

Nursing BCEN-CPEN

**Board of Certification for Emergency Nursing: Certified
Pediatric Emergency Nurse**

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Question: 1

A nine-year-old male arrives at the emergency department via ambulance with a left leg fracture. Radiologic findings reveal a closed fracture of the fibula. The physician performs a closed reduction and casts the extremity. The patient is receiving IV morphine every 2-4 hours as needed for pain control. The mother calls the nurse on the call light and states her son is experiencing severe pain in the casted extremity with even the slightest movement, despite the pain medication. The nurse suspects which of the following complications?

- A. Fat embolism
- B. Osteomyelitis
- C. Compartment syndrome
- D. Thrombus formation

Answer: C

Explanation:

Compartment syndrome occurs when too much pressure is exerted within the myofascial compartments, decreasing blood flow to the tissues. As the pressure builds within the affected compartment, this will inhibit blood supply and nerve function to this muscle. If it is left untreated for over 6 hours, the damage is irreversible.

While compartment syndrome is rare in children, it does still happen. It is more often seen in the lower extremities compared to the upper extremities. High suspicion of compartment syndrome should be raised if the child complains of sharp pain or numbness in the casted extremity, despite adequate pain relief.

The other choices are complications of a fracture but not likely given this patient's symptoms.

Question: 2

A 15-year-old female is admitted to the ED with a suspected overdose after her mother found her unconscious in her bedroom and rushed her to the hospital. She had a prescription bottle of her father's nortriptyline at her bedside table.

Which of the following signs and symptoms would the nurse expect to observe in this type of toxicity?

- A. Dysrhythmias and hypotension
- B. Respiratory distress and drooling
- C. Hypothermia and tachycardia
- D. Profound hypertension and diaphoresis

Answer: A

Explanation:

The toxicity of tricyclic antidepressants (TCAs) is related to the effects of the following:

- anticholinergic effects
- direct alpha-adrenergic blockage
- inhibition of norepinephrine and serotonin reuptake
- blockade of fast sodium channels in myocardial cells

The most serious adverse effects of TCA toxicity are CNS effects and cardiovascular instability. A classic presentation of overdose poisoning includes profound hypotension, metabolic acidosis, and numerous dysrhythmias (especially ventricular dysrhythmias, conduction delays, and potentially the rapid onset of grand mal seizures and coma shortly after ingestion). In addition, sinus tachycardia on ECG is common.

Question: 3

A three-month-old infant is admitted to the emergency department with suspected tricuspid atresia (TA). Which of the following findings on electrocardiogram (ECG) is indicative of this condition?

- A. Diminished left ventricular (LV) forces
- B. Increased right ventricular (RV) forces
- C. Left axis deviation
- D. Right axis deviation

Answer: C

Explanation:

Most forms of congenital heart disease show right axis deviation and right heart strain. With tricuspid atresia (TA), the right ventricle is bypassed, and the left ventricle ends up doing all the work. The lack of tricuspid valve formation results in the absence of blood flow from the right artery (RA) to the right ventricle (RV) and poor RV formation in utero.

ECG shows a superior and leftward QRS axis, RA enlargement, absent or diminished RV forces, and increased LV forces. Survival is contingent upon the placement of an obligatory right-to-left atrial shunt.

Question: 4

The course of iron poisoning in a child younger than six years of age is typically described in five phases. Phase I usually occurs within how many hours after ingestion?

- A. 12 hours
- B. 24 hours
- C. 4 hours
- D. 6 hours

Answer: D

Explanation:

Iron in the form of adult-strength supplements and prenatal vitamins with iron causes dangerous overdose in children younger than six years old. Iron supplements are occasionally used in suicide attempts by others, especially pregnant adolescents. When toxicity occurs, iron causes significant

corrosive injury to the GI tract, injures blood vessels, damages hepatocytes, and produces metabolic acidosis.

Severe iron poisoning is typically described in five sequential phases, although individual patients may not always exhibit each phase. Phase I usually occurs within the first 6 hours after ingestion and includes GI tract symptoms (often severe) consisting of hemorrhagic gastritis, vomiting, hematemesis, diarrhea, lethargy, and pallor. A patient first experiences GI symptoms, which are then followed by systemic toxicity.

- Phase I: within the first 6 hours after ingestion
- Phase II: about 6 to 12 hours after ingestion
- Phase III: about 12 to 24 hours after ingestion
- Phase IV: 2 to 3 days post-ingestion
- Phase V: 2 to 6 weeks post-ingestion

Question: 5

When developing a plan of care for a hospitalized adolescent male, a pediatric nurse must take into account this patient's psychosocial needs. Based on the psychosocial development of the adolescent, the care plan should not focus on which of the following?

- A. Giving the adolescent permission to initiate conversation
- B. Respecting privacy and avoiding unnecessary physical exposure
- C. Facilitating visits with peers when possible
- D. Giving the choice of whether they want their parents to be present

Answer: A

Explanation:

While it is important to allow an adolescent patient to make choices whenever possible and ask questions, teens who must be hospitalized will not likely know how to initiate conversation around their current illness. They often prefer the discussion to be led by the healthcare provider (with plenty of room for questions and concerns).

The nurse should respect the adolescent's desire for privacy and avoid unnecessary physical exposure, explain every care step, and encourage teens to discuss their concerns. These patients should be included in decision-making regarding their health and illness and should be taught about normal physical and sexual development. Friends are most important to teens, so visits with peers should be facilitated whenever possible.

Question: 6

A child in hemorrhagic shock will experience a drastic decrease in intravascular volume. This decrease leads to all the following, except:

- A. Anaerobic metabolism
- B. Decreased serum creatinine
- C. Decreased serum lactate
- D. Decreased central venous pressure (CVP)

Answer: C

Explanation:

During hemorrhagic shock, there is less intravascular volume, leading to decreased oxygen flow to the cells, anaerobic metabolism, and lactic acidosis (increased, not decreased, serum lactate). Serum creatinine is decreased, and CVP is also decreased with a low circulating volume secondary to hemorrhagic shock.

A decreased serum lactate (lactic acid) is an indicator that cells are receiving adequate oxygen flow and that volume replacement therapy is effective (i.e., circulating volume is increasing).

Question: 7

A nurse is caring for a six-year-old child on digoxin therapy for congestive heart failure. The nurse reviews the child's laboratory values and is most concerned with which of the following findings?

- A. Calcium level of 9.4 mg/dL
- B. Digoxin level of 1.2 ng/mL
- C. Potassium level of 3.2 mEq/L
- D. Magnesium level of 1.5 mEq/L

Answer: C

Explanation:

Digoxin is used for the treatment of mild to moderate heart failure, to decrease the ventricular response rate in fast atrial arrhythmias, and to treat fetal tachycardia in the absence of hydrops. Digoxin has inotropic effects from the inhibition of the sodium-potassium pump. The nurse should watch for hypokalemia (as evidenced by serum levels that fall below 3.5 mEq/L), hypercalcemia (as evidenced by serum levels that rise above 10 mg/dL), and hypomagnesemia (as evidenced by serum levels that fall below 1.4 mEq/L). These levels may aggravate digoxin cardiotoxicity, even if the digoxin level is normal (the therapeutic trough range is 0.5 to 2 ng/mL).

The nurse should also assess the child's heart rate (HR) prior to each dose administered to verify it is greater than 60 bpm.

Question: 8

Per an annual survey, hospital nursing staff members feel routine 5:00 AM lab draws cause an extreme interruption in pediatric sleep patterns. What is the best strategy for addressing this issue?

- A. Create a group of staff members to discuss current hospital policy
- B. Move all non-emergent 5:00 AM lab draws to daytime hours
- C. Request an in-service session for phlebotomy personnel on the effects of sleep deprivation in children
- D. Send the results of the survey to the hospital administrator

Answer: A

Explanation:

Utilizing the nurse competencies—which reflect the integration of nursing knowledge, skills, and experiences that are required to meet the patient's and family's needs and optimize their outcomes—a systematic, collaborative approach to problem-solving is necessary for this scenario.

An alternative strategy to avoid interrupting typical patient sleep patterns may be identified by various team members working together.

Question: 9

A pediatric critical care nurse admits a patient with cerebral salt wasting (CSW). They first presented with a history of acute bacterial meningitis 10 days prior. What treatment should be initiated promptly?

- A. Furosemide (Lasix) for diuresis
- B. Fluid replacement therapy with normal saline as maintenance IV fluids
- C. Fluid bolus of 20 mL/kg with isotonic normal saline
- D. Fluid restriction for insensible fluid loss

Answer: C

Explanation:

CSW is a transient condition that presents within the first 10 days of diagnosis of an acute neurologic condition involving hyponatremia and hypovolemia. CSW is often seen in children with neurologic and neurosurgical injuries, infection (e.g., bacterial meningitis), or oncologic processes. CSW can have life-threatening effects secondary to hypovolemia if not differentiated from other disease states, making prompt recognition vital.

Fluid should be given in CSW to replete the hypovolemic state caused by diuresis and natriuresis. An IV bolus of 20 mL/kg of isotonic normal saline (NS) should be given initially and promptly. Once euvolemia is reached, the fluid type and rate should be near maintenance levels, and the composition should reflect urine sodium losses. Sodium should be normalized slowly over 24 to 48 hours, at a rate no faster than 0.5 to 1 mEq/hr or no more than 10 mEq/day.

Question: 10

A pediatric critical care nurse is developing a plan of care for an 11-year-old child admitted to the PICU with syndrome of inappropriate antidiuretic hormone (SIADH). What would be a potential nursing diagnosis for this patient?

- A. Deficient fluid volume
- B. Risk for impaired skin integrity
- C. Fluid volume excess
- D. Acute pain

Answer: C

Explanation:

SIADH is a disorder of impaired water excretion caused by the inability to suppress the secretion of antidiuretic hormone (ADH). If water intake exceeds the reduced urine output, the ensuing water retention leads to hyponatremia.

This syndrome should be suspected in any child presenting with hyponatremia, hypo-osmolality, and a urine osmolality above 100 mOsmol/kg. In SIADH, the urine sodium concentration is usually above 40 mEq/L, serum potassium concentration is normal, there is no acid-base disturbance, and the serum uric acid concentration is often low.

Nursing diagnoses include fluid and volume excess and congestive heart failure related to excessive ADH secretion and water retention. Other potential diagnoses include an alteration in mental state related to underlying conditions, hyponatremia, or acute changes in serum osmolality; seizures related to hyponatremia; and cerebral hemorrhage that results from correcting the hypo-osmolar state too rapidly.

Question: 11

After pulling a cup of hot tea off the kitchen table, a three-year-old child is admitted for second-degree burns on approximately 20% of his body. The nurse should expect an order to initiate fluid resuscitation with which of the following?

- A. Dextrose 5% in water (D5W)
- B. Dextrose 10% in water (D10W)
- C. Lactated Ringer's (LR) solution
- D. Dextrose 5% in normal saline (D5NS)

Answer: C

Explanation:

For a pediatric patient who sustains burns that appear to be bigger than 15% of the total body surface area (TBSA) and deep (second-degree or third-degree burns), the nurse should begin fluid resuscitation for the first 24 hours postburn injury. Lactated Ringer's (LR) or NS are appropriate choices for resuscitation fluid.

Maintenance fluids, if indicated, may include dextrose. These augment the initial fluid resuscitation using LR or NS.

Question: 12

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

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

Answer: C

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: 13

A nurse is caring for a child with acute pericarditis. Which assessment finding would prompt the nurse to contact the physician immediately?

- A. Pericardial friction rub
- B. Shortened PR interval
- C. Muffled heart sounds
- D. Chest pain that is worse in supine positioning

Answer: C

Explanation:

Acute pericarditis is inflammation of the pericardium characterized by pericarditic chest pain, pericardial friction rub, and serial ECG changes, which may show ST elevation or depression, an inverted T wave, a prolonged PR interval (not shortened), diminished QRS and T-wave voltage, or arrhythmias.

Muffled heart sounds may indicate cardiac tamponade, which is a serious complication of acute pericarditis and is considered a medical emergency. Because of this, the nurse should immediately contact the physician.

Chest pain and pericardial friction rub are both expected symptoms of acute pericarditis. While the nurse should closely monitor these elements, they would not immediately indicate a potential emergency.

Question: 14

You are the triage nurse and must institute infection-control measures to isolate a four-year-old patient with suspected methicillin-resistant *Staphylococcus aureus* (MRSA) who has just arrived at the emergency department (ED). Which of the following would be the most appropriate infection control precaution to initiate in this scenario?

- A. Contact
- B. Airborne
- C. Droplet
- D. Standard

Answer: A

Explanation:

MRSA is a highly contagious infection that is resistant to many antibiotics. MRSA may cause life-threatening cases of bloodstream infections, surgical site infections, or pneumonia. Contact precautions should be utilized for any patient diagnosed with an MRSA infection. This includes keeping the patient in an isolation room and donning gloves and gowns for patient care. Following discharge from the room, special cleaning measures should take place to disinfect the equipment appropriately.

Question: 15

What is an example of a type III hypersensitivity reaction?

- A. Poison ivy
- B. ABO incompatibility
- C. Asthma
- D. Serum sickness

Answer: D









Explanation:

The classic clinical syndrome of serum sickness is caused by the immunization of a human by nonhuman serum proteins and subsequent illness due to the formation of immune complexes. Serum sickness is a classic example of "type III" or immune complex-mediated hypersensitivity disease. The reaction requires the presence of the antigen, alongside antibodies directed against the antigen, leading to the formation of antigen-antibody or immune complexes, which are later deposited in blood vessels or healthy tissue.

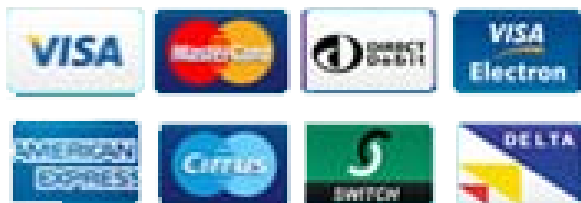
Asthma is an example of a type I anaphylactic reaction. ABO incompatibility is a type II or tissue-specific hypersensitivity. Poison ivy is a type IV delayed hypersensitivity reaction.

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