

Pediatric Board Review

50 Advanced Scenario-Based Multiple-Choice Questions

Based on Pediatric Board Study Guide: A Last-Minute Review, Third Edition (2024)

The correct option is underlined in each question.

Questions 1-17: Advanced Clinical Reasoning

1. A 19-day-old term infant is brought for rectal temperature 38.2 C and decreased feeding. He is arousable, has normal perfusion, no focal findings, and urinalysis is negative. CBC shows ANC 3,200/mm³; procalcitonin is 0.12 ng/mL and CRP 8 mg/L. Blood and urine cultures were obtained. According to a risk-stratified approach to a well-appearing febrile infant of this age, what is the most appropriate next step?

- A. Discharge without lumbar puncture if reliable follow-up is available
- B. Perform lumbar puncture, administer parenteral antibiotics, and observe in hospital
- C. Administer intramuscular ceftriaxone and discharge without CSF evaluation
- D. Observe without antibiotics until blood culture becomes positive

2. A 36-hour-old infant born at 38 weeks has total bilirubin 17.8 mg/dL. The infant is feeding poorly and has lost 8% of birth weight. Maternal blood type is O positive, infant type is A positive, and direct antiglobulin test is positive. The bilirubin is 1.5 mg/dL below the hour-specific phototherapy threshold and has risen 0.32 mg/dL/hour over the preceding 6 hours. What is the best management?

- A. Start phototherapy and evaluate for hemolysis
- B. Immediate exchange transfusion without phototherapy
- C. Interrupt breastfeeding for 24 hours as the sole intervention
- D. Routine follow-up in 48 hours because the value is below threshold

3. A 7-day-old newborn presents with vomiting, poor feeding, weight loss, and lethargy. Sodium is 124 mEq/L, potassium 7.1 mEq/L, glucose 48 mg/dL, and bicarbonate 15 mEq/L. Examination reveals clitoromegaly and hyperpigmentation. After stabilization of airway and circulation, which treatment should be initiated immediately?

- A. Insulin infusion as definitive therapy
- B. Oral dexamethasone after confirmatory genetic testing
- C. Fludrocortisone alone without glucocorticoid
- D. Intravenous hydrocortisone, isotonic saline, and dextrose

4. A 2-day-old infant develops profound cyanosis. Preductal saturation is 68% despite 100% oxygen. The second heart sound is single, chest radiograph shows a narrow mediastinum, and echocardiography demonstrates ventriculoarterial discordance with a restrictive atrial communication. Which intervention is most urgently required in addition to prostaglandin E1?

- A. Inhaled nitric oxide as definitive therapy
- B. Indomethacin administration
- C. Balloon atrial septostomy
- D. Immediate complete repair without stabilization

5. A preterm infant born at 27 weeks remains ventilator dependent at 4 weeks. Chest radiograph shows diffuse hazy opacities and evolving cystic changes. Oxygen need has increased, but temperature, cultures, and inflammatory markers do not suggest infection. Echocardiography shows a moderate patent ductus arteriosus with left atrial enlargement. Which pathophysiologic process most directly contributes to the infant's respiratory course?

- A. Reduced pulmonary blood flow causing alveolar ischemia
- B. Pulmonary overcirculation with interstitial edema and impaired lung development
- C. Right-to-left ductal shunting causing isolated systemic hypertension
- D. Premature closure of the ductus causing pulmonary venous obstruction

6. A 15-year-old girl requests contraception and asks that her parents not be informed. She denies coercion, abuse, depression, and suicidal ideation. Pregnancy and STI testing are negative. Her jurisdiction permits minors to consent to confidential contraceptive services. What is the most appropriate response?

- A. Provide confidential counseling and contraception while encouraging supportive adult involvement
- B. Inform her parents because all adolescent sexual activity must be disclosed
- C. Provide contraception only if she agrees to abstinence counseling
- D. Refuse care until a parent provides written consent

7. A 16-year-old wrestler has lost 9 kg in 2 months. Heart rate is 42/min, blood pressure is 86/54 mmHg, temperature is 35.6 C, and orthostatic pulse increases by 32/min. Potassium is 3.0 mEq/L and phosphorus is low. He admits severe restriction and daily exercise but denies purging. What is the most appropriate disposition?

- A. Begin a stimulant to improve energy
- B. Permit continued sports participation if electrolytes are replaced orally
- C. Outpatient nutrition referral within 2 weeks
- D. Hospital admission for medical stabilization and monitored refeeding

8. A 3-year-old has developmental delay, hand-wringing movements, loss of purposeful hand use, deceleration of head growth, and episodes of hyperventilation after apparently normal early development. Which genetic mechanism most likely explains this presentation?

- A. Maternal uniparental disomy of chromosome 15
- B. Paternal deletion of 15q11-q13
- C. Pathogenic variant in MECP2
- D. Trinucleotide repeat expansion in FMR1

9. A newborn has hypotonia and poor feeding. At age 2 years he develops hyperphagia and rapid weight gain. Examination shows almond-shaped eyes, narrow bifrontal diameter, small hands, and hypogonadism. Which molecular abnormality is most likely?

- A. Loss of maternally expressed genes at 15q11-q13
- B. Loss of paternally expressed genes at 15q11-q13
- C. Deletion of 22q11.2
- D. Mutation of the dystrophin gene

10. A 6-month-old becomes lethargic after an overnight fast during gastroenteritis. Glucose is 34 mg/dL, serum ketones are absent, ammonia is mildly elevated, and liver enzymes are normal. Acylcarnitine profile shows increased C8 species. Which management best prevents future episodes?

- A. Avoid prolonged fasting and provide rapid carbohydrate during illness
- B. Daily uncooked cornstarch as the only therapy from infancy
- C. Restrict galactose and lactose
- D. Protein restriction and sodium benzoate

11. A 4-day-old becomes tachypneic and encephalopathic after protein-containing feeds. Blood gas shows respiratory alkalosis; ammonia is 620 micromol/L, glucose is normal, and urine ketones are absent. While arranging dialysis, which therapy most directly reduces nitrogen burden?

- A. Intravenous bicarbonate alone
- B. Glucagon infusion and fasting
- C. High-protein enteral feeding
- D. Stop protein temporarily, provide high-calorie dextrose, and administer nitrogen-scavenging agents

12. A 9-year-old with severe asthma presents after repeated albuterol at home. He is anxious, speaks in single words, and has diffuse wheezing. After continuous albuterol, ipratropium, systemic corticosteroid, and magnesium, he becomes drowsy; wheezing diminishes and PaCO₂ rises from 32 to 48 mmHg. What is the best next step?

- A. Obtain outpatient spirometry before further treatment
- B. Reassure because wheezing has improved
- C. Prepare for endotracheal intubation and mechanical ventilation
- D. Discontinue bronchodilators to avoid lactic acidosis

13. A 3-year-old suddenly develops coughing while eating nuts. He has persistent unilateral wheeze and decreased breath sounds. Inspiratory and expiratory chest radiographs are nondiagnostic, and oxygen saturation is 97%. What is the most appropriate next step?

- A. Discharge because normal radiographs exclude aspiration
- B. Proceed to rigid bronchoscopy
- C. Order a sweat chloride test before intervention
- D. Treat with antibiotics and repeat imaging in 6 weeks

14. A 13-year-old with cystic fibrosis has increased cough and a 12% decline in FEV1. Sputum grows *Pseudomonas aeruginosa* susceptible to several agents. Which principle should guide treatment of this pulmonary exacerbation?

- A. Select antipseudomonal therapy informed by prior microbiology and clinical severity
- B. Avoid airway-clearance therapy during acute illness
- C. Treat only if chest radiograph shows a new infiltrate
- D. Use an oral macrolide alone regardless of prior cultures

15. A 2-month-old has tachypnea, diaphoresis with feeding, poor weight gain, hepatomegaly, and a holosystolic murmur. Echocardiography shows a large nonrestrictive ventricular septal defect with left atrial and ventricular dilation. Which medical regimen best treats the current physiology while awaiting definitive repair?

- A. Beta-blocker alone to increase systemic resistance
- B. Indomethacin to close the ventricular defect
- C. Prostaglandin E1 and volume expansion
- D. Diuretic therapy with nutritional optimization; consider afterload reduction

16. A 13-year-old collapses during basketball. He reports prior exertional chest pain. His uncle died suddenly at age 28. Examination reveals a systolic murmur at the left sternal border that becomes louder with standing and Valsalva. Which immediate recommendation is most appropriate?

- A. Treat empirically for exercise-induced bronchospasm
- B. Clear him for sports after a normal chest radiograph
- C. Restrict competitive athletics and obtain urgent cardiology evaluation
- D. Encourage increased exercise to improve conditioning

17. A newborn has shock, weak femoral pulses, metabolic acidosis, and differential blood pressure with higher values in the right arm than the legs. Echocardiography is not immediately available. Which treatment should be started while arranging definitive evaluation?

- A. Prostaglandin E1 infusion
- B. Indomethacin infusion
- C. High-dose furosemide without vascular access
- D. Adenosine rapid intravenous push

Questions 18-34: Advanced Diagnosis and Management

18. A 5-year-old with single-ventricle physiology after Fontan completion presents with edema, chronic diarrhea, and poor growth. Albumin is 1.9 g/dL; urinalysis shows no protein and liver synthetic function is preserved. Which complication is most likely?

- A. Protein-losing enteropathy
- B. Celiac disease as an unrelated incidental finding
- C. Acute viral hepatitis
- D. Minimal change nephrotic syndrome

19. A 4-year-old has fever, pallor, petechiae, and bone pain. CBC shows hemoglobin 7.4 g/dL, platelets 28,000/mm³, and WBC 46,000/mm³ with circulating lymphoblasts. He has a mediastinal mass on chest radiograph. Which action is most important before procedural sedation for diagnostic sampling?

- A. Begin iron therapy and repeat CBC in one week
- B. Administer live vaccines before chemotherapy
- C. Perform lumbar puncture immediately under deep sedation
- D. Assess airway and cardiovascular compression and avoid unsafe sedation

20. A 2-year-old with sickle cell disease develops fever, pallor, tachycardia, and splenomegaly extending to the pelvis. Hemoglobin falls from 9 to 4.8 g/dL and reticulocyte count is 14%. What is the most likely diagnosis and immediate treatment?

- A. Acute chest syndrome; exchange transfusion is always mandatory
- B. Aplastic crisis; observe without transfusion
- C. Splenic sequestration; urgent red-cell transfusion with careful volume assessment
- D. Autoimmune hemolysis; platelet transfusion

21. An 8-year-old with sickle cell disease presents with fever, chest pain, hypoxemia, and a new lower-lobe infiltrate. Hemoglobin is 2 g/dL below baseline. Despite oxygen, antibiotics, incentive spirometry, and simple transfusion, respiratory distress and oxygen requirement worsen. What is the next best intervention?

- A. Discharge on oral antibiotics
- B. Urgent exchange transfusion
- C. Withhold all transfusion because of alloimmunization risk
- D. Administer iron chelation as acute therapy

22. A 12-year-old has prolonged epistaxis and heavy menstrual bleeding. Platelet count is normal, PT is normal, aPTT is mildly prolonged, and factor VIII activity is reduced. Which additional finding would best distinguish von Willebrand disease from hemophilia A?

- A. Absent fibrinogen
- B. Markedly prolonged PT
- C. Schistocytes on peripheral smear
- D. Reduced von Willebrand factor activity with impaired ristocetin-dependent platelet function

23. A 6-year-old has fatigue, jaundice, splenomegaly, hemoglobin 7.8 g/dL, reticulocytes 12%, spherocytes, and elevated MCHC. Direct antiglobulin test is negative. Which test most appropriately confirms the suspected inherited disorder?

- A. ADAMTS13 activity
- B. Bone marrow biopsy
- C. Hemoglobin electrophoresis
- D. Eosin-5-maleimide binding or osmotic fragility testing

24. A 9-year-old receiving induction chemotherapy for leukemia develops temperature 39.1 C. ANC is 120/mm³, blood pressure is normal, and no source is identified. What is the most appropriate initial antimicrobial approach?

- A. Empiric antifungal monotherapy as the first agent
- B. Wait for culture results because the child is hemodynamically stable
- C. Prompt intravenous antipseudomonal beta-lactam therapy after cultures
- D. Oral amoxicillin alone

25. A 7-year-old has recurrent pneumonia, skin abscesses, and osteomyelitis caused by Serratia. Dihydrorhodamine testing confirms chronic granulomatous disease. Which long-term strategy is appropriate in addition to prompt treatment of infections?

- A. Prophylactic trimethoprim-sulfamethoxazole and antifungal prophylaxis
- B. Monthly intravenous iron
- C. Avoid all inactivated vaccines
- D. Daily complement replacement

26. A 6-month-old has persistent thrush, chronic diarrhea, Pneumocystis pneumonia, absent thymic shadow, and profound T-cell lymphopenia. Which transfusion precaution is essential while definitive therapy is planned?

- A. Use irradiated, leukoreduced, CMV-safe blood products
- B. Avoid all red-cell transfusions regardless of severity
- C. Use blood from a first-degree relative without irradiation
- D. Use only unfiltered whole blood

27. A 4-year-old develops urticaria, wheeze, vomiting, and hypotension minutes after eating cashews. Intramuscular epinephrine is administered with improvement, but symptoms recur 25 minutes later. What is the next best step?

- A. Use inhaled albuterol as the sole treatment
- B. Delay further epinephrine because two-phase reactions are benign
- C. Give a second intramuscular epinephrine dose and continue emergency monitoring
- D. Administer an oral antihistamine and discharge immediately

28. A 5-year-old has 7 days of fever, conjunctival injection, oral changes, rash, cervical lymphadenopathy, and swollen hands. Echocardiography shows a small coronary aneurysm. Fever persists 36 hours after completion of initial IVIG. What is the best next management step?

- A. Administer oral penicillin for presumed rheumatic fever
- B. No further therapy because IVIG response may take one week
- C. Treat IVIG-resistant Kawasaki disease with additional anti-inflammatory therapy guided by specialty care
- D. Stop aspirin permanently

29. An 11-year-old develops palpable purpura, abdominal pain, and arthralgia. Four weeks later, blood pressure is elevated and urinalysis shows 3+ protein and red-cell casts. What is the most appropriate next step?

- A. Reassurance because renal involvement is always self-limited
- B. Quantify proteinuria, assess renal function, and urgently involve nephrology
- C. Start platelet transfusions
- D. Perform skin-prick allergy testing

30. A 10-year-old has fever, arthritis, weight loss, a malar rash, hypertension, low C3 and C4, positive anti-double-stranded DNA antibodies, and urine protein-to-creatinine ratio 2.1 mg/mg with red-cell casts. Which procedure is most useful to guide treatment?

- A. Skin biopsy of uninvolved skin
- B. Bone marrow aspiration
- C. Voiding cystourethrography
- D. Renal biopsy

31. A 6-year-old develops bloody diarrhea followed by anemia, thrombocytopenia, and acute kidney injury. Peripheral smear shows schistocytes. The child is euvolemic, potassium is 6.3 mEq/L, and ECG shows peaked T waves. Which intervention is the immediate priority?

- A. Prophylactic platelet transfusion despite no bleeding
- B. High-dose corticosteroids for presumed immune thrombocytopenia
- C. Antimotility medication
- D. Emergency treatment of hyperkalemia and preparation for renal replacement therapy

32. An 8-year-old with steroid-sensitive nephrotic syndrome develops fever, diffuse abdominal tenderness, and ascites. Paracentesis shows 700 neutrophils/mm³. Which empiric management is most appropriate?

- A. Immediate nephrectomy
- B. Observe while awaiting culture because ascites is expected
- C. Prompt parenteral antibiotics covering pneumococcus and other enteric organisms
- D. High-dose diuretic alone

33. A 9-year-old has polyuria, polydipsia, weight loss, glucose 520 mg/dL, venous pH 7.08, and corrected sodium 138 mEq/L. After initial isotonic fluid, potassium is 2.8 mEq/L. Which step should precede insulin infusion?

- A. Start insulin immediately at 0.2 units/kg/hour
- B. Begin potassium replacement and delay insulin until potassium is safely above 3.3 mEq/L
- C. Give intravenous bicarbonate routinely
- D. Switch to hypotonic fluid and restrict potassium

34. A 13-year-old with diabetic ketoacidosis is improving when she develops severe headache, bradycardia, incontinence, and declining consciousness. What is the best immediate action?

- A. Administer hypertonic saline or mannitol immediately and reduce neurologic injury risk
- B. Give a rapid large-volume hypotonic bolus
- C. Stop all fluids and insulin for 12 hours
- D. Wait for CT confirmation before treatment

Questions 35-50: Advanced Multisystem Decisions

35. A 7-year-old with short stature has height below the third percentile, growth velocity 3 cm/year, delayed bone age, low IGF-1, and normal weight for height. Which finding most strongly suggests an acquired intracranial cause of growth hormone deficiency?

- A. Delayed bone age
- B. Low IGF-1 alone
- C. Proportionate short stature
- D. Headache with visual-field abnormality

36. A 9-year-old girl has breast development, pubic hair, and accelerated growth beginning at age 7. Bone age is advanced by 2.5 years. Basal LH is pubertal and rises after GnRH stimulation. Brain MRI is normal. What is the most appropriate treatment to preserve adult height?

- A. Aromatase inhibitor as standard first-line monotherapy
- B. Long-acting GnRH agonist
- C. Combined oral contraceptive only
- D. Recombinant growth hormone as sole therapy

37. A 14-year-old has weight loss, tremor, goiter, exophthalmos, free T4 elevation, and suppressed TSH. She develops fever, agitation, vomiting, severe tachycardia, and heart failure after an infection. Which regimen best addresses thyroid storm?

- A. Levothyroxine and iodine together
- B. Beta-blockade, thionamide, iodine after thionamide, and glucocorticoid with supportive care
- C. Radioactive iodine as the immediate first intervention
- D. Observation until thyroid antibody results return

38. A 12-year-old has fatigue, abdominal pain, weight loss, bloody diarrhea, growth deceleration, perianal tags, anemia, elevated CRP, and hypoalbuminemia. Which diagnostic approach is most appropriate?

- A. Ileocolonoscopy and upper endoscopy with biopsies, supplemented by small-bowel imaging
- B. Barium enema as the sole diagnostic test
- C. Empiric gluten-free diet before evaluation
- D. Diagnose irritable bowel syndrome without testing

39. A 3-week-old has progressive jaundice, dark urine, acholic stools, hepatomegaly, and direct bilirubin 5.2 mg/dL. Ultrasound shows an absent or small gallbladder but is not definitive. What is the most important principle of management?

- A. Use phototherapy until direct bilirubin normalizes
- B. Stop all enteral feeds
- C. Wait until 3 months because neonatal cholestasis often resolves
- D. Urgently evaluate for biliary atresia because earlier surgery improves bile drainage

40. A 5-week-old has forceful nonbilious vomiting, weight loss, and hypochloremic alkalosis. Ultrasound is equivocal because measurements are borderline. The infant continues to vomit after correction of dehydration. What is the best next diagnostic step?

- A. Colonoscopy
- B. Upper gastrointestinal contrast study
- C. Barium enema
- D. Meckel scan

41. A 2-day-old has bilious emesis and abdominal distention. Radiograph is nonspecific. The infant is hemodynamically stable without peritoneal signs. Which study should be obtained urgently to evaluate malrotation with midgut volvulus?

- A. Upper gastrointestinal contrast series
- B. Abdominal MRI in one week
- C. Gastric emptying study
- D. Hepatobiliary scan

42. A 7-year-old has progressive gait difficulty, frequent falls, calf hypertrophy, and Gowers sign. CK is 15,000 U/L. Genetic testing identifies a dystrophin variant of uncertain significance that does not establish the diagnosis. Which test may now be appropriate to clarify dystrophin expression?

- A. Lumbar puncture
- B. Nerve conduction study alone
- C. Serum acetylcholine receptor antibodies
- D. Muscle biopsy with dystrophin analysis

43. A 10-year-old has morning headaches, vomiting, papilledema, and horizontal diplopia from sixth-nerve palsy. CT shows obstructive hydrocephalus and a posterior fossa mass. Which management priority is most appropriate?

- A. Treat as migraine and reassess in one month
- B. Begin anticoagulation before further imaging
- C. Perform lumbar puncture to measure opening pressure
- D. Urgent neurosurgical evaluation and avoidance of lumbar puncture

44. A 6-year-old has abrupt behavioral change, insomnia, orofacial dyskinesias, autonomic instability, seizures, and fluctuating consciousness. CSF shows mild lymphocytic pleocytosis; infectious studies are negative. Pelvic imaging identifies an ovarian teratoma. Which diagnosis and treatment are most likely?

- A. Acute disseminated encephalomyelitis; no tumor treatment
- B. Sydenham chorea; penicillin alone
- C. Anti-NMDA receptor encephalitis; tumor removal and immunotherapy
- D. Tourette disorder; behavioral therapy only

45. A 14-year-old has syncope during exercise. ECG shows QTc 520 ms, and a sibling died unexpectedly while swimming. Electrolytes are normal. Which management is most appropriate while specialist evaluation proceeds?

- A. Clear for competitive swimming because the resting rhythm is sinus
- B. Avoid QT-prolonging drugs and strenuous sports; initiate expert-directed therapy such as beta-blockade
- C. Use stimulant medication to prevent bradycardia
- D. Reassure because syncope is vasovagal in most adolescents

46. An 8-year-old develops ascending weakness and areflexia 2 weeks after diarrheal illness. Vital capacity is falling, and he has episodic hypertension and tachycardia. CSF shows high protein with 2 leukocytes/mm³. What is the most appropriate management?

- A. Begin high-dose corticosteroids as proven first-line monotherapy
- B. Discharge with outpatient physical therapy
- C. Perform lumbar puncture daily until protein normalizes
- D. Hospitalize with respiratory and autonomic monitoring and give IVIG or plasma exchange

47. A 12-year-old has fever, severe unilateral hip pain, inability to bear weight, ESR 78 mm/hour, CRP 16 mg/dL, and WBC 15,500/mm³. Ultrasound shows a hip effusion. What is the most appropriate next step?

- A. Delay aspiration until MRI is completed in several days
- B. Begin physical therapy without antimicrobial treatment
- C. Treat as transient synovitis with NSAIDs only
- D. Urgent joint aspiration for cell count and culture followed by empiric antibiotics

48. A 5-year-old has fever, refusal to walk, and focal metaphyseal tibial tenderness. MRI is consistent with acute hematogenous osteomyelitis. Blood culture grows methicillin-susceptible Staphylococcus aureus, and the child improves after 72 hours of intravenous cefazolin. Which plan is most appropriate?

- A. Surgical amputation is required for all culture-positive cases
- B. Stop antibiotics after 72 hours because blood culture is sterile on repeat
- C. Transition to an active oral agent when clinically improved and complete an adequate total course
- D. Continue intravenous vancomycin for 6 months

49. A 13-year-old presents 8 hours after ingesting an unknown number of extended-release acetaminophen tablets. Initial acetaminophen concentration plots below the treatment line, but a repeat level 4 hours later is higher. What is the best management?

- A. Discharge based only on the initial level
- B. Begin N-acetylcysteine and continue serial levels and liver tests
- C. Administer activated charcoal only and avoid antidote
- D. Use the nomogram at 24 hours only

50. A 2-year-old is found with an open bottle of iron tablets. Four hours later she has hematemesis, lethargy, metabolic acidosis, and serum iron 620 micrograms/dL. Abdominal radiograph shows radiopaque tablets. Which therapy is indicated?

- A. Intravenous deferoxamine with aggressive supportive care and consideration of whole-bowel irrigation
- B. N-acetylcysteine infusion
- C. Observation because serum iron peaks late
- D. Oral activated charcoal as definitive therapy