of the soft tissue of the neck
- (E) Throat culture and complete blood cell count

Content Area: Eyes, Ears, Nose, & Throat (6%)

Critique

This question evaluates the examinee's ability to recognize acute epiglottitis and determine the most appropriate initial step in confirming the diagnosis. The correct answer is Option (D), lateral x-ray studies of the soft tissue of the neck. The patient described is of the appropriate age for acute epiglottitis, has high fever, and has not been immunized. All of these factors increase his risk of Haemophilus influenzae infection. The physical examination findings of drooling and stridor are characteristic of this condition. Lateral x-ray study of the soft tissue of the neck is the most appropriate next step because it will readily identify swelling of the epiglottis and loss of the vallecular air column.

Option (A), chest x-ray study, is incorrect because this study does not adequately evaluate the upper airway and, therefore, does not address the patient's symptom of stridor. Option (B), immunization with primary vaccine series and immunoglobulin gamma, is incorrect because this intervention will not confirm the diagnosis or have an immediate effect on the patient's

condition. Option (C), intramuscular administration of a corticosteroid, is incorrect because a hallmark of management of acute epiglottitis is to provide minimal noxious stimuli. Although corticosteroids may be indicated, they are not the most appropriate next step in this case. Option (E), throat culture and complete blood cell count, is incorrect because each of these studies involves noxious stimuli, which could precipitate acute airway obstruction, and neither study will assist in determining the diagnosis.

Question #8

A 16-year-old boy is brought to the emergency department by ambulance in full spinal immobilization after he sustained injuries in a motor vehicle collision. He says he has pain in the lower back and numbness of his legs. He is unable to move his lower extremities. Pulse rate is 112/min, respirations are 20/min, and blood pressure is 104/68 mmHg. Physical examination shows total loss of strength and pain sensation distal to the umbilicus. Proprioception is intact. Which of the following is the most likely diagnosis?

- (A) Anterior cord syndrome
- (B) Brown-Séquard syndrome
- (C) Cauda equina syndrome
- (D) Conus medullaris syndrome
- (E) Spinal stenosis

Content Area: Neurologic System (8%)

Critique

This question tests the examinee's ability to differentiate between the different cord syndromes. The correct answer is Option (A), anterior cord syndrome. The patient exhibits the classic presentation of this syndrome, including loss of motor function and pain and/or temperature sensation with preservation of proprioception.

Option (B), Brown-Séquard syndrome, is incorrect because this condition involves a relatively greater ipsilateral loss of proprioception and motor function, with contralateral loss of pain and

temperature sensation. Option (C), cauda equina syndrome, is incorrect because this condition involves injury to the lumbosacral nerve roots and is characterized by an areflexic bowel and/or bladder with variable motor and sensory loss in the lower limbs. Option (D), conus medullaris syndrome, is incorrect because it is a sacral cord injury with or without involvement of the lumbar nerve roots and is characterized by areflexia in the bladder, bowel, and to a lesser degree, the lower limbs. Motor and sensory loss in the lower limbs is variable. Option (E), spinal stenosis, is incorrect because this condition involves narrowing of the spinal canal, nerve root canals, or intervertebral foramina due to spondylosis and degenerative disk disease.

Question #9

An 18-year-old man is brought to the emergency department by his mother because he has had elevated mood, irritability, and grandiosity during the past four hours. The mother says the patient was so depressed three days ago that he would not come out of his room. Results of drug and alcohol screening are negative. Which of the following is the most likely diagnosis?

- (A) Borderline personality disorder
- (B) Generalized anxiety disorder
- (C) Major depressive disorder
- (D) Bipolar I disorder
- (E) Schizophrenia

Content Area: Psychobehavioral Disorders (7%)

Critique

This question tests the examinee's ability to differentiate between the various mood and personality disorders to determine the most likely diagnosis on the basis of history and symptoms. The correct answer is Option (D), bipolar I disorder. The symptoms of profound depression and elevated mood with grandiosity are the hallmark of this disorder.

Option (A), borderline personality disorder, is incorrect because this condition, which is seen as lying on the border between psychosis and neurosis, is characterized by marked instability in

functioning, affect, mood, interpersonal relationships, and, at times, reality testing. Option (B), generalized anxiety disorder, is incorrect because this condition is characterized by excessive, uncontrollable, and often irrational worry about everyday situations that is disproportionate to the actual source of worry. Option (C), major depressive disorder, is incorrect because the patient's symptoms of elevated mood, irritability, and grandiosity rule out this condition as the most likely diagnosis. Option (E), schizophrenia, is incorrect because this condition is characterized by fluctuating, gradually deteriorating, or relatively stable disturbances in thinking, behavior, and perception.

Question #10

A 13-year-old boy is brought to the emergency department by his parents 20 minutes after he had sudden onset of severe pain in the left side of his scrotum as well as vomiting. The patient is otherwise healthy and takes no medications. Temperature is 37.0°C (98.6°F), pulse rate is 130/min, respirations are 30/min, and blood pressure is 120/98 mmHg. Physical examination shows no abnormalities and no evidence of trauma. Which of the following is the most appropriate initial study?

- (A) Complete blood cell count
- (B) CT scan of the abdomen and pelvis
- (C) Stool analysis
- (D) Ultrasonography of the testicles
- (E) Urinalysis

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

Critique

This question tests the examinee's ability to determine the most sensitive diagnostic test to rule out testicular torsion in a patient with pain in the scrotum. The correct answer is Option (D), ultrasonography of the testicles. In any patient who has sudden onset of pain in the testicles, it is imperative to rule out testicular torsion, and the most effective study to do that is ultrasonography of the testicles.

Option (A), complete blood cell count, Option (B), CT scan of the abdomen and pelvis, Option (C), stool analysis, and Option (E), urinalysis, are incorrect because all of these studies are nonspecific and are ineffective in ruling out testicular torsion.

Question #11

A 69-year-old woman is brought to the emergency department by her husband 45 minutes after she had sudden onset of dyspnea and severe pain in the left side of the chest. The patient underwent right total hip replacement three weeks ago. Temperature is 37.3°C (99.2°F), pulse rate is 120/min, respirations are 22/min and labored, and blood pressure is 140/88 mmHg in the left arm with the patient supine. The patient seems anxious. Physical examination shows persistent cough. Auscultation of the chest shows accentuation of the pulmonary component of S₂, unilateral crackles, and wheezing. Which of the following is the most likely diagnosis?

- (A) Acute myocardial infarction
- (B) Aortic aneurysm
- (C) Bacterial pneumonia
- (D) Pulmonary embolism
- (E) Spontaneous pneumothorax

Content Area: Pulmonary System (10%)

Critique

This question tests the examinee's ability to determine the most likely diagnosis in a patient who has sudden onset of chest pain and shortness of breath after undergoing surgery and a period of immobilization. The correct answer is Option (D), pulmonary embolism. The history and physical examination findings in the setting of recent surgery and immobilization are most suggestive of pulmonary embolism.

Option (A), acute myocardial infarction, is incorrect because cough and unilateral lung findings are unusual in the setting of this condition. Option (B), aortic aneurysm, is incorrect because of

the absence of symptoms such as tearing pain or radiation to the back. Option (C), bacterial pneumonia, is incorrect because this condition is characterized by fever and/or chills, and the presentation of this condition is not typically acute. Option (E), spontaneous pneumothorax, is incorrect because no obvious risk factors for this condition are noted. In addition, unilateral absent breath sounds might be expected with spontaneous pneumothorax.

Question #12

A 44-year-old man is brought to the emergency department by ambulance after he was found by police in an unconscious state. He had been sitting in his car with the engine running inside a garage with the door closed. The patient was intubated en route by emergency medical technicians and is currently unresponsive. Rectal temperature is 38.0°C (100.4°F), pulse rate is 130/min, respirations are 12/min with ventilator support, and blood pressure is 140/100 mmHg. Oxygen saturation is 100%. Which of the following tests is most appropriate to determine whether this patient has sustained carbon monoxide poisoning?

- (A) Arterial blood gas analysis
- (B) Chest x-ray study
- (C) Measurement of carboxyhemoglobin level
- (D) Pulse oximetry
- (E) Ventilation-perfusion lung scan

Content Area: Toxicologic Disorders (4%)

Critique

This question tests the examinee's knowledge about the most appropriate test for suspected carbon monoxide poisoning. The correct answer is Option (C), measurement of carboxyhemoglobin level. In a patient in whom carbon monoxide poisoning is suspected, the most effective method of confirming or ruling out this diagnosis is measurement of carboxyhemoglobin level.

Option (A), arterial blood gas analysis, Option (B), chest x-ray study, Option (D), pulse oximetry, and Option (E), ventilation-perfusion lung scan, are incorrect because these studies are not useful in determining a patient's carbon monoxide level. In addition, oxygen levels may be normal in the setting of carbon monoxide poisoning.

Question #13

A 2-year-old boy is brought to the emergency department by his parents after he sustained an injury to his left forearm while playing with his siblings. The parents say an older sibling was picking the patient up off the floor by his arms when he suddenly cried out. Since that time, he has refused to use his left arm. The patient is in no distress unless an attempt is made to examine his left arm. On physical examination, the left upper extremity is held next to the patient's body in slight flexion and pronation. Which of the following is the most appropriate next step?

- (A) Reduction of the subluxed radial head
- (B) Skeletal survey
- (C) Sling immobilization of the left arm
- (D) X-ray studies of both upper extremities
- (E) X-ray studies of the left wrist, including scaphoid views

Content Area: Traumatic Disorders (6%)

Critique

This question tests the examinee's ability to determine the most appropriate next step in a patient with subluxation of the radial head, which is otherwise known as nursemaid's elbow. The correct answer is Option (A), reduction of the subluxed radial head. Often, the chief symptom of nursemaid's elbow is not localized to the elbow or is not perceived as being in the elbow. This is depicted in the stem of this item, which elevates it to a specialty level. The chief symptom is presented as an injury to the forearm because, in a 2-year-old patient who is too young to accurately describe the symptom, the parents have made the supposition that the forearm is the location of the injury. Because reduction of a subluxed radial head is relatively easy in the emergency department setting, that intervention is the most appropriate next step.

Option (B), skeletal survey, is incorrect because this study is appropriate if physical abuse is suspected, which is not the case in the patient described. Also, this study would expose the patient to unnecessary radiation. Option (C), sling immobilization of the left arm, is incorrect because although this intervention may lead to spontaneous reduction, rapid reduction to restore normal function of the extremity is most appropriate. Option (D), x-ray studies of both upper extremities, is incorrect because, in the patient described, there is no clinical indication for comparison views of the upper extremities. In addition, the area of clinical concern (the radial head) is not yet ossified in a 2-year-old patient and, therefore, would not be visualized on x-ray studies. Option (E), x-ray studies of the left wrist, including scaphoid views, is incorrect because, in the patient described, there is no clinical indication for x-ray studies of the wrist. These studies are indicated in patients who have experienced the typical mechanism for a scaphoid fracture, which is falling on an outstretched hand.

Question #14

A 27-year-old man is brought to the emergency department by ambulance after he sustained injuries in a one-car motor vehicle collision. Emergency medical technicians report that the patient was the unrestrained driver of a car that struck a telephone pole head-on. The patient is immobilized with a cervical collar and spine board. He is conscious and says he has chest pain. Pulse rate is 130/min, respirations are 40/min, and systolic blood pressure is 80 mmHg. On physical examination, the neck veins are distended, the trachea is displaced to the right, and the left side of the chest is hyperresonant to percussion. Heart sounds are distant. On the basis of these findings, this patient has most likely sustained which of the following traumatic injuries?

- (A) Flail chest
- (B) Pneumomediastinum
- (C) Pneumothorax
- (D) Pulmonary contusion
- (E) Rupture of the left main bronchus

Content Area: Traumatic Disorders (6%)

Critique

This question tests the examinee's ability to determine the most likely diagnosis in a patient who has sustained a traumatic injury to the chest. The correct answer is Option (C), pneumothorax. The findings of chest pain, tachypnea, deviation of the trachea, and hyperresonance to percussion after a traumatic injury are characteristic of tension pneumothorax.

Option (A), flail chest, is incorrect because this condition is characteristically described as paradoxical movement of a segment of the chest wall caused by fractures of three or more ribs anteriorly and posteriorly within each rib. Option (B), pneumomediastinum, is incorrect because pain associated with pneumomediastinum is typically retrosternal and worsened by inspiratory maneuvers. The pain may radiate to the shoulders or back, suggesting the possibility of myocardial infarction or pericarditis. Option (D), pulmonary contusion, is plausible considering the mechanism of injury but is incorrect because this condition would not cause deviation of the trachea or hyperresonance to percussion. Option (E), rupture of the left main bronchus, is plausible but incorrect because although this rare condition is usually caused by trauma and could have similar presenting symptoms, the findings described are more characteristic of tension pneumothorax.