

American Heart Association

Pediatric Advanced Life Support

Pretest

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**Pediatric Advanced Life Support Course
Written Examination**

Please do not mark on this evaluation. Record the best answer on the separate answer sheet.

1. **Which of the following statements about poisoning and overdose in the pediatric population is *true*?**
 - a. whenever a poison or toxin is ingested, you should induce vomiting to eliminate it from the body
 - b. poisoning and overdose cause a significant number of deaths in the 15- to 24-year-old age group
 - c. poisoning and overdose do not occur in the pediatric population
 - d. the first priority of management for the child with poisoning or a drug overdose is to "get the antidote"

2. **A 3-year-old unresponsive, apneic child is brought to the Emergency Department. The EMTs transporting the child tell you the child became pulseless as they pulled up to the hospital. The child is receiving CPR, including positive-pressure ventilation with bag and mask and 100% oxygen and chest compressions. You confirm that apnea is present and that ventilation is producing bilateral breath sounds and chest expansion while a colleague confirms absence of spontaneous central pulses and other signs of circulation. A third colleague attaches the ECG monitor and reports that ventricular fibrillation is present. Which of the following therapies is most appropriate for this child at this time?**
 - a. establish IV/IO access and administer amiodarone 5 mg/kg
 - b. establish IV/IO access and administer lidocaine 1 mg/kg
 - c. attempt defibrillation at 2 J/kg
 - d. establish IV/IO access and administer epinephrine 0.01 mg/kg

3. **You are attempting resuscitation of an infant or child with severe symptomatic bradycardia and no evidence of vagal etiology. The bradycardia persists despite establishment of an effective airway, oxygenation, and ventilation. Which of the following is the *first drug* you should administer?**
 - a. atropine
 - b. dopamine
 - c. adenosine
 - d. epinephrine

4. **You are preparing to use a manual external defibrillator and external paddles in the pediatric setting. When would it be *most appropriate* to use the smaller "pediatric-sized" paddles for delivery of direct-current energy?**
- the smaller paddles should be used for synchronized cardioversion but not for defibrillation
 - the smaller paddles should be used when the patient weighs less than approximately 25 kg or is less than 8 years old
 - the smaller paddles should be used when the patient weighs less than approximately 10 kg or is less than 1 year old
 - the smaller paddles should be used whenever you can compress the victim's chest using only the heel of one hand
5. **A 7-year-old boy is found unresponsive, apneic, and pulseless. CPR is provided, and tracheal intubation and vascular access are achieved. The ECG monitor reveals pulseless electrical activity (PEA). An initial IV dose of epinephrine has been administered, and effective ventilations and compressions continue for 1 minute. Which of the following therapies should you perform *next*?**
- attempt to identify and treat reversible causes (using the 4 H's and 4 T's as a memory aid)
 - attempt defibrillation at 4 J/kg
 - administer escalating doses of epinephrine
 - administer synchronized cardioversion
6. **Which of the following statements about the effects of epinephrine during attempted resuscitation is *true*?**
- epinephrine decreases peripheral vascular resistance and reduces myocardial afterload so that ventricular contractions are more effective
 - epinephrine can improve coronary artery perfusion pressure and can stimulate spontaneous contractions when asystole is present
 - epinephrine is not useful in ventricular fibrillation because it will increase myocardial irritability
 - epinephrine decreases myocardial oxygen consumption
7. **You are participating in the elective intubation of a 4-year-old child with respiratory failure. You must select the appropriate size of uncuffed tracheal tube. Which of the following sizes is most appropriate for an average 4-year-old?**
- 3-mm tube
 - 4-mm tube
 - 5-mm tube
 - 6-mm tube

8. **A 9-month-old infant presents with a respiratory rate of 45 breaths/min and a heart rate of 250 bpm with narrow (<0.08 seconds) QRS complexes. The infant is receiving 100% oxygen by face mask, and an IV catheter is in place. The infant's systolic blood pressure is 64 mm Hg and palpable with faint pulses, and capillary refill time is 5 to 6 seconds. The infant responds only to painful stimulation, and he has no history of vomiting or diarrhea. Which of the following is the most appropriate initial treatment for this infant?**
- a. attempt immediate defibrillation
 - b. administer a 20 mL/kg fluid bolus of normal saline over 20 minutes or less
 - c. administer adenosine 0.1 mg/kg rapid bolus (2-syringe technique)
 - d. administer verapamil
9. **You are in a restaurant when a woman at the next table cries out, "I think he's choking." You look over and see a 3-year-old child who does appear to be choking. You go to the table and confirm that the child is responsive, but he is cyanotic, unable to cough or talk, and is not moving air. Which of the following is the most appropriate initial therapy for this child?**
- a. give 5 back blows and then 5 chest thrusts
 - b. perform a blind finger sweep
 - c. do not intervene unless the child becomes unresponsive; then perform abdominal thrusts
 - d. tell the victim you will help and give abdominal thrusts
10. **You are evaluating a 7-month-old boy. The infant presented with a history of poor feeding, fussiness, and sweating. He is alert and responsive, and he has a respiratory rate of 48 breaths/min with good bilateral breath sounds. Heart rate is 250 bpm with narrow (<0.08 seconds) QRS complexes, and the heart rate does not vary with activity or cry. Pulses are readily palpable, and capillary refill is 2 seconds. Which of the following therapies is *most* appropriate for this infant?**
- a. make an appointment with a pediatric cardiologist for later in the week
 - b. consider vagal maneuvers (eg, ice to the face) while IV access is attempted and provide IV adenosine once access is established
 - c. perform immediate synchronized cardioversion without awaiting establishment of IV access
 - d. establish IV access, administer a fluid bolus of 20 mL/kg of isotonic crystalloid, and administer antibiotics
11. **You are evaluating a responsive 6-year-old girl. The child presented with fever, irritability, mottled color, cool extremities, and a prolonged capillary refill time. Her heart rate is 160 bpm, respiratory rate is 45 breaths/min, and BP is 98/56 mm Hg. Which of the following most accurately describes this child's condition, using the terminology taught in the PALS course?**

- a. decompensated shock associated with inadequate tissue perfusion
 - b. decompensated shock associated with inadequate tissue perfusion and significant hypotension
 - c. compensated shock requiring no intervention
 - d. compensated shock associated with inadequate tissue perfusion
- 12. An 8-year-old child was struck by a car. He arrives in the Emergency Department alert, anxious, and in respiratory distress. His cervical spine is immobilized, and he is receiving a 10 L/min flow of 100% oxygen by face mask. Respirations are 60 breaths/min, heart rate is 150 bpm, and systolic blood pressure is 60 mm Hg. No breath sounds are heard over the right chest, and the trachea is clearly deviated to the left. Pulse oximetry reveals an oxyhemoglobin saturation of 84%. Which of the following is the most appropriate *immediate* intervention for this child?**
- a. perform tracheal intubation and call for a STAT chest x-ray
 - b. obtain a chest x-ray and provide bag-mask ventilation until the x-ray is read
 - c. establish IV access and administer a 20 mL/kg bolus of normal saline
 - d. perform needle decompression of the right chest and assist ventilation with a bag and mask if necessary
- 13. A 2-year-old child presents with mild difficulty breathing of gradual onset. She is alert, but she has a sore throat and is making coarse, high-pitched inspiratory sounds (mild stridor). Her oxyhemoglobin saturation is 94% in room air, and her lung sounds are clear with adequate breath sounds bilaterally. Which of the following is the most appropriate *initial* intervention for this child?**
- a. immediate tracheal intubation
 - b. immediate radiologic evaluation of the soft tissues of the neck
 - c. evaluation of oxyhemoglobin saturation with pulse oximetry and analysis of arterial blood gases to determine if hypercarbia is present
 - d. administration of humidified supplemental oxygen as tolerated and continued evaluation
- 14. An 18-month-old child presents with a 1-week history of a cough and runny nose. He is cyanotic and responds only to painful stimulation. His heart rate is 160 bpm; respirations have dropped from 65 to 10 per minute with severe intercostal retractions and a capillary refill time of less than 2 seconds. Which of the following is the most appropriate *immediate* treatment for this toddler?**
- a. establish vascular access and administer a 20 mL/kg bolus of isotonic fluids
 - b. open the airway and provide positive-pressure ventilation using 100% oxygen and a bag-mask device
 - c. administer 100% oxygen by face mask, establish vascular access, and obtain a STAT chest x-ray
 - d. administer 100% oxygen by face mask, obtain blood for arterial blood gas analysis, and establish vascular access

15. You are supervising another healthcare provider in the insertion of an intraosseous needle into an infant's tibia. Which of the following signs should you tell the provider will *best* indicate successful insertion of a needle into the bone marrow cavity?
- pulsatile blood flow will be present in the needle hub
 - fluids or drugs can be administered freely without local soft tissue swelling
 - resistance to insertion suddenly *increases* as the tip of the needle passes through the bony cortex into the marrow
 - once inserted the shaft of the needle moves easily in all directions within the bone
16. An anxious but alert 7-year-old child is brought to the Emergency Department. The child has a heart rate of 260 bpm with narrow QRS complexes and no variability in heart rate with activity. Respirations are 30 breaths/min and unlabored. Extremities are warm, and capillary refill time is less than 2 seconds. He is awake and alert, and he denies chest pain or shortness of breath. Which of the following is the most appropriate *initial* treatment for this child?
- perform immediate synchronized cardioversion (0.5 to 1 J/kg)
 - establish vascular access and administer a 20 mL/kg bolus of normal saline
 - attempt vagal maneuvers by having the child blow into an occluded straw, and establish vascular access to deliver adenosine if needed
 - begin immediate transcutaneous overdrive pacing
17. A pale and obtunded 3-year-old child with a history of diarrhea is brought to the hospital. Respirations are 45 breaths/min with no distress and good breath sounds bilaterally. Heart rate is 150 bpm, and BP is 88/64 mm Hg. Capillary refill time is 5 seconds, and peripheral pulses are weak. After placing the child on a 10 L/min flow of 100% oxygen and obtaining vascular access, which of the following is the *most appropriate* immediate treatment for this child?
- obtain a chest x-ray
 - administer a maintenance crystalloid infusion
 - administer a 20 mL/kg bolus of IV or IO isotonic fluids
 - administer a dopamine infusion at a rate of 2 to 5 $\mu\text{g}/\text{kg}$ per minute
18. An infant with a history of vomiting and diarrhea arrives by ambulance. The infant responds only to painful stimulation. The upper airway is patent, respiratory rate is 40 breaths/min with good bilateral breath sounds, and 100% oxygen is being administered. She has cool extremities, weak pulses, and a capillary refill time of more than 5 seconds. Blood pressure is 85/65 mm Hg, and glucose concentration (measured by bedside test) is 100 mg/dL. Which of the following is the *most appropriate* treatment for this infant?

- a. establish IV or IO access and administer 20 mL/kg 5% dextrose and 0.45% sodium chloride over 5 minutes
 - b. establish IV or IO access and administer 20 mL/kg lactated Ringer's solution over 60 minutes
 - c. perform tracheal intubation and administer 0.1 mg/kg epinephrine (0.1 mL/kg of 1:1000 solution) by tracheal tube
 - d. administer 20 mL/kg isotonic crystalloid over 10 to 20 minutes
- 19. Which of the following devices will *most reliably* deliver a high (90% or greater) concentration of inspired oxygen?**
- a. a nasal cannula with oxygen flow of 4 L/min
 - b. a simple oxygen mask
 - c. a non-rebreathing face mask with an oxygen reservoir
 - d. a partial rebreathing mask
- 20. You are transporting a 6-year-old tracheally intubated patient who is receiving positive-pressure mechanical ventilation. The child begins to move his head and suddenly becomes cyanotic and bradycardic. You remove the child from the mechanical ventilator circuit and provide manual assisted ventilation with a bag via the tracheal tube. During manual ventilation with 100% oxygen, the child's color and heart rate improve slightly and his blood pressure remains adequate. Breath sounds and chest expansion are present and adequate on the right side, but they are consistently diminished on the left side. The trachea is not deviated, and the neck veins are not distended. A suction catheter passes easily beyond the tip of the tracheal tube. Which of the following is the *most likely* cause of this child's acute deterioration?**
- a. tracheal tube displacement
 - b. tracheal tube obstruction
 - c. tension pneumothorax
 - d. equipment failure
- 21. An 11-year-old skateboarder suffered multiple system trauma with no obvious midface injury. He is obtunded and apneic. After bag-mask ventilation with 100% oxygen and appropriate cervical spine immobilization, which of the following is the preferred method for tracheal intubation?**
- a. nasotracheal route
 - b. orotracheal route
 - c. cricothyrotomy
 - d. nasogastric tube

22. An unresponsive 7-month-old infant presents with cold extremities and a capillary refill time of more than 5 seconds. His heart rate is 260 bpm with weak pulses and narrow QRS complexes. IV access is established with difficulty. The infant is receiving 100% oxygen by non-rebreathing face mask, and oxygenation and ventilation are adequate. Pediatric monitor/defibrillation/pacing electrode pads are in correct position on the infant's chest. You attempt to flush the IV line with normal saline and note that it is no longer patent. Which of the following is the *most appropriate* initial treatment for this infant?

- a. perform immediate tracheal intubation
- b. reattempt vascular access to enable administration of IV adenosine
- c. establish IO access and administer a 20 mL/kg bolus of isotonic crystalloid followed by adenosine
- d. perform immediate synchronized cardioversion

23.
Deleted

24. You are preparing to attempt synchronized cardioversion for a child with supraventricular tachycardia. What is the recommended *initial* energy dose for synchronized cardioversion for infants and children?

- a. 0.05 to 0.1 J/kg
- b. 0.5 to 1 J/kg
- c. 2 to 4 J/kg
- d. 6 to 10 J/kg

25. Deleted

26. **An 18-month-old submersion (near-drowning) victim is currently stable in a community hospital ED. A tracheal tube is in place with proper position confirmed. The toddler is receiving mechanical ventilation and a low-dose dopamine infusion to support blood pressure and perfusion. Which of the following options is *most appropriate* for transporting this child from the community hospital to a tertiary care center?**
- a helicopter team with no pediatric experience that is 20 minutes away
 - the local EMS service with a Basic EMT
 - a pediatric critical care transport team from the receiving tertiary care center that is 30 minutes away
 - the local basic EMS service with a pediatric nurse along to help
27. **A 3-year-old boy presents with multiple system trauma. The child was an unrestrained passenger in a motor vehicle crash. He is unresponsive to voice or painful stimulation, and his right pupil is dilated and responds sluggishly to light. His respiratory rate is less than 6 breaths/min, heart rate is 170 bpm, systolic blood pressure is 60 mm Hg, and capillary refill time is 5 seconds. What are the *first* actions you should take to support this child?**
- provide 100% oxygen by simple mask, immobilize the cervical spine, establish vascular access, and provide maintenance IV fluids
 - provide 100% oxygen by simple mask and perform a head-to-toe survey to identify the extent of all injuries; begin an epinephrine infusion and titrate to maintain a systolic blood pressure of at least 76 mm Hg
 - establish immediate vascular access, administer 20 mL/kg of isotonic crystalloid, and reassess the patient; if the child's systemic perfusion does not improve, administer 10 to 20 mL/kg of packed red blood cells
 - open the airway (jaw thrust technique) while immobilizing the cervical spine, administer positive-pressure ventilation, and attempt immediate tracheal intubation
28. **You are caring for a 7-year-old boy. The child was a pedestrian struck by a car. He is breathing spontaneously with oxygen supplementation, and he has good central pulses. He has an open mid-shaft fracture of the right femur; his right thigh is swollen and bleeding heavily. The child arrives in your medical facility with adequate ventilation and perfusion, and his spine is immobilized. Which of the following are the best initial steps for you to take to treat this child's leg injury?**
- apply direct pressure to the wound and continue to evaluate and support systemic perfusion, including perfusion of the leg
 - call the orthopedic surgeon and do not touch the leg
 - attempt to align the fracture and apply a tourniquet above the wound
 - attempt to control bleeding with hemostatic clamps, apply a tourniquet, and then attempt to align the fracture

29. Which of the following statements about pediatric injury in the United States is *true*?
- motor vehicle–related trauma accounts for less than 10% of all pediatric injuries resulting in death
 - injuries are the leading cause of death in children older than 6 months
 - bicycle helmets will not reduce the severity of most bicycle-related head injuries
 - most fire-related deaths occur in schools
30. You are alone when you see your neighbors' 13-year-old daughter floating face-down in their swimming pool. She is unresponsive, limp, and cyanotic when you pull her from the water. You did not witness her entry into the water. Which of the following best summarizes the *first* steps you should take to maximize this adolescent's chances of survival?
- shout for help, open her airway with a jaw thrust while keeping her cervical spine immobilized, check breathing, and provide 2 rescue breaths if she is not breathing adequately
 - carefully lay her on the ground, leave her to phone 911, and then return, open her airway, and continue the steps of CPR
 - immediately begin cycles of 5 chest compressions and 1 ventilation
 - shout for help and if no one arrives, open her airway with a head tilt–chin lift, check breathing, and provide 2 rescue breaths if she is not breathing adequately
31. You find a 7-year-old boy unresponsive in his bed. You open his airway and check breathing and find that he is not breathing at all. You deliver 2 effective rescue breaths. You now want to check for signs of circulation. Which of the following assessments should you perform to determine if signs of circulation are present in this child?
- attempt to feel a carotid pulse and check for adequate breathing, coughing, or movement in response to the 2 rescue breaths
 - palpate a radial pulse and check the child's blood pressure during both inspiration and exhalation
 - look at the child's color and recheck responsiveness
 - look to see if the child resumes normal breathing
32. You have just assisted with the elective tracheal intubation of a child with respiratory failure and a perfusing rhythm. You perform a clinical assessment during assisted manual ventilation to verify proper tracheal tube position, and you want to confirm tube position with a secondary technique. Which of the following would provide the *most reliable*, prompt *secondary* confirmation of correct tracheal tube placement in this child?

- a. some color improvement, some chest rise, and an oxygen saturation (per pulse oximetry) above 70%
 - b. auscultation of breath sounds over the peripheral areas of both lung fields and presence of inspiratory sounds over the abdomen during assisted manual ventilation
 - c. presence of mist in the tracheal tube
 - d. presence of exhaled CO₂ in a colorimetric detector after delivery of 6 positive-pressure breaths
- 33. You are assisting at a statewide track and field event in a professional sports facility. You witness a young teenage girl collapse while running. She is unresponsive when you arrive at her side. Other bystanders have called for EMS support and are performing well-coordinated CPR. They report that the teen has no known health problems, but she is now apneic and pulseless. Which of the following actions would most likely improve this teen's chance of survival?**
- a. take over mouth-to-mouth resuscitation
 - b. attach and operate an AED as soon as one is retrieved
 - c. provide crowd control
 - d. get a blanket to keep the patient warm