

8 • Blueprints Q&A Step 2 Pediatrics

22. A 9-year-old boy comes to your office because of progressive, generalized, bilateral lower extremity weakness and ataxia. He has also been complaining of some diminished sensation in his fingers and toes. On physical examination, you cannot elicit DTRs in his legs, and there appears to be mild facial weakness. Aside from a URI about 10 days ago, he has been healthy. CSF shows elevated protein with minimal pleocytosis. What is the most likely diagnosis?

- A. Viral meningitis
- B. Tick paralysis
- C. Enteroviral encephalitis
- D. Guillain-Barré syndrome
- E. Acute lymphoblastic leukemia

23. A 9-month-old infant who was previously healthy and gaining weight was recently discharged from the hospital. The hospitalization was the result of a bout of severe rotavirus diarrhea that required rehydration with IV fluids. Four days later, he is brought to your office because he continues to have loose stools after each feeding. He is now drinking his regular cow's milk-based formula well. On physical examination he appears to be happy and well hydrated. A repeat rotavirus test is negative. What is the most likely reason for the baby's continued loose stools?

- A. Cow's milk protein allergy
- B. Starvation diarrhea
- C. Secondary lactose intolerance
- D. Viral gastroenteritis
- E. Cystic fibrosis

24. A 24-month-old child is brought to your office for evaluation of a nasal discharge that has been present for 4 days. The mother has been using a drugstore decongestant but there has been no improvement. Immediately on entering the examining room, you notice a foul odor. On physical examination, you discover a purulent unilateral nasal discharge. The most likely diagnosis is:

- A. Viral URI
- B. Allergic rhinitis
- C. Sinusitis
- D. Nasal foreign body
- E. Nasal polyp

25. An obese, 12-year-old, African-American boy comes to your office because of a painful limp that has been present for 1 week. There is no history of trauma. The patient has had no fever or other signs of illness. Radiographs of the boy's hips are obtained (Figure 25). The most likely diagnosis is:

- A. Osteomyelitis
- B. Legg-Calvé-Perthes disease
- C. Septic hip
- D. Slipped capital femoral epiphysis
- E. Limp secondary to growing pains



Figure 25 • Image courtesy of the Department of Radiology, Phoenix Children's Hospital, Phoenix, Arizona.

26. A 15-month-old boy comes to your office because of bloody diarrhea that started today. The previous night he was seen in the local emergency room for management of a febrile seizure. The child had no previous history of convulsions. You collect a stool sample for microscopic examination and note that the stool contains many polymorphonuclear cells. Which organism is most likely responsible for this child's illness?

- A. Group A *Streptococcus*
- B. *Staphylococcus aureus*
- C. *E. coli*
- D. *Shigella*
- E. Rotavirus

27. A 10-year-old boy is brought to your office because of intermittent, unexplained fevers over the past 18 months. His mother is especially concerned because she thinks her son has stopped growing. In fact, when you look at the boy's growth chart, you note no height increase since age 8 and his height percentile has fallen from the 25th percentile to well below the 5th percentile for age. A CBC demonstrates very mild anemia, but the patient's erythrocyte sedimentation rate (ESR) is elevated. The urine pH is 5 and the serum bicarbonate is normal. The mother's height and father's height both fall at the 25th percentile of the adult range. What is the most likely diagnosis?

- A. Constitutional growth delay
- B. Familial short stature
- C. Inflammatory bowel disease (IBD)
- D. Renal tubular acidosis
- E. Pituitary tumor and growth hormone deficiency

26 • Blueprints Q&A Step 2 Pediatrics

20. C. Epiglottitis is a potentially lethal condition in which a child may develop air hunger, restlessness, cyanosis, and coma in just hours. Typically, the patient will present with fever, sore throat, and drooling. The child often keeps the neck in a hyperextended position to keep the airway open. Patients with epiglottitis do not have the typical barky cough seen in viral croup. Stridor is a late finding and may not be present until the airway is nearly completely obstructed. Anxiety-provoking interventions should always be avoided in patients with epiglottitis. Phlebotomy, IV line placement, supine placement of the child, or direct visualization of the oral cavity should be delayed until the airway is secure. The classic finding on lateral neck radiographs is the “thumb sign.” Patients suspected of having epiglottitis should never be taken to the radiology department until after endotracheal intubation is performed to prevent complete airway obstruction. H. flu vaccine has nearly eradicated this illness.

A. Viral croup is preceded by a URI and progresses at a much slower pace than epiglottitis. The typical presentation includes the characteristic “barky” cough, hoarseness, inspiratory stridor, and low-grade fever. Patients are usually under 3 years of age.

B. Spasmodic croup tends to occur in the evening or nighttime and is preceded by coryza and hoarseness. The child awakens with a barky cough, stridor, and may appear anxious. The patient is usually afebrile. This condition may be an allergic reaction to viral antigens, but the exact cause is unknown.

D. Bacterial tracheitis is a life-threatening condition, often caused by *Staphylococcus*, in which there are purulent secretions in the trachea. Patients present with a brassy cough, stridor, fever, and toxicity, but they generally do not drool or have dysphagia.

E. Reactive airway disease is a problem that primarily involves the lower airways. The prominent physical finding is expiratory wheezing and prolongation of the expiratory phase of respiration. Upper airway obstruction, such as viral croup and epiglottitis, usually causes inspiratory noises known as stridor.

21. D. To do this calculation, the pediatrician must know that (1) standard cow’s milk formula contains 20 kcal per ounce and (2) the daily energy requirement for an infant is approximately 100 kcal per kilogram of body weight. Therefore, this baby requires 550 kcal per day, which will be supplied by about 27 to 28 oz of formula.

A, B, C, E. These calculations are incorrect. See explanation for D.

22. D. Guillain-Barré syndrome generally causes an ascending paralysis with absent DTRs. This syndrome is thought to result from immune-mediated neuronal injury provoked by a respiratory or gastrointestinal infection (i.e., Epstein-Barr, *Varicella*, *Campylobacter jejuni*) or immunization. The most serious complications are respiratory failure and autonomic dysfunction (arrhythmia, hypertension, hypotension, GI motility disorders). Since respiratory failure can occur in 10% to 15% of cases, careful monitoring of respiratory effort is critical. For patients with severe symptoms, IV gamma globulin or plasmapheresis can be given. Approximately 85% of patients with Guillain-Barré syndrome will have a good recovery.

- A. The CSF in cases of viral meningitis would show pleocytosis, but one would not expect to find neurologic deficits, including areflexia.
- B. Certain wood ticks and dog ticks produce a neurotoxin that can cause a picture of ascending paralysis and areflexia that mimics Guillain-Barré syndrome. When the tick is removed, the patient can recover very quickly.
- C. Enteroviral encephalitis would be associated with a greater degree of mental status change than is seen in this patient. A patient with encephalitis would not generally demonstrate areflexia.
- E. Leukemia may present with severe bone or joint pains, particularly in the legs. The paralytic pattern and absence of reflexes in this patient is not typical of leukemia.

23. C. After a severe bout of viral gastroenteritis, many babies will develop villous atrophy with depletion of intestinal lactase. When these babies are given a formula containing lactose (including breast milk and cow's milk formulas), they may have watery stools resulting from sugar malabsorption. This problem usually resolves if the baby is fed a non-lactose-containing formula for a few weeks.

- A. Cow's milk protein allergy is relatively uncommon in babies. This condition would be expected to present prior to 9 months of age.
- B. Starvation diarrhea can be the result of the prolonged use of oral electrolyte solutions. The intestine requires adequate nutrition to allow villi to regenerate and replenish lactase.
- D. Several organisms may cause gastroenteritis. Although some organisms (rotavirus, coronavirus) can cause prolonged chronic diarrhea, most cases of viral gastroenteritis resolve spontaneously in just a few days.
- E. Cystic fibrosis can cause chronic malabsorption, failure to thrive, and recurrent pneumonia. This patient's history is not typical of cystic fibrosis. Patients with cystic fibrosis frequently require treatment with pancreatic enzymes and close nutritional monitoring.

24. D. A foul-smelling, purulent, unilateral discharge is the classic presentation of a nasal foreign body. Referral to an otolaryngologist may be needed if suctioning the secretions from the nose does not allow visualization and removal of the object.

- A. The discharge in URI is generally bilateral and not foul smelling. The turbinates are generally inflamed and erythematous.
- B. The discharge in allergic rhinitis tends to be watery. The turbinates usually appear quite swollen and pale.
- C. Sinusitis can cause persistent rhinorrhea, purulent discharge, and foul-smelling breath. The discharge itself is generally not foul smelling. The onset of sinusitis is generally more prolonged than in this case. Cough and fever may also be present.
- E. Nasal polyps are often associated with longstanding conditions such as cystic fibrosis or chronic allergies. This child's course was much more acute. Furthermore, no polyp was seen on physical examination.

28 • Blueprints Q&A Step 2 Pediatrics

25. **D.** Slipped capital femoral epiphysis (SCFE) is the most common hip disorder that presents during adolescence. The limp is painful and there may also be limb shortening. Lateral-view radiographs show displacement of the epiphysis inferiorly and posteriorly. The condition is twice as common in males as in females. It has been associated with obesity, renal disease, and hypothyroidism. Patients should be advised to be non-weight bearing and referred to an orthopedist immediately.

A. Plain radiography frequently does not detect osteomyelitis until the infection in the bone has been present for a week or longer. Patients often have fever and an elevated ESR.

B. Legg-Calvé-Perthes disease, or avascular necrosis of the femoral head, most often presents in children 5 to 10 years of age. It may first be noted as a painless limp, vague knee and hip pain, knee pain alone, or decreased range of motion around the hip. Treatment involves reduction of activities, NSAIDs, and the use of crutches. For severe cases or in older children, braces or surgical procedures may be needed.

C. Septic hip is usually associated with fever and an ill-appearing child. Blood cultures may be positive in about 40% of the cases. Joint space widening is seen on the plain radiograph.

E. Growing pains are recurrent nighttime leg aches in children 4 to 8 years old. Treatment includes massage, muscle stretching, and local heat application. This is a benign condition that resolves without complication.

26. **D.** *Shigella* often causes seizures and bloody diarrhea in children. *Shigella* is a Gram-negative rod that can cause fever, headache, profuse watery diarrhea (with or without blood), cramps, and tenesmus. As with other bacterial gastroenteritis, the stools often contain blood and leukocytes. *Shigella* is commonly associated with neurologic manifestations (in 10% to 45%), such as a brief seizure, lethargy, confusion, hallucinations, and severe headache. CSF analysis is usually normal. Antibiotics do shorten the duration of *Shigella* diarrhea.

A, B. *Streptococcus* and *Staphylococcus* do not commonly cause diarrhea in children.

C. *E. coli* can certainly cause bloody diarrhea, but this organism is generally not associated with an increased risk of seizures. *E. coli* is associated with an increased chance of developing HUS, particularly after exposure to antibiotics.

E. Rotavirus diarrhea is generally not bloody in nature. Rotavirus vaccine was recently released, but later recalled when it was found to be associated with intussusception.

27. **C.** Inflammatory bowel disease (IBD), including ulcerative colitis and Crohn disease, may first present as short stature before any GI symptoms develop. The growth arrest, unexplained fevers, mild anemia, and elevated ESR are most consistent with this diagnosis. The stool should be checked for blood. Additional tests for IBD might include pANCA and ASCA (anti-*Saccharomyces cerevisiae* antibody). Imaging studies and referral to a gastroenterologist for possible endoscopy are warranted.

- A. In constitutional growth delay, the decrease in growth rate always occurs in the first 2 years of life. It would not be associated with abnormal lab test results or fever.
- B. The complete growth arrest seen in this child is not consistent with a diagnosis of familial short stature. Based on the parents' heights, the child would not be expected to have a height below the 5th percentile.
- D. Renal tubular acidosis can present with failure to thrive and short stature. The renal problem is often secondary to malnutrition. Serum bicarbonate level tends to be low and the urinary pH may be elevated.
- E. The growth arrest pattern could be due to a brain tumor, but the laboratory abnormalities and fever in this case are more consistent with IBD.

28. D. Children with bacterial meningitis may develop the syndrome of inappropriate antidiuretic hormone secretion, also known as SIADH. In this condition, excessive water is retained by the kidney and the electrolytes become diluted. Because of the overhydration, the kidney tends to excrete increased amounts of sodium. The result is hyponatremia, which is a common cause of seizure activity and can be evaluated with serum electrolytes. Treatment involves fluid restriction. Hypertonic saline solutions should be reserved for emergency situations with repeated seizures. Diuretics should not be used because they can worsen the hyponatremia.

A. It is important to monitor the electrolytes and weight of a child with meningitis. SIADH may develop within 24–48 hours after the initial diagnosis of meningitis is made.

B. Antipyretic therapy may increase comfort in patients with high fevers.

C. Bacterial meningitis in children this age is most often caused by *Streptococcus pneumoniae*, *Neisseria meningitidis*, and *H. influenzae*. The antibiotic coverage is adequate.

E. Children with meningitis, especially neonates, may develop a brain abscess or subdural effusions. However, this complication typically occurs around 7 to 10 days from the initial presentation, and would be unlikely this early.

29. C. Research has demonstrated that babies put to sleep in a prone position are at a 2 to 12 times higher risk for sudden infant death syndrome (SIDS). Since the Academy of Pediatrics has been recommending supine sleep position, SIDS rates have fallen by about 40% to 50%. SIDS remains the most common cause of infant death beyond the neonatal period. Other risk factors for SIDS include maternal smoking during pregnancy, soft sleep surfaces, loose bedding, bed sharing, overheating, preterm birth, and low birth weight. The peak incidence of SIDS is 2 to 4 months of age. The cause remains incompletely understood and there actually may be several mechanisms. One hypothesis involves the delayed development of arousal or cardiorespiratory control in the central nervous system (arcuate nucleus).

A. Prone sleeping position has the highest risk for SIDS. Babies can and should be placed on their belly while awake. This will help with positional occipital plagiocephaly (flattening of the skull) that may result from lying on the back for long periods of time.