EMRAM Practice Exam

Question 1

A 44 year-old woman presents after a motor vehicle collision with a complaint of neck pain. Neurologic examination reveals that bilateral upper extremity strength is 1/5 and bilateral lower extremity strength is 4/5. Which of the following is the most likely pathophysiologic process?

A) Anterior Cord Syndrome

B) Brown-Sequard Syndrome

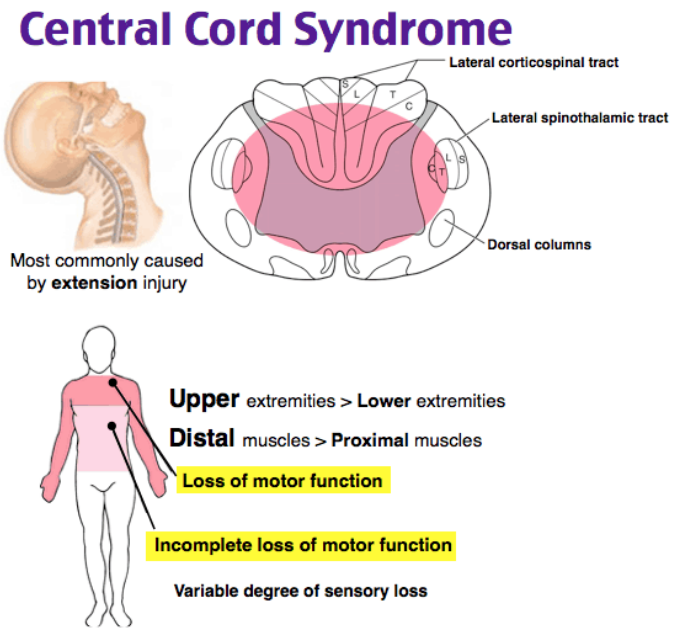
C) Cauda Equina Syndrome

D) Central Cord Syndrome

E) Complete Cord Injury

Answer

- The classic neurologic deficit seen in central cord syndrome is upper extremity weakness greater than lower extremity weakness. This is because of the cervical motor axons being closer to the midline than the lumbar motor axons. Large central cord injuries can initially be clinically indistinguishable from compete cord syndromes. Anterior cord syndrome results in deficits of bilateral motor function and pain/temperature sensation with sparing of vibration/position sensation. Brown-Sequard syndrome, or cord hemisection, results in deficits in ipsilateral motor function and vibration/position sensation with contralateral pain/temperature sensation. Cauda equina syndrome, usually due to disk henation, preferentially affects the lower extremities and bowel/bladder function. Complete cord injury affects all neurologic functions below the level of injury.



Syndrome	Mechanism	Clinical	Prognosis
Anterior cord	Flexion or vascular	Complete loss of motor, pain, & temperature below injury, but retains proprioception and vibratory sensation	Poor
Central cord	**Forced hyperextension**	**Sensory and motor deficit Upper > Lower Extremities**	**Average**
Brown-Séquard	Penetrating trauma	Ipsilateral loss of motor, vibratory sensation, and proprioception with contralateral loss of pain and temperature sensation	Good

Question 2

A 20 year-old man presents to the ED with several days of progressive chest pain, fatigue, myalgias, and exertional dyspnea. He states that he had the “flu” 1 week before. He denies any illicit drug use or family history of heart disease. Physical examination reveals temperature of 100.5ºF, heart rate of 125, no murmurs on cardiac examination, and scattered bilateral crackles on lung examination. EKG demonstrates sinus tachycardia, chest x-ray reveals cardiomegaly and mild pulmonary edema, and laboratory reports are normal except for troponin I, which is elevated at 10 ng/mL. Which of the following is the most likely etiology?

A) Aortic Dissection

B) Diabetic Ketoacidosis

C) Myocardial Infarction

D) Viral Infection

E) Stroke

Answer

- The patient most likely has myocarditis, which in the United States is usually because of viruses, most commonly Coxsackie B. A viral prodrome usually precedes overt signs of cardiac involvement, such as chest pain or signs of heart failure. No common ED laboratory of imaging study is helpful in making the diagnosis of myocarditis. Coronary artery disease is uncommon in patients of this age in the absence of risk factors. Aortic dissection is uncommon in the absence of trauma or history of hypertension or Marfan's disease. Stroke is not suggested by the symptoms, and DKA is unlikely with normal glucose and bicarbonate.

Question 3

A 65 year-old woman presents to the emergency room with signs and symptoms of digitalis toxicity, ventricular tachycardia, and digoxin level of 8.5 ng/mL. She is treated with digitalis antibody fragment therapy and the cardiac rhythm is now sinus. A repeat digoxin level after the fragments are given is 12 ng/mL. Which of the following is the most appropriate next step in management?

A) Calcium Chloride 1g IV

B) Cardioversion at 50J

C) No acute therapy

D) Potassium chloride 40 mEq IV

E) Procainamide 1g IV

Answer

- The standard serum digoxin assay measures levels of all digoxin in the body, including drug bound to Fab fragments. It is not useful to measure digoxin levels once Fab has been given. Precedence should be given to dialysis to remove the drug-Fab complexes. Cardioversion may be performed in unstable patients, but it is unlikely to be curative in patients with digitalis toxicity. Procainamide should be avoided in patients with digitalis toxicity as it may exacerbate dysrhythmias. Calcium chloride should be avoided to prevent the theoretical risk of “stone heart” which occurs from massive calcium influx into the cardiac myocytes causing sustained contraction. Potassium chloride should be given with extreme caution as hyperkalemia is life threatening in this setting.

Question 4

Which of the following is the most commonly injured abdominal organ in pediatric blunt trauma?

A) Kidney

B) Large Intestine

C) Liver

D) Small Intestine

E) Spleen

Answer

- The spleen and liver (in that order) are the most commonly injured abdominal organs in children with blunt trauma. Liver lacerations tend to have higher mortality than splenic lacerations. Unlike the past, splenic lacerations are currently non-operatively managed as much as possible, because of the deleterious immunologic effects of splenectomy. Renal injury is also common, given its proportionally larger size in children relative to adults. Bowel injury in blunt trauma is rare.

Question 5

A 26 year-old man develops headache, dizziness, and nausea while hiking at 10,000ft. His destination is a cabin 500ft higher. The cabin has a medical kit with acetazolamide and dexamethasone. Which of the following is the next best step?

A) Continue to the cabin for the medications
B) Descend 1,500-2,000ft or until symptoms resolve
C) Set up a tent and sleep at the current altitude for the night
D) Stimulate the hypoxic ventilatory response with a Bang energy drink
E) Stop and take acetaminophen and ondansetron then continue hiking

Answer

- The patient has Acute Mountain Sickness (AMS), which is characterized by the presence of a headache (typically bitemporal or occipital) and at least one other symptom including gastrointestinal upset (nausea, anorexia, or vomiting), fatigue, dizziness, lightheadedness, or difficulty sleeping. The key principle in the management of AMS is that further ascent is absolutely contraindicated. This is especially important because the severity of symptoms at onset cannot predict the clinical course. If the symptoms are mild and shelter is available, remaining at the current altitude or treatment with acetazolamide or dexamethasone are options. However, descent is the most effective means of treatment.

Question 6

A 23 year-old woman presents with fever, myalgias, and headache for 3 days. She then developed a rash, which started on her wrists and ankles and has now spread all over her body. The non-blanching rash is shown. Which of the following is the most likely etiology?

A) Borrelia burgdorferi

B) Coxsackievirus

C) N. gonorrhea

D) N. meningitidis

E) Rickettsia rickettsii

Answer

- The rash is petechial in nature and combined with the history of starting on the wrists and ankles along with the nonspecific viral symptoms indicate the diagnosis of Rocky Mountain Spotted Fever (RMSF). This tick-borne illness is caused by R. Rickettsii. Treatment of RMSF is with doxycycline and admission to the hospital. Borrelia burgdorferi is the causative bacterium of Lyme disease. Coxsackievirus causes herpangina and myocarditis. Gonococcus may cause a vesicular rash in association with septic arthritis, cervicitis, or pelvic inflammatory disease. Meningococcus may cause a petechial rash with signs and symptoms of meningitis, but the onset is much more acute and severe and RMSF.

Question 7

Which of the following has the highest statistical chance of completed suicide?

A) 18 year-old African American woman

B) 35 year-old pregnant woman

C) 50 year-old married white man

D) 75 year-old African American man

E) 75 year-old white man

Answer

- Elderly white men have the highest rate of completed suicide, respresenting more than ¾ of all suicide deaths, and women have the highest rate of suicide attempts. White patients are more likely to commit suicide than African Americans or Hispanics, and non-pregnant women of child-bearing age are more likely than pregnant women to do so. Divorced patients have higher rates than unmarried patients. Most successful suicide attempts involved firearms and most unsuccessful attempts involve drug ingestions. The presence of a firearm in the house is an independent risk factor for completed suicide and the patient should be directly asked about this on history. Substance abuse, especially alcohol and cocaine, is extremely common in patients who complete suicide. Patients who present to the ED with attempted suicide must be evaluated for medical illness that may masquerade as mood disorder or thought disorder leading to suicide attempt.

Question 8

A 35 year-old woman presents after a fall from the fourth-story window. She was initially awake and moaning, but then becomes unresponsive. Her pupils are both initially pinpoint and progress to midpoint with loss of light reflex. She exhibits decorticate posturing in response to pain and hyperventilation. You suspect cerebral herniation. Which of the following is the most likely mechanism?

A) Central transtentorial

B) Cerebellotonsillar

C) Medullary

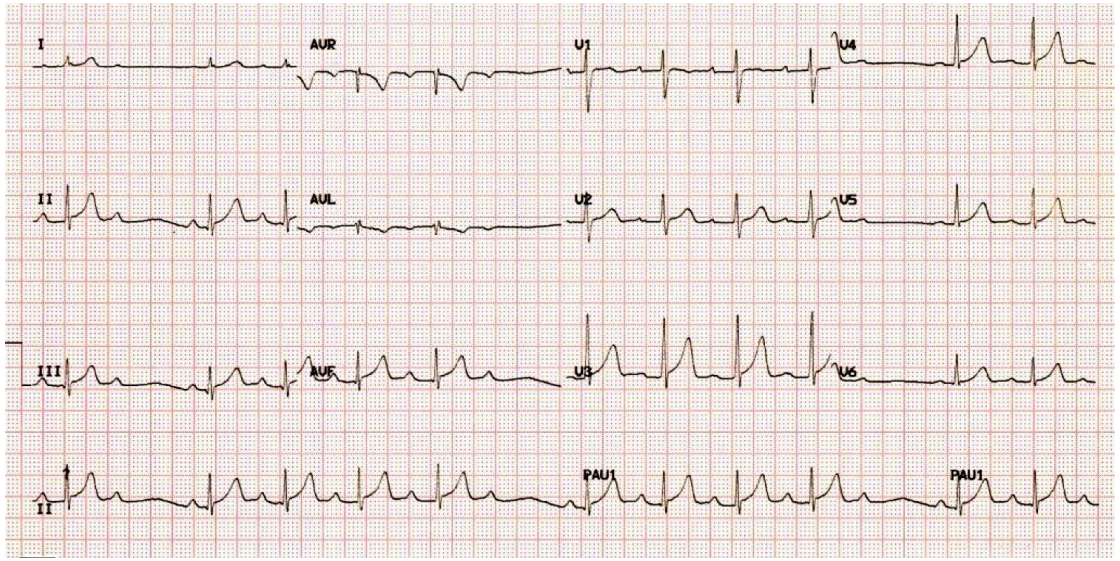
D) Uncal

E) Upward transtentorial

Answer

- Cerebral herniation syndromes are a result of severely increased ICP, usually because of trauma. Herniation occurs when increased ICP causes movement of various parts of the brain causing compression of various nerves and blood vessels. Uncal herniation results from lateral injury causing the ipsilateral temporal lobe to be compressed through the tentorium cerebelli. The initial clinical manifestation is oculomotor nerve injury, causing ipsilateral ptosis, oculomotor dysfunction, and mydriasis. As the uncal herniation progresses, contralateral hemiparesis occurs. Eventually, the contralateral uncus is compressed, leading to bilateral decerebrate posturing, and the brainstem herniates causing respiratory failure. In central transtentorial herniation, an expanding midline lesion causes bilateral pinpoint pupils, positive Babinkski reflexes, and decorticate posturing. Cerebellotonsillar herniation results from cerebellar hematoma, which causes the sudden onset of pinpoint pupils, and respiratory and cardiovascular compromise with complete, bilateral paralysis. Brainstem and medullary herniation is the common endpoint for all herniation syndromes and is manifested by respiratory arrest.

Question 9



A 65 year-old man presents with a syncopal event without prodromal symptoms. His vital signs are 98.6F, HR 60, RR 18, BP 142/75, 99%RA. The EKG is shown. Which of the following is the most appropriate next step in management?

A) Admission and pacemaker placement

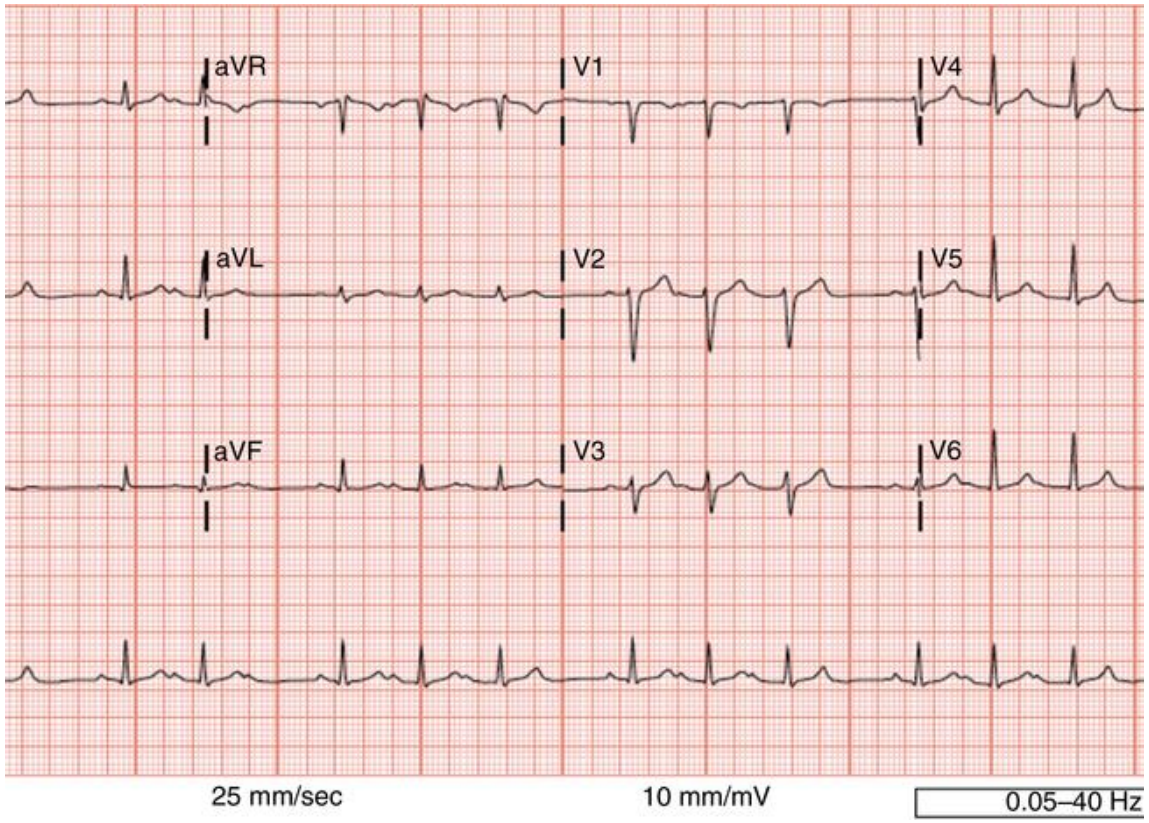
B) Amiodarone 150mg IV

C) Cardioversion at 50J

D) Defibrillation at 200J

E) Discharge home with cardiology follow up

Answer



- This patient has a Mobitz Type 2 second degree AV block, which is an indication for admission to a telemetry bed and possible pacemaker placement. The PR interval does not show any observable pattern of increasing prolongation as in Mobitz Type 1 second degree AV block (Wenckebach). Cardioversion and amiodarone are not indicated in stable bradydysrhythmias, and defibrillation of an awake patient is never indicated.

Question 10

Which of the following toxins is suggested by the smell of garlic?

A) Cyanide

B) Hydrogen Sulfide

C) Organophosphate

D) Toluene

E) Zinc

Answer

- Isopropyl Alcohol – Fruity
- Cyanide – Almonds
- Arsenic, organophospates, selenium – garlic
- Hydrogen Sulfide – Rotten Eggs
- Phosgene – Hay
- Methyl Salicylate – Wintergreen

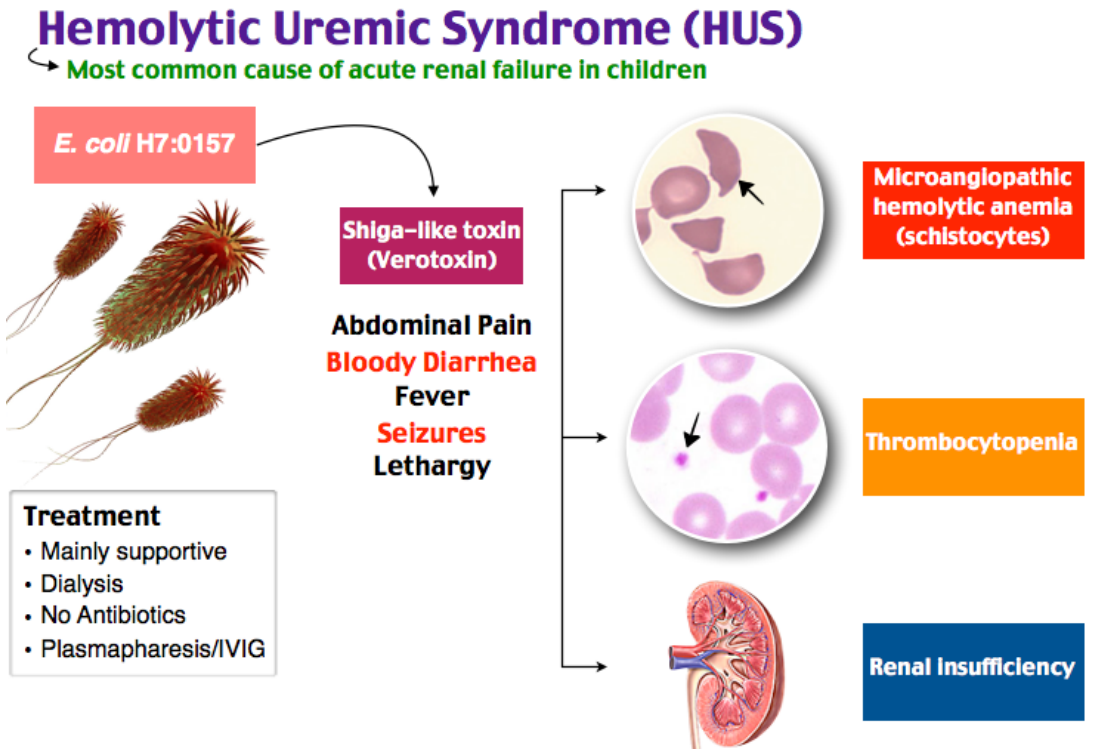
Question 11

A 5 year-old boy presents with bloody diarrhea for several days, follow by fatigue, pallor, and malaise. Several kids at school have similar complaints. Blood tests at his pediatrician's office demonstrate severe anemia, thrombocytopenia, and renal insufficiency. Which of the following is the most likely cause?

A) Child abuse
B) Escherichia coli
C) Rotavirus
D) Salmonella
E) Shigella

Answer

- The triad of anemia, thrombocytopenia, and renal insufficiency should prompt evaluation for either hemolytic uremic syndrome (HUS) or thrombotic thrombocytopenic purpura (TTP). Fever and neurologic signs and symptoms are mor common in the latter, but the tow are thought to be on the same spectrum of disease. The toxin-forming bacterium E. coli O157:H7 is responsible for most epidemic cases of HUS. Treatment is primarily supportive and aimed at preventing complications of severe anemia and thrombocytopenia. Plasmapheresis is used for cases of idiopathic HUS or TTP. Shigella is less common precipitant of HUS than E. coli, but Salmonella species and rotavirus are not implicated.



Question 12

Which of the following tissues has the greatest resistance to electrical flow?

A) Blood

B) Fat

C) Muscle

D) Nerves

E) Skin

Answer

- Fat, tendons, and bones have the greatest resistance to electrical flow (bones have the highest resistance of all) whereas nerves, blood, mucous membranes, and muscle have the least resistance. The resistance of dry skin is intermediate, although it varies greatly depending on the skin surface involved. Tissues with high resistance tend to heat up and coagulate in response to electrical flow.

Question 13

A 34 year-old woman with acquired immune deficiency syndrome (AIDS) presents with first time seizure. Which of the following is the most likely cause of her seizure?

A) Electrolyte abnormality

B) Mass lesion

C) Meningitis

D) Stroke

E) Syphilis

Answer

- The single most common identifiable cause of seizures in HIV/AIDS pateints is toxoplasmosis, which causes seizures through mass effect. Other mass lesions such as malignancy and abscess are additional causes. In cases that are not due to any identifiable cause, HIV-encephalopathy is postulated to be the etiology. Meningitis, usually cyryptococcal, is the second most common cause. Electrolyte abnormalities, stroke, and neurosyphilis are less commonly implicated.

Question 14

Which of the following is the most common mode of completed suicide?

A) Carbon monoxide

B) Drug ingestion

C) Firearms

D) Hanging

E) Wrist cutting

Answer

- The majority of completed suicides among both men and women involve firearms. The presence of a firearm in the house is an independent risk factor for completed suicide and the patient should be directly asked about this on history. Drug ingestion, usually with antidepressants, is the most common method of suicide attempts, and the second most common method of completed suicide by women. Carbon monoxide poisoning is employed less often. Hanging is the second most common method of completed suicide by men. Wrist cutting almost never results in completed suicide.

Question 15

A 27 year-old male is brought to the ED after an accident he had while riding an ATV. He was riding in an open field with a helmet and body armor when he was struck in the neck with a wire fence that knocked him off the bike and knocked him out. He now complains of a mild headache and neck and back soreness but is otherwise without complaints. His examination reveals left sided ptosis and anisocoria with a smaller left pupil. Which of the following is most like to reveal significant injury?

A. Cervical spine series
B. Chest x-ray
C. CT angiography head/neck
D. CT head without contrast
E. Laryngoscopy

Answer

- This patient has Horner's syndrome caused by disruption to the sympathetic fibers that encircle the carotid artery. Division of the sympathetics results in ptosis, miosis, and anhidrosis on the side of the injury and can occur after either blunt or penetrating trauma. Though the presence of Horner's Syndrome is not a life threatening emergency, it may represent a life threatening vascular emergency due to proximity of the sympathetic chain to the carotid artery. Therefore all patients with Horners syndrome should have a definitive evaluation of the carotid artery to exclude intimal injury (CTA head/neck). Delayed presentation of neurologic deficits is typical of vascular injuries to the neck due to blunt trauma. In the absence of Horner's syndrome, most patients experience stroke symptoms between 1 and 24 hours after injury due to carotid of vertebral artery dissection or thrombosis. Vascular injury should be suspected in all patients with neurologic findings that are incongruent with head CT findings.

Question 16

Which of the following is true regarding pericardial effusion?

A) As little as 50mL of pericardial fluid can cause abnormalities on the cardiac shadow on chest x-ray

B) Beck's triad is seen in less than half the number of patients with signs of tamponade

C) Blind pericardiocentesis is the treatment of choice for stable pericardial effusions

D) Electrical alternans is the most common EKG abnormality

E) MRI is the diagnostic test of choice

Answer

- Pericardial effusions are seen as cardiomegaly on chest x-ray when approximately 250mL of fluid has accumulated around the heart. Beck's triad of hypotension, muffled heart sounds, and JVD occurs in <25% of patients with tamponade and should not be relied upon to make the diagnosis. Echo, no MRI, is the diagnostic test of choice in most cases (CT scan can add helpful information). Blind pericardiocentesis should only be performed in unstable cases of tamponade when echo is not available as the complication rate is too high. Tachycardia is the most common abnormal finding found on EKG, and decreased voltage can be found more commonly than electrical alternans.

Question 17

A 25 year-old male ingests an unknown quantity of iron tablets 2 hours before presentation in an overdose attempt. Which of the following is the most appropriate next step in management?

A) Activated charcoal
B) Gastric lavage
C) Hemodialysis
D) Ipecac
E) Polyethylene Glycol

Answer

- Iron toxicity can be life threatening. Ingestion of large quantities of iron overwhelms the body's iron-binding capacity and causes GI, cardiac, CNS, hepatic, and renal damage. Nausea, vomiting, diarrhea, and GI bleeding are the most common symptoms. Diagnosis involveds serial serum iron levels and plain abdominal radiographs to demonstrate passage of the radiopaque iron pills. Treatment involves whole bowel irrigation with polyethylene glycol, deferoxamine chelation in patients with severe overdoses (ie rising iron levels, absolute level >500, worsening clinical course), and dialysis of the chelated iron when renal failure is present. Activated charcoal does not adequately bind heavy metals. Gastric lavage is rarely indicated for any overdose. Hemodialysis is only necessary when renal failure limits the body's ability to clear chelated iron.

Question 18

A 7 year-old girl is brought in by her father after choking on a plastic toy. She was coughing violently and gasping in the car, so the father tried the Heimlich maneuver and a blind finger sweep but she seemed to get worse. His daughter is now unconscious and cyanotic. After performing a jaw-thrust maneuver, you fail to locate the foreign body. Attempts to place an ET tube fail, as the tube seems to be striking an object. What is the best next step?

A. Back blows to dislodge the foreign body

B. Blind finger sweeps to remove the foreign body

C. Laryngeal mask airway

D. Needle cricothyroidotomy

E. Surgical cricothyroidotomy

Answer

- This patient has complete airway obstruction due to foreign body aspiration. Although she initially had partial foreign body obstruction, it progressed to complete obstruction and she needs a definitive airway. Back blows and chest thrusts would be reasonable initial approaches in *infants*. Abdominal thrusts can be used in children older than 12 months, although the Heimlich maneuver is preferred for older children and adults. Blind finger sweeps should be discouraged since they have the potential to convert a partial airway obstruction to complete. The fastest way to establish a definitive airway in complete obstruction is with cricothyroidotomy. A needle cric should be preferred over surgical cric in children less than 8 years of age. Surgical cric is more difficult in younger children due to small size of the cricothyroid membrane and places them at risk for subglottic stenosis. Needle cric is performed using a 12-16g angiocatheter and inserting it through the membrane into the trachea. The catheter can then be attached to an adapter for 3-0 ET tube or use percutaneous transtracheal jet ventilation. These maneuvers are temporary until more definite airway can be established.

Question 19

Which of the following is a unique aspect of tarantulas?

A) Envenomation of an extremity can cause transient paralysis distal to the wound.
B) In addition to venom, they serve as a vector for Borrelia spp. And may transmit Lyme disease
C) Tarantula envenomation may result in anaphylaxis and rapid respiratory failure
D) Their abdominal hairs can become embedded in the skin resulting in subsequent allergic reactions
E) Their venom triggers widespread mast cell degranulation resulting in diffuse flushing and pruritis

Answer

- Although tarantula bites may inflict a significant amount of pain, there is usually minimal erythema and swelling at the bite site. Severe envenomation is extremely uncommon and fatalities have not been described in the United States. However, tarantulas are covered with “urticating hairs” that it can cast out toward a victim. The hairs become embedded in the skin and may cause an intense inflammatory response, resulting in pruritis and occasionally erythematous papules. After rubbing the area, patients may also unintentionally transfer the hairs to their eyes resulting in a severe keratoconjunctivitis that requires ophthalmologic referral for treatment and hair removal.

Question 20

A 23 year-old man with a past medical history for AIDS presents with fever and headache. Brain CT scan is unremarkable and CSF results from the lumbar puncture results are shown:

WBC – 35, lymphocyte predominance

RBC – 2

Glucose – normal

Protein – normal

Gram Stain – Negative

India Ink - Positive

What is the most appropriate medication at this time?

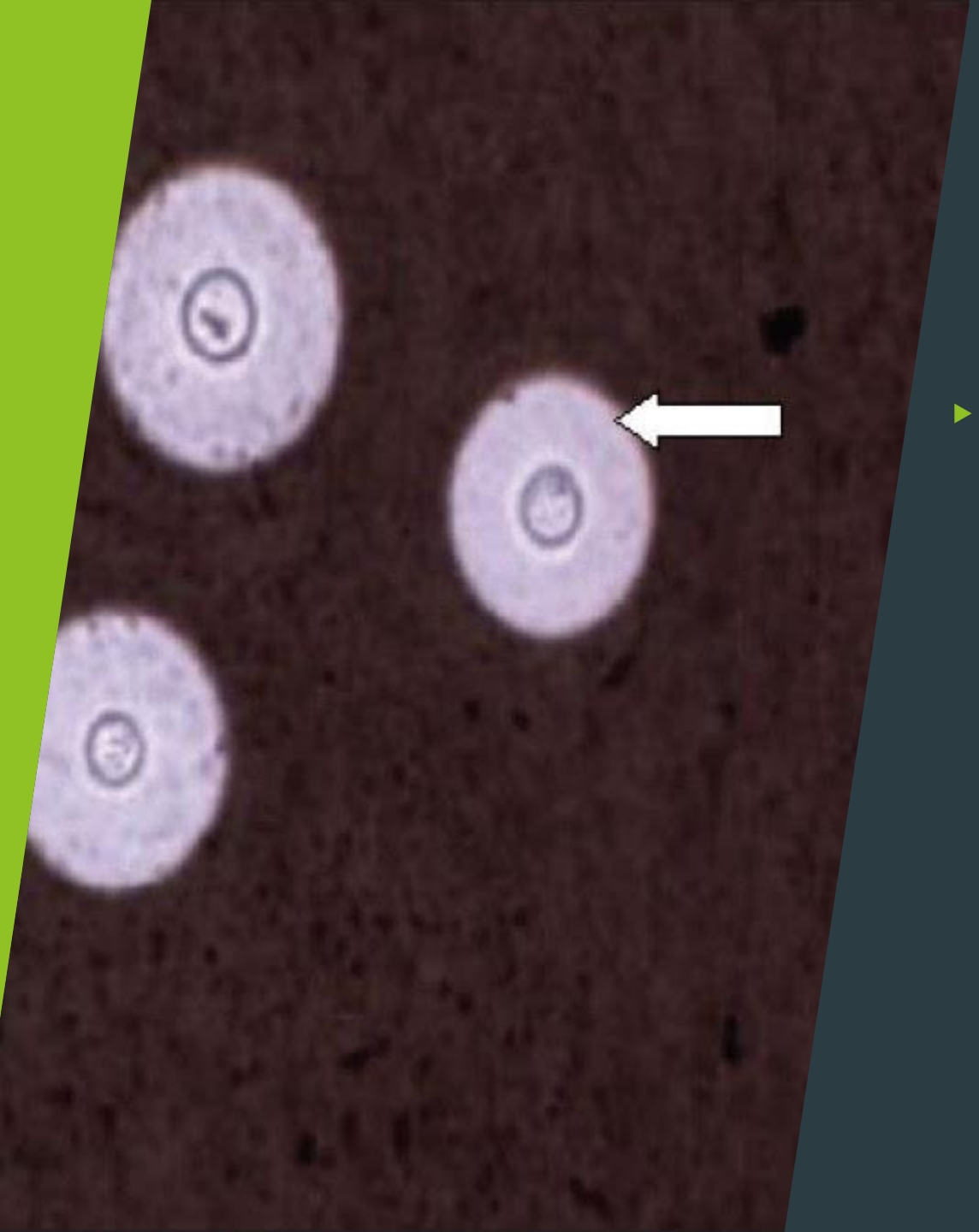
A) Acyclovir

B) Amphotericin B + Flucytosine

C) Ceftriaxone

D) Itraconazole

E) Vancomycin



Answer

- With a positive India Ink stain of the CSF, the patient has fungal meningitis, most likely due to Cryptococcus neoformans, an opportunistic infection common in patients with AIDS. Patients usually present with typical symptoms of aseptic meningitis. The CSF WBC and protein are usually only slightly elevated. India ink staining has approximately 80% sensitivity, so CSF should also be sent for cryptococcal antigen, which has close to 1100% sensitivity and specificity. Treatment for cryptococcal meningitis is with amphotericin B plus flucytosine, which is superior to itraconazole monotherapy. Fluconazole monotherapy may be used in very mild cases. Ceftriaxone and Vancomycin are used for therapy of bacterial menigitis. Acyclovir is used for herpes simplex encephalitis, which is suggest by altered mental status and elevated CSF RBC count.

Question 21

A 25 year-old man with schizophrenia presents with acute agitation. According to family, he was seen by the psychiatrist during the previous week and diagnosed with schizophrenia. He is extremely agitated, tachycardic, diaphoretic, febrile, and exhibits muscle rigidity. Which of the following is the most appropriate next step in management?

A) Acetaminophen

B) Amantadine

C) Bromocriptine

D) Haloperidol

E) Lorazepam

Answer

- With the history of recent diagnosis of schizophrenia (and likely started on new antipsychotic medication) the patient has evidence for neuroleptic malignant syndrome (NMS). Hyperthermia, muscle rigidity, altered mental status, and elevated creatine phosphokinase (CPK) levels are characteristic. Treatment involved aggressive sedation with benzodiazepines, cooling, and paralysis with neuromuscular blockade in sever cases. Acetaminophen is unlikely to be of benefit in patients with hyperthermia because hyperthermia does not exhibit an elevation of the hypothalamic set point as is seen in fever. Amantadine and bromocriptine are dopamine agonists which have not been proven to be beneficial in patients with NMS. Haloperidol is an antipsychotic which might further exacerbate the pathophysiologic process in this case. Dantrolene, which blocks calcium release in muscle cells, may afford some benefit, but is unlikely to be more effective than benzodiazepines and paralytics.

Question 22

Regarding victims of motor vehicle crashes, which of the following is true?

A) Hypotension due to hemorrhagic shock occurs earlier in adults than in children.

B) Hypothermia during resuscitation occurs earlier in adults than in children.

C) Liver injury is more common in adults than in children.

D) Renal injury is more common in adults than in children.

E) Serious head injury is more common in adults than in children.

Answer

- Owing to anatomic and physiologic differences, pediatric blunt trauma patients tend to exhibit more injuries to specific organs than adults. Hypotension is an extremely late sign of hemorrhagic shock in pediatric patients and often signals imminent cardiac arrest. Extreme tachycardia in pediatric patient may compensate for severe acute blood loss and maintain an adequate cardia output for a brief period of time. Most pediatric patients lack sufficient amounts of adipose tissue to withstand the cold environment of the trauma resuscitation room and unwarmed IV fluid administration, putting them at a much higher risk than adults for severe hypothermia. Solid organs, including liver, spleen, and kidney, are more often injures in pediatric patients due to lower amounts of surrounding extra – abdominal soft tissue. Because children's heads are proportionally larger than those of adults, serious head injury is more common in children.

Question 23

A 65-year-old woman presents with lightheadedness. She denies chest pain or shortness of breath. Vital signs are 99.0 F, 160,20,144/75,96% RA. The EKG is attached. Which is the following is the most appropriate next step in management?

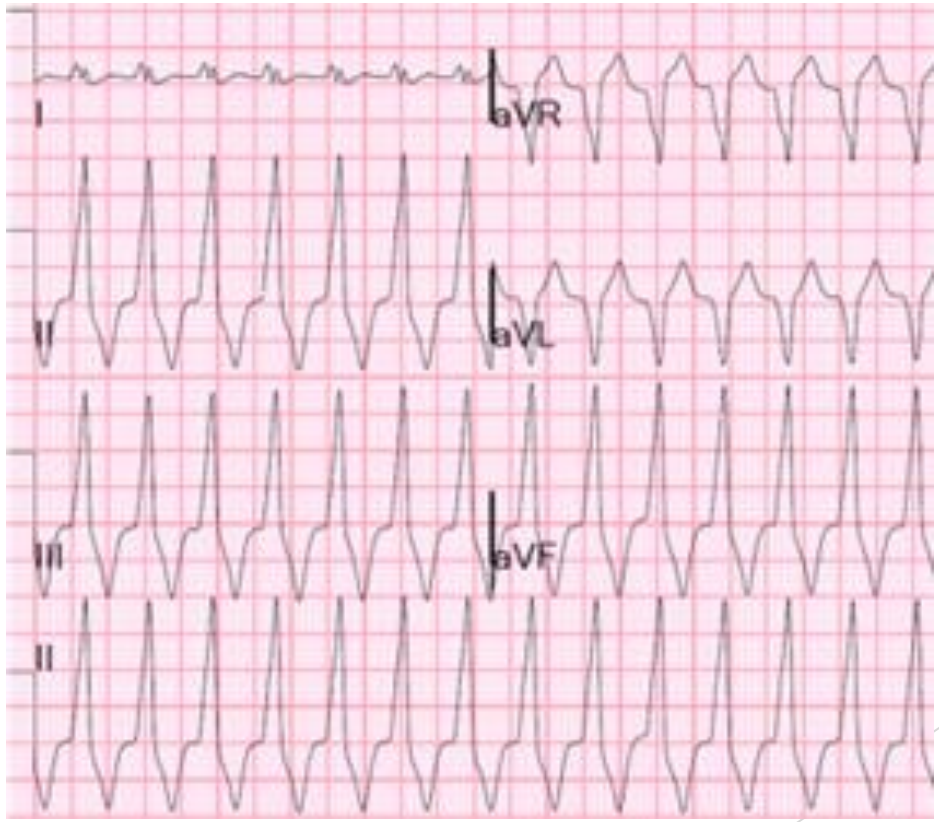
A) Adenosine

B) Amiodarone

C) Cardioversion at 50 J

D) Cardioversion at 200 J

E) Diltiazem



Answer

- The EKG shows a wide-complex, regular tachycardia, which is almost always ventricular tachycardia (VT). Amiodarone, procainamide, or lidocaine may be used to treat stable VT. Although cardioversion may also be performed, it is painful for awake patients and may not be necessary for patients without hemodynamic instability. Adenosine and diltiazem are both used in patients with narrow-complex tachycardias and have no role in ventricular dysrhythmias. Supraventricular tachycardia (SVT) with aberrant conduction can also cause a regular , wide-complex tachycardia. VT is far more common, and may be distinguished from SVT with aberrance by the presence of fusion beats, atrioventricular (AV) dissociation, wider QRS complexes (>0.14 second), and concordance of precordial leads. When in doubt, the EP should always treat regular wide-complex tachycardia as VT.

Question 24

Which of the following is most characteristic of ethylene glycol overdoses?

A) Hypermagnesemia

B) Hypocalcemia

C) Hypokalemia

D) Microcytic Anemia

E) Thrombocytopenia

Answer

- Ethylene glycol is metabolized to glycoaldehyde by alcohol dehydrogenase, and glycoaldehyde is converted to glycolic acid by aldehyde dehydrogenase. Glycolic acid is then converted to glyoxylic acid, which is converted to oxalic acid. Oxalic acid binds calcium and forms calcium oxalate crystals, which can precipitate in the renal tubules, brain, and lungs, causing necrosis. Approx. one third of patients with ethylene glycol poisoning have hypocalcemia, which can lead to QT prolongation and seizures. Hyperkalemia is more common than hypokalemia , probably due to the metabolic acidosis caused by ethylene glycol poisoning. Anemia, thrombocytopenia, and hypermagnesemia do not usually occur in patients with ethylene glycol poisoning.

Question 25

A 4-year-old boy presents with generalized abdominal pain, and multiple episodes of bloody diarrhea. His mother says he had a hamburger at a local fast-food restaurant 5 days ago but that “they eat there all the time”. The patient’s illness started 1 day before seeing you. It began with watery diarrhea and mild abdominal pain, but his symptoms have progressed to more severe pain with bloody diarrhea. He has no fever. Which of the following statements is true.

A) Most affected children have a very high fever

B) The hamburger is likely unrelated to this patient’s diarrheal illness as the incubation period is more commonly 12-24 hours

C) Thrombotic thrombocytopenic purpura is the most common systemic

D) TMP-SMX is the treatment of choice

E) Up to 25% of children may develop hemolytic-uremic syndrome (HUS)

Answer

- E. coli O157:H7 (also known as enterohemorrhagic E. coli or enterohemorrhagic Escherichia coli (EHEC) is the most important strain of E.coli that commonly causes diarrhea is the US. It is most frequently associated with eating undercooked ground beef. However, outbreaks from contamination of apple cider, raw milk, and most recently, spinach, have also been reported. Antibiotics are contraindicated in all cases because they may induce the expression and release of toxins (Shiga toxins), which may worsen the disease and increase the risk of developing hemolytic–uremic syndrome (HUS). HUS is a syndrome characterized by microangiopathic hemolytic anemia, thrombocytopenia, and renal failure and occurs in as many as 25% of cases(most of which occur in children). HUS is the most common cause of renal failure in children. Thrombotic thrombocytopenic purpura (TTP) is a less frequent complication of EHEC results infection, and more commonly occurs in elderly or immunocompromised. Infection with EHEC results in a hemorrhagic colitis after an incubation period, which ranges from 3 – 8 days. Fever is atypical and a different pathogen should be considered is fever is present.

Question 26

Which of the following is true regarding electrical injury?

A) Asystole is the most common dysrhythmia resulting from low-voltage electrical injury.
B) AC current travels in one direction
C) Direct current (DC) is more dangerous than alternating current (AC)
D) In contrast to other multi-victim traumatic events, patients without signs of life should be resuscitated first.
E) In high-voltage injuries, the extent of cutaneous burns is a good predictor of internal tissue damage.

Answer

- For a given voltage, AC is thought to be three times more dangerous than DC. This is due to the fact that AC current causes repetitive muscle contraction or tetany once the “let-go” current is exceeded. This results in prolonged exposure and more severe injury. High-voltage electrical injuries should be treated like crush injuries, because there is often a large amount of tissue damage underneath normal appearing skin. It is impossible to predict the degree of underlying damage from the extent of cutaneous burns. Fewer than 10% of patients experiencing low-voltage electrical injury develop cardiac dysrhythmia. In those patients who do suffer cardiac arrest due to arrhythmia, ventricular fibrillation is most common. Tirage priorities are different in cases of high-voltage electrical injury or lightening strikes. Patients with obvious signs of life tend to do well and can afford a small delay in definitive care. Furthermore, due to the possibility of a good outcome with cardiopulmonary resuscitation (CPR), patients without signs of life should receive immediate care.

Question 27

A 61-year-old male smoker recently performed some repairs on several air conditioner units during the late summer. He is now brought in by his family confused, with high fever, chills, a dry cough, and diarrhea. The test that will best determine the likely specific cause of his illness is which of the following?

A) Blood Cultures

B) Chest x-ray

C) Serology testing

D) Sputum cultures

E) Urine antigen testing

Answer

- L. pneumophila is an important cause of the severe community acquired pneumonia. In patients with more severe symptoms due to CAP, the percentage of Legionella spp. isolates increases. Epidemiologic studies have exposed links of legionellosis to exposure to contaminated water sources, such as air-conditioning units and cooling towers. Furthermore, older patients with a history of alcoholism, tobacco use, and COPD as well as patients on immunosuppressive therapy appear to be at higher risk. Although the role of Leigionella spp. is still being defined in the setting of more benign illness, legionellosis is classically described as a severe infection, associated with high fevers, dry cough which may turn productive late in the course, pleuritic chest pain, and prominent gastrointestinal symptoms including abdominal cramps and diarrhea. However, several studies have demonstrated that the clinical and radiographic features of the disease are nonspecific. Therefore, to make the diagnosis lab testing is required. Urinary antigen testing is the test of choice as it is both highly sensitive and specific, and it is also quite rapid. Although antibiotic therapy should be started empirically before such results are obtained, urine testing can be initiated in the ED to guide the patient's further therapy and to provide useful information about the prognosis.

Question 28

A 34 year-old male with history of schizophrenia is brought to the ED by police with acute agitation. He was reported to be threatening passersby on the street. He now begins to threaten staff, stating that he will kill anyone who comes near him, and starts to swing punches at people standing near him. The patient is physically restrained by security staff and secured to a cart in four-point restraints. He is still yelling at the top of his lungs and struggling against the restraints. Which of the following is the most appropriate next step in management?

A) Administer haloperidol, lorazepam, and diphenhydramine
B) CT scan of the brain without contrast
C) Observe for 1 hour and repeat H&P
D) Observe for 4 hours and discharge when calm
E) Perform rapid sequence intubation

Answer

- Any patient with acute agitation and potential for violence either to self or to others must be physically and chemically restrained. Rapid tranquilization is ideally accomplished with a combination of haloperidol and benzodiazepine. Diphenhydramine is used to reduce the incidence of acute dystonic reactions that may accompany the administration of the antipsychotic medication. Observing the patient in an agitated state struggling against restraints is contraindicated, as the patient may cause harm to himself. Trying to perform a CT scan with the patient acutely agitated will be impossible and just put the patient and staff at risk for injury. Rapid sequence intubation is not indicated unless rapid tranquilization is unsuccessful and serious morbidity is suspected in the patient, necessitating emergent work up for acute medical or traumatic cause for the psychosis.

Question 29

A 23 year-old man presents to the ED after being kicked in the head with loss of consciousness. He is awake and alert and complains of headache. CT of the head is performed and shown. Right after CT he becomes unresponsive. Which of the following is the most appropriate next step in management?

A) Burr hold placement
B) CT angiography of head/neck
C) Endotracheal intubation
D) Emergent thoracotomy
E) Nasogastric tube placement

Answer

- The CT shows a right sided epidural hematoma. While the patient was initially awake and alert, this may be indicative of the lucid interval that is often seen in patients with epidural hematoma. Acute worsening of the clnical status mandates returning to the ABCs of trauma evaluation. Although burr hole placement is the most important definitive management, control of the airway is the most important initial action. CT angiography may help to visualize the bleeding vessel but is not indicated acutely. Thoracotomy is indicated for patients with penetrating trauma to the chest who arrest in the ED or shortly beforehand. Nasogastric tube placement is contraindicated in patients with severe head and facial trauma as damage to the inferior portion of the skull may allow the tube to pass from the nose to the cranium.

Question 30

A 65 year-old man with past history of hypertension presents with sudden onset of shortness of breath 8 hours ago. He also reports orthopnea and lower extremity edema, but denies chest pain. He saw his primary care physician who noted a new diastolic murmur. Vital signs are T 98.4F, HR 110, BP 115/76, RR 25, O2 90%RA. Exam reveals a patient in moderate respiratory distress, diastolic murmur at the right upper sternal border, bilateral crackles and lower extremity pitting edema. The EKG shows signs of left ventricular hypertrophy, troponin is negative, and chest x-ray demonstrates cardiomegaly and pulmonary edema. Which of the following is the most appropriate definitive therapy?

A) Dobutamine

B) Pacemaker placement

C) Percutaneous transluminal coronary angioplasty

D) Surgical valve replacement

E) Tissue plasminogen activator

Answer

- The patient has CHF from acute aortic regurgitation. The history of a new diastolic murmur with signs of pulmonary edema and normal EKG and cardiac markers indicates a valvular pathology. Surgical aortic valve replacement is the only definitive treatment for these patients.

Question 31

A 28 year-old man presents to the ED stating that he drank a whole bottle of antifreeze 4 hours prior to presentation. He had drunk a fifth of liquor just before drinking the antifreeze. Except for the moderate intoxication, he is asymptomatic, and his vital signs and exam are normal. Which of the following is the most appropriate next step in management?

A) Check an ethanol level and administer fomepizole if negative

B) Check an oxalic acid level and discharge him in <50mg/dL

C) Check urine for crystals and discharge him if negative

D) Check urine for fluorescence and discharge him if negative

E) Discharge him without further testing

Answer

- Toxic alcohol ingestions often present with delayed morbidity and mortality, especially when ethanol is co-ingested. Ethylene glycol is the main toxic alcohol present in antifreeze, and its half life without co-ingestants is up to 9 hours. In the presence of ethanol, the half-life roughly doubles. Therefore, patients who have ingested both ethanol and ethylene glycol may be asymptomatic on presentation (other than inebriation). Diagnosis involves cardiac monitoring, basic chemistry labs, ethanol level, blood gas, EKG, urinalysis, and CPK. Fomepizole, a pharmacologic alcohol dehydrogenase inhibitor, is administered if there is suspicion of ethylene glycol overdose, especially if an ethanol level is negative, which indicates that alcohol dehydrogenase is free to convert ethylene glycol to its toxic metabolites. Fomepizole does not detoxify the parent compound, it simply buys time for the definitive removal of the toxic alcohol by dialysis.

Question 32

A 1-month-old boy is brought in by his teenage mother due to vomiting. Emesis has been nonbloody and nonbilious, but it has progressively increased over past week. Mother has attempted three different formulas without improvement. No reported fever or other pertinent finds on review of systems. On your exam, the child appears mildly dehydrated. Bedside glucose reads 72. IVF therapy is begun and the basic metabolic panel (BMP) reveals sodium 130, potassium 2.8, chloride 92, and bicarbonate 32. What test will confirm your suspicion for this etiology of this child's problems?

A) Abdominal radiograph

B) Abdominal Ultrasound

C) Cerebrospinal fluid (CSF) studies

D) Milk protein allergy panel

E) Upper gastrointestinal (GI) radiograph

Answer

- The infant presents with the classic abnormalities associated with hypertrophic pyloric stenosis: hyponatremic, hypokalemic, and hypochloremic metabolic alkalosis (HPS). HPS usually presents in the first month of life with progressive nonbilious emesis that is often reported as being projectile. Laboratory studies are not always abnormal due to earlier diagnosis with ultrasound. An olive-shaped mass below the liver may be felt on physical examination, but ultrasound is the diagnostic gold standard. CSF studies are not indicated due to history of present illness, absence of fever, and other physical exam findings. Abdominal radiograph would most likely reveal a nonspecific gas pattern and is not diagnostic standard for pyloric stenosis. Upper GI may be indicated if there is concern for other obstructive processes such as malrotation. In malrotation, the emesis is more likely to be bilious. The emesis with HPS is always nonbilious. Milk protein allergy typically presents with vomiting and diarrhea and blood in stool.

Question 33

Which of the following is a positive prognostic sign in patients with frostbite?

A) Early formation of clear blebs in the affected tissue

B) Development of hemorrhagic blebs

C) Lack of edema formation

D) Violaceous appearance after rewarming

E) Woody firmness of the SQ tissue

Answer

- Hyperemia and erythema are expected findings on rewarming frostbitten tissue, but a residual violaceous color is an ominous sign. Positive prognostic signs include a return to normal pliability, early return of normal sensation, and early formation of large clear blebs in the affected area. Persistent firmness of the SQ tissue, lack of edema, or delayed formation of hemorrhagic blebs all portend a worse outcome.

Question 34

A 63 year-old woman is brought to the ED by her children because she is lethargic and has labored breathing. They last saw her 4 days ago when she seemed well. Her bital signs are T 101.8F, HR 120, RR 32, O2 89% on NRB. She is intubated and placed on assist control ventilation. A subsequent chest x-ray reveals diffuse bilateral infiltrates, and normal heart size. You suspect she has severe pneumonia and acute respiratory distress syndrome (ARDS). Which of the following summarizes the best ventilation strategy in patients with ARDS?

A) Due to high lung compliance, patients require lower tidal volumes (TV) and lower positive end expiratory pressures (PEEP) to improve oxygenation

B) Due to high lung compliance, pateints with ARDS do not require PEEP

C) Due to low lung compliance, patients with ARDS need higher tidal volumes (TV) and higher positive end expiratory pressure (PEEP) to ensure adequate ventilation

D) Due to low lung compliance, patients require lower tidal volumes and higher PEEP to avoid barotrauma

E) Due to significant airway obstruction, such patients require very low or no PEEP similar to asthma patients to avoid air trapping.

Answer

- In ARDS the alveoli are flooded with protein-rich fluid due to leaky pulmonary capillaries. The result is poorly ventilated and poorly compliant alveoli. Owing to the presence of poorly compliant alveoli, both peak and plateau airway pressures in ARDS are higher than in healthy individuals. Ventilating such patients with “normal” or high TV pushes airway pressure higher and may result in barotrauma. ARDS protocols use a “lung protective” strategy in which patients are ventilated with lower than normal TVs. The idea is to reduce ventilator associated lung injury as a result of alveolar over distension from high tidal volumes. However due to the low TVs, patients require higher PEEP to recruit alveoli in order to ensure oxygenation. The goal is to use the lowest PEEP required to get the FiO2 < 50%. An inadvertent result of this strategy is hypoventilation and hypercapnea.

Question 35

A 34 year-old woman who takes phenelzine for depression presents with agitation, severe hypertension, mydriasis, and hyperthermia. Which of the following foods did she most likely eat?

A) Apples

B) Cheese

C) Graham crackers

D) Ice cream

E) Oranges

Answer

- The patient has the characteristic “wine and cheese” reaction due to ingestion of a tyramine containing food with pharmacologic monoamine oxidase inhibitor activity (MAOI). Tyramine is normally converted to endogenous stimulatory amines and monamine oxidase functions to break these down. Use of MAOIs inhibits this degradation function, and excess dietary tyramine in this setting causes a disorder similar to serotonin syndrome or sympathomimetic crisis. Tyramine is present in high quantities in cheese, alcohol, dried meats and fruits, and soy.

Question 36

A 13-year-old boy presents to the ED after falling off his dirt bike. He hyperextended his head and neck and he complained of transient bilateral burning hands. These symptoms lasted approximately 2 hours, but they have now resolved. His neurologic exam is normal. His cervical spine plain films are negative for fracture. Which of the following is the best course of action?

A) CT scan of the cervical spine should be performed

B) Discharge home with nonsteroidal anti-inflammatory medication

C) Flexion/extension views of the cervical spine should be obtained

D) MRI should be performed

E) The patient should be started on high dose steroids

Answer

- This patient has a classic history for SCIWORA. Due to bilateral symptoms of burning hands, the most likely etiology of the pain is a cervical spinal cord injury. The diagnostic test of choice to evaluate the spinal cord is an MRI. A CT scan does not provide adequate spinal cord imaging. Starting high-dose steroids without a diagnosis of spinal cord injury would be incorrect, and flexion and extension films should not be obtained when the patient has neurologic symptoms.

Question 37

A 43-year-old man presents in a coma. His pupils are dilated, nonreactive with papilledema. Investigational studies reveal a wide anion gap acidosis, a normal osmolar gap, and a normal renal function. Which of the following overdoses is the most likely cause of this patient's condition?

A) Acetaminophen

B) Ethylene Glycol

C) Iron

D) Methanol

E) Theophylline

Answer

- This patient has acute methanol poisoning, but his presentation to the hospital is delayed. This accounts for his wide anion gap but normal osmolar gap, since all the methanol is now metabolized to formic acid. His papilledema is a sign of the retinal toxicity, which is also a delayed finding. Acute acetaminophen toxicity results in early vomiting and delayed hepatitis. Delayed ethylene glycol would cause a similar anion gap acidemia and normal osmolar gap but would produce renal failure, which is absent in this patient. Significant iron poisoning produces hemorrhagic vomiting, hypotension, and acidemia. Theophylline overdose causes tachycardia, wide pulse pressure, hypokalemia, and seizures.

Question 38

A 60-year-old female returns to the ED 3 days after anterior nasal packing for epistaxis. She now complains of fevers, chills, myalgias, and diffuse abdominal pain. Her temperature is 39.2°C, blood pressure is 82/44, and heart rate is 132. She has a diffuse, raised, blanching, erythematous rash that resembles severe sunburn. What is the MOST beneficial course of treatment?

A) Intravenous access, blood transfusion, leave the packing in place due to likely disseminated intravascular coagulation, and admission

B) Intravenous access, fluid resuscitation, administer intravenous antibiotics, remove packing, and admission

C) Intravenous access, fluid resuscitation, epinephrine for anaphylaxis, and admission

D) Order a CT scan of the abdomen to evaluate for abscess

E) Reassure the patient she has sinusitis and a viral exanthem and discharge home

Answer

- The presentation is strongly suggestive for toxic shock syndrome (TSS). Menstrual causes of TSS have decreased since the withdrawal of highly absorbent tampons. Nonmenstrual causes of TSS include wound infections, mastitis, respiratory infections following viral pneumonia, and enterocolitis. Additionally, nasal packing has been associated with *S. aureus* invasion. The diffuse rash is known as erythroderma. Patients may experience massive vasodilation and cardiac dysfunction, requiring profound fluid resuscitation. The history and the erythroderma are not consistent with anaphylaxis. Vague, diffuse abdominal pain is characteristic of the disease, and while investigation may be indicated, the nasal packing is a likely source, and a CT is not initially indicated. Erythroderma is not consistent with a viral exanthem. Vancomycin plus clindamycin is an appropriate antibiotic regimen for staphylococcal TSS. Although patients may develop bleeding complications due to thrombocytopenia, the nasal packing must be removed, as it is the source of the disease.

Question 39

A child is undergoing endoscopy and procedural sedation for a swallowed coin. The child suddenly becomes acutely cyanotic. The pulse oximetry on ambient air is 89%. The initial blood gas reveals pH 7.34, PCO_2 32 mm Hg, PO_2 117 mm Hg, and HCO_3 22 mEq/L. Which of the following agents was the most likely cause of this patient's condition?

A) Benzocaine

B) Ethylene oxide

C) Etomidate

D) Fentanyl

E) Lorazepam

Answer

- This patient has methemoglobinemia. Local anesthetics, particularly benzocaine, are a common cause of methemoglobinemia. The duration of spraying the benzocaine as well as the orientation of the canister during spraying affects the dose delivered and the risk of methemoglobinemia. None of the other agents are commonly implicated in methemoglobinemia. Ethylene oxide has a sweet odor and is used in the sterilization of medical equipment. Toxicity results in nausea, vomiting, mucous membrane irritation, pulmonary edema, and convulsions. Lorazepam, fentanyl, and etomidate are not common causes of methemoglobinemia.

Question 40

Which of the following is an indication for polyvalent Crotalidae Immune Fab (CroFab™) administration after a rattlesnake bite?

A) Elevated platelets

B) Hypertension

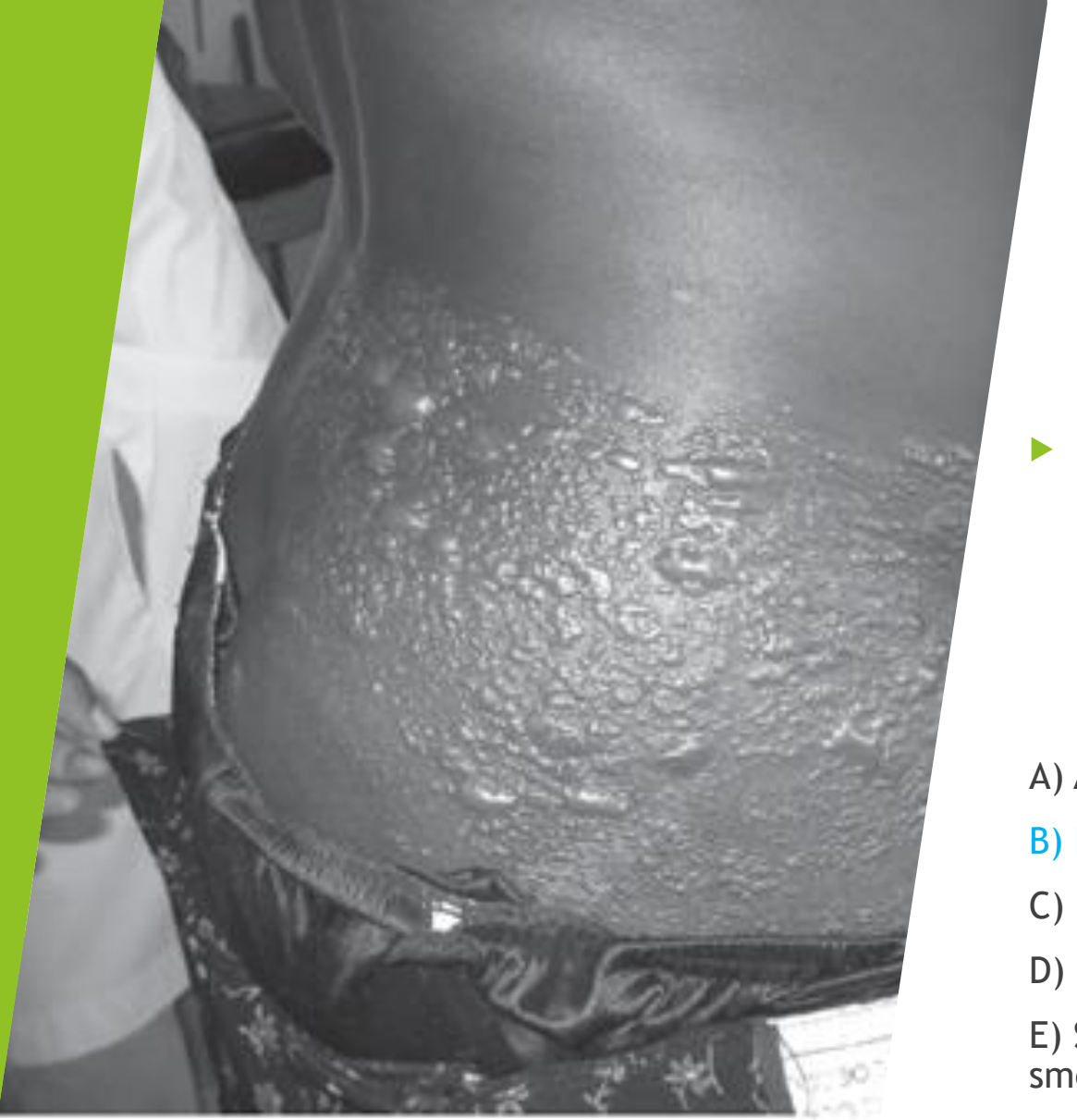
C) Localized pain and redness

D) Progressive pain and swelling

E) Normal prothrombin time (PT)

Answer

- CroFab™ is indicated in any rattlesnake victim with progressive signs and symptoms, evidence of systemic toxicity such as hypotension or altered mental status (AMS), serious neurological toxicity (e.g., limb paralysis), or serious hematologic toxicity such as elevated PT or falling (not elevated) platelet count.



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Question 41

- A 26-year-old male presents to the ED with 3 days of malaise and the painful rash depicted in Figure 10-4. In addition to treating with antiviral agents, what further testing should be considered in this patient?

A) Aspiration of a vesicle for viral culture

B) HIV testing

C) Punch biopsy for histology and cytology

D) Skin scraping for KOH prep

E) Swab of an unroofed vesicle for Tzanck smear

Answer

- Herpes zoster is a reactivation of latent infection with the varicella zoster virus. The papulovesicular rash typically has a unilateral, dermatomal distribution that does not cross the midline, and at most may involve two to three contiguous dermatomal segments. It is predominantly a disease of older patient populations due to waning cell immunity. Zoster in younger patients, or lesions involving multiple noncontiguous dermatomes, should raise suspicion for an immunocompromised state. Testing this patient for HIV is prudent. The diagnosis of zoster is typically made on clinical grounds. Viral culture may be warranted in severe disseminated disease or when the diagnosis is uncertain, but would not apply to this case. In a typical presentation of zoster, a biopsy would not add to the case. A Tzanck smear may reveal giant cells with multiple nuclei but cannot differentiate between varicella-zoster and other herpes viruses and is not useful.

Question 42

- Which of the following clinical features best distinguishes serotonin syndrome from neuroleptic malignant syndrome (NMS)?

A) Altered mentation

B) Clonus

C) Hyperthermia

D) Onset >24 hours

E) Rigidity

Answer

- Serotonin syndrome and NMS have several overlapping features for altered mentation, autonomic instability (hypertension, hyperthermia), and neuromuscular findings. However, serotonin syndrome has a more rapid onset, typically less than 24 hours, and is characterized by clonus, rather than the muscular rigidity seen with NMS.

Question 43

- A 2-year-old boy with 1 week of upper respiratory infection presents with fever of 38.7°C. His left eye area has redness and swelling. The eyelids are edematous, but he can still open them and able to look around without difficulty. Aside from nasal discharge, the rest of the physical exam is normal. What is the next appropriate step?

A) Admit for parenteral antibiotics

B) Computed tomography (CT) of the orbit

C) Prescribe 10-day course of amoxicillin-clavulanate

D) Ophthalmology referral

E) Recommend warm compresses along with topical antibiotic ointment

Answer

- Outpatient management with oral antibiotics is indicated with your diagnosis of periorbital cellulitis. Well-appearing children with no evidence of proptosis or pain with eye movement do not require a CT scan of the orbits. Failure of outpatient management with oral antibiotics or development of orbital cellulitis warrants parental antibiotics as well as an ophthalmology consult. Topical antibiotic would be helpful for a conjunctivitis but not in periorbital cellulitis.

Question 44

- A child presenting with an acute crisis of their congenital adrenal hyperplasia (CAH) will likely have the following abnormality?

A) Hypoglycemia with absence of urinary ketones

B) Hypoglycemia with ketonuria

C) Metabolic acidosis with hyperammonemia

D) Metabolic acidosis with hypernatremia and hypokalemia

E) Metabolic acidosis with hyponatremia and hyperkalemia

Answer

- Classic findings from salt wasting CAH crisis include metabolic acidosis with hyponatremia and hyperkalemia. Hypoglycemia can be present but not always. This condition is due to a cortisol deficiency leading to hyperaldosteronism and resultant electrolyte abnormalities. Urea cycle, mitochondrial, respiratory chain, and fatty acid oxidation defects lead to metabolic acidosis with elevated ammonia levels. Hypoglycemia with absence of urinary ketones suggests fatty acid oxidation defect and hypoglycemia with ketonuria can be due to organic acidemias.

Question 45

- A construction worker is struck on the top of the head with a manhole cover that was dislodged during an explosion. The manhole cover landed directly on the top of his head. What type of cervical spine injury is this patient most likely going to have?

A) Chance Fracture

B) Clay shoveler fracture

C) Dens fracture

D) Hangman fracture

E) Jefferson fracture

Answer

- A Jefferson fracture results from axial loading injuries: this results in a burst fracture of C1 and the lateral masses of C1 are displaced outward on the odontoid view on the cervical spine radiograph. A dens fracture or odontoid fracture is a fracture of the second vertebrae at the odontoid process. These usually result from a fall, or hyperflexion or extension. They are graded from one to three based on the location of the fracture. They will frequently have associated neurological symptoms. A Hangman fracture is a fracture of both pedicles of C2. This is usually caused by severe extension as one would see with a judicial hanging, or other mechanisms that would lead to severe hyperextension (motor vehicle crash, diving in shallow water). A clay shoveler fracture is a fracture of the spinous process, usually at C7. This is due to muscle contractions avulsing a portion of the spinous process or from direct trauma. These are typically stable fractures. The chance fracture is a transverse fracture of the lumbar or thoracic spine.

Question 46

- Which feature is MOST suggestive of an organic etiology in a patient with acute psychosis?

A) Auditory Hallucinations

B) Family history of psychosis

C) Normal mental status

D) Onset before 40 years of age

E) Visual hallucinations

Answer

- While visual hallucinations can occur in functional psychotic illness (schizophrenia or affective disorder), they are much more common and indicative of organic disease. The opposite is true for auditory hallucinations. Functional psychiatric illness typically presents in young adulthood—well before age 40. There are strong inheritance patterns for a number of psychiatric disorders, particularly schizophrenia and depression, so family history of behavior disorders can be an important clue. Patients with organic psychosis often manifest some degree of cognitive impairment, delirium, or altered mental status related to their underlying disease process.

Question 47

- A 31-year-old female is an unrestrained driver involved in a high-speed motor vehicle collision. She was ejected 20 feet into the woods. She has a Glasgow Coma Score of 4 and was intubated in the field. Her vital signs now are heart rate of 120, blood pressure of 85/50, and oxygen saturation of 95% on the ventilator. Her pupils are equal and reactive, breath sounds are clear, and the FAST exam is negative. The following chest x-ray was obtained. Which of the following is TRUE regarding her most likely diagnosis?

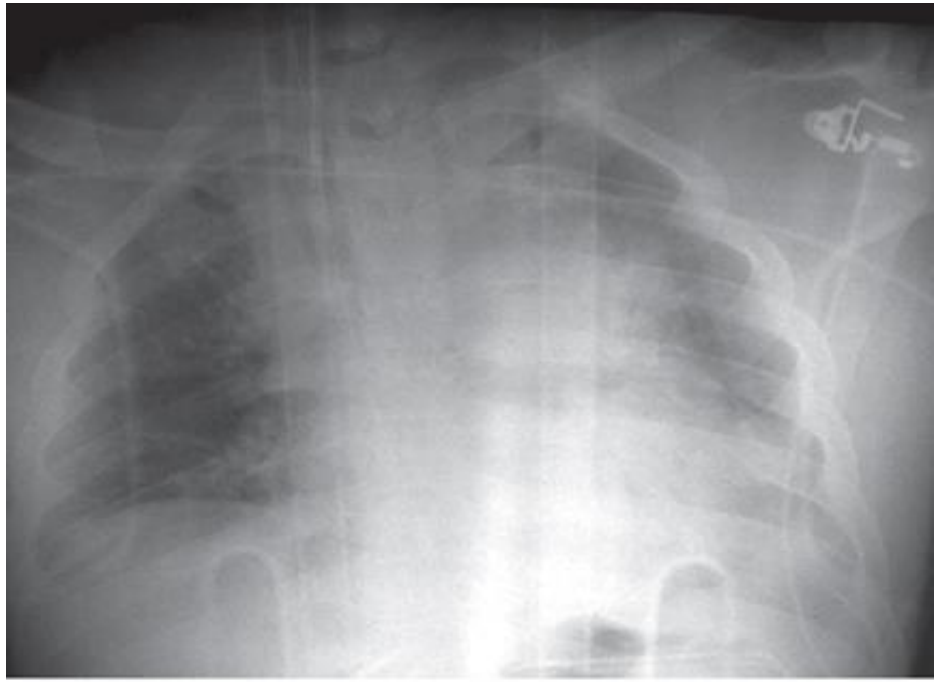
A) A normal mediastinum on chest x-ray almost always excludes an aortic injury

B) As a temporizing measure, arterial vasodilators, like nitroprusside, should be used alone in the treatment of aortic injuries

C) A widened mediastinum on chest x-ray is very sensitive for detecting a major vascular injury

D) The distal descending aorta is the most commonly injured in blunt trauma

E) Transesophageal echocardiography is the study of choice to diagnose an aortic injury



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Answer

- The chest x-ray demonstrates a widen mediastinum, defined as a measured width of greater than 8 cm or a mediastinal:chest ratio of >0.38. Although a widen mediastinum is the most sensitive findings in patients with an aortic injury, a normal mediastinum does not rule out an aortic injury. The chest x-ray should be used as a screening test and further imaging should be based on mechanism of injury and physical exam. Because of the fixation of the vessels between the left subclavian artery and the ligamentum arteriosum, the proximal descending aorta is most commonly injured in blunt trauma. Most institutions use multidetector CT scanners with angiography, not transesophageal echocardiography, as the screening study of choice for aortic injury. Transesophageal echocardiography can be used at the bedside in hemodynamically unstable patients. With partial- and full-thickness aortic tears, medical treatment involves decreasing the slope of the d*P*/d*T* (change in pressure over the change in time) to decrease wall tension and shearing forces. Titrating a short-acting beta-blocker, such as esmolol, can decrease the heart rate. Once the heart rate is controlled, an arterial vasodilator, such as sodium nitroprusside, can be added to help control the blood pressure. Sodium nitroprusside should not be used alone because rebound tachycardia may occur.

Question 48

- Ingestion of which of the following plants is NOT associated with life-threatening toxicity?

A) Castor Bean

B) Foxglove

C) Jimsonweed

D) Oleander

E) Water hemlock

Answer

- Jimsonweed is commonly ingested for its hallucinogenic properties. It can cause an anticholinergic toxidrome that is not usually life threatening. Castor beans contain ricin toxin, one of the most potent naturally occurring toxins. Oleander and foxglove both contain cardiac glycosides resembling digitalis and can cause fatal cardiac dysrhythmias. Water hemlock contains cicutoxin that may be rapidly fatal.

Question 49

- A 3-year-old boy presents with refusing to bear weight on his left leg. Parents state that the child awoke in this condition. No known trauma or recent activity to cause abnormality. Child has been well since getting over a cold last week. On exam, the child is afebrile, well appearing sitting in his mother's lap. The child guards with range of motion with the left hip and lifts his left leg when placed in standing position. The rest of the physical exam is normal. Radiographs of the hip is read as normal per radiologist; therefore, you obtain laboratory studies: white blood cell (WBC) count 8900, CRP <0.2, ESR 18 mm/hr. Next course of action is:

A) Aspiration of the hip by interventional radiology

B) Bone scan pelvis

C) Magnetic resonance imaging (MRI) of the hip

D) Scheduled ibuprofen with primary medical doctor follow up

E) Ultrasound of the hip

Answer

- Nonsteroidal anti-inflammatory drugs with PMD follow-up is all that is needed for transient synovitis. A child with septic arthritis would likely appear ill, likely febrile, and have significant guarding with the hip exam. The CRP and WBC would be elevated in a septic joint. Ultrasound can show effusion in 50–95% of children with transient synovitis and is unnecessary in a well-appearing child with reassuring laboratory studies. Arthrocentesis is not indicated unless suspicion of septic joint. Bone scan and MRI may be useful if other diagnostic modalities and exam still question strong possibility of infectious etiology.

Question 50

- A 58-year-old man is brought in by paramedics after a witnessed syncopal episode while walking with friends. He denies headache, chest pain, or shortness of breath prior to the event, or now. He has hypertension and takes lisinopril. Vital signs are BP 150/100, HR 78, RR 18, T 98.6, room air saturation 97%. Physical examination is notable for a harsh, systolic murmur at the right base, which radiates into the neck. His lungs are clear to auscultation. A transthoracic echocardiogram is pending. The ECG shows normal sinus rhythm with left atrial enlargement but is otherwise normal. What is the MOST appropriate next step in management?

A) Admit patient

B) Arrange computed tomography (CT) of the chest

C) Arrange EEG

D) Arrange outpatient electrophysiologic testing

E) Arrange outpatient tilt-table testing

Answer

- This patient has strong evidence of a structural cardiac abnormality, most likely aortic stenosis, and should be admitted for further evaluation of cardiac function. A transthoracic echocardiography is essential. Critical aortic stenosis is associated with a classic triad of chest pain, dyspnea on exertion, and syncope. Older patients with aortic stenosis and syncope who are asymptomatic upon ED presentation should still be admitted due to the increases risk of death. Patients with documented cardiac syncope have a 6-month mortality exceeding 10%. Electrophysiologic testing is done for patients with dysrhythmias, preexcitation, or conduction delays. Tilt-table testing is performed on patients with recurrent unexplained syncope, suspected to have a reflex-mediated etiology. EEGs would be reserved for patients with suspected seizures.

Thank you for participating!