Pediatric Airway Emergencies: Review Questions

Muhammad Waseem, MD

QUESTIONS
Choose the single best answer for each question.

1. Which of the following statements regarding the pediatric airway as compared with the adult airway is true?
   (A) A child has a smaller tongue relative to the size of the oral cavity
   (B) An infant’s epiglottis is relatively short and thicker
   (C) The vocal cords in infants have a higher attachment
   (D) In children younger than 10 years, the narrowest portion of the airway is below the vocal cords
   (E) In children, endotracheal tube size should be selected based on the glottic opening

2. An 18-month-old boy presents to the emergency department (ED) with a 3-day history of cough, runny nose, and fever. In the ED, he is alert and playful but has marked inspiratory stridor. Which of the following is the most common etiology for this patient’s clinical condition?
   (A) Foreign body
   (B) Mycoplasma pneumoniae
   (C) Parainfluenza virus
   (D) Respiratory syncytial virus (RSV)
   (E) Streptococcus pneumoniae

3. A 3-year-old boy develops fever and noisy breathing. In the ED, he is irritable, anxious, and has stridor and drooling. He does not want to lie down. His mother reports up-to-date immunizations. What is the most appropriate next step in this patient’s management?
   (A) Immediate administration of intravenous antibiotics
   (B) Immediately visualize the epiglottis to confirm epiglottitis
   (C) Keep the child in a position of comfort pending endotracheal intubation
   (D) Obtain complete blood count and blood culture
   (E) Obtain lateral neck radiograph

4. A 5-month-old previously healthy male infant presents to the ED with cough and dyspnea for 2 days and a temperature of 38.4°C (101.1°F). There is no family history of asthma. He is tachypneic (respiratory rate, 48 breaths/min) and has bilateral expiratory wheezing and subcostal retractions. His oxygen saturation is 93% to 94%. Which of the following is the most common cause of his illness?
   (A) Adenovirus
   (B) M. pneumoniae
   (C) Parainfluenza virus
   (D) RSV
   (E) Staphylococcus aureus

5. Which of the following statements regarding pneumonia in children is true?
   (A) Blood cultures frequently reveal the cause of pneumonia in children
   (B) Cough is the most prominent symptom in neonates with pneumonia
   (C) Cough is the best single predictor of pneumonia
   (D) Dehydration is the most common systemic complication
   (E) Streptococcus pneumoniae is the most common cause of pneumonia

Dr. Waseem is an assistant professor of emergency medicine in clinical pediatrics, Weill Medical College of Cornell University, New York, NY, and attending physician, Lincoln Hospital, Bronx, NY.
ANSWERS AND EXPLANATIONS

1. **(D)** In children younger than 10 years, the narrowest portion of the airway is below the vocal cords. The pediatric airway differs from the adult airway in many respects. The airway of a pediatric patient is much smaller than that of an adult. Infants have a relatively large and floppy epiglottis, and children have large tongue relative to the oropharynx. The vocal cords have a lower attachment anteriorly, not a higher attachment. In children younger than 10 years, the narrowest portion of the airway is below the vocal cords at the level of the cricoid cartilage. Endotracheal tube size should, therefore, be selected based on the size of cricoid ring rather than the glottic opening.

2. **(C) Parainfluenza virus.** Croup is the most common cause of stridor in a febrile child. Parainfluenza type 1 virus is the most common cause of croup in pediatric patients, which can be recovered in up to 60% of cases. Children between the ages of 6 months and 3 years are most commonly affected by croup, which occurs more commonly in the winter months. Croup begins with a prodrome of a few days of mild upper respiratory infection. Inspiratory stridor is a prominent symptom in severe cases of croup.

3. **(C) Keep the child in a position of comfort pending endotracheal intubation.** The case patient has presented with the clinical triad of epiglottitis (ie, drooling, dysphagia, distress). The first priority is to secure the airway. The child should be allowed to assume a position of comfort. Endotracheal intubation can be difficult for a toxic child with epiglottitis; therefore, assistance should be sought from a surgeon and/or an anesthesiologist with experience in difficult airways and intubation. Once the patient is intubated, an intravenous line can be inserted and antibiotics can be administered. All further examinations can then be performed.

4. **(D) RSV.** The clinical condition of this infant is consistent with acute bronchiolitis. RSV is the most common organism associated with acute bronchiolitis, but other organisms, such as adenovirus and *M. pneumoniae*, may produce a similar clinical picture. Peak incidence usually occurs at age 2 to 8 months. Tachypnea is the most common physical sign of acute bronchiolitis. Hypoxia indicates severe illness and requires hospitalization.

5. **(D) Dehydration is the most common systemic complication.** Dehydration in pneumonia results from decreased fluid intake and excessive respiratory effort. Fluid loss is also increased because of vomiting, fever, and tachypnea. Cough is an unusual symptom in neonates with pneumonia. Most cases of pediatric pneumonia are due to viruses; parainfluenza viruses, influenza virus, adenovirus, and RSV are the most common. *Streptococcus pneumoniae* is the most common cause of bacterial pneumonia. Tachypnea is the best indicator of pneumonia. Blood cultures are rarely positive in children with pneumonia.