33. You are assisting at a statewide track and field event, in a sports facility, when 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 and is now apneic and pulseless. Which of the following therapies could you add to this teen’s resuscitation that would be most likely to improve her survival?

a. you should take over mouth-to-mouth resuscitation  

b. you should attach and operate an AED as soon as one can be retrieved  
c. you should provide crowd control  
d. you should get a blanket to keep the patient warm

**The correct answer is b.**

Although primary cardiac events are an uncommon cause of cardiopulmonary arrest in children, they do occur and are more common in adolescents than in school-age children. This scenario describes an adolescent with an apparent primary cardiac event during strenuous exertion. With sudden cardiac arrest, the most likely rhythm is ventricular fibrillation or pulseless ventricular tachycardia.

Answer a is incorrect because if "well-coordinated" CPR is being performed, you should not interfere.

Answer b is incorrect because although crowd control is helpful, it will not contribute to this young girl’s survival.

Answer d is incorrect because the therapies that will have the greatest impact on this girl’s survival will be prompt bystander CPR and early defibrillation.
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 provides 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 lateral chest bilaterally 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 after delivery of 6 positive-pressure breaths

The correct answer is d.

The presence of exhaled CO₂ after delivery of positive-pressure ventilations confirms correct tracheal tube placement when a colorimetric CO₂ detector is used in patients with a perfusing rhythm who weigh more than 2 kg.

Answer a is incorrect because color improvement and chest rise are part of the primary evaluation of tracheal tube placement. In addition, some color improvement and chest rise may occur despite pharyngeal or esophageal placement of the tube. An oxygen saturation above 70% does not confirm correct tracheal tube placement. Secondary confirmation of tracheal tube placement is strongly recommended in the PALS guidelines because primary confirmation alone can be unreliable.

Answer b is incorrect because inspiratory sounds heard over the abdomen generally suggest esophageal tube placement. In small infants, however, breath sounds may be transferred from the chest and heard over the abdomen.

Answer c is incorrect because mist may be present in the tube despite placement in the pharynx or esophagus instead of the trachea.
31. You find an 7-year-old boy is unresponsive in his bed. You open his airway and check breathing and find that 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 choices best describes the assessment you should perform to determine if signs of circulation are present in this child?

a. attempt to feel a carotid pulse and check for adequate breathing, coughing or movement in response to the 2 rescue breaths
b. palpate a radial pulse and check the child's blood pressure during both inspiration and exhalation
c. look at the child's color and recheck responsiveness
d. look to see if the child resumes normal breathing

The correct answer is a.

Healthcare providers should check for signs of circulation, including a pulse. other signs of circulation include breathing, coughing or movement in response to the two rescue breaths.

Answer b is incorrect because the rescuer must immediately determine the need for chest compressions. The assessment of signs of circulation does not rely on any equipment and can be accomplished in seconds. The Assessment of blood pressure requires equipment and is part of a more detailed rapid cardiopulmonary assessment.

Answer c is incorrect because the child's color and responsiveness are not reliably linked to signs of circulation and the need for chest compressions. The child's color may be bad before cardiopulmonary arrest occurs. If the child does respond, chest compressions are not needed, but unresponsiveness does not always mean that chest compressions are required.

Answer d is incorrect because the child may not be breathing normally but may have other signs of circulation, such as coughing or movement, that would indicate that chest compressions are not needed.
30. You are a lone rescuer when you see your neighbor’s 13-year-old adolescent floating face-down in her home 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 perform to maximize this adolescent’s chances of survival?

a. shout for help, open her airway with a jaw thrust while keeping her cervical spine immobilized, check breathing and if she is not breathing adequately provide 2 rescue breaths

b. carefully lay her on the ground and leave her to phone 911, then return and open her airway and continue the steps of CPR

c. immediately begin cycles of 5 chest compressions and 1 ventilation

d. shout for help and if no one arrives, open her airway with a head tilt–chin lift maneuver, check breathing and if she is not breathing adequately provide 2 rescue breaths

The correct answer is a.

This child is 13 years old. Although she falls within the age category for the “adult” sequence of BLS actions, and “adult” providers may be tempted to “call first” before beginning the steps of CPR, for victims of all ages, submersion is a special resuscitation situation. All submersion victims need immediate rescue breathing if they are not breathing when they are recovered from the water. Whenever you rescue a submersion victim and the submersion was not witnessed, you should presume that head and neck injury (eg, a diving injury) may be present and You must immobilize the cervical spine and open the airway using a jaw thrust technique.

Answer b is incorrect because you should immediately check breathing and provide rescue breathing if the victim is not breathing adequately. You should not utilize the typical “adult” sequence of resuscitation for submersion victims.

Answer c is incorrect for two reasons. First, you should not begin chest compressions unless there are no signs of circulation after you have delivered two rescue breaths. Second, a 5:1 compressiontoventilation ratio is appropriate for children 1-8 years of age, but a 15:2 ratio should be used for children 8 years of age and older and for adults.

Answer d is incorrect because you should not use a head tilt–chin lift to open the airway. The victim may have a head or neck injury. You should treat all submersion victims as though they have a head or neck injury unless you witnessed the submersion.
29. Which of the following statements about pediatric injury in the United States is true?

a. motor vehicle–related trauma accounts for less than 10% of all pediatric injuries resulting in death
b. injuries are the leading cause of death in children older than 6 months
c. bicycle helmets will not reduce the severity of most bicycle-related head injuries
d. most fire-related deaths occur in schools

The correct answer is b.

In the United States trauma remains the leading cause of death and disability in children, and it is responsible for more deaths than all childhood diseases combined. In the developing world, pneumonia, diarrhea, and infectious disease are leading causes of childhood death.

Answer a is incorrect because motor vehicle–related trauma accounts for nearly half of all pediatric injuries resulting in death.

Answer c is incorrect because proper use of bicycle helmets can reduce the severity of bicycle-related head and brain injuries by about 85%.

Answer d is incorrect because most fire-related deaths occur in the home (private residences), especially those without working smoke detectors.
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 spine immobilization. Which of the following are the best initial steps for you to take to treat the child’s leg injury?

a. apply direct pressure to the wound and continue to evaluate and support systemic perfusion, including perfusion of the leg
b. call the orthopedic surgeon and do not touch the leg
c. attempt to align the fracture and apply a tourniquet above the wound
d. attempt to control bleeding with hemostatic clamps, apply a tourniquet, and then attempt to align the fracture

The correct answer is a.

Initial support of systemic perfusion requires control of external hemorrhage and then ongoing assessment and support of cardiovascular function and systemic perfusion. Direct pressure is the best initial method to stop external bleeding. Use thin sterile gauze dressings and wear gloves. Bulky dressings are not recommended because they may absorb large amounts of blood and dissipate the pressure applied to the wound. Continued evaluation includes assessment of the severity of bleeding and evaluation of distal leg pulses.

Answer b is incorrect because you must control the external hemorrhage immediately. Do not wait for a consultant to treat life-threatening emergencies. Control of the hemorrhage can often be accomplished with the simple application of direct pressure.

Answer c is incorrect because control of external hemorrhage and assessment and support of cardiovascular function are the priorities. Although an open long-bone fracture should be immobilized in an anatomic position, alignment is not the initial priority. Tourniquets should not be used except in cases of traumatic amputation associated with uncontrolled bleeding from a major vessel. You may need to reposition the leg if distal pulses are lost.

Answer d is incorrect because direct pressure to control the hemorrhage should be attempted first. Blind application of hemostatic clamps is not recommended.
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. Which of the following most accurately summarizes the first actions you should take to support this child?

a. provide 100% oxygen by simple mask, immobilize the cervical spine, establish vascular access, and provide maintenance IV fluids
b. 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
c. 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
d. open the airway (jaw thrust technique) while immobilizing the cervical spine, administer positive-pressure, and attempt immediate tracheal intubation

The correct answer is d.

Children with multiple system trauma often present with shock and head injury. The first steps in their care include opening and clearing the airway while maintaining cervical spine immobilization. Assess respiratory rate and effort, and initiate positive-pressure ventilation. Then assess the adequacy of oxygenation, ventilation, and circulation and treat life-threatening injuries. You will need to rapidly establish vascular access to administer a 20 mL/kg bolus of isotonic crystalloid because the child has signs of decompensated shock (ie, systolic blood pressure <70 mm Hg + [2 × age in years]). After fluid administration, you should reassess the ABCs and systemic perfusion.

Answer a is incorrect because the victim’s ventilation is inadequate (respiratory rate <6 breaths/min), requiring assisted ventilation. Although the role of fluid resuscitation in pediatric trauma victims continues to be debated, support of airway and breathing with cervical spine immobilization takes priority over establishment of vascular access. In addition, maintenance fluids are insufficient for resuscitation of a child with decompensated hypovolemic shock.

Answer b is incorrect because airway and breathing should be supported in the initial assessment before the head-to-toe survey is performed. Epinephrine infusion is not indicated until after adequate volume resuscitation is provided.

Answer c is incorrect because vascular access and volume resuscitation (with crystalloid and with blood products) are not the initial priorities. Although those actions will eventually be required, you must first open the airway and provide assisted ventilation with 100% oxygen while keeping the cervical spine immobilized.
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. a helicopter team with no pediatric experience that is 20 minutes away
b. the local EMS service with a Basic EMT
c. a pediatric critical care transport team from the receiving tertiary care center that is 30 minutes away
d. the local basic EMS service with a pediatric nurse along to help

The correct answer is c.

Triage and transport decisions must be based on local EMS and transport conditions and on communication between the medical control teams from the referring and receiving institutions. Because the specifics of the given EMS/transport locale are unknown in this case, the best answer is the pediatric critical care transport team from the receiving tertiary care center. Pediatric critical care transport teams provide optimal transport for critically ill children, and they should generally be used to transport the most critically ill children. This preference is true even if the pediatric critical care team takes somewhat longer to arrive or to stabilize the patient than a less-skilled team.

Answer a is incorrect because a team with pediatric critical care expertise is preferable to a helicopter team without pediatric experience, particularly since the pediatric team can theoretically arrive within a few minutes of the helicopter team.

Answer b is incorrect because local EMS teams often do not have the training, experience, or equipment for long-distance transport of a critically ill child. Basic EMTs cannot re-intubate the patient if the tracheal tube becomes displaced.

Answer d is incorrect because local basic EMS service personnel will likely have limited experience in prehospital management of critically ill children, and the pediatric nurse may find it difficult to provide ongoing care in a moving vehicle with limited equipment and unfamiliar surroundings. The personnel accompanying critically ill children during transport should be skilled in the interventions that potentially will be needed during transport (eg, establishment of vascular access, tracheal intubation, and relief of pneumothorax).
25. You are participating in the attempted resuscitation of a 3-year-old child in pulseless ventricular tachycardia. You have attempted defibrillation 3 times without converting the VT to a perfusing rhythm. The airway is secure and ventilation is effective. Attempts at IV access have been unsuccessful but IO access has been attained. You have not been able to identify any reversible cause of the VT. After administering IO epinephrine, circulating it for 30 to 60 seconds, and unsuccessful defibrillation, what is the next therapy that will be most appropriate if the child remains in VT?

- a. tracheal epinephrine 0.1 mg/kg (1:1000, 0.1 mL/kg)
- b. adenosine 0.1 mg/kg IV push
- c. IO epinephrine 0.1 mg/kg (1:1000, 0.1 mL/kg)
- d. lidocaine 1 mg/kg IO or amiodarone 5 mg/kg IO

The correct answer is d.

Lidocaine and amiodarone are listed in the Pediatric Pulseless Arrest Algorithm under the pulseless ventricular tachycardia/ventricular fibrillation branch (left side). If 3 shocks, epinephrine, and a fourth shock are unsuccessful, lidocaine or amiodarone may be administered. These drugs may successfully treat the ventricular tachycardia because they decrease automaticity and may suppress ventricular ectopy.

Answer a is incorrect because it is too soon for the next epinephrine dose. In addition, the vascular or intraosseous route is preferred for resuscitative medications, and intraosseous access is available in this patient. Each drug should be followed by 30 to 60 seconds of CPR and additional attempts at defibrillation.

Answer b is incorrect because adenosine is recommended for supraventricular tachycardia with pulses, not for pulseless ventricular tachycardia.

Answer c is incorrect because it is too soon for the next dose of epinephrine. In addition, the standard intravascular dose of epinephrine is 0.01 mg/kg or 0.1 mL/kg of 1:10 000 solution (not 0.1 mL/kg of 1:1000 solution). The standard dose should be given unless special resuscitation circumstances exist.

{{[FGS/MFH: Is “/kg” needed in the second-to-last sentence of the answer d response, (ie, 0.01 mg/kg and 0.1 mL/kg--yes from mfh)??]}}

NOTE THAT I MODIFIED THE apparent "command" that you "need" to administer either amiodarone or lidocaine--either MAY be administered.
24. You are preparing to provide 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

**The correct answer is b.**

A starting dose of 0.5 to 1 J/kg is recommended for cardioversion. If the patient remains in a rhythm requiring cardioversion, the energy dose should be doubled to 1 to 2 J/kg.

Answer a is incorrect because a dose of 0.05 to 0.1 J/kg is too low for routine cardioversion. If a child is known to be receiving a drug such as digitalis, a low initial cardioversion dose may be used. But digitalis therapy is a special resuscitation circumstance, and the initial dose would still be higher than 0.05 to 0.1 J/kg.

Answer c is incorrect because an initial dose of 2 to 4 J/kg is too high for routine cardioversion. If ventricular fibrillation occurs, defibrillation with an initial dose of 2 J/kg is recommended with subsequent doses of 4 J/kg.

Answer d is incorrect because 6 to 10 J/kg is much higher than the dose recommended for attempted cardioversion in a child.
23. A pulseless 11-month-old infant arrives in the Emergency Department in ventricular fibrillation with CPR in progress. You ensure that bag-mask ventilation with 100% oxygen is producing effective chest expansion and breath sounds bilaterally, establish an IV with a large catheter, attempt defibrillation 3 times and administer a first dose of epinephrine. The child remains in ventricular fibrillation after 30-60 seconds of CPR. Which of the following should be performed next?

a. provide lidocaine 1 mg/kg IV or amiodarone 5mg/kg bolus IV  
b. attempt defibrillation at 4 J/kg  
c. provide 2nd dose of epinephrine IV 0.1 mg/kg (1:1000, 0.1 mL/kg)  
d. consider adenosine at 0.1 - 0.2 mg/kg

The correct answer is b.

The recommended sequence for refractory ventricular fibrillation is CPR-drug-shock (or CPR-drug-shock-shock-shock). Defibrillation should be attempted within 30 to 60 seconds after each dose of medication. If ventricular fibrillation continues after a fourth shock, consider antiarrhythmics while continuing to provide epinephrine every 3 to 5 minutes. This information is included in the Pediatric Pulseless Arrest Algorithm.

Answer a is incorrect because neither lidocaine nor amiodarone is recommended until 3 shocks, a dose of epinephrine, and a fourth shock have been provided.

Answer c is incorrect because 30 to 60 seconds is too soon for the next dose of epinephrine. Subsequent doses of epinephrine should be administered every 3 to 5 minutes. In addition, the epinephrine dose listed in this answer option is a "high dose," and there is no special circumstance that would indicate the need for a high dose. The standard dose of epinephrine is 0.1 mL/kg of 1:10 000 solution (ie, 0.01 mg/kg). This dose is recommended unless there are special resuscitation circumstances such as sepsis or anaphylaxis.

Answer d is incorrect because adenosine is not recommended for the treatment of VF. It is the drug of choice for treatment of supraventricular tachycardia.
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

The correct answer is d.

If vascular or intraosseous access is established or rapidly attainable, IV adenosine may be administered even if systemic perfusion is compromised. But in this infant vascular access was difficult to establish and the line is no longer functional. This infant is in shock and needs immediate synchronized cardioversion.

Answer a is incorrect because there is no immediate indication for tracheal intubation. Ventilation and oxygenation are adequate, and the shock appears to be due to SVT. The treatment for SVT is synchronized cardioversion. If hypoventilation is present, provide bag-mask ventilation with supplementary oxygen.

Answers b and c are incorrect because further delay of cardioversion to reattempt vascular access cannot be justified in an infant with poor perfusion. In addition, a fluid bolus is not the best choice in this situation because the infant's poor systemic perfusion is most likely due to the tachycardia itself. Delay of cardioversion to give a fluid bolus is inappropriate.
21. An 11-year-old skateboarder suffered multiple system trauma without 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

The correct answer is b.

Orotracheal intubation with cervical spine immobilization is the preferred intubation approach during resuscitation of injured children.

Answer a is incorrect because the anterior location of vocal cords and prominent adenoid tissue in children make nasotracheal intubation potentially problematic for resuscitation. Insertion of nasotracheal and nasogastric tubes is particularly dangerous if a child has midface fractures because the tube may be inadvertently directed through the cribiform plate and into the brain. "Blind" nasotracheal intubation is difficult to perform, and it is not recommended for patients with apnea.

Answer c is incorrect because there are no indications for cricothyrotomy. Indications for cricothyrotomy include severe upper airway obstruction with an inability to insert a tracheal tube, unstable cervical spine injury, or severe midface trauma preventing orotracheal access to the lower airway.

Answer d is incorrect because nasogastric tubes are not designed for ventilation of the trachea. Once the child's trachea is appropriately intubated and the lungs are ventilated, gastric decompression may be appropriate to relieve abdominal distention. Cervical spine immobilization is required throughout the intubation procedures.
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, 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

**The correct answer is a.**

The child's movement has most likely displaced the tracheal tube into the right main bronchus. The child's symptoms of cyanosis, bradycardia, and decreased breath sounds on the left are most consistent with tracheal tube displacement. The "DOPE" mnemonic (Displacement of the tube from the trachea, Obstruction of the tube, Pneumothorax, and Equipment failure) is a convenient tool to recall the causes of sudden decompensation in patients who are tracheally intubated and mechanically ventilated.

Answer b is incorrect because tracheal tube obstruction would likely cause a bilateral decrease in breath sounds that would not improve with manual ventilation. In addition, the suction catheter passes easily beyond the tip of the tube, suggesting a lack of obstruction.

Answer c is incorrect because both the child's color and heart rate improve marginally and do not deteriorate during manual assisted ventilation. In addition, breath sounds, although diminished on the left, are present on both sides. (Note, however, that diminished breath sounds on one side could indicate tension pneumothorax.) Also, neither midline shift nor neck vein distension is present, but these are late and uncommon signs of tension pneumothorax in children. Nonetheless these signs together make tube displacement much more likely than tension pneumothorax.

Answer d is incorrect because if equipment failure were the problem, the child would likely improve once he was removed from the mechanical ventilatory circuit and manual ventilation was provided.
19. Which of the following is the most reliable equipment for delivering 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

The correct answer is c.

With an oxygen flow of 10 to 12 L/min and a good seal between the patient’s face and mask, a non-rebreathing face mask can provide an inspired oxygen concentration of 95%.

Answer a is incorrect because a nasal cannula cannot reliably provide a stable high concentration of inspired oxygen. The inspired oxygen concentration provided by a nasal cannula will vary on the basis of the child’s respiratory rate, respiratory effort, and size. Although a nasal cannula will deliver higher inspired oxygen concentrations to infants than to older children, an oxygen concentration greater than 90% will not be achieved.

Answer b is incorrect because a simple oxygen mask is a low-flow device. A simple oxygen mask delivers only 35% to 60% oxygen with a flow rate of 6 to 10 L/min.

Answer d is incorrect because a partial rebreathing mask with a reservoir bag reliably delivers an inspired oxygen concentration of only 50% to 60%.
18. An infant arrives by ambulance with a history of vomiting and diarrhea. The infant is responsive only to pain. The upper airway is patent, the respiratory rate is 40/minute 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. Her Blood pressure is 85/65 mm Hg, and glucose concentration by bedside test is 100 mg/dL. Which of the following would be the most appropriate treatment for you to provide for this infant?

a. achieve IV/IO access and administer 20 mL/kg of 5% dextrose and 0.45% sodium chloride over 5 minutes
b. achieve IV/IO access and administer 20 mL/kg of lactated Ringer’s over 60 minutes
c. perform tracheal intubation and administer 0.1 mg/kg (0.1 mL/kg of 1:1,000 solution) of epinephrine by tracheal route
d. administer 20 mL/kg of isotonic crystalloid over 10-20 minutes

The correct answer is d.

This infant is in shock, with poor perfusion (cool extremities, weak pulses and prolonged capillary refill) with a history that suggests that hypovolemic shock is present. Immediate volume resuscitation is needed.

Answer a is incorrect because you should not routinely utilize glucose solutions during resuscitation (unless there is documented hypoglycemia).

Answer b is incorrect because fluid resuscitation should be accomplished with rapid fluid administration (administration of 20 mL/kg boluses over 20 minutes or less). Administration of the fluids over 60 minutes is not sufficiently rapid to restore intravascular volume and improve systemic perfusion.

Answer c is incorrect for several reasons. First, this infant's airway and breathing appear to be adequate at this time. The first priority for resuscitation should be support of the circulation with volume administration. Volume administration should not be delayed to perform tracheal intubation. Second, there is no indication for epinephrine administration. This infant requires volume administration and that should be accomplished without delay.
17. A pale and obtunded 3-year-old child is brought to the hospital with a history of diarrhea. Respirations are 45/minute with no distress and good breath sounds bilaterally. The Heart rate is 150/minute, and the BP is 88/64 mm Hg. Capillary refill 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 would be the most appropriate immediate treatment for this child?

a. obtain a chest x-ray  
b. administer maintenance crystalloid infusion  
c. administer a bolus of 20 mL/kg of IV or intraosseous isotonic fluids  
d. administer dopamine infusion at approximately 2-5 mcg/kg/minute

The correct answer is c.

This child has signs of compensated shock, including prolonged capillary refill, weak peripheral pulses and tachycardia with a blood pressure that is adequate for age. The shock is probably caused by hypovolemia secondary to diarrhea, so administration of an isotonic crystalloid fluid bolus is needed.

Answer a is incorrect because a chest x-ray is not indicated during the initial stabilization of the child. The child's respiratory rate is 45/minute with clear breath sounds and no evidence of distress.

Answer b is incorrect because in order to correct hypovolemic shock, you must give fluid in bolus allotments (20 mL/kg). Maintenance fluids will be inadequate to correct the shock that is present.

Answer d is incorrect because fluid resuscitation is needed, and it may not be necessary to use Vasopressors like dopamine if fluid resuscitation is adequate.
16. An anxious but alert 7-year-old child presents with a heart rate of 260/minute with narrow QRS complexes and no variability in heart rate with activity. Respirations are 30/minute and unlabored. Extremities are warm, and capillary refill time is less than 2 seconds. He is awake and alert, and denies chest pain or shortness of breath. Which of the following would be the most appropriate initial treatment that you should provide for this child?

a. perform immediate synchronized cardioversion (0.5 to 1 J/kg)
b. establish vascular access and administer 20 mL/kg fluid bolus of 0.9% sodium chloride ((FG and JM--0.9% sodium chloride vs normal saline?})
c. attempt vagal maneuvers by asking the child to blow into an occluded straw, and establish vascular access to deliver adenosine if needed
d. begin immediate transcutaneous overdrive pacing

The correct answer is c.

The child is relatively stable with good perfusion, so urgent cardioversion is not indicated. Vagal maneuvers (such as blowing through an obstructed straw) may be attempted and you should achieve vascular access to provide a route of administration for adenosine.

Answer a is incorrect because immediate synchronized cardioversion is appropriate for children with tachycardia and poor perfusion.

Answer b is incorrect because there is no evidence that the child has hypovolemic shock. Capillary refill time is less than 2 seconds and extremities are warm. The child is awake and alert.

Answer d is incorrect because transcutaneous overdrive pacing may be considered if the child's perfusion is poor and urgent intervention is required. This child is not in acute distress.
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?

a. pulsatile blood flow will be present in the needle hub
b. fluids or drugs can be administered freely without local soft tissue swelling
c. resistance to insertion suddenly increases as the tip of the needle passes through the bony cortex into the marrow
d. once inserted, the needle shaft moves easily in all directions within the bone

The correct answer is b.

If fluids or drugs can be administered freely and no soft tissue swelling develops near the site, the needle must be correctly placed into the intraosseous space.

Answer a is incorrect because an IO needle is inserted into the bone marrow into a non-collapsible venous plexus. This venous plexus will not have pulsatile blood flow.

Answer c is incorrect because resistance decreases with correct insertion and does not increase as passage through the cortex and into the bone marrow.

Answer d is incorrect because the needle should not move easily after insertion if it is correctly placed--It should remain upright because the needle passes and is held by bone. It will be held firmly in an upright position by the rigid material comprising bone.
14. An 18-month-old child presents with a 1-week history of a cough and a runny nose. He is cyanotic and responsive only to painful stimulation. His heart rate is 160 per minute; 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 would be the most appropriate immediate treatment for this toddler?

a. establish vascular access and administer a 20 mL/kg isotonic fluid bolus
b. open the airway and provide positive-pressure ventilation using 100% oxygen and 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 and arterial gases, and establish vascular access

The correct answer is b.

This child demonstrates signs of overt respiratory failure with a decreased responsiveness, severe intercostal retractions, and a respiratory rate dropping acutely from 65 to 10 per minute. Immediate and aggressive support of ventilation is indicated.

Answer a is incorrect because the child has no signs of poor systemic perfusion (capillary refill time is 2 seconds). Although the child is tachycardic, the tachycardia is probably related to the respiratory distress, and the heart rate should normalize once the respiratory distress is treated. Establishment of vascular access does not address the airway problem.

Answers c and d are incorrect for two reasons. First, the child requires support of respiratory rate and not simply oxygenation. Second, oxygen delivered by face mask does not solve the problem of loss of respiratory effort.
13.  {{Julie--this is identical to #18 in Exam A}}A 2-year-old child presents with gradual onset of mild difficulty in breathing. She is alert, has a sore throat and is making coarse, high-pitched inspiratory sounds (mild stridor). Her oxyhemoglobin saturation is 92% in room air, and her lung sounds are clear with adequate breath sounds bilaterally. Which of the following is the most appropriate initial therapy for this child?

a. perform immediate endotracheal intubation  
b. obtain immediate radiologic evaluation of the soft tissues of the neck  
c. begin pulse oximetry to evaluate oxyhemoglobin saturation and obtain an arterial blood gas analysis to determine if hypercarbia is present  
d. administer humidified supplemental oxygen as tolerated and continue evaluation

The correct answer is d.

As described, this child is not in acute distress, and has no clinical evidence of respiratory failure. Therefore, provide humidified oxygen as tolerated and observe the child to determine if he improves, deteriorates or stays the same. It may be useful to establish monitoring of pulse oximetry, but it is not mandatory at this time.

Answer a is incorrect because this child does not meet criteria for intubation. If you determine that the child has upper airway obstruction and cannot maintain an airway, or if the child demonstrates signs of fatigue or respiratory failure, then tracheal intubation is indicated.

Answer b is incorrect because radiologic evaluation should wait until you have determined that this child will be stable with administered oxygen.

Answer c is incorrect because although it would be appropriate to institute monitoring of pulse oximetry, it is not necessary to perform an arterial puncture for arterial blood gas analysis at this point (the child was described as demonstrating only "mild difficulty breathing"). Such an invasive procedure would also be likely to worsen the child's respiratory distress.
12. An 8-year-old child has been 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. Respiration is 60/minute, his heart rate is 150/minute, and his systolic BP is 60 mm Hg. Breath sounds are absent 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 immediate endotracheal intubation and call for "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 an immediate fluid bolus of 20 mL/kg of normal saline
d. perform needle decompression of the right chest and assist ventilation with bag-mask if necessary

The correct answer is d.

This victim has a tension pneumothorax, indicated by the following signs: tachypnea with respiratory distress, absent breath sounds over the right chest, tracheal deviation to the left, and oxyhemoglobin saturation of 84%. There is evidence that this tension pneumothorax may be interfering with cardiovascular function, because he is tachycardic and hypotensive.

You must evacuate the pneumothorax immediately and be prepared to assist ventilation with a bag-mask if needed.

Answer a is incorrect because needle decompression of the pneumothorax, not intubation, is the treatment for the tension pneumothorax. This child's airway appears to be patent but the compromise in respiratory function is entirely explainable by the tension pneumothorax.

Answer b is incorrect because the diagnosis of a tension pneumothorax should be a clinical and not a radiographic process. The tension pneumothorax should be evacuated as soon as the clinical diagnosis is made--Delay to await the obtaining and reading of a chest radiograph will result in worsening hypoxemia and progressive deterioration in cardiorespiratory function. Obtaining a CXR will result in an unnecessary delay during which the hypoxia can worsen and progressive deterioration of cardiorespiratory function can develop.

Answer c is incorrect because the establishment of IV access is not as high a priority as stabilization of the respiratory function. The cardiovascular compromise is probably secondary to the tension pneumothorax. Although fluid administration may be required, you should evaluate the child's systemic perfusion after the tension pneumothorax is evacuated and you ensure that airway and breathing are adequate.
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 the 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

The correct answer is d.

The child definitely is in shock. Compensated shock is present because her blood pressure is adequate (ie, hypotension is not present) but signs of inadequate tissue and organ perfusion (eg, irritability, mottled color, cool extremities) are observed. To determine whether blood pressure is adequate in children aged 1 to 10 years, estimate the lower limit (fifth percentile) of adequate systolic blood pressure using the following formula: 70 mm Hg + (2 × age in years). A systolic blood pressure below the number yielded by this formula indicates hypotension. Using this formula, the lower limit of adequate systolic blood pressure for a 6-year-old child is 82 mm Hg. In this case the child’s SBP was 98 mm Hg, indicating adequate blood pressure and thus compensated shock.

Answers a and b are incorrect because decompensated shock is defined by the presence of hypotension. In this case decompensated shock would be present if the child’s systolic blood pressure fell below 82 mm Hg.

Answer c is incorrect because compensated shock should be treated promptly. Failure to treat compensated shock may result in deterioration to decompensated shock or cardiac arrest.
10. You are evaluating a 7-month-old infant 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

The correct answer is b.

The infant has signs and symptoms of SVT with a heart rate >220 bpm, narrow-complex QRS, and no variability in the rate. Because the infant is stable (alert with good pulses and normal capillary refill), vagal maneuvers may be considered. Administer IV adenosine if vagal maneuvers are unsuccessful.

Answer a is incorrect because even a stable child with SVT requires medical attention within a few hours. Consultation with a pediatric cardiologist is appropriate, but you should not delay medical treatment for a week.

Answer c is incorrect because immediate or urgent synchronized cardioversion is not indicated for the treatment of tachycardia with adequate perfusion. You should first attempt vagal maneuvers, establish IV access, administer adenosine, and consult a pediatric cardiologist.

Answer d is incorrect because these therapies will not treat the SVT. Heart rates greater than 220 bpm are unlikely to be sinus in origin, and therefore they are unlikely to be caused by sepsis or hypovolemia.
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 is cyanotic, unable to cough or talk, and is not moving air. Which of the following is the most appropriate initial therapy for you to provide?

a. give 5 back blows, then 5 chest thrusts  
b. attempt a blind finger sweep  
c. do not intervene unless the child becomes unresponsive; then perform abdominal thrusts  
d. give abdominal thrusts

The correct answer is d.

If you suspect complete foreign-body airway obstruction in a responsive child or adult, you should tell the victim you will help them and you should administer abdominal thrusts until the object is expelled or the victim becomes unresponsive. This child’s inability to cough, talk or move air and his dusky lips suggest complete foreign-body airway obstruction.

Answer a is incorrect because back blows and chest thrust are not recommended for relief of complete foreign-body airway obstruction in children. Back blows and chest thrusts are recommended for infants less than 1 year old.

Answer b is incorrect because blind finger sweeps should not be performed in infants and children and no finger sweeps should be performed in responsive choking victims. A blind finger sweep may push the foreign body back into the airway, causing further obstruction.

Answer c is incorrect because the child needs immediate help in relieving the foreign-body airway obstruction. You should not wait until the child becomes unresponsive—you should intervene immediately to help the child clear the foreign body.
8. A 9-month-old infant presents with a respiratory rate of 45/minute, and a heart rate of 250/minute with narrow (<0.08 sec) QRS complexes. The infant is receiving 100% oxygen by face mask and an IV catheter is in place. The infant’s blood pressure is 64/palpable with faint pulses and capillary refill is 5-6 seconds. The infant is responding only to pain and there is no history of vomiting or diarrhea. What is the most appropriate initial treatment for this infant?

a. immediate defibrillation
b. administration of a 20 mL/kg fluid bolus of 0.9% sodium chloride \{(FG/JM: 0.9% sodium chloride vs normal saline?)\} over 20 minutes or less
c. administration of adenosine 0.1 mg/kg using rapid bolus (two-syringe) administration technique
d. administration of verapamil

The correct answer is c.

The narrow-complex heart rate of 250 bpm suggests that the infant is in SVT; sinus tachycardia rarely produces a rate above 220 bpm in infants. Adenosine is the drug of choice for treatment of SVT because it blocks conduction through the AV node and interrupts SVT, enabling the return of normal sinus rhythm. Because the infant is unstable with hypotension and signs of poor perfusion, either synchronized cardioversion (0.5 to 1 J/kg initially) or immediate administration of adenosine by rapid push (using the 2-syringe technique) is an appropriate treatment. IV access is immediately available, so you should administer adenosine. If IV access or adenosine is not present or immediately available, synchronized cardioversion would be the treatment of choice.

Answer a is incorrect because defibrillation is performed in an unsynchronized manner, and unsynchronized shocks may convert the SVT to VF. Defibrillation also uses higher initial and subsequent energy "doses" (2 J/kg initially) than synchronized cardioversion.

Answer b is incorrect because volume resuscitation will not resolve the basic problem of SVT.

Answer d is incorrect because the routine use of verapamil, a calcium channel blocker, is not recommended for use in infants (<1 year of age). Refractory hypotension and cardiac arrest have been reported in association with verapamil administration in this age group.
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 would be the most appropriate size for an average 4-year-old?

a. 3-mm tube  
b. 4-mm tube  
c. 5-mm tube  
d. 6-mm tube

The correct answer is c.

To estimate uncuffed tracheal tube size from age for children 1-10 years of age, you can use either of two formulasthey that will yield the same answer:

\[
\text{mm internal diameter ET tube} = \frac{\text{Age (years)} + 16}{4}
\]

Both of these formulas yield an estimated mm tracheal tube size of 5 mm. In the first formula, \(\frac{4}{4} = 1\) and \(1+4 = 5\ \text{mm}\). In the second formula, \(4 + 16 = 20\) and \(20/4 = 5\ \text{mm}\).

Answer a is incorrect because a 3mm tube size is too small for a 4-year-old and would likely result in a large air leak around the tracheal tube. A 3mm tracheal tube would be appropriate for a newborn.

Answer b is incorrect because a 4mm tube is too small for an average 4-year-old child. A 4mm tube is the appropriate size for an infant approximately 6-12 months of age.

Answer d is incorrect because a 6mm tube is much too large for an average 4-year-old child. A 6mm tube is the appropriate size for a child approximately 8 years of age.
6. Which of the following statements about the effects of epinephrine during attempted resuscitation is true?

a. epinephrine decreases peripheral vascular resistance and reduce myocardial afterload so that ventricular contractions are more effective
b. epinephrine can improve coronary artery perfusion pressure and can stimulate spontaneous contraction when asystole is present
c. epinephrine is not useful in ventricular fibrillation because it will increase myocardial irritability
d. epinephrine decreases myocardial oxygen consumption

The correct answer is b.

Epinephrine improves coronary artery perfusion pressure and myocardial oxygen delivery during CPR by increasing peripheral vascular resistance and aortic diastolic pressure. Epinephrine may also stimulate spontaneous cardiac contractions, so it may restore cardiac activity when asystole is present.

Answer a is incorrect because epinephrine increases peripheral vascular resistance, ventricular afterload, and oxygen demand.

Answer c is incorrect because epinephrine is useful in the treatment of ventricular fibrillation. It can increase the coarseness of ventricular fibrillation, enhancing the potential for termination of ventricular fibrillation by attempted defibrillation.

Answer d is incorrect because epinephrine increases myocardial oxygen consumption. Although epinephrine-induced elevation of coronary artery perfusion pressure during chest compressions enhances delivery of oxygen to the heart, oxygen consumption is increased, not decreased.
5. A 7-year-old boy is found unresponsive, apneic and pulseless. CPR is provided and endotracheal 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 one minute. Which of the following therapies should be performed next?

a. attempt to identify and treat reversible causes (use the 4 H’s and 4 T’s as a memory aid)
b. attempt defibrillation at 4 J/kg
c. administer escalating doses of epinephrine
d. administer synchronized cardioversion

**The correct answer is a.**

Whenever the child does not respond to support of airway, oxygenation and ventilation plus one dose of IV epinephrine, you should attempt to identify and treat potentially reversible causes of the cardiopulmonary arrest, especially when PEA is present. These potentially reversible conditions can be recalled by the use of 4 H’s (hypoxemia, hypovolemia, hypo- or hyperthermia, and hypo- and hyperkalemia and other metabolic disorders) and the 4 T’s (tamponade, tension pneumothorax, toxins/poisons/drugs or thromboembolism).

Answer b is incorrect because defibrillation is not recommended for treatment of PEA. However, epinephrine is the treatment of choice for ventricular fibrillation/pulseless ventricular tachycardia.

Answer c is incorrect because escalating doses of epinephrine are not recommended for the treatment of pulseless arrest of any cause. Highdose epinephrine may be considered for special resuscitation situations, such as sepsis or anaphylaxis.

Answer d is incorrect because synchronized cardioversion not the treatment choice for PEA, but it is used to treat symptomatic tachycardias.
4. You are preparing to use a manual external defibrillator and external paddles in the pediatric setting. When would it be most appropriate to utilize the smaller "pediatric" sized paddles for delivery of direct-current energy?

a. the smaller paddles should be used for provide synchronized cardioversion but not for defibrillation
b. the smaller paddles should be used when the patient weighs less than approximately 25 kg or is under than 8 years of age
c. the smaller paddles should be used when the patient weighs less than approximately 10 kg or is under 1 year of age
d. the smaller paddles should be used whenever you can compress the victim's chest using only the heel of one hand

The correct answer is c.

The guidelines for defibrillation and cardioversion in infants and children recommend the use of the external "pediatric" paddles only for infants under approximately 1 year of age and weighing less than 10 kg. If defibrillation or cardioversion is required for larger infants or children, the "adult" paddles should be used. The larger paddles reduce impedance and increase current flow. The paddle size is selected to provide the largest surface area of paddle or electrode contact with the chest wall without contact between the paddles or electrodes.

Answer a is incorrect because you should use the same paddle size for both defibrillation and cardioversion. There is no justification for using a smaller paddle size for cardioversion.

Answer b is incorrect because use of the small paddles for children beyond 1 year of age or over 10 kg in weight will result in delivery of less current to the heart. In order to decrease chest impedance and increase current delivery to the heart the paddles used should be the largest that can be in complete contact with the chest wall without touching.

Answer d is incorrect because you compress the chest with the heel of one hand for children approximately 1 to 8 years of age. The infant paddles would be too small for use in this age group.
3. During the attempted resuscitation of the infant or child with severe symptomatic bradycardia and no evidence of vagal etiology, that persists despite establishment of an effective airway, oxygenation and ventilation, Which is the first drug you should administer?

a. atropine  
b. dopamine  
c. adenosine  
d. epinephrine

The correct answer is d.

Epinephrine is the first drug recommended for the treatment of severe symptomatic bradycardia unresponsive to establishment of airway, oxygenation and ventilation.

Answer a is incorrect because atropine should be administered after epinephrine unless you suspect that the bradycardia is vagally induced.

Answer b is incorrect because dopamine is not included in the treatment algorithm for severe symptomatic bradycardia. Dopamine provides only indirect release of catecholamines that can stimulate the heart rate. Epinephrine, a catecholamine with direct effects, should be administered for severe symptomatic bradycardia unresponsive to establishment and support of airway, oxygenation and ventilation.

Answer c is incorrect because adenosine blocks AV conduction and is used to treat supraventricular tachycardia. It is not recommended for the treatment of severe symptomatic bradycardia.
2. A 3-year-old child is brought to the Emergency Department unresponsive and apneic. The EMTs transporting the child indicate that 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 places the patient on the ECG monitor and reports that ventricular fibrillation is present. Which of the following therapies would be most appropriate for you to provide at this time for this child?

a. establish IV/intraosseous access and administer amiodarone 5 mg/kg IV
b. establish IV/intraosseous access and administer lidocaine 1 mg/kg IV
**c. attempt defibrillation at 2 J/kg**
d. establish IV/intraosseous access and administer epinephrine 0.01 mg/kg IV

**The correct answer is c.**

The first therapy you should provide for ventricular fibrillation or pulseless ventricular tachycardia is an immediate attempt at defibrillation, and the first "dose" for infants and children is 2 J/kg. If that dose is ineffective, you should attempt defibrillation with a dose of 4 J/kg.

Answer a and b are incorrect because although establishment of IV/intraosseous access should be accomplished quickly, it should not delay the defibrillation attempt. You can wait to establish vascular access until after the delivery of the first three shocks, if needed. Amiodarone or lidocaine administration is not recommended unless or until the VF/pulseless VT persists despite 3 shocks, a dose of epinephrine and a fourth shock.

Answer d is incorrect because although establishment of IV/intraosseous access should be accomplished quickly, it should not delay the defibrillation attempt. You can wait to establish vascular access until after the delivery of the first three shocks if needed. Epinephrine should be given if VF/pulseless VT persists after 3 shocks.
1. Which of the following statements is true regarding poisoning and overdose in the pediatric population?

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 15-24 year-old age group

Answer a is incorrect for several reasons. First and most important, vomiting should not be induced unless recommended by a local poison control center. No human clinical trials have shown that induction of vomiting changes outcome. In addition, vomiting introduces the risk of aspiration, and should not be induced in patients with limited airway protective reflexes, or following ingestion of caustic material or hydrocarbons, or after ingestion of drugs that may rapidly depress mental status (such as tricyclic antidepressants).

Answer c is incorrect because although poisoning and ingestion do not cause a large number of deaths in younger children, they are responsible for a large number of ED visits and hospitalizations.

Answer d is incorrect because the first priority of management for the child with poisoning or a drug overdose is to support airway, breathing and circulation. Administration of an antidote may not be necessary, or there may be no known antidote to the poison. If an antidote is needed, it should be administered only after you have assessed and supported airway, breathing and circulation.

The correct answer is b.