Caring for a sick child

in a nonpediatric setting

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If adults are your specialty, a child in crisis can be an especially challenging assignment. Rely on these triage and care guidelines to see you through.

BY DAVID S. SALATI, RN, CCRN, CEN, NREMTP, BSN

CE
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TWO CHILDREN arrive at triage in your community hospital's emergency department (ED). One is a 2-year-old who's had a seizure. His pediatrician had diagnosed otitis media earlier in the day, prescribed antibiotics and antipyretics, and sent him home. Later, his fever spiked to 101.9° F (38.8° C) and he had a brief seizure.

Responding to his mother's 911 call, the paramedics administered blow-by oxygen, inserted an intermittent vascular access device, and brought the child to the ED. Now alert with a pink complexion, he's in no apparent respiratory distress; in fact, he's crying loudly for his mother.

Your other patient is a listless 4-year-old carried into the ED by her parents. They report that she's been vomiting and had diarrhea for several days. Today she refused to drink anything and hasn't urinated since early morning. (It's now midafternoon.) The child is pale, but she seems calm and in no acute distress.

Which patient should take priority?

If you're new to nursing or typically care for adults only, the decision may not be clear-cut. Even experienced pediatric nurses often find the emergency care of children challenging. In this article, I'll explain how to sort out priorities and avoid common pitfalls when you care for children in a nonpediatric setting. Let's start with a few general principles that guide pediatric nursing care.

Good news, bad news

The good news about kids is that they're typically healthy and resilient. Although some children have conditions such as asthma or diabetes, most are free from common health problems that can complicate the care of adults, such as coronary artery disease.

Credit their resilience to excellent physiologic compensatory mechanisms. A child's body can maintain central organ perfusion and "normal" blood pressure despite fluid depletion as high as 35%.

The bad news is that despite these advantages, a child can decompensate extremely fast. When his body can no longer maintain central organ perfusion, deterioration can be rapid and catastrophic. Any serious preexisting health problems, such as a congenital heart defect, complicate the picture.

Not just small adults

At one time, clinicians thought of children as small adults needing

comparable care, just downsized and delivered with smaller equipment. For example, they assumed that a child would need roughly the same amount of drug per kilogram as an adult and cut the dose accordingly.

Today, however, we recognize that a child's physiology differs from an adult's in many ways apart from height and weight and that clinical interventions must be tailored with these factors in mind. Remember these key physiologic differences when you assess and treat a child.

Pulmonary. Not only does a child have less pulmonary reserve than an adult, but he also has a proportionally higher oxygen requirement. A fast, accurate pulmonary assessment is critical, and intervention must be more aggressive than in adults. Don't simply address existing problems; take actions to maintain and support respiration to prevent respiratory failure that can quickly lead to cardiovascular collapse and death.

Cardiovascular. A child can maintain central organ perfusion in the face of staggering fluid loss because powerful peripheral vasoconstriction shunts blood from the limbs to the central circulation. This causes the cool, mottled extremities and decreased peripheral pulses characteristic of shock in children.

But compared with an adult, a young child has less ability to boost cardiac output by increasing cardiac contractility; he relies on increased heart rate to maintain cardiac output. So in a crisis, maintaining a child's heart rate is a priority.

Metabolic. A child has a higher metabolic rate than an adult, which explains his increased oxygen demand. In addition, a young child's renal and hepatic systems are immature, which affects his ability to metabolize and clear drugs. Consequently, some drugs clear faster than in an adult; others, more slowly. For instance, acetaminophen can cause liver toxicity at doses only slightly higher than those recommended. On the other hand, a child may need a proportionately *higher* dose of drugs that metabolize more rapidly in children than in adults. Because of these differences, pediatric dosages based on adult guidelines can be unsafe or ineffective.

The best way to avoid medication and other treatment errors when caring for children is to keep an equipment-sizing/drug-dosing nomogram on hand. Know how to access the information and how to apply it. Several computer programs provide medication dosing and equipment information for any given weight.

A low-tech option is a length-based resuscitation aid, such as the Broselow Tape. These aids translate a child's length into an approximate weight. Appropriate medication doses and equipment sizes appear right on the tape.

Body temperature. With children, temperature is a particularly telling physiologic indicator. In adults, up to 70% of body heat is lost through the head; children have proportionally larger heads than adults, increasing the potential for heat loss. They also have a greater surface-area/body-mass ratio than adults, which also makes them more susceptible to heat loss. When children are compromised by illness or injury, both factors make maintaining normal body temperature difficult. During emergency treatment, warmed intravenous (I.V.) fluids and temperature-regulating blankets are a must for children with low and even normal temperatures.

Learning the basics of pediatric emergency care

Three nationally recognized courses help health care providers prepare to manage pediatric emergencies.

- The American Academy of Pediatrics (AAP)/American Heart Association's Pediatric Advanced Life Support (PALS) course focuses primarily on prevention and management of cardiopulmonary arrest. It also covers postresuscitation stabilization and transport.
- The Emergency Nurses Association's Emergency Nursing Pediatric Course approaches care of children from a nursing perspective. It discusses emergencies by system and includes nursing diagnosis information and assessment parameters.
- The newest course is Pediatric Education for Prehospital Professionals, which is sponsored primarily by the AAP. Although designed mainly for emergency responders, much of the information also applies to hospital care, especially the Pediatric Assessment Triangle.

Making a fast initial assessment

Keeping the potential for rapid deterioration in mind when you triage a child, you want your assessment to be both thorough and fast. One excellent resource to help with initial triage is the Pediatric Assessment Triangle (PAT), an element of the Pediatric Education for Prehospital Professionals program. (See *Learning the Basics of Pediatric Emergency Care*.) Use the PAT to help form a rapid initial impression of a patient without delaying assessment of the ABCs. You can use the PAT without touching the patient, or even as you're approaching him. Here are its three elements:

- *Appearance*, or the child's overall "look," which reflects adequacy of brain perfusion. Two mnemonics you can use to assess appearance are AVPU or TICLS ("tickles").

The simpler of the two, AVPU stands for **a**lert, rousable to **v**oice, rousable to **p**ain, or **u**nresponsive.

Use TICLS to assess **t**one, **i**nteractiveness, **c**onsolability, **l**ook (gaze), and **s**peech/cry.

A child with intact appearance will be alert, interactive, easy to console, and able to recognize caregivers.

- *Work of breathing,* which experts recognize as a better indication of oxygenation and ventilation than respiratory rate or breath sounds. Labored respirations with accessory muscle use indicate impending respiratory failure.
- *Perfusion to the skin,* which reflects the adequacy of circulating blood volume. Blood volume is probably adequate in children with light complexions whose extremities are pink. In dark-skinned children, assess skin color on the palms, soles of the feet, and nail beds.

Children who exhibit a fully intact PAT are in reasonably stable condition at the time of assessment. Problems with one component of the PAT indicate that the child is compromised and requires more urgent care. If the child has alterations in two or three of the components, intervene immediately to prevent further compromise and death.

As an example, let's use the PAT to help triage the two children introduced at the beginning of this article. You find that the 2-year-old boy who'd had a seizure is alert and reaching for his mother. Although he's crying, his respirations are unlabored and his extremities are pink. He has an intact PAT, despite his history of fever and a seizure.

In contrast, the 4-year-old girl with a history of vomiting and diarrhea appears lethargic as she stares into space. Her respirations are unlabored but rapid (effortless tachypnea), and her extremities are pale and mottled. One component of her PAT is adequate (work of breathing); the other two are compromised. This child needs your immediate attention.

Reciting the ABCs

As with adults, your first priority in any pediatric emergency is the ABCs: airway, breathing, and circulation. Here's how to proceed.

Airway

This is always your first priority: Any other supports or drugs are useless if the airway isn't patent.

If the child can't protect her airway, open it immediately using basic life-support measures, such as a head-tilt/chin-lift maneuver. These interventions are easy to do and take precedence over more advanced techniques. If you suspect trauma, stabilize the head and neck in a neutral position and use a jaw thrust.

Breathing

First, determine whether the child is breathing. If not, call for help and initiate basic life support as indicated.

If the child is breathing, assess the adequacy of respirations by answering four questions:

- Is the respiratory rate fast, slow, or normal? Charts listing the normal respiratory rate for different ages can help, but here's a quick-and-dirty method to use in a pinch: If you feel out of breath watching a child breathe, the rate is abnormally fast. And if you feel the need to help a child breathe, the rate is probably too slow.
- What's the depth of respirations? Deep respirations can suggest a metabolic problem. Shallow respirations more commonly accompany neurologic problems or shock.
- How would you describe the patient's respiratory effort? Easy respiratory effort points away from a pulmonary reason for the child's distress. Increased effort with accessory muscle use or retractions indicates a primary pulmonary problem.
- Can you auscultate any abnormal breath sounds? Wheezes generally arise from narrowing of small airways and bronchospasm. Fluid in the alveoli causes crackles. Narrowing or, more commonly in children, obstruction of larger airways causes stridor.

Assuming the airway is patent, the first step in respiratory support is to administer supplemental oxygen—the higher the concentration, the better. High-flow oxygen via non-rebreather mask is ideal if the child can tolerate it. Blow-by oxygen is better than nothing if the patient refuses to wear a mask. (Blow-by oxygen is a noncontact delivery method used for short-term oxygen delivery to patients who can't tolerate a more intrusive delivery method.)

If a child accepts a nasal cannula, she's probably too sick to care and needs more than low-flow oxygen.

Most children won't tolerate nasal cannula prongs in their nostrils. If a child accepts a nasal cannula, he's probably too sick to care and needs more than low-flow oxygen. Although blow-by oxygen is a poor second choice to a face mask, it can give the child a higher oxygen concentration than a nasal cannula if the oxygen source is held close enough to his face.

Inadequate respiratory rate or depth indicates the need for support with a bag-valve–mask device and supplemental oxygen. Endotracheal intubation is the gold standard for long-term respiratory support. Someone experienced at pediatric intubation should perform the procedure.

Circulation

When assessing cardiovascular status, focus on presence, location, and rate and strength of pulses; skin color and tempera-

ture; and capillary refill time. In children, blood pressure may not be a reliable indicator. Although low blood pressure is almost always a dire sign, normal or high blood pressure isn't necessarily reassuring. Vasoconstriction in response to fluid loss may keep a child's blood pressure up even if she's in severe shock.

First, assess central pulses for rate and strength. Check brachial or femoral pulses in infants under age 1 and the carotid in older children. Then, assess peripheral pulses. Remember, in a child the first compensatory mechanisms for lost blood volume are increased heart rate and peripheral vasoconstriction. As blood vessels in the limbs become more constricted, pulses will become weaker until they disappear altogether. Because of decreased blood flow, arms and legs begin to feel cooler and look pale or mottled. However, in young infants, peripheral cyanosis and mottling can be normal findings, so check other assessment parameters to determine circulatory status.

Capillary refill time is probably the most sensitive and easily quantifiable measure of circulatory status. In an adult, you'd press on the nail beds to assess capillary refill. But this isn't a reliable test in a child: Because his nail beds are so small, capillary refill may be brisk even if his circulatory status is poor. Check capillary refill time by pressing on the fleshy parts of the palm, sole of the foot, or forehead instead.

A capillary refill time of 2 seconds is considered normal. A capillary refill time of more than 3 seconds indicates impaired circulation. A capillary refill time of less than 2 seconds may be a sign of some type of distributive shock (septic or neurogenic).

To get the full picture, look at all parameters, including patient history. For example, an injured child who'd been lying outside in winter weather before being transported may have cool, pale extremities with delayed capillary refill time due to the cold. These findings aren't as worrisome if his heart rate and pulse strength are relatively normal.

Now let's look at some childhood emergencies you may encounter and discuss how to respond.

Shock. If your assessment findings point to shock, take immediate and aggressive action. First-line treatment for any shock state is administering isotonic fluid. Give a bolus of 20 ml/kg of 0.9% sodium chloride solution or lactated Ringer's solution I.V. or intraosseously as quickly as possible and assess the patient's response. An improvement in heart rate, color, or capillary refill points to fluid depletion as the problem. As indicated, give a second or third bolus (20 ml/kg) of 0.9% sodium chloride or lactated Ringer's solution until signs of shock reverse.

A patient with traumatic injuries who's lost a lot of blood may also need a transfusion of packed red blood cells (10-ml/kg bolus) or whole blood (20-ml/kg bolus) if she's still unstable after two or three crystalloid boluses. For children with fluid loss related to vomiting or diarrhea, however, continue to administer crystalloid fluid. Although not the norm, bolus totals as high as 180 ml/kg are sometimes necessary to resuscitate children with severe fluid depletion.

If at any point your assessment shows continued hypotension and inadequate systemic perfusion with signs of fluid overload (new-onset crackles, a new S_3 heart sound, or signs of venous congestion), hold further fluid boluses in favor of vasoactive infusions, such as epinephrine or dopamine.

Many dehydrated children, especially infants, are also hypoglycemic. Be sure to check a

Keeping your head during an emergency

As with adults, your primary focus in a pediatric emergency is the ABCs—airway, breathing, and circulation. But situations involving children and their parents can create unexpected distractions.

First, children are noisy—sometimes very noisy! In general, noise is good. Loud screaming means that the child's airway is patent, gas exchange is adequate, and the brain is functioning well enough to perceive fear or pain. Notably bad noises include stridor, which signals airway obstruction, and the high-pitched, irritable cry of a child with a central neurologic problem.

A child's silence in an anxiety-provoking situation is another cause for concern. Is he in respiratory distress but too tired to make a sound? Is his level of consciousness impaired? Does he have the flat affect characteristic of abused children? Investigate silence as well as noise.

Distraught family members can be another distraction. The recognized standard in pediatric care is to allow the family to be present for all procedures, including cardiac resuscitation. Although their presence can be initially distracting and make caregivers uncomfortable, it's often therapeutic for both patient and family.

Remember to extend your care to the whole family. Involve parents in decision making. Ask them for information about the child that will help you make an accurate assessment. Reassure siblings.

A final distracting element is your own emotion when you're confronted with a traumatic injury. Even if you're accustomed to dealing with trauma in adults, blood or angulated extremities somehow seem more shocking on a small body. Don't let your own dismay distract you from the ABCs.

whole-blood glucose level as early as possible. Although it may seem wise to treat hypovolemia and hypoglycemia at the same time by administering a dextrose-containing fluid, the patient will be much better off if you address each problem separately and correctly. Treat hypoglycemia by administering I.V. dextrose in water at 0.25 gram/kg in the following strengths: 10% for neonates under age 1 month, 25% for children up to age 8, and 50% for older children and adolescents.

Don't administer glucose therapy routinely during resuscitation without first obtaining blood glucose levels confirming hypoglycemia. Hyperglycemia may worsen neurologic outcomes following trauma or cardiopulmonary arrest.

Seizures. Seizures can be categorized as febrile or nonfebrile. More common in infants and children up to age 5, febrile seizures are usually self-limiting. Though the cause of the underlying fever may require treatment with antipyretics and possibly antibiotics, the seizure itself rarely requires intervention beyond providing airway support and protecting the patient from injury.

Febrile seizures don't necessarily reflect a dangerously high temperature. The key is not how high the fever gets, but how fast the child's temperature rises. Even an extremely high fever won't necessarily trigger a seizure if the temperature rose gradually, but a relatively low fever may cause a seizure if the temperature rose abruptly.

Treat higher fevers (greater than 100.9° F [38.3° C]) with antipyretics, either by mouth or rectally. Give acetaminophen, 10 to 15 mg/kg P.O. or rectally every 4 hours, not to exceed five doses in 24 hours, or ibuprofen, 5 to 10 mg/kg P.O. every 6 hours, not to exceed 40 mg/kg/day. Passive cooling measures such as undressing the child may also help. Avoid active cooling with a tepid bath because it can cause shivering, which will actually increase temperature. Never wash a child with alcohol, which can be absorbed through the skin or inhaled and cause neurologic toxicity.

Nonfebrile seizures can have many causes, including epilepsy, metabolic problems, and trauma. Treat the underlying cause.

Your priorities during any seizure are to protect the patient from injury and keep the airway open. For prolonged or repeated seizures—status epilepticus—expect to administer a benzodiazepine, such as diazepam, or an anticonvulsant, such as phenytoin.

Most seizures are followed by a postictal period, which may last several minutes to several hours. During this time, the child may be difficult to rouse and be irritable or agitated when awakened. Keep the environment as calm and quiet as possible during this period.

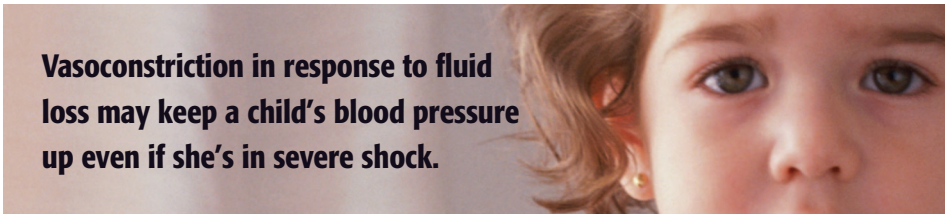
Respiratory emergencies. Probably the most common respiratory illness in children, *asthma* is also the most dangerous. Hallmarks of an asthma attack are increased work of breathing, sometimes to the point of wheezing; air trapping; and respiratory failure.

When treating a child with acute asthma, your goal is to reverse the lower airway narrowing that causes the air trapping and wheezing. Prepare to administer aerosolized beta-agonists (albuterol) and steroids, the drugs of choice for children. Endotracheal intubation, mechanical ventilation, and even general anesthesia may be necessary to support a child through a severe exacerbation.

The hallmark of *croup*, a viral respiratory illness, is a barky cough that's typically worse at night. Although croup can lead to respiratory failure in severe cases, its bark is usually worse than its bite.

Initial treatment for croup is cool, moist air, which is often exactly what kids get outside during the ride to the ED. This may explain why they're often much better by the time they reach the hospital!

If cool, moist air doesn't help, anticipate giving aerosolized epinephrine and oral steroids. Monitor for "epi rebound" about 2 hours after treatment, when the stridor may return worse than ever. The child will need another aerosolized epinephrine treatment and admission or transfer to a pediatric facility.



Respiratory syncytial virus (RSV) is another troublesome disease for children. Although RSV can cause the common cold in older children and adults, in younger children—especially those with chronic illnesses—it can cause bronchiolitis, which causes respiratory distress. You'll auscultate wheezing and see a lot of clear nasal discharge. Treatment is mainly supportive. Keep in mind that RSV is extremely contagious, so follow contact precautions to prevent spreading the infection.

Congenital heart defects. Many children with congenital defects outgrow their heart problems, but others require surgical repair. For example, a child with a cyanotic or ductal-dependent lesion requires surgery to ensure that the ductus arteriosus remains patent.

Treatment for these patients, who are almost always infants less than 6 weeks old, aims to maintain

blood flow through the ductus arteriosus. The infant will receive infusions of prostaglandins until undergoing surgery to create a more permanent blood pathway.

Just as prostaglandins will keep the ductus open, high concentrations of oxygen can cause it to close faster. If a child receiving supplemental oxygen is deteriorating in the absence of other factors that would explain his worsening condition, suspect a ductal heart defect. Contact a facility familiar with this condition for care guidelines. For example, some children with this disorder are maintained on oxygen concentrations as low as 16% by adding supplemental nitrogen to the gas mixture.

Vomiting and diarrhea. Especially dangerous for infants and small children, vomiting and diarrhea can rapidly lead to dehydration and shock if not treated. To treat dehydration, replace lost fluid either by mouth or by I.V. infusion. During aggressive fluid resuscitation, remember to reassess frequently for signs of improved circulation or overhydration.

Children with mild dehydration not caused by trauma may respond to conservative oral hydration. Start by giving 5 to 10 ml of an oral hydrating solution (Pedialyte or Gatorade) by mouth every 15 to 20 minutes. Increase amounts and frequency as tolerated, but always keep an emesis basin handy. Monitor the patient's response closely and be prepared to initiate I.V. therapy if she continues to vomit or begins to exhibit signs of more serious dehydration.

Traumatic injury. Trauma is the number-one cause of death in children. A child's proportionally larger head makes her somewhat top-heavy and more likely to land on her head during a fall or accident. Always suspect head injury in any injured child until it's ruled out. Support the ABCs and provide fluid resuscitation to maintain central organ perfusion. Hospitals not equipped to handle pediatric head trauma and other traumatic injuries should transfer a seriously injured child to an appropriate trauma center as soon as possible after recognition of serious injury.

Facing special challenges

Take advantage of any educational opportunities to improve your expertise with pediatric patients. Children are special; we owe them the best care we can give. N

SELECTED REFERENCES

Dieckmann, R., et al. (eds): *Pediatric Education for Prehospital Professionals.* Sudbury, Mass., Jones and Bartlett Publishers, 2000.

Hazinski, M. (ed): *PALS Provider Manual.* Dallas, Tex., American Heart Association, 2002.

Kline, A.: "Pinpointing the Cause of Pediatric Respiratory Distress," *Nursing2003.* 33(9):58-63, September 2003.

Petrillo, T., et al.: "Emergency Department Use of Ketamine in Pediatric Status Asthmaticus," *Journal of Asthma.* 38(8):657-664, December 2001.

Slota, M. (ed): *Core Curriculum for Pediatric Critical Care Nursing.* Philadelphia, Pa., W.B. Saunders Co., 1998.

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The author has disclosed that he has no significant relationship with or financial interest in any commercial companies that pertain to this educational activity.

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Caring for a sick child in a nonpediatric setting

GENERAL PURPOSE To provide nurses with an overview of emergency care priorities when caring for a child in a nonpediatric setting.
LEARNING OBJECTIVES After reading the preceding article and taking this test, you should be able to: **1.** Identify key physiologic differences between adults and children. **2.** List components in the initial assessment of a child. **3.** Identify nursing interventions for common pediatric emergencies.

1. Which statement best describes children?
a. They have poor compensatory mechanisms.
b. They're typically healthy.
c. They should be thought of as small adults.
d. They're less resilient than adults.

2. A child's body can maintain central organ perfusion despite fluid depletion as high as
a. 35%.
b. 45%.
c. 55%.
d. 65%.

3. Compared with adults, key physiologic differences in children include
a. increased pulmonary reserve.
b. proportionally lower oxygen requirements.
c. increased reliance on heart rate to maintain cardiac output.
d. decreased metabolic rate.

4. Compared with adults, children
a. are more susceptible to heat loss.
b. have proportionally smaller heads.
c. have less potential for heat loss through their heads.
d. have a smaller surface-area/body-mass ratio.

5. Which statement is correct about the PAT?
a. You can use it without touching the patient.
b. A problem with only one PAT component shouldn't worry you.
c. Using the PAT requires opening the child's airway.
d. Using the PAT requires checking the child's carotid pulse.

6. The best indicator of oxygenation and ventilation in children is
a. respiratory rate.
b. breath sounds.
c. skin perfusion.
d. work of breathing.

7. Rapid, unlabored respirations are called
a. bradypnea.
b. eupnea.
c. effortless tachypnea.
d. apnea.

8. If you suspect trauma, open the child's airway by performing
a. a head-tilt/chin-lift maneuver.
b. neck hyperextension.
c. jaw thrust.
d. head-tilt/neck-lift maneuver.

9. Which statement is correct about respiratory assessment findings in children?
a. Increased effort with retractions indicates a primary pulmonary problem.
b. Deep respirations more commonly accompany neurologic problems.
c. Accessory muscle use points away from a pulmonary problem.
d. Deep respirations more commonly accompany shock.

10. Large airway obstruction in children commonly causes
a. wheezes.
b. stridor.
c. crackles.
d. gurgles.

11. Inadequate respiratory rate or depth in a child indicates the need for supplemental oxygen using a
a. bag-valve–mask device.
b. nasal cannula.
c. non-rebreather face mask.
d. simple face mask.

12. The first compensatory mechanisms for lost blood volume in children are
a. increased heart rate and peripheral vasodilation.
b. decreased heart rate and peripheral vasodilation.
c. increased heart rate and peripheral vasoconstriction.
d. decreased heart rate and peripheral vasoconstriction.

13. The most sensitive and easily quantifiable measure of circulatory status in a child is
a. skin color.
b. pulse amplitude.
c. capillary refill time.
d. skin temperature.

14. Which capillary refill time is considered normal in a child?
a. 1 second
b. 2 seconds
c. 4 seconds
d. 5 seconds

15. First-line treatment for any shock state is the administration of
a. hypotonic fluid.
b. hypertonic fluid.
c. packed red blood cells.
d. isotonic fluid.

16. Treat hypoglycemia by administering I.V. dextrose in water at
a. 0.025 gram/kg.
b. 0.25 gram/kg.
c. 2.5 grams/kg.
d. 25 grams/kg.

17. The maximum daily pediatric dosage of ibuprofen is
a. 10 mg/kg/day.
b. 20 mg/kg/day.
c. 30 mg/kg/day.
d. 40 mg/kg/day.

18. A barky cough that's typically worse at night is the hallmark of
a. asthma.
b. croup.
c. RSV.
d. bronchiolitis.

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*In accordance with the Iowa Board of Nursing administrative rules governing grievances, a copy of your evaluation of the CE offering may be submitted directly to the Iowa Board of Nursing.