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## Question: 1

Pulsus paradoxus is evaluated by:

- A. Heart rate (auscultation)
- B. Radial pulse (palpation)
- C. Systolic blood pressure readings
- D. Diastolic blood pressure readings

**Answer: C**

Explanation:

Pulsus paradoxus is evaluated by systolic blood pressure readings. During the normal respiratory cycle, the blood pressure decreases slightly on inhalation while the pulse increases, and the blood pressure increases slightly on exhalation while the pulse decreases. This is exaggerated with pulsus paradoxus, which is evaluated by finding the first systolic reading during exhalation and then decreasing blood pressure cuff readings until the systolic pressure can be heard during both cycles. A difference between the exhalation-only systolic reading and the inhalation-exhalation reading of more than 10 mmHg is positive for pulsus paradoxus.

## Question: 2

A patient involved in a car accident is being airlifted by helicopter over mountainous terrain more than 5000 feet above sea level. The patient is receiving intravenous (IV) fluids by gravity as the pump has malfunctioned. What effect will the increase in altitude to more than 5000 feet have on the IV infusion?

- A. There will be no effect
- B. The IV flow will stop
- C. The IV flow will increase
- D. The IV flow will decrease

**Answer: C**

Explanation:

The intravenous (IV) flow will increase with this increase in altitude, so adjustments to the flow rate may be necessary. Because barometric pressure affects the flow rate, a pump that adjusts to maintain a specified flow rate should be used whenever possible. As altitude increases, the barometric pressure decreases, and the reduced pressure allows flow to increase in the IV tubing. This may affect the dose of IV medications administered. For high-altitude fixed-wing air transports, cabins are pressurized but only to the equivalent of 6000-8000 feet, not to sea level.

### Question: 3

A 17-year-old girl took an overdose of acetaminophen (thirty 500-mg tablets) in a suicide attempt; she told her parents, who called for emergency assistance, 8 hours after ingestion. Which of the following is the appropriate initial emergent treatment?

- A. N-acetylcysteine
- B. Gastrointestinal decontamination and instillation of activated charcoal
- C. Sodium bicarbonate
- D. Fomepizole

**Answer: A**

Explanation:

N-acetylcysteine is the antidote for acetaminophen toxicity and is most effective in protecting the liver if given within 8 hours. Since 8 hours has elapsed in the case described in the question, the antidote should be given without waiting for serum levels as it decreases hepatotoxicity even if 24 hours have elapsed. Gastrointestinal decontamination is most effective if done within 1 hour of ingestion, although activated charcoal may have some protective effects if given within 4 hours of ingestion. Toxicity is plotted on the Rumack-Matthew nomogram with serum levels of more than 150 mg requiring an antidote. The 72-hour N- acetylcysteine protocol includes 140 mg/kg (PO) initially and 70 mg/kg every 4 hours for seventeen more doses (orally or intravenously).

### Question: 4

Which of the following arterial blood gas findings is consistent with metabolic acidosis in an adult?

- A.  $\text{HCO}_3^- < 22 \text{ mEq/L}$  and  $\text{pH} < 7.35$
- B.  $\text{HCO}_3^- > 26 \text{ mEq/L}$  and  $\text{pH} > 7.45$
- C.  $\text{PaCO}_2$  35-45 mmHg and  $\text{PaO}_2 \geq 80 \text{ mmHg}$
- D.  $\text{PaCO}_2 > 55 \text{ mmHg}$  and  $\text{PaO}_2 < 60 \text{ mmHg}$

**Answer: A**

Explanation:

Bicarbonate ( $\text{HCO}_3^-$ ) less than 22 mEq/L and a pH less than 7.35 are consistent with metabolic acidosis, which may result from severe diarrhea, starvation, diabetic ketoacidosis, kidney failure, and aspirin toxicity. Symptoms may include headache, altered consciousness, and agitation to lethargy to coma. Cardiac dysrhythmias and Kussmaul respirations are common. The other readings listed in the question indicate the following:

$\text{HCO}_3^-$  more than 26 mEq/L and a pH more than 7.45 are consistent with metabolic alkalosis  $\text{PaCO}_2$  of 35-45 mmHg and  $\text{PaO}_2$  of 80 mmHg or more are normal adult readings

$\text{PaCO}_2$  more than 55 mmHg and  $\text{PaO}_2$  less than 60 mmHg are consistent with acute respiratory failure in a previously healthy adult

### Question: 5

Which of the following is the most appropriate initial action?

- A. Arrange ground transport for the patient
- B. Provide physical restraints or chemical restraints
- C. Delay the flight until the patient calms
- D. Leave the patient at the rural hospital for treatment

**Answer: B**

Explanation:

Patients who are violent or combative should be physically restrained for transport and may also require chemical restraints to ensure personal safety as well as safety of the medical and flight crew. Because most rural hospitals lack the specialists and facilities needed to do limb reattachments, leaving the patient at the hospital is not a good option. Delaying transport by waiting or arranging ground transport may reduce the chance of successful reattachment.

### Question: 6

What is the correct procedure for transporting the amputated limb?

- A. Submerge the amputated limb in ice water
- B. Place the amputated limb in a sealed plastic bag, label it, and submerge it in ice
- C. Clean the amputated limb with disinfectant to decontaminate it, and place it on ice
- D. Place the amputated limb in a sealed plastic bag, label it, and place it on top of ice

**Answer: D**

Explanation:

An amputated limb should be sealed in a plastic bag, labeled, and placed on top of ice in a container. It should not be washed unless it is contaminated with hazardous waste, and then proper protocols for decontamination must be followed. Care should be taken not to submerge the limb in ice water or cover with ice because this might result in freezing of the tissue and impairing its viability.

### Question: 7

A tornado has caused significant damage in a rural town and multiple injuries. The closest hospital is 150 miles away. Only one helicopter is available for transport, but ambulances are scheduled to arrive within 15 minutes. After triage, which of the following patients should be airlifted?

- A. A 50-year-old woman with first- and second-degree burns on arms and hands (12% of body surface area)
- B. A 12-year-old boy with a fractured elbow

- C. A 25-year-old woman at 26 weeks' gestation in active labor
- D. A 45-year-old man with penetrating trauma in his left leg from shards of wood

**Answer: C**

Explanation:

A woman in active premature labor with a singleton or multiple births at 22 or more weeks' gestation should be airlifted because the infant or infants may be viable. Burns require air transport if they involve an explosion with respiratory distress or confusion, unconsciousness, or 18% or more (second- or third-degree burns) of body surface area is involved. Fractures can be immobilized for ground transport. Penetrating trauma (e.g., shrapnel, gunshot wound, stabbing) to the head, especially with prolonged unconsciousness, or trunk usually requires air transport, but injury to a limb, unless associated with severe bleeding or impaired circulation, is less critical.

### Question: 8

Which of the following conditions is an absolute contraindication to nasotracheal intubation?

- A. Cervical spine injury
- B. Facial trauma
- C. Skull fracture
- D. Apnea

**Answer: D**

Explanation:

Apnea is an absolute contraindication to nasotracheal intubation. The primary indications are suspected or confirmed cervical spine injury, resulting in a clenched jaw but with the gag reflex intact, and severe respiratory distress. Facial and skull fractures may, in some cases, be contraindications, depending on the location and extent of fractures. The nares size must be adequate to accept endotracheal tube in sizes 7 to 8. Usually a decongestant, such as phenylephrine, 0.5 mg, is administered to the nostril before tube insertion.

### Question: 9

Using the "4-2-1" rule to determine maintenance fluid requirements, a child weighing 20 kg requires how much maintenance fluid per hour?

- A. 20 mL/hr
- B. 40 mL/hr
- C. 60 mL/hr
- D. 80 mL/hr

**Answer: C**

Explanation:

Maintenance fluid requirement for a 20-kg child is 60 mL/hr. The 4-2-1 rule is calculated by:

- 4 mL/kg/hr for first 10 kg
- 2 mL/kg/hr for second 10 kg
- 1 mL/kg/hr for remaining kg

Pediatric fluid deficits must be carefully estimated and managed. Fluid deficits should be replaced over 3 hours with half the first hour and a quarter in the remaining 2 hours. Fluid deficits are calculated by first finding the maintenance fluid requirement and then inserting that into the following equation:

- Maintenance fluid mL x hours NPO (nothing by mouth) = fluid deficit

### Question: 10

A patient with a traumatic head injury has the head elevated to 30 degrees and is receiving intravenous fluids and oxygen. During transport, the helicopter hits severe turbulence and incurs damage. The pilot tells the crew to prepare for a crash landing. Which is the correct action to prepare for the landing?

- A. Secure the patient in flat supine position
- B. Shut off the oxygen
- C. Remove the intravenous line
- D. Stand beside the patient to ensure his or her safety

**Answer: B**

Explanation:

The nurse should immediately shut off the oxygen because it may cause an explosion during a crash landing. Patients are usually positioned for impact with the head of the stretcher elevated to 30 degrees. Intravenous lines should be secured but remain in place. As with all takeoff and landings, medical staff and crew must be seated and secured by seatbelt. Helmets should be in place and secure. After crash landing, the crew should wait until the rotors stop turning to exit the aircraft and should meet at the nose of the aircraft or other safe place before attempting additional rescues if necessary.

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