

# EMS

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## Question: 1

A patient presents with altered mental status, dilated pupils, hot flushed skin, and dry mucous membranes. Which of the following drugs did the patient most likely overdose from?

- A. Anticholinergics
- B. NSAIDs
- C. Organophosphates
- D. SSRIs

**Answer: A**

Explanation:

Correct answer: Anticholinergics

Anticholinergic effects range from mild sedation to delirium. Peripheral manifestations may include dry mouth and skin, blurred vision, urinary retention, constipation, paralytic ileus, cardiac dysrhythmias, and exacerbation of angle-closure glaucoma. The central anticholinergic syndrome is characterized by dilated pupils, dysarthria, and an agitated delirium. Treatment is discontinuation of the antipsychotic and supportive measures. The phrase, “Mad like a hatter, blind as a bat, red as a beet, hot like a hare, and dry as a bone” is a way to remember the symptoms of anticholinergic overdose. These drugs block ACh from muscarinic receptors and, as such, stop the parasympathetic nervous system.

The morbidity from NSAIDs (Non-Steroidal Anti-Inflammatory Drugs) in acute overdose is far overshadowed by complications of NSAIDs at therapeutic doses, which include GI bleeding, drug-induced renal failure, and atherosclerotic heart disease.

Serotonin syndrome is a potentially life-threatening adverse drug reaction when SSRIs (Selective Serotonin Reuptake Inhibitors) are used in combination with another agent that has serotonergic activity such as monoamine oxidase inhibitors, opiates (including tramadol), CNS (Central Nervous System) stimulants (including cocaine, ecstasy), serotonin agonists, St. John’s wort, lithium, dextromethorphan, risperidone, olanzapine, ondansetron, and metoclopramide. Serotonin syndrome is characterized by tremor, myoclonus, hyperreflexia/clonus, seizures, restlessness, agitation, excitement, confusion, tachycardia, tachypnea, fever, diaphoresis, nausea, vomiting, and/or diarrhea.

## Question: 2

Which of the following statements regarding the use of a defibrillator during air medical transport is most accurate?

- A. Risk of electrocution of medical crew members is increased when administering defibrillation during air medical transport.
- B. When defibrillation is required during medical helicopter transport, crew members must follow defibrillation precautions specific to this modality of transport.

- C. The medical crew should use self-adhesive defibrillation pads and follow established ACLS defibrillation guidelines.
- D. The medical crew should provide immediate defibrillation through use of a defibrillator specific for use in rotor-wing aircraft.

**Answer: C**

Explanation:

Correct answer: The air medical crew should use self-adhesive defibrillation pads and follow established ACLS defibrillation guidelines

Recent studies have found that when using modern defibrillation equipment in a medical helicopter, the rapid administration of defibrillation continues to significantly improve patient outcomes and is safe for the members of the medical crew. Crew members should ensure that they follow current ACLS defibrillation guidelines when delivering defibrillation, and should also make sure to use self-adhesive defibrillation pads.

As whenever defibrillation is discharged, the crew should make sure to cease any contact with the patient or patient equipment and, in addition, the pilot should be notified before the defibrillator is discharged.

### Question: 3

Which of the following statements regarding flight crew traveling as a crew member in a ground transport vehicle is most accurate?

- A. Only the patient is required to remain seat belted at all times in ground transport vehicles.
- B. Training for response to ground vehicle accidents is not required for medical air transport crew.
- C. All crew members are required to wear a seat belt at all times.
- D. All crew members are required to be trained in response to ground vehicle accidents.

**Answer: D**

Explanation:

Correct answer: All crew members are required to be trained in response to ground vehicle accidents.

All medical air transport crew members should be trained in response to ground vehicle accidents in the event that they are required to participate in a ground vehicle mission.

Both the patient and all crew members riding in the front of the ground transport vehicle are required to remain buckled in their seat belts at all times while the vehicle is in motion. If possible, crew members in the patient compartment should also remain buckled in their seat belts, but may need to remove their seat belts and move around the compartment in the provision of patient care.

### Question: 4

Which of the following statements regarding medical transport of the pediatric patient is most accurate?

- A. The pediatric patient's response to various medical interventions does not typically interfere with delivery of necessary care
- B. The medical transport provider should focus communication on the parents when transporting pediatric patients
- C. When transporting a pediatric-aged patient, the medical transport provider is also providing care to the family members
- D. When transporting pediatric patients with special needs, the medical transport provider should follow standard developmental guidelines

**Answer: C**

Explanation:

Correct answer: When transporting a pediatric-aged patient, the medical transport provider is also providing care to the family members

The medical transport provider will face unique challenges when providing care and transport of the pediatric population. While generalizations about developmental level and developmental achievements can be made, not all pediatric patients will respond or communicate at the level most typically consistent for their chronological age. Children with special health care needs particularly may present greater challenge in this area if they are developmentally delayed as well, requiring the medical transport provider to present information in a manner and at a level that the child can understand, and performing necessary procedures or interventions in a way that is less frightening or overwhelming to the patient. When caring for the pediatric population that presents these challenges, the tendency is for the medical provider to "ignore" the child and focus communication solely with the parents or family members; the medical transport provider must remember to verbally engage with the pediatric patients he or she cares for, taking steps to ensure his communication with the child is at a level the child can understand. In addition, the medical transport provider must remember that when caring for a pediatric patient, they are also caring for the parents and family members of the child.

### Question: 5

Which of the following factors has been identified as being one of the highest risk aspects of the provision of emergency care of trauma patients?

- A. The transport of the patient
- B. Unforeseen trauma sequela
- C. The patient handoff
- D. Accurate patient injury assessment

**Answer: C**

Explanation:

Correct answer: The patient handoff

When provision of appropriate patient care involves multiple transfers, as is the case during provision of critical care or emergency care in transport situations, the patient handoff has been identified as being one of the riskiest components of care. It is during patient handoff that critical details of the patient's

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history or injuries, or details of the care that has already been administered, may be lost, putting the transport team at risk of being unprepared for evolution of injuries or side effects of already administered medications. Due to these risks, the transport team needs to have a well-established operations process both for obtaining patient data and for communicating this accurately with the next patient handoff.

### Question: 6

Which of the following fetal heart tone tracings is an ominous sign?

- A. Early decelerations
- B. Late decelerations
- C. Sinusoidal
- D. Accelerations

**Answer: C**

Explanation:

Correct answer: Sinusoidal

Sinusoidal fetal heart tone tracing is an ominous sign of fetal distress. In most cases, this is secondary to fetal anemia of different causes, usually Rh isoimmunization, fetomaternal transfusion, placental abruption, bleeding vasa previa, placental chondroangioma, or traumatic amniocentesis. Emergency C-section is indicated.

### Question: 7

Which of the following statements regarding establishing a patent airway for a pediatric patient experiencing a severe asthma exacerbation is the most accurate?

- A. The child should be intubated using a cuffed Endotracheal Tube (ETT)
- B. Positive-Pressure Ventilation (PPV) using a bag-valve-mask device should be used to stent open the airway
- C. Positive-Pressure Ventilation (PPV) using a laryngeal mask airway should be used to stent open the airway
- D. The child should be intubated using an uncuffed Endotracheal Tube (ETT)

**Answer: A**

Explanation:

Correct answer: The child should be intubated using a cuffed Endotracheal Tube (ETT)

In asthmatic children who are not experiencing an asthma exacerbation but who require the establishment of an airway, such as in preparation for surgery, endotracheal intubation should be avoided to prevent instrumentation of the airway, which places the child at risk of wheezing and bronchospasm. In a situation such as this, the use of a laryngeal mask airway or bag-valve-mask device

to provide PPV is advisable. However, in the event of a severe asthma exacerbation in which the child requires endotracheal intubation, a cuffed ETT should be used due to the presence of higher airway pressures.

### Question: 8

What is normal cardiac output in an adult and how is it calculated?

- A. 4-8 L/min,  $CO = \text{heart rate} \times \text{stroke volume}$
- B. 4-8L/min,  $CO = SBP \times HR$
- C. 1-2 L/min,  $CO = MAP/HR$
- D. 4-8 mL/kg,  $CO = (\text{heart rate})/(\text{stroke volume})$

**Answer: A**

Explanation:

Correct answer: 4-8 L/min,  $CO = \text{heart rate} \times \text{stroke volume}$

Normal cardiac output is 4-8 L/min and is calculated by multiplying heart rate by stroke volume. An easy way to remember this value is that minute volume is also 4-8 L/min in the respiratory system. Knowing that there is a ventilation to perfusion ratio to maintain, it is easy to see why these two values are the same.

### Question: 9

The patient you are transporting has a Pulmonary Artery Catheter (PAC) in place for hemodynamic monitoring. In regard to the PAC, you and your air medical crew members should complete all of the following next best steps prior to take-off, except:

- A. Place an "X" on the phlebostatic axis to mark the site
- B. Use a laser level to align the air-fluid interface with the phlebostatic axis
- C. Tape the transducer to the phlebostatic axis
- D. Relevel the transducer to the phlebostatic axis each time the patient changes position

**Answer: D**

Explanation:

Correct answer: Relevel the transducer to the phlebostatic axis each time the patient changes position

The greatest amount of errors, and the greatest frequency of errors in management of an invasive hemodynamic monitoring device, comes with incorrect leveling of the device. The device transducer should be placed at the patient's phlebostatic axis, located at the 4th intercostal space (considered to be the level of the atria), which should then be marked with an "X." A laser level, or carpenters level, should then be used to ensure accurate alignment of the air-fluid interface component of the device with the phlebostatic axis. Once the site has been identified and marked, and the air-fluid interface aligned through use of a leveling device, the transducer should then be taped to the phlebostatic axis.

If the crew completes all these steps prior to aircraft take-off, then it will not be necessary to relevel the transducer to the phlebostatic axis each time the patient's position is changed.

### Question: 10

Your patient is a 65-year-old male with Type I diabetes and renal failure requiring dialysis 3 times per week. He ran out of insulin 3 days ago and is a day overdue for dialysis. He is found in cardiac arrest with PEA,

What is the likely cause of his presentation?

- A. Respiratory failure
- B. Coronary stent thrombosis
- C. Metabolic acidosis
- D. Diabetic ketoacidosis

**Answer: C**

Explanation:

Correct answer: Metabolic acidosis

The first step in managing pulseless electrical activity is to begin chest compressions according to ACLS protocols, followed by administration of epinephrine every 3 to 5 minutes, while simultaneously looking for any reversible causes. The patient is suffering from end-stage renal disease and is experiencing secondary pulseless electrical activity due to discontinuation of dialysis. The AHA lists medically reversible conditions as "The 5 H&Ts." These are: hypovolemia, hypoxia, hydrogen ion (acidosis), hypo/hyperkalemia, and hypothermia; tension pneumothorax, trauma, tamponade, thrombosis (pulmonary), thrombosis (coronary).

Treatment of the acidosis by administration of sodium bicarbonate, to raise the extracellular pH, is controversial, as it appears to worsen intracellular acidosis without reducing morbidity and mortality. For severe, systemic acidosis, hyperkalemia, or tricarboxylic acid overdose, your medical direction team may instruct a sodium bicarbonate dose of 1 mEq/kg.

### Question: 11

Which of the following is an increased physiologic risk factor for respiratory failure in children, compared with adults?

- A. Young children have larger occiputs affecting extension in the supine position.
- B. The trachea is longer in neonates.
- C. Children have larger and more vascular tonsils.
- D. The epiglottis is larger and more firm in children under three years.

**Answer: C**

Explanation:

Correct answer: Children have larger and more vascular tonsils

Children have larger adenoids, and larger and more vascularized tonsils than adults, which may experience bleeding and partial obstruction due to airway procedures or manipulation.

Children under three years of age have a large and floppy epiglottis, and a Miller blade may be required (to lift the epiglottis out of the visual field) for direct visualization of vocal cords. In neonates, the trachea is shorter than adults, and young children have larger occiputs, affecting flexion in the supine position; improvement of airway positioning can be achieved by placing a towel under the child's shoulders.

## Question: 12

Which of the following statements regarding abdominal aortic aneurysm AAA is most accurate?

- A. Males are at a much greater risk of experiencing AAA than females
- B. Half of all AAA occur in women under 65
- C. The medical crew should prepare for aggressive volume resuscitation in the event of cardiac arrest
- D. Transport should not be delayed due to the emergent need for surgical repair

**Answer: B**

Explanation:

Correct answer: Half of all AAA occur in women under 65

While many patients with Abdominal Aortic Aneurysm (AAA) do not experience Rupture of the AAA (RAAA) and are able to undergo surgery in a timely fashion to correct the defect, the risk of RAAA is real, and poses greater than an 80% mortality risk. Due to this significant risk of death should a AAA rupture, medical transport crew members should be willing to consider a brief delay of transport to allow family members to spend time with their loved one prior to transport. The medical crew should also be prepared for the likelihood of cardiac arrest in the event of RAAA; however, in the event of hemorrhage, fluid volume resuscitation should be managed very cautiously due to the risk of dislodging a clot with aggressive fluid volume administration.

Until recently, it was standard "knowledge" that males made up the lion's share of AAA cases. More recent data has found that nonsmoking females who are under the age of 65 make up 50% of all cases of AAA.

## Question: 13

A Helicopter EMS (HEMS) team responded to the scene for a trauma patient. Which of the components of the secondary assessment should the HEMS team perform prior to loading the patient into the aircraft in order to ensure an accurate assessment?

- A. Assessing for a patent airway
- B. Palpating of injured extremities
- C. Auscultation of bowel sounds
- D. Assigning of a Glasgow Coma Scale score



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**Answer: C**

Explanation:

Correct answer: Auscultation of bowel sounds

The medical transport team is responsible for completing both a primary and secondary assessment of the trauma patients in their care during the transport. Typically, the secondary assessment is delayed, often even several times, until the primary assessment has been completed and the patient's condition stabilized for transport. Should the medical transport team begin the secondary assessment and find the patient's condition is deteriorating during the secondary assessment, completion of the secondary assessment should be stopped, necessary resuscitative measures taken to bring about hemodynamic stability, and then the primary assessment completed again. Only once the second primary assessment is completed and the patient's condition stabilized should the team begin the secondary assessment anew.

Two components of the secondary assessment are critical enough that they should be completed in the field with the primary assessment, prior to loading the patient into the HEMS vehicle. Auscultation of both lung sounds and bowel sounds should be completed out of sequence, as the noise of the helicopter will prevent accurate assessment of both these parameters.

Assessing airway patency and assigning a Glasgow Coma Scale score are both components of the primary assessment.

Assessing injured extremities would be part of the secondary assessment, unless the severity of the injury was such that it was contributing to hemodynamic instability.

### Question: 14

A 15-year-old female with multiple abdominal stab wounds. She is pale, her skin is cold, and she has a weak, thready pulse. In order to prevent worsening of her condition and provide the best care, which of the following steps should you take?

- A. Immediately place an Intraosseous (IO) line and begin rapid fluid volume infusion using the crystalloid solution stored in the air-conditioned transport vehicle
- B. Immediately apply warmed blankets, leave the girl's clothing intact, and begin heating the transport vehicle
- C. Immediately place an Endotracheal Tube (ETT) and begin administration of mechanical ventilation using humidified oxygen
- D. Immediately place an Intraosseous (IO) line and administer packed red blood cells stored in the refrigerator of the transport vehicle

**Answer: B**

Explanation:

Correct answer: Immediately apply warmed blankets, leave the girl's clothing intact, and begin heating the transport vehicle

Victims of violence who experience hemorrhage are at risk of succumbing to the "trauma triad of death" if not appropriately managed during resuscitation. A vicious cycle of hypothermia, acidosis, and

coagulopathy often results from hemorrhage, and this cycle can be exacerbated by the care that is delivered during resuscitative efforts. Hypothermia often results from hemorrhage, both as a result of environmental exposure and the massive loss of blood, and when patients are disrobed during provision of emergency care, or receive necessary fluid infusions and blood transfusions that are either at room temperature or even recently removed from a refrigerator, this contributes to increased bleeding, worsening the acidosis and the hypothermia. During the best provision of care, the patient should be kept warm and clothing left intact if possible to prevent worsening of the hypothermia. All administered fluids and blood product should be warmed, and delivered oxygen should be humidified and warmed.

### Question: 15

An air medical transport crew is preparing to package and load a patient that has an Intraaortic Balloon Pump (IABP) in place. Which of the following methods of positioning the patient in the aircraft can help to decrease preload?

- A. Position the patient with their head toward the head of the aircraft
- B. Position the patient with their head elevated 30 degrees
- C. Position the patient with their head toward the tail of the aircraft
- D. Position the patient in the left lateral position

**Answer: A**

Explanation:

Correct answer: Position the patient with their head toward the head of the aircraft

The medical crew of air transport programs may be frequently called upon to transport patients who have an IABP in place in an effort to improve and support function of the left ventricle. Fiberoptic manometers located at the tip of the Intraaortic Balloon Pump (IABP) have improved output readings from the device, allowing the medical air crew members to provide improved support and intervene rapidly while they care for the broad range of patients requiring these devices.

And while the newer IABPs provide automatic interventions in regard to programming as they read and adapt to the ever-changing status of the patient, there are still some basic interventions that the medical crew need to apply to these patients in order to protect the state of their cardiac function. Patients with IABPs should be positioned in the aircraft (particularly fixed-wing aircraft) with their head toward the head of the aircraft. This position helps to decrease cardiac preload, decreasing overdistention of the ventricles.

Placing the patient with their feet positioned toward the front of the aircraft increases preload.

### Question: 16

You need to initiate a dopamine drip for a cardiac patient during flight transport. The patient weighs 85 kg. Which of the following dosage rates of dopamine is the correct dosage for this patient, assuming the infusion solution is comprised of an addition of 400 mg of dopamine mixed in 250 mLs of Normal Saline (NS), and assuming you will initiate administration with the lowest possible dose?

- A. 2.7 mLs/hour
- B. 0.27 mLs/minute
- C. 6.38 mLs/minute
- D. 6.38 mLs/hour

**Answer: B**

Explanation:

Correct answer: 0.27mLs/minute

If patients in third-degree heart block are not able to be treated with transcutaneous or transvenous pacing, or if the patient is stable enough to forego immediate pacing, the patient's condition may be treated by the administration of a dopamine or lidocaine infusion. Per 2020 ACLS pharmacologic dosing guidelines for dopamine infusion used to treat third-degree heart block, dopamine infusions should be dosed at 5 to 20 mcg/kg/minute. You were instructed to initiate the dopamine infusion using the lowest recommended dose possible. Current ACLS guidelines also recommend a dopamine solution of 400 mg of dopamine mixed in 250 mLs of Normal Saline (NS). The patient in this scenario weighs 85 kg. The basic formula we need to use calls for us to determine:

- $\text{desired dose} \times \text{kg} \times 60 / \text{concentration} = \text{mL/hr}$

We want to administer 5 mcg/kg/minute to our patient in this scenario. And we have mixed 400 mg of dopamine in 250 mLs of NS. We first need to convert our concentration from mg to mcg. There are 1,000 mcg in 1 mg. Based on a simple math computation of  $400 \times 1,000 = 400,000$ , we have 400,000 mcg of dopamine in our 250 mL bag of NS.

Breaking this down to the number of mcg/mL, we use this computation:  $400,000 \text{ mcg} / 250 \text{ mLs} = 1,600 \text{ mcg/mL}$

Now that we have this number, we can begin working on our basic formula.

- $5 \text{ mcg (the lowest possible dose per ACLS guidelines)} \times 85 \text{ kg (patient weight)} \times 60 \text{ (60 seconds, or 1 minute)} / 1,600 \text{ mcg} = \text{mL/hr}$
- $25,550 / 1,600 = \text{mL/hr}$
- $15.93 = \text{mL/hr}$

Finally, we want to calculate the minute rate of our dopamine infusion.

- $15.93 \text{ mL} / 60 = 0.265$

And we will round that number to 0.27 mLs/minute.

## Question: 17

A patient who intentionally ingested a known toxic dose of acetaminophen is being transported to an acute care center via medical air transport. The medical transport crew has established IV access, and is preparing to administer an IV loading dose of N-Acetylcysteine (NAC) to the patient who weighs 80 kg. Assuming the medical crew mixes the NAC in a 200 mL bag of 5% dextrose, and the dose is to be administered over 60 minutes, please calculate the loading dose and the concentration per mL of the solution that the patient should receive.

- A. 8,000 mg; 60 mg/mL
- B. 4,000 mg; 3.33 mg/mL
- C. 11,200 mg; 3.33 mg/mL
- D. 12,000 mg; 60 mg/mL

**Answer: D**

Explanation:

Correct answer: 12,000 mg; 60 mg/mL

N-Acetylcysteine (NAC) (Mucomyst, Acetadote) should be administered to treat acetaminophen poisoning if serum acetaminophen levels are toxic at 4 hours following ingestion, or if the medical transport team is unable to obtain serum levels and 8 hours or more have passed since the ingestion, or it is suspected the patient has ingested a toxic amount of acetaminophen. NAC may be administered orally or IV. When administered orally, the loading dose should be administered at 140 mg/kg; a dose of 150 mg/kg is administered when IV administration is used. The IV loading dose should be mixed in a 200 mL bag of 5% dextrose and administered over 60 minutes. The initial administration is followed by 2 more doses of NAC, these via continuous infusion, administered over 4 hours and then 16 hours respectively. Patients should receive a total of 300 mg/kg of NAC administered over the 3 divided doses. Using the information presented in our scenario, and the knowledge of IV loading dose to be administered at 150 mg/kg, the patient in this scenario should receive a loading dose of:

$150 \text{ mg} \times 80 \text{ kg} = 12,000 \text{ mg}$

We next need to calculate the concentration of the solution. According to the information presented in the scenario, the 12,000 mg dose will be mixed in a 200 mL bag of 5% dextrose. We calculate concentration through use of the following formula:

$\text{total dose/volume} = \text{concentration}$

$12,000 \text{ mg} / 200 \text{ mLs} = \text{concentration}$

60 mg/mL is the concentration of the NAC solution that was mixed.

### Question: 18

As part of providing patient care during a survival situation in which a medical air transport aircraft was downed as a result of the sudden death of the pilot during transport, which of the following statements is most accurate?

- A. The crew should prepare for the death of the patient.
- B. The crew should attempt to transport the patient to safety due to complex medical needs.
- C. The crew should attempt to continue continuous monitoring of the patient.
- D. The crew should maintain current intravenous fluid (IV) rate for the patient until IV fluid supply is exhausted.

**Answer: A**

Explanation:

Correct answer: The crew should prepare for the death of the patient.

As difficult as it may be to accept the fact that the patient being transported may suffer a negative outcome, the crew of the medical air transport aircraft needs to prepare, mentally and emotionally, for this likelihood. Patients who are being transported by medical air services are typically acutely ill or injured, hence the need for medical air transport; involvement in an emergency landing or crash

situation of the transport vehicle does nothing to improve the patient's odds of survival from their underlying illness or injury.

Patient supplies such as monitoring equipment and IV fluid should be conserved and only used intermittently in an attempt to prolong patient survival.

### Question: 19

In the event of an open-water emergency landing in which the survivors are too far from shore to be able to reasonably swim, which of the following survival strategies may be the next best step?

- A. Begin signaling for help
- B. Assume the HELP posture
- C. Wear a flight helmet
- D. Huddle together

**Answer: B**

Explanation:

Correct answer: Assume the HELP posture

If involved in an open-water landing while part of a medical air transport mission, all survivors should attempt to reach the shore. If this is not possible due to extreme far distance from shore or in the case of injured parties whose injuries prevent them from attempting to swim to shore, the next best step is for survivors to assume the HELP position in an attempt to try to prevent the development of hypothermia. HELP stands for Heat Escape-Lessening Posture and involves placing oneself in the fetal position with knees tucked up against the chest and arms crossed over the chest. A flotation device must be worn when using the HELP position.

Flight helmets should be worn when in the water, as they provide a degree of insulation, and can aid in being spotted by rescuers. Survivors should then huddle together to, again, decrease development of hypothermia, and should signal to would-be rescuers. In addition, any life rafts should be carefully maintained.

### Question: 20

While assessing a patient, you note the presence of Hamman's Sign. Other assessment findings include tachycardia, tachypnea, and pyrexia. The patient's physical complaints include severe epigastric pain, retrosternal chest pain, and repeated vomiting. Chest radiograph findings included subcutaneous emphysema. Which of the following conditions is this patient most likely experiencing?

- A. Boerhaave's tears
- B. Aortic dissection
- C. Perforated gastric ulcer
- D. Pneumothorax

**Answer: A**

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Explanation:

Correct answer: Boerhaave's tears

Boerhaave's tears, a complete transmural rupture of the lower thoracic esophagus, is a medical emergency with a 40% fatality rate. The rupture occurs as a result of increased pressure in the esophagus and is most commonly caused by repeated vomiting, childbirth, weightlifting, forceful defecation, seizures due to epilepsy, or traumatic injury to the abdomen. Patients often present with complaints of severe epigastric pain, lower thoracic pain, or retrosternal chest pain, and they are typically tachypneic, tachycardic, and pyrexia. Hamman's sign, also known as Hamman's Crunch, a crunching sound which is heard when auscultating the heart due to pneumomediastinum, is frequently noted, and chest radiograph often confirms pneumomediastinum or subcutaneous emphysema. Definitive diagnosis is made by esophagogastroduodenoscopy (EGD), although computed tomography (CT) diagnosis is becoming more prevalent due to lower risk. If the diagnosis is delayed due to uncertainty, patients typically die within just a few days of the rupture.

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