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## *Nursing*

*CCRN-Pediatric*

*American Association of Critical Care Nurses: Critical Care Registered Nurse (Pediatric)*

### Questions & Answers PDF

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# Latest Version: 6.0

## Question: 1

A 6-year-old male is rescued, unconscious, from his bed by firefighters during a house fire. He is intubated in the field. An intravenous line is placed, and fluids are started. At the emergency hospital, he has 45% total-body-surface-area (TBSA) burns covering his torso and legs. This child is at the highest risk of which of the following complications?

- A. Wound sepsis
- B. Fractures of the femur due to muscle tetany
- C. Hypothermia
- D. Abdominal compartment syndrome

**Answer: C**

Explanation:

Children are more prone to developing hypothermia secondary to major burn injuries, as a result of their increased body surface-area-to-mass ratio. This places a child at a greater risk of evaporative water loss and conductive heat loss. Hypothermia remains a major problem until the burn wounds have been skin grafted and properly healed. Every effort should be made to minimize heat loss for a child with burn injuries, including providing care in a heated and humidified hospital room.

Abdominal compartment syndrome is a risk if resuscitation volumes are excessive, or if the child has suffered massive burns (>80% TBSA). Wound sepsis is always a risk, although not as great of a risk as hypothermia. Unrecognized femoral fractures due to muscle tetany are a less common complication associated with electrical burns, not thermal burn injuries.

## Question: 2

A 4-year-old boy was brought into the emergency department by EMS after reportedly swallowing a handful of his mother's prescription diazepam (Valium). Which of the following is used as an antidote to the potential toxicity of this drug?

- A. Flumazenil
- B. Activated charcoal
- C. Naloxone
- D. N-acetylcysteine

**Answer: A**

Explanation:

Benzodiazepines are used as adjuncts to anesthesia, anticonvulsants for muscle spasms, and anxiety relief. Young children may have access to these drugs if they are being taken therapeutically by family members. Flumazenil is the specific antidote to benzodiazepine toxicity or overdose, as it effectively

reverses respiratory depression. A test dose should be used to help determine whether respiratory depression is caused by a benzodiazepine overdose. Flumazenil should never be used if the patient also overdosed on a tricyclic antidepressant (TCA) due to an increased risk of seizures. If the patient is known to have a seizure disorder, it should also not be used.

Naloxone reverses the effects of an overdose of an illicit or prescription opioid. An acetaminophen overdose is treated with N-acetylcysteine (NAC). Activated charcoal is indicated for most poison ingestions.

### Question: 3

Which pediatric burn injuries should NOT be referred to a burn center?

- A. Suspected inhalation injury
- B. Partial-thickness burns greater than 9% total body surface area (TBSA)
- C. Any full-thickness burn across all pediatric age groups
- D. Any chemical burn

**Answer: B**

Explanation:

The American Burn Association (ABA) has established a set of criteria for referring patients to a burn-specific critical care environment, to receive specialized care for certain types of burn injuries. Any child who suffered partial-thickness (second-degree) burns over greater than 10% of their total body surface should be referred to a burn center.

Additional criteria include burns that involve the face, hands, feet, genitalia, perineum, or major joints; third-degree (full-thickness) burns in any age group; electrical burns; chemical burns; inhalation injury; burns on patients with preexisting medical conditions that could complicate management; any patient with burns and concomitant trauma in which the burn poses the greatest risk of morbidity and mortality; and burn injury in patients requiring specialized social, emotional, or rehabilitative intervention.

### Question: 4

Which of the following common pacemaker modes is indicated as an emergent treatment to establish ventricular activity when AV dissociation is present, maintaining cardiac output (CO) without an atrial kick?

- A. VOO (ventricular asynchronous pacing)
- B. AAI (atrial demand pacing)
- C. VVI (ventricular demand pacing)
- D. DDD (dual-chambered pacing)

**Answer: C**

Explanation:

Pacemakers deliver an electrical stimulus to the heart to initiate depolarization and stimulate cardiac contraction. Common indications for pediatric pacemaker placement include surgically induced heart block, congenital complete heart block, SSS and other symptomatic bradyarrhythmias, long QT syndrome (LQTS), and neurocardiogenic syncope.

Ventricular demand pacing mode (VVI) prevents ventricular bradycardia and is primarily used in emergencies for patients with atrial fibrillation who have a slow ventricular response to establish ventricular activity and maintain CO. In this pacemaker mode, the ventricle is paced and sensed, and the pulse generator inhibits pacing output in response to a sensed ventricular event.

VOO pacing is indicated for asystole and is dangerous, as it can cause R-on-T with ventricular fibrillation (use DDD or VVI instead). DDD pacing is indicated for any arrhythmia without AV conduction (blocks); it should be avoided for patients with atrial fibrillation or flutter since it tracks atrial rate. AAI pacing is indicated for sinus or high-junctional bradycardias when the AV conduction system is intact.

### Question: 5

Intracranial hemorrhage (ICH) is an important concern for infants born prematurely and is classified into four grades. Which of the following grades involves intraventricular blood?

- A. Grade II
- B. Grade IV
- C. Grade I
- D. Grade III

**Answer: A**

Explanation:

Grade I hemorrhage usually has a good outcome, whereas the prognosis of grade IV hemorrhage is frequently poor. Grade I hemorrhage is confined to the germinal matrix. This is the last fetal germinal matrix to mature and is prone to hemorrhage in preterm babies.

Grade II intracranial hemorrhage involves intraventricular blood. Grade III hemorrhage is associated with ventricular dilation as the intraventricular clot enlarges the lateral ventricles. Grade IV hemorrhage is defined by parenchymal extension.

### Question: 6

A nurse is providing education to the family of an infant with DiGeorge syndrome and associated congenital heart disease (CHD). The family was unaware of the infant's condition prior to delivery. Which support and anticipatory guidance measures are appropriate to discuss?

- A. Reassure the family that the infant's condition will not interfere with normal growth and development
- B. During resuscitative measures and procedures, limit and/or avoid family presence since the diagnosis was a shock
- C. Encourage breastfeeding and pumping to maintain supply
- D. Arrange social work, palliative care, and genetics referrals

**Answer: C**

Explanation:

This infant may be intubated and will not be able to eat prior to surgery (NPO). In addition, the infant's bowel function may be at risk due to surgery, and the incidence of necrotizing enterocolitis (NEC) is higher in these infants. Critical illness, genetic predisposition, and the use of cardiopulmonary bypass during surgical repair all place the infant at higher risk of immunosuppression.

Breastmilk provides an easily digestible feeding that includes antibodies to assist with immune suppression, decrease the risk of NEC, and optimize feeding progression. Pumping should be encouraged to maintain the breast milk supply until the infant can tolerate enteral feedings. This will require support from nursing, lactation, nutrition, and social work.

### Question: 7

Which of the following factors will negatively impact the oxyhemoglobin dissociation curve by shifting it to the right?

- A. Hyperthermia
- B. Metabolic alkalosis
- C. Hypothermia
- D. Respiratory alkalosis

**Answer: A**

Explanation:

The oxyhemoglobin dissociation curve indicates the relationship between the oxygen saturation (SaO<sub>2</sub>) of hemoglobin (Hgb) and the partial pressure of arterial oxygen (PaO<sub>2</sub>) within the body.

An elevated temperature shifts the oxyhemoglobin dissociation curve to the right, decreasing Hgb's affinity for oxygen for a given PaO<sub>2</sub> value, and the SaO<sub>2</sub> value decreases below normal. Hemoglobin releases oxygen to the tissues more readily in an effort to keep tissues adequately perfused because oxygen demand is higher than normal.

Hypothermia and an increase in serum pH levels (alkalosis states) are factors associated with a left shift to the curve. A shift to the left increases hemoglobin's affinity for oxygen.

### Question: 8

A pediatric patient is prescribed digoxin (Lanoxin) for heart failure. The nurse knows that toxicity is usually seen at levels greater than what value?

- A. 2 ng/mL
- B. 4 ng/mL
- C. 1 ng/mL
- D. 3 ng/mL

**Answer: A**

Explanation:

Digoxin is commonly used for the treatment of mild to moderate heart failure in pediatric patients. The toxic effects of digoxin are exacerbations of therapeutic effects (dysrhythmias, bradycardia, and heart block). Clinical effects of acute overdose occur in the gastrointestinal and cardiovascular systems, consisting of nausea, vomiting, hypotension, bradycardia, and dysrhythmias. Digoxin immune Fab (Digibind) is the antidote to digoxin and can be used in acute and symptomatic digoxin toxicity.

A toxic dose can be estimated by history, but laboratory evaluation of serum levels and careful evaluation of the patient are critical components to avoiding overdose. The therapeutic trough range is 0.5 to 2 ng/mL, and toxicity is usually seen at levels above 2 ng/mL (although toxicity can occur within this range, too).

### Question: 9

A nurse is caring for a 7-year-old male in the PICU in the postictal period of a tonic-clonic seizure involving involuntary jerking of the limbs and loss of consciousness. What is an expected finding in this phase?

- A. Aura, loss of appetite, insomnia
- B. Crying, "pins-and-needles" sensation, tachycardia
- C. Immediate return to baseline behavior
- D. Drowsiness, headache, nausea

**Answer: D**

Explanation:

The postictal period is the recovery period after a seizure. Some children recover quicker than others, but most take minutes to hours to return to their baseline behaviors; the process is rarely immediate. The seizure this child experienced was violent, and therefore the child is expected to be tired or even lethargic in this phase. Headaches and nausea are also very common symptoms. The best intervention at this point is to allow the child to sleep while keeping a close eye on him.

The other choices are commonly seen in the prodromal period (loss of appetite, insomnia) and the ictal period (aura, "pins-and-needles" sensation, tachycardia). The sudden contraction of the muscles and vocal cords in a tonic-clonic seizure may result in a cry that is heard during the seizure (ictal phase).

### Question: 10

A pediatric patient is being prepped for cardiac catheterization to obtain a cardiac biopsy. Which allergies should the patient be assessed for prior to this procedure?

- A. Penicillin
- B. Antiarrhythmic medications
- C. Iodine or shellfish
- D. Opioid pain medications

**Answer: C**

**Explanation:**

Cardiac catheterization is an invasive procedure that can be used to diagnose a congenital heart defect, as well as repair certain congenital heart defects. It can also help identify rejection in a transplanted heart, aid in the diagnosis of infectious etiology or continued inflammatory response in myocarditis (both via a biopsy), and assess for cellular disease such as mitochondrial disease.

A catheter is inserted into the femoral artery and then threaded to the heart. Prior to the procedure, it is important to assess for any allergies to iodine or shellfish. If a patient has an allergy to either of these, this increases the risk of an allergic reaction to the contrast dye used in the procedure.