COMPREHENSIVE MOCK EXAM 8

Supplemental to: Pediatric Anesthesiology Board Review 2026-2027

Rasmus Broberg

American Board of Anesthesiology (ABA) Pediatric Anesthesiology Certification Exam — 200 questions, A-type single-best-answer, three options (A-C), domain-weighted to the official blueprint

Board-Review Questions

1. A 3-month-old infant becomes apneic after induction. Compared with an adult, why will arterial oxygen saturation usually fall more rapidly?

A. Lower oxygen consumption combined with a larger functional residual capacity

B. Higher oxygen consumption combined with a smaller functional residual capacity

C. Higher hemoglobin concentration combined with a lower closing capacity

2. During positive-pressure ventilation of a neonate, small changes in airway radius markedly alter resistance. Which physical relationship best explains this?

A. Airway resistance is essentially independent of airway radius at clinical flows

B. Airway resistance varies inversely with approximately the fourth power of radius

C. Airway resistance varies directly with approximately the square of radius

3. A term neonate has a normal hemoglobin concentration but a lower P50 than an older child. What is the principal explanation?

A. A high proportion of fetal hemoglobin shifts the oxygen dissociation curve leftward

B. A high concentration of 2,3-DPG shifts the oxygen dissociation curve rightward

C. A low methemoglobin fraction shifts the oxygen dissociation curve rightward

4. A neonate becomes hypotensive after a modest decrease in heart rate. Why is cardiac output particularly heart-rate dependent at this age?

A. Systemic vascular resistance falls automatically whenever heart rate decreases

B. The neonatal ventricle can markedly increase stroke volume during bradycardia

C. The neonatal myocardium has limited ability to augment stroke volume

5. Which body-composition characteristic most strongly contributes to the larger weight-based dose requirement for some water-soluble drugs in neonates?

A. A smaller extracellular-fluid compartment with greater adipose tissue per kilogram

B. A lower total-body-water fraction with greater plasma protein concentration

C. A larger extracellular-fluid and total-body-water compartment per kilogram

6. A neonate receives a highly protein-bound amide local anesthetic. Which developmental factor increases the unbound drug fraction?

A. Higher plasma protein binding that lowers the freely active drug fraction

B. Lower concentrations of alpha-1 acid glycoprotein and other binding proteins

C. Higher concentrations of alpha-1 acid glycoprotein and albumin

7. Why are neonates especially susceptible to accumulation of amide local anesthetics during repeated dosing?

A. Enhanced hepatic enzyme activity markedly increases amide local-anesthetic clearance

B. Immature hepatic metabolic pathways reduce clearance of many amide agents

C. Renal filtration is the primary route of unchanged amide local-anesthetic elimination

8. A healthy 6-month-old and a healthy 10-year-old receive the same volatile anesthetic. Which age-related statement about MAC is most accurate?

A. MAC is essentially identical from birth through adulthood

B. MAC is lowest in infancy and rises steadily through adolescence

C. MAC is generally higher in infants than in older children and adults

9. Sevoflurane is often selected for inhalational induction in children. Which property most directly supports rapid changes in anesthetic depth?

A. A relatively low blood-gas partition coefficient

B. A relatively high blood-gas partition coefficient

C. Extensive ionization within plasma at physiologic pH

10. Compared with adults, infants often require a larger intravenous succinylcholine dose per kilogram for intubation. What best explains this?

A. Mature pseudocholinesterase activity causes unusually rapid elimination in all infants

B. A smaller extracellular-fluid volume concentrates the drug at the neuromuscular junction

C. A larger extracellular-fluid volume increases the apparent distribution volume

11. A neonate receives a nondepolarizing neuromuscular blocker. Which developmental feature can prolong the clinical effect?

A. Accelerated renal clearance combined with resistance at the neuromuscular junction

B. Increased plasma cholinesterase activity that rapidly hydrolyzes all nondepolarizers

C. Immature renal and hepatic elimination combined with neuromuscular sensitivity

12. Why do small infants lose body heat rapidly in a cool operating room?

A. They have a large surface-area-to-mass ratio and limited insulating tissue

B. They produce little heat because brown adipose tissue is absent at birth

C. They have a small surface-area-to-mass ratio and abundant insulating tissue

13. A cold-stressed neonate increases heat production without shivering. Which tissue is primarily responsible?

A. Skeletal muscle using sustained tetanic contraction

B. Hepatic glycogen using anaerobic glycolysis alone

C. Brown adipose tissue using nonshivering thermogenesis

14. Which developmental respiratory feature contributes to early airway closure during anesthesia in infants?

A. A high elastic recoil that keeps small airways open at low lung volumes

B. A compliant chest wall and relatively low functional residual capacity

C. A rigid chest wall and relatively high functional residual capacity

15. Why may diaphragmatic fatigue develop more rapidly in young infants during increased work of breathing?

A. The diaphragm contains an unusually high proportion of fatigue-resistant type I fibers

B. The diaphragm is protected from fatigue by a larger functional residual capacity

C. The diaphragm contains a lower proportion of fatigue-resistant type I fibers

16. A neonate receives a drug primarily eliminated by glomerular filtration. Which developmental fact is most relevant?

A. Glomerular filtration is fully mature at birth in healthy term neonates

B. Glomerular filtration rate exceeds adult values at birth and falls over time

C. Glomerular filtration rate is low at birth and rises during early infancy

17. Which acid-base change most directly increases cerebral blood flow in an otherwise healthy child?

A. An acute decrease in arterial carbon dioxide tension

B. An acute increase in arterial carbon dioxide tension

C. A mild increase in serum bicarbonate without changing carbon dioxide

18. An infant is ventilated with excessive tidal volumes. Which mechanical property makes the lungs particularly vulnerable to volutrauma?

A. A small absolute lung volume means a modest volume error is large relative to capacity

B. Lower lung compliance that substantially limits volume delivery at usual pressures

C. A large absolute lung volume buffers even substantial volume errors

19. Pulse oximetry is used during induction. What does the device primarily estimate?

A. The partial pressure of dissolved oxygen in arterial plasma

B. The percentage of pulsatile arterial hemoglobin that is oxygen-saturated

C. The total oxygen content including hemoglobin concentration and dissolved oxygen

20. Capnography shows a progressive increase in inspired carbon dioxide during a long case. Which equipment problem is most likely?

A. A pulse oximeter probe positioned on the same extremity as the cuff

B. Exhausted carbon dioxide absorbent or significant rebreathing

C. An excessive fresh-gas flow that washes carbon dioxide from the circuit

21. A pressure-controlled breath is delivered through a very small endotracheal tube. What happens as tube radius decreases?

A. Resistance rises steeply, increasing the pressure required for a given flow

B. Resistance falls steeply, decreasing the pressure required for a given flow

C. Resistance changes minimally because tube length is the dominant determinant

22. A 2-year-old has a cuffed endotracheal tube. Which principle best protects against mucosal ischemia?

A. Keep cuff pressure no higher than needed for an effective seal

B. Use a high cuff pressure because pediatric tracheal mucosa tolerates compression well

C. Inflate the cuff until no leak exists at any airway pressure

23. During rapid blood loss, why can blood pressure remain normal until late in an infant?

A. Stroke volume reserve is so large that heart rate usually falls during hypovolemia

B. A large increase in stroke volume is the main early response to hypovolemia

C. Compensatory vasoconstriction and tachycardia can temporarily preserve pressure

24. A child develops a low measured ionized calcium level during massive transfusion. Which transfusion component is responsible?

A. 2,3-DPG in donor erythrocytes chelates calcium in plasma

B. Citrate in stored blood binds circulating calcium

C. Potassium in stored blood directly precipitates circulating calcium

25. A neonate has a higher resting metabolic rate per kilogram than an adult. Which perioperative implication follows most directly?

A. Hypoglycemia and oxygen depletion can develop more rapidly during physiologic stress

B. Fasting is better tolerated because hepatic glycogen stores are proportionally larger

C. Oxygen reserve is greater because metabolic demand falls sharply during infancy

26. A local anesthetic enters the systemic circulation in a high concentration. Which property makes bupivacaine particularly concerning?

A. Predominant beta-adrenergic stimulation causing transient sinus tachycardia

B. Strong cardiac sodium-channel binding can cause severe refractory cardiotoxicity

C. Rapid spontaneous hydrolysis prevents significant cardiac toxicity

27. A child with acidosis develops a greater un-ionized fraction of a weak acid drug. Which concept governs this change?

A. The Fick principle relating flow to arteriovenous concentration difference

B. The alveolar gas equation relating inspired oxygen to alveolar oxygen

C. The Henderson-Hasselbalch relationship between pH and ionization

28. A volatile anesthetic concentration rises rapidly in the alveoli during mask induction. Which change would generally accelerate this rise?

A. Increasing cardiac uptake of anesthetic from the alveoli

B. Increasing alveolar ventilation relative to functional residual capacity

C. Increasing blood solubility while holding ventilation constant

29. Why does right-to-left intracardiac shunting delay inhalational induction?

A. All pulmonary blood flow is forced through ventilated alveoli, increasing uptake

B. Some cardiac output bypasses ventilated alveoli and reaches the brain without equilibrating

C. The shunt increases alveolar ventilation and rapidly raises arterial anesthetic tension

30. A child has a large left-to-right shunt. Which effect on intravenous induction is most expected?

A. Intravenous induction is usually only modestly affected compared with major right-to-left shunting

B. Intravenous induction is substantially slowed by recirculation through the pulmonary circuit

C. Intravenous induction is accelerated because pulmonary overcirculation increases drug delivery to the brain

31. A neuromuscular monitor shows four equal twitches after recovery. What is the principal limitation of visual or tactile assessment?

A. Four visible twitches guarantee a train-of-four ratio above 0.9

B. Qualitative monitoring is more sensitive than quantitative ratio measurement

C. Residual weakness may persist despite an apparently normal qualitative train-of-four

32. A child is receiving high inspired oxygen concentration for prolonged ventilation. Which mechanism contributes to absorption atelectasis?

A. High inspired oxygen prevents alveolar gas uptake from low-ventilation units

B. Nitrogen washout allows oxygen in poorly ventilated alveoli to be absorbed rapidly

C. Oxygen increases alveolar nitrogen concentration and splints small airways open

33. A 4-year-old with an upper respiratory infection has fever, purulent secretions, and wheezing before elective surgery. What is the best plan?

A. Proceed because upper respiratory symptoms do not alter perioperative respiratory risk

B. Postpone elective anesthesia until the significant respiratory illness has resolved

C. Proceed after giving an antitussive because fever does not affect airway reactivity

34. A child with well-controlled asthma develops bronchospasm after intubation. Which anesthetic is most helpful for bronchodilation while deepening anesthesia?

A. Sevoflurane delivered while ensuring adequate ventilation and oxygenation

B. Nitrous oxide alone because it directly relaxes bronchial smooth muscle

C. Desflurane rapidly increased because airway irritation improves bronchospasm

35. A child with severe obstructive sleep apnea is scheduled for tonsillectomy. Which postoperative concern is most important?

A. Resistance to opioid effect requiring substantially larger postoperative doses

B. Enhanced sensitivity to opioid respiratory depression and recurrent airway obstruction

C. Low risk of airway obstruction once the tonsils have been removed

36. A toddler with suspected epiglottitis is sitting upright, drooling, and has inspiratory stridor. What is the safest airway principle?

A. Administer a long-acting neuromuscular blocker before airway equipment is ready

B. Avoid upsetting the child and preserve spontaneous ventilation until the airway is secured

C. Force the child supine and perform repeated direct laryngoscopy while awake

37. A child with tracheomalacia has expiratory airway collapse. Which intervention is most likely to improve patency during anesthesia?

A. Reducing end-expiratory pressure to zero to increase dynamic collapse

B. Using vigorous spontaneous expiration to raise intrathoracic pressure

C. Applying positive airway pressure to pneumatically splint the airway

38. A 2-year-old aspirated a peanut and now has unilateral wheeze. Which procedure is definitive for removal?

A. Routine endotracheal intubation followed by postoperative observation

B. Flexible nasopharyngoscopy performed without airway equipment

C. Rigid bronchoscopy performed with an experienced airway team

39. A child with pulmonary hypertension becomes hypoxemic and acidotic. Why is this particularly dangerous?

A. Hypoxemia and acidosis reliably decrease pulmonary vascular resistance

B. Hypoxemia and acidosis can acutely increase pulmonary vascular resistance

C. Pulmonary vascular tone is governed mainly by fixed anatomy rather than acute gas exchange

40. A newborn with a congenital diaphragmatic hernia requires stabilization. Which initial respiratory strategy is preferred?

A. Spontaneous breathing without gastric decompression until surgical incision

B. Repeated bag-mask ventilation with large tidal volumes before gastric decompression

C. Tracheal intubation with gastric decompression while avoiding vigorous mask ventilation

41. A premature infant with bronchopulmonary dysplasia requires general anesthesia. Which ventilatory approach is most appropriate?

A. Use moderately larger tidal volumes with recruitment to overcome chronically reduced compliance

B. Use rapid respiratory rates with minimal expiratory time to prevent atelectasis

C. Use lung-protective pressures while allowing adequate expiratory time and avoiding air trapping

42. A child with cystic fibrosis has copious secretions. Which perioperative strategy is most useful?

A. Optimize airway clearance and hydration while minimizing secretion retention

B. Avoid humidification because dry gases reduce mucus production during anesthesia

C. Withhold bronchodilators and airway-clearance therapy on the day of surgery

43. A child develops inspiratory stridor immediately after extubation following prolonged intubation. What is the most likely mechanism?

A. Lower-airway bronchospasm causing increased expiratory resistance after airway stimulation

B. Pulmonary embolism causing dynamic supraglottic collapse

C. Postextubation upper-airway edema causing critical narrowing of the pediatric airway

44. A child with a mediastinal mass has orthopnea and airway compression on imaging. Which feature most increases anesthetic risk?

A. Normal exercise tolerance with no positional symptoms

B. Symptoms and imaging suggesting dynamic airway or cardiovascular compression when supine

C. A small asymptomatic mass without tracheal or vascular compression

45. A cyanotic child with tetralogy of Fallot develops an acute hypercyanotic spell. Which intervention is appropriate?

A. Decrease systemic vascular resistance to promote right-to-left ejection

B. Increase systemic vascular resistance and reduce right-to-left shunting

C. Increase pulmonary vascular resistance by inducing hypercarbia

46. A neonate has a ductal-dependent systemic circulation. Which infusion is used to maintain ductal patency?

A. Prostaglandin E1

B. Ibuprofen

C. Indomethacin

47. A neonate receiving prostaglandin E1 becomes apneic. What is the best interpretation?

A. Apnea proves the ductus has closed and prostaglandin should be doubled

B. Apnea indicates opioid withdrawal rather than an effect of prostaglandin

C. Apnea is a recognized adverse effect and may require ventilatory support

48. A child with a large ventricular septal defect has pulmonary overcirculation. Which change tends to increase left-to-right shunting?

A. A fall in systemic arterial pressure with unchanged pulmonary resistance

B. A decrease in pulmonary vascular resistance relative to systemic vascular resistance

C. A marked increase in pulmonary vascular resistance relative to systemic resistance

49. A child with a bidirectional Glenn circulation becomes markedly hypercarbic. What effect is most concerning?

A. Increased pulmonary vascular resistance can reduce passive pulmonary blood flow

B. Lower pulmonary vascular resistance can reduce the pressure gradient driving cavopulmonary flow

C. Hypercarbia primarily increases cerebral blood flow without materially changing pulmonary resistance

50. A child with Fontan circulation becomes hypovolemic. Why can cardiac output fall sharply?

A. Systemic output is independent of pulmonary vascular resistance in Fontan physiology

B. Pulmonary blood flow depends on adequate venous pressure and preload without a subpulmonary ventricle

C. The Fontan circuit contains a powerful subpulmonary ventricle that compensates for low preload

51. A neonate with transposition of the great arteries is profoundly cyanotic despite oxygen. Which physiologic feature is necessary for survival?

A. Complete closure of all atrial and ductal communications

B. A very high systemic vascular resistance with no intracardiac mixing

C. Adequate mixing between the parallel pulmonary and systemic circulations

52. A child with unrepaired coarctation of the aorta is anesthetized. Where should arterial pressure be assessed to best evaluate perfusion proximal to the obstruction?

A. A femoral or pedal artery distal to the obstruction to estimate cerebral perfusion

B. A lower-extremity artery because distal pressure best reflects proximal aortic pressure

C. An upper-extremity artery proximal to the coarctation

53. A child with aortic stenosis becomes tachycardic and hypotensive. Which hemodynamic goal is most appropriate?

A. Deliberately reduce systemic vascular resistance to maximize forward flow

B. Preserve sinus rhythm, preload, and systemic vascular resistance while avoiding tachycardia

C. Allow marked tachycardia to shorten systole and reduce ventricular work

54. A child with severe pulmonary stenosis has right-ventricular hypertrophy. Which intraoperative change should be avoided?

A. An acute increase in pulmonary vascular resistance

B. Maintenance of normal oxygenation and acid-base status

C. A modest increase in systemic vascular resistance

55. A child with dilated cardiomyopathy has poor systolic function. Which anesthetic goal is most appropriate?

A. Avoid sudden increases in afterload and preserve forward flow with careful preload

B. Increase afterload substantially to improve ventricular ejection fraction

C. Use a slower heart rate even if systemic pressure falls, to maximize diastolic filling time

56. A child with hypertrophic cardiomyopathy becomes hypotensive after induction. Which change may worsen dynamic outflow obstruction?

A. A slower heart rate with preserved diastolic filling

B. Increased preload with a modest increase in systemic vascular resistance

C. Decreased preload and decreased systemic vascular resistance

57. A child with Eisenmenger physiology is anesthetized. Which event is especially hazardous?

A. A sudden fall in systemic vascular resistance that increases right-to-left shunting

B. A modest rise in systemic vascular resistance that supports systemic pressure

C. Avoidance of hypoxemia, hypercarbia, and acidosis

58. A child with a left-to-right shunt develops pulmonary vascular disease. What change marks progression toward Eisenmenger physiology?

A. Pulmonary vascular resistance rises enough for shunt reversal to right-to-left

B. Shunt direction is determined mainly by the anatomic defect once pulmonary hypertension develops

C. Pulmonary vascular resistance falls progressively and pulmonary flow increases indefinitely

59. A child after cardiopulmonary bypass has low ionized calcium and poor contractility. Which treatment directly addresses this finding?

A. Administer sodium bicarbonate first because correcting acidosis restores ionized calcium sufficiently

B. Administer calcium while reassessing hemodynamics and ionized concentration

C. Give free water to dilute citrate and raise ionized calcium

60. A child with pericardial tamponade needs urgent drainage. Which induction principle is most important?

A. Apply high positive intrathoracic pressure immediately to improve venous return

B. Maintain venous return, heart rate, and sympathetic tone until decompression

C. Use deep vasodilating anesthesia to reduce systemic vascular resistance before drainage

61. A child with acute myocarditis has ventricular dysfunction and arrhythmias. Which anesthetic concern is greatest?

A. Excessive contractile reserve causing hypertension during all anesthetic stages

B. Complete protection from arrhythmia once general anesthesia is induced

C. Limited cardiac reserve with risk of malignant arrhythmia and hemodynamic collapse

62. A child with a prolonged QT syndrome is scheduled for surgery. Which perioperative goal is most appropriate?

A. Avoid major sympathetic surges and medications known to further prolong QT

B. Maintain a low heart rate even if long pauses occur, because repolarization is improved

C. Intentionally produce hypokalemia to shorten ventricular repolarization

63. A child with supraventricular tachycardia is stable but has a regular narrow-complex rhythm. Which initial approach is appropriate?

A. Give a large dose of long-acting beta agonist to slow AV conduction

B. Attempt vagal maneuvers and follow pediatric tachycardia algorithms

C. Perform immediate unsynchronized defibrillation despite stable perfusion

64. A child with increased intracranial pressure requires induction. Which physiologic disturbance should be avoided because it increases cerebral blood volume?

A. Normocapnia

B. Mild hypocarbia

C. Hypercarbia

65. A child with a ventriculoperitoneal shunt has headache, vomiting, and declining mental status. What should be assumed until proven otherwise?

A. Simple postoperative nausea unrelated to intracranial pressure

B. Shunt malfunction with rising intracranial pressure

C. Low intracranial pressure from chronic hyperventilation causing compensatory nausea and lethargy

66. A child with myelomeningocele has had many prior operations. Which perioperative allergy is particularly important?

A. Nickel intolerance limited to jewelry exposure

B. Latex hypersensitivity

C. Iodine deficiency

67. A child with Duchenne muscular dystrophy requires anesthesia. Which agent should generally be avoided because of rhabdomyolysis and hyperkalemia risk?

A. Rocuronium

B. Cisatracurium

C. Succinylcholine

68. A child with a seizure disorder has missed several doses of anticonvulsant medication. What is the best perioperative approach?

A. Hold the anticonvulsant until after surgery to minimize interactions, then restart promptly

B. Withhold all antiepileptics for 24 hours to reduce anesthetic drug interactions

C. Restore the antiepileptic regimen when feasible and avoid unnecessary interruption

69. A child with severe cerebral palsy has chronic aspiration and reflux. Which anesthetic issue deserves particular attention?

A. Reduced secretion burden because impaired swallowing decreases oral intake before anesthesia

B. Airway protection and aspiration risk during induction and emergence

C. Universal resistance to sedatives and opioids requiring unusually high doses

70. A child with nephrotic syndrome has marked hypoalbuminemia. Which pharmacologic effect is plausible for a highly albumin-bound drug?

A. Protein binding has little clinical effect because rapid tissue uptake dominates highly bound drugs

B. A larger free drug fraction may increase clinical effect at a given total concentration

C. A smaller unbound fraction may occur because hypoalbuminemia increases compensatory drug binding

71. A child with advanced renal failure has hyperkalemia before elective surgery. What is the most appropriate response?

A. Evaluate and correct clinically significant hyperkalemia before proceeding electively

B. Proceed without further evaluation because potassium does not affect cardiac conduction

C. Give succinylcholine specifically to lower serum potassium before incision

72. A child with renal failure receives morphine. Why can prolonged respiratory depression occur?

A. Renal failure converts morphine into an inactive metabolite more rapidly

B. Active morphine metabolites are renally eliminated and can accumulate

C. Renal failure increases hepatic conversion of morphine into less active glucuronide metabolites

73. A child with posterior urethral valves has chronic kidney disease. Which preoperative issue is most important?

A. Assess volume status, electrolytes, renal function, and blood pressure

B. Focus on urine output because chronic obstruction rarely causes major electrolyte disturbance

C. Avoid measuring blood pressure because hypertension is not associated with renal disease

74. An infant with pyloric stenosis has persistent vomiting. Which acid-base pattern is classic before adequate resuscitation?

A. Hypochloremic, hypokalemic metabolic alkalosis

B. Respiratory acidosis caused by chloride retention

C. Hyperchloremic metabolic acidosis with severe hyperkalemia

75. A neonate with gastroschisis arrives for surgery. Which physiologic problem is especially important?

A. Minimal fluid loss because the bowel is covered by a protective sac

B. Low risk of hypothermia because exposed bowel generates metabolic heat

C. Large evaporative heat and fluid losses from exposed bowel

76. A neonate with an omphalocele is evaluated before repair. What additional concern is particularly important?

A. Primary pulmonary vascular disease is the major associated abnormality in most affected neonates

B. Associated anomalies are uncommon, so routine cardiac evaluation rarely changes perioperative planning

C. Associated congenital anomalies, including cardiac abnormalities

77. A child with biliary atresia and advanced liver disease presents for surgery. Which hemostatic issue is common?

A. Coagulopathy from impaired synthesis and vitamin-K-related deficiency

B. Universal hypercoagulability with no bleeding risk

C. Normal coagulation because pediatric liver disease spares synthetic function

78. A child with sickle cell disease requires surgery. Which strategy helps reduce perioperative sickling risk?

A. Allow prolonged hypoxemia because fetal hemoglobin protects older children

B. Induce hypothermia and relative dehydration to reduce blood viscosity

C. Avoid hypoxemia, hypothermia, acidosis, dehydration, and severe pain

79. A boy with hemophilia A is scheduled for major surgery. Which deficiency requires replacement planning?

A. Factor IX

B. von Willebrand factor alone

C. Factor VIII

80. A child with von Willebrand disease has mucosal bleeding. Which therapy may be useful in selected responsive types?

A. Desmopressin to increase endogenous von Willebrand factor release

B. Vitamin K to replace a congenital factor VIII mutation

C. Protamine to neutralize endogenous heparin

81. A child receiving massive transfusion develops diffuse bleeding despite adequate surgical hemostasis. Which acquired problem should be considered?

A. Dilutional coagulopathy with platelet and fibrinogen depletion

B. Isolated polycythemia caused by crystalloid administration

C. Stored red-cell transfusion usually replaces enough fibrinogen to offset dilution from crystalloid

82. A child with congenital adrenal hyperplasia on chronic glucocorticoids presents for major surgery. What is the principal endocrine concern?

A. Primary hyperinsulinemia caused by chronic glucocorticoid therapy

B. Inadequate stress cortisol response requiring perioperative steroid planning

C. Excess endogenous cortisol response making supplementation dangerous in all cases

83. A child with type 1 diabetes is fasting for surgery. Which management goal is most appropriate?

A. Stop all insulin because fasting eliminates the risk of ketoacidosis

B. Allow severe hyperglycemia because it protects against perioperative hypoglycemia

C. Prevent both hypoglycemia and significant hyperglycemia while providing necessary insulin

84. A child with hyperthyroidism is poorly controlled before elective surgery. Which complication is most concerning?

A. Thyroid storm triggered by surgical and anesthetic stress

B. Profound bradycardia as the expected response to catecholamines

C. Myxedema coma from excess thyroid hormone

85. A child with mitochondrial disease requires anesthesia. Which principle is most appropriate?

A. Prolong fasting to force fatty-acid metabolism before anesthesia

B. Minimize prolonged fasting and avoid major metabolic stress while tailoring drugs to phenotype

C. Use a standard anesthetic plan because mitochondrial phenotypes respond similarly to fasting and stress

86. A former 28-week premature infant is now 52 weeks postmenstrual age and scheduled for hernia repair. What postoperative issue is most important?

A. Primary risk of malignant hyperthermia caused by prematurity

B. Postoperative apnea risk becomes negligible once the infant reaches term-equivalent postmenstrual age

C. Risk of postoperative apnea requiring appropriate monitoring

87. A premature infant with anemia is scheduled for elective surgery. How does anemia affect postoperative apnea risk?

A. Anemia reliably protects against apnea by increasing cardiac output

B. Anemia has no relationship to postoperative respiratory events in former preterm infants

C. Anemia increases the risk and supports more cautious postoperative monitoring

88. A neonate with necrotizing enterocolitis requires laparotomy and has metabolic acidosis and hypotension. What is the anesthetic priority?

A. Resuscitate sepsis and shock while providing controlled rapid operative support

B. Use minimal monitoring because neonates compensate well for septic shock

C. Delay all resuscitation until the bowel has been resected

89. A neonate with esophageal atresia and distal tracheoesophageal fistula requires repair. Which airway goal is important?

A. Position the endotracheal tube to ventilate the lungs while minimizing gas flow through the fistula

B. Intentionally ventilate through the fistula to distend the stomach before surgery

C. Use high airway pressures because fistula flow decreases as pressure rises

90. A neonate with congenital diaphragmatic hernia is stable after initial resuscitation. When should repair generally occur?

A. Proceed to immediate repair before stabilization to minimize continuing pulmonary compression

B. After physiologic stabilization rather than as an immediate delivery-room emergency

C. Immediately before stabilization because anatomy alone determines outcome

91. A neonate with omphalocele has a very large defect and pulmonary hypoplasia. What anesthetic challenge is likely during closure?

A. Increased intra-abdominal pressure can impair ventilation and venous return

B. Primary closure usually improves compliance because returning bowel restores diaphragmatic mechanics

C. Closure pressure mainly affects the wound and has little effect on venous return

92. An infant with hypertrophic pyloric stenosis has been resuscitated and is ready for pyloromyotomy. Which induction issue remains important?

A. Avoid gastric decompression because it increases aspiration risk

B. Treat the stomach as potentially full and use an aspiration-risk strategy

C. Assume gastric emptying is normal once serum chloride is corrected

93. A neonate undergoes surgery for intestinal obstruction. Which temperature strategy is most appropriate?

A. Allow mild hypothermia to reduce oxygen demand while avoiding active warming during bowel surgery

B. Use warmed fluids but avoid external warming because premature skin is highly vulnerable to heat injury

C. Use active warming, warmed fluids, and continuous core-temperature monitoring

94. A newborn needs laser treatment for retinopathy of prematurity. Which perioperative concern is common in this population?

A. Apnea and cardiorespiratory instability related to extreme prematurity

B. Respiratory risk is low because ophthalmic procedures do not require airway manipulation

C. Systemic hypertension from retinal vascular disease is the dominant perioperative problem

95. A neonate with an open abdominal wall defect requires transport to the operating room. Which immediate measure is most important?

A. Leave exposed bowel uncovered to permit cooling and inspection

B. Protect exposed viscera while minimizing heat and evaporative fluid loss

C. Apply direct pressure to reduce the bowel into the abdomen before stabilization

96. A child with tetralogy of Fallot is undergoing complete repair. Before bypass, what change most favors pulmonary blood flow?

A. Maintaining systemic vascular resistance and avoiding increases in pulmonary vascular resistance

B. Inducing hypercarbia and acidosis to dilate the right-ventricular outflow tract

C. Reducing systemic vascular resistance while increasing pulmonary vascular resistance

97. A neonate with hypoplastic left heart syndrome is awaiting stage-one palliation. Why can excessive oxygen and hyperventilation be harmful?

A. Higher inspired oxygen improves systemic delivery by raising saturation without changing flow distribution

B. They close the ductus arteriosus immediately through a direct mechanical effect

C. They may lower pulmonary vascular resistance and steal flow from systemic perfusion

98. A child after a bidirectional Glenn procedure is ventilated in the ICU. Which strategy generally supports pulmonary blood flow?

A. Induce persistent hypercarbia because it lowers pulmonary vascular resistance

B. Use very high positive end-expiratory pressure to force venous blood into the lungs

C. Avoid excessive mean airway pressure and maintain low pulmonary vascular resistance

99. A child with Fontan circulation requires laparoscopic surgery. What is a specific concern with pneumoperitoneum?

A. Pneumoperitoneum invariably increases passive pulmonary blood flow

B. Raised intrathoracic and abdominal pressures can reduce venous return and Fontan flow

C. Fontan flow is maintained primarily by ventricular systolic pressure and is relatively preload independent

100. A child after congenital heart surgery develops junctional ectopic tachycardia. Which consequence is most concerning?

A. Junctional tachycardia mainly increases myocardial oxygen demand while preserving atrioventricular filling

B. Rapid junctional rhythm can improve output by increasing heart rate when stroke volume is limited

C. Loss of atrioventricular synchrony and rapid rate can markedly reduce cardiac output

101. A child undergoing cardiopulmonary bypass is cooled. What is one important effect of hypothermia on anesthetic management?

A. Drug metabolism accelerates uniformly and recovery becomes faster

B. Drug metabolism and recovery may be slowed as temperature falls

C. Neuromuscular blocker recovery is largely temperature independent compared with volatile anesthetic washout

102. After pediatric cardiac surgery, a child has low cardiac output and high lactate. Which assessment is most important?

A. Give an empiric fluid bolus first because postoperative low output most often reflects hypovolemia

B. Evaluate preload, rhythm, contractility, afterload, and residual lesions systematically

C. Increase opioid analgesia first because sympathetic stress is the usual cause of low cardiac output

103. A child with repaired congenital heart disease presents for noncardiac surgery. What is the best preoperative approach?

A. Use the original lesion and repair type as the main guide because residual physiology is usually minimal

B. Stop all cardiac medications routinely on the morning of surgery

C. Define current anatomy, ventricular function, rhythm, medications, and residual lesions

104. A 6-year-old with recurrent tonsillitis and severe OSA is scheduled for adenotonsillectomy. Which analgesic strategy is preferable?

A. Avoid nonopioid analgesics because they do not reduce respiratory events

B. Use large routine opioid doses because OSA causes opioid resistance

C. Use multimodal, opioid-sparing analgesia with postoperative respiratory vigilance

105. A child undergoing tonsillectomy has brisk pharyngeal bleeding and swallowed blood. What is the induction concern?

A. Assume the stomach is empty because the child has been fasting

B. Treat the child as having a full stomach with potential hypovolemia

C. Use a carefully titrated inhalational induction while maintaining spontaneous ventilation despite swallowed blood

106. A toddler undergoing myringotomy has no IV before induction. Which approach is commonly appropriate for an otherwise healthy child?

A. Place central venous access before induction because short ear procedures frequently cause major fluid shifts

B. Brief inhalational induction with airway management tailored to procedure and risk

C. Perform awake flexible endoscopic intubation to avoid mask ventilation during the brief procedure

107. A child with a large lingual tonsil or craniofacial anomaly has a known difficult airway. What is the key planning principle?

A. Induce paralysis before confirming that mask ventilation or rescue options are feasible

B. Rely on a single preferred device because backup plans increase confusion

C. Preserve oxygenation and have a staged primary and rescue airway plan

108. A child develops laryngospasm after tonsillectomy. Initial airway maneuvers and continuous positive pressure fail. What is the next step if severe obstruction persists?

A. Deepen anesthesia and administer an effective neuromuscular relaxant if needed

B. Remove oxygen because high inspired oxygen prolongs laryngospasm

C. Continue forceful bagging indefinitely without changing treatment

109. A child with Pierre Robin sequence has micrognathia and glossoptosis. Which airway problem is most likely?

A. Lower-airway obstruction caused by fixed mainstem bronchial stenosis

B. Easy direct laryngoscopy because micrognathia increases mandibular space

C. Upper-airway obstruction and difficult laryngoscopy from posterior tongue displacement

110. An infant with cleft palate is undergoing repair. Which postoperative issue deserves special attention?

A. Airway obstruction from edema, blood, positioning, or residual anesthetic effect

B. Positive-pressure ventilation after palate repair commonly causes a small pneumothorax that explains obstruction

C. Palatal closure usually enlarges the functional pharyngeal airway enough to reduce early obstruction risk

111. A child with Treacher Collins syndrome requires surgery. Which finding should be anticipated?

A. Difficult mask ventilation or intubation related to craniofacial hypoplasia

B. Direct laryngoscopy is often straightforward because mandibular hypoplasia improves the line of sight

C. A primary lower-airway disease with normal upper-airway anatomy

112. A child with craniosynostosis and midface hypoplasia has severe OSA. What postoperative disposition may be appropriate after major craniofacial surgery?

A. Routine ward care is sufficient once the trachea is extubated because the major obstructive lesion is corrected

B. Monitored care with readiness for airway obstruction and respiratory support

C. Immediate unmonitored discharge once the child is awake

113. A child undergoes posterior fossa surgery in a sitting position. Which intraoperative complication requires vigilance?

A. Tension pneumocephalus from intracranial air expansion during head elevation

B. Venous air embolism from entrainment of air into open cranial veins

C. Acute appendicitis caused by head elevation

114. A child with a large brain tumor has vomiting and papilledema. Which induction priority is most important?

A. Use severe hypotension to reduce cerebral blood volume

B. Allow prolonged hypoventilation to increase cerebral perfusion

C. Avoid hypoxemia, hypotension, and uncontrolled hypercarbia while securing the airway

115. A child with a seizure focus undergoes electrocorticography. Which anesthetic consideration is important?

A. Volatile anesthetic depth has little influence on cortical epileptiform activity used for mapping

B. Deep neuromuscular blockade eliminates cortical seizure discharges

C. Anesthetic drugs can alter cortical electrical activity and may need adjustment for mapping

116. A child undergoing spinal fusion for neuromuscular scoliosis has restrictive lung disease. What preoperative issue is most important?

A. Assess pulmonary reserve and plan for possible postoperative ventilatory support

B. Pulmonary evaluation can be limited to symptoms because spinal deformity seldom changes postoperative ventilation needs

C. Assume normal respiratory mechanics because the disease is primarily orthopedic

117. A child with Duchenne muscular dystrophy undergoes scoliosis surgery. Which anesthetic technique reduces a major drug-related risk?

A. Use succinylcholine for rapid intubation because brief exposure minimizes potassium release

B. Use prolonged fasting because it prevents muscular breakdown

C. Avoid succinylcholine and carefully consider avoiding volatile-triggered rhabdomyolysis

118. During scoliosis surgery with motor-evoked potentials, which drug class most strongly suppresses the monitored response?

A. Low-dose ketamine

B. Short-acting opioids

C. Neuromuscular blocking agents

119. A child undergoes limb surgery with a tourniquet for a prolonged period. What can occur after tourniquet release?

A. Immediate severe hypokalemia from sequestration of potassium in the limb

B. A transient washout of acid, potassium, and metabolites with hemodynamic change

C. No systemic physiologic effect because tourniquet blood is isolated permanently

120. A child with osteogenesis imperfecta is scheduled for fracture fixation. Which anesthetic concern is important?

A. Use succinylcholine to reduce muscle movement and thereby lower the chance of fracture during induction

B. Fragile bones require careful positioning and transfer to avoid iatrogenic fracture

C. Standard forceful positioning is acceptable if fractures are supported immediately after they occur

121. A child undergoing hypospadias repair receives a caudal block. What is the main benefit?

A. Effective lower abdominal and perineal analgesia with opioid sparing

B. Reliable anesthesia of the entire upper thorax and both arms

C. Caudal blockade prevents postoperative urinary retention by reducing pelvic-floor muscle tone

122. A child with posterior urethral valves undergoes endoscopic treatment. What perioperative data are especially important?

A. Serum amylase because urinary obstruction primarily affects the pancreas

B. Platelet count and coagulation testing are more important than renal chemistry for lower urinary obstruction

C. Renal function, electrolyte status, and current blood pressure control

123. A child undergoes nephrectomy for a large renal tumor. Which preparation is appropriate?

A. Plan for potential major blood loss and secure adequate vascular access

B. Assume blood loss will be negligible because the patient is a child

C. Routine blood availability is unnecessary because pediatric renal tumors are typically minimally vascular

124. A child with severe reflux and recurrent aspiration undergoes fundoplication. Which pulmonary issue is relevant?

A. Aspiration history has no anesthetic relevance once the child is fasting

B. Chronic aspiration may have caused reactive airways or recurrent lung injury

C. Reflux protects the lungs by increasing cough clearance

125. A child with inflammatory bowel disease on long-term steroids undergoes abdominal surgery. Which preoperative issue is important?

A. Consider adrenal suppression and immunosuppressive complications

B. Chronic steroid therapy usually preserves a full stress cortisol response, so supplementation is rarely considered

C. Stop all steroids abruptly before surgery to reduce infection risk

126. A child with short bowel syndrome has a central venous catheter and is on parenteral nutrition. Which perioperative concern is common?

A. Electrolyte disturbances are unusual when parenteral nutrition is prescribed by weight and adjusted regularly

B. Central-line infection or thrombosis plus parenteral-nutrition metabolic abnormalities

C. Liver dysfunction is unlikely because nutrients bypass the gastrointestinal tract and enter the venous circulation

127. A child undergoing laparoscopic appendectomy becomes bradycardic immediately after peritoneal insufflation. What is the likely mechanism?

A. Vagal stimulation from rapid peritoneal stretch

B. Carbon dioxide absorption causing hypercarbia with secondary sympathetic changes

C. Acute sodium depletion caused by the insufflation gas

128. A child with major blunt trauma is hypotensive and has abdominal distention. What is the anesthetic priority?

A. Use repeated large crystalloid boluses until the blood pressure normalizes before giving blood products

B. Rapid hemorrhage control with balanced resuscitation and prevention of hypothermia

C. Delay vascular access until after induction to avoid distress

129. A burned child presents several weeks after the injury and needs grafting. Why is succinylcholine dangerous?

A. The burn causes persistent hypokalemia that succinylcholine worsens

B. Upregulated extrajunctional acetylcholine receptors can cause severe hyperkalemia

C. Succinylcholine effect is reduced after burns because denervated muscle becomes less responsive to depolarization

130. A child with 30% total body surface area burns is in the early resuscitation phase. Which physiologic problem is expected?

A. Large capillary leak with intravascular volume depletion and edema

B. The eschar limits evaporative heat loss enough that hypothermia is less important during early resuscitation

C. Immediate sustained hypervolemia because burned tissue releases fluid into plasma

131. A child with traumatic brain injury is hypotensive. Why is prompt treatment important?

A. Hypotension reduces intracranial pressure enough to protect injured brain

B. Children with head injury tolerate hypotension better than adults because autoregulation is stronger

C. Hypotension can reduce cerebral perfusion pressure and worsen secondary brain injury

132. A child after liver transplantation requires a nontransplant procedure. What should be reviewed preoperatively?

A. Graft function, immunosuppression, infection risk, renal function, and drug interactions

B. Stop immunosuppression routinely to improve wound healing

C. The original transplant indication is the key determinant because graft function and immunosuppression are usually stable

133. A child needs MRI under anesthesia and has a difficult airway history. What is the central remote-location concern?

A. MRI eliminates the need for airway equipment because no surgical incision is made

B. Airway rescue is harder in the scanner, so equipment and an extraction plan must be ready

C. Standard airway equipment can be used near the scanner as long as the anesthesiologist maintains physical control

134. A child with a tracheostomy presents for dental surgery. What preoperative information is most important?

A. Tracheostomy type, size, maturity, indication, and the plan if it becomes dislodged

B. Mature tracheostomy tubes can generally be replaced without knowing the original airway indication

C. The dental procedure and fasting status are more important than tracheostomy details when the tube is functioning

135. A child with repaired esophageal atresia has chronic cough and recurrent pneumonia. Which late problem should be considered?

A. Tracheomalacia or recurrent aspiration-related disease

B. Successful repair usually resolves the tracheomalacia and aspiration tendency

C. Postrepair cough is most consistent with fixed fibrosis from the thoracic operation

136. A child with Down syndrome is scheduled for surgery. Which airway and cervical issue should be considered?

A. Routine neck extension is appropriate unless the child has previously documented cervical neurologic symptoms

B. Airway anatomy is usually favorable, so obstructive sleep apnea is not a major perioperative concern

C. Macroglossia, OSA, and potential cervical instability depending on symptoms and procedure

137. A child with mucopolysaccharidosis requires repeated procedures. Which anesthetic challenge often worsens with age?

A. Progressively easier mask ventilation as soft tissue deposition increases

B. Complete resolution of cervical spine abnormalities after early childhood

C. Progressive difficult airway from tissue deposition and skeletal changes

138. A healthy 5-year-old drank clear apple juice two hours before elective anesthesia. What is the appropriate fasting interpretation?

A. Clear liquids are generally acceptable up to two hours before anesthesia in standard fasting guidance

B. Clear liquids require the same fasting interval as fatty solid food

C. Treat apple juice as a light meal and require a longer fasting interval before elective anesthesia

139. A child on chronic clonidine presents for surgery. Which medication plan is generally appropriate?

A. Continue clonidine to avoid withdrawal hypertension and sympathetic activation

B. Hold the morning clonidine dose to reduce additive bradycardia and restart it after surgery

C. Double the dose automatically because anesthetics cause clonidine resistance

140. A child with severe OSA and obesity is scheduled for ambulatory surgery. What is the most important preoperative planning issue?

A. Plan routine ambulatory discharge if the procedure is brief, because obesity increases oxygen reserve

B. Assume obesity lowers respiratory risk because oxygen stores are larger

C. Assess postoperative airway risk and whether the setting can provide needed monitoring

141. A child with a recent uncomplicated mild URI has only clear rhinorrhea and no fever or wheeze. What is the best approach?

A. Individualize the decision based on age, procedure, airway plan, and symptom severity

B. Postpone for several weeks after any URI symptom because airway reactivity remains uniformly high

C. Proceed without modification because clear rhinorrhea does not measurably affect respiratory events

142. A child with an implanted pacemaker needs surgery using electrocautery. What is the key preoperative step?

A. Deactivate the device without knowing whether the child is pacemaker-dependent

B. Determine device type, dependence, settings, and an electrocautery management plan

C. Assume all pacemakers behave identically and require no interrogation

143. A child with a family history of malignant hyperthermia presents for elective surgery. Which preparation is appropriate?

A. Use sevoflurane with enhanced temperature monitoring because family history alone does not confirm susceptibility

B. Give prophylactic succinylcholine before induction to test susceptibility

C. Use a nontriggering anesthetic and prepare the workstation according to MH protocols

144. A child with a severe latex allergy arrives for surgery. What is the best preventive strategy?

A. Create a latex-safe environment and avoid latex-containing equipment and medications packaging where relevant

B. Premedicate with antihistamine and corticosteroid, then use standard latex-containing supplies with close monitoring

C. Administer antihistamine and then use latex equipment as usual

145. A child with a known difficult airway is scheduled for elective surgery. What should the preoperative briefing include?

A. Focus on the primary intubation device because multiple backup techniques can delay decisive airway management

B. A plan to repeat direct laryngoscopy indefinitely until successful

C. Primary airway plan, rescue oxygenation strategy, equipment, roles, and escalation pathway

146. A frightened 2-year-old refuses an IV. Which induction technique is commonly appropriate when no major aspiration or airway risk exists?

A. Inhalational induction with sevoflurane while maintaining a calm environment

B. Use intramuscular sedation deep enough to permit IV placement before any inhaled anesthetic is given

C. Use awake flexible endoscopic intubation to avoid the possibility of losing airway tone during induction

147. During inhalational induction, a child develops complete laryngospasm. What is the first treatment sequence?

A. Continue the provoking stimulus while applying repeated abdominal thrusts

B. Remove the stimulus, apply jaw thrust with continuous positive pressure, and deepen anesthesia

C. Give oral fluids to relax the larynx before providing oxygen

148. A child becomes difficult to ventilate immediately after intubation. Breath sounds are absent on the left and the tube depth is excessive. What is the likely problem?

A. Severe pulmonary edema from induction

B. Bilateral tension pneumothoraces

C. Right mainstem intubation

149. A child cannot be intubated but can be ventilated effectively with a face mask. What is the best next principle?

A. Repeat direct laryngoscopy with the same device after deepening anesthesia because mask ventilation remains adequate

B. Maintain oxygenation and move deliberately through the difficult-airway plan

C. Administer progressively larger sedative doses without reassessing airway patency

150. A child cannot be intubated and cannot be effectively oxygenated by mask or supraglottic airway. What is the priority?

A. Move rapidly to emergency invasive airway rescue according to pediatric difficult-airway planning

B. Wait for spontaneous recovery from anesthetic without providing oxygen

C. Continue attempts at noninvasive oxygenation longer because invasive pediatric airway rescue carries high complication rates

151. A child with a full stomach requires urgent surgery. Which induction goal is appropriate?

A. Minimize the interval between loss of protective reflexes and securing the airway

B. Prolong mask ventilation with high inspiratory pressures after deep induction

C. Prioritize avoiding mask ventilation even if oxygen saturation falls, because insufflation increases aspiration risk

152. During mask induction, a child's oxygen saturation falls and the capnogram disappears. What should be checked first?

A. Serum sodium because electrolyte shifts are the usual cause of absent capnography

B. Check the anesthesia circuit monitor first because capnography artifact is common during mask induction

C. Airway patency and effective ventilation before assuming monitor failure

153. A child with severe micrognathia has difficult mask ventilation. Which simple maneuver may improve patency while preparations continue?

A. Forceful neck flexion with the chin compressed to the chest

B. Jaw thrust with optimal head positioning and an oral or nasal airway if appropriate

C. Abdominal compression to increase upper-airway pressure

154. A cuffed tracheal tube has no leak and measured cuff pressure is high. What should be done?

A. Leave the cuff unchanged if ventilation is adequate because short pediatric cases rarely cause mucosal injury

B. Add more air to eliminate all possibility of microaspiration

C. Reduce cuff volume to the minimum pressure that maintains an adequate seal

155. A child is extubated after upper-airway surgery. Which finding most strongly favors awake extubation?

A. High aspiration risk or concern that airway obstruction would be difficult to rescue

B. A desire to avoid all coughing despite substantial airway risk

C. A perfectly easy airway with no blood, edema, or aspiration concern

156. A child under general anesthesia develops bronchospasm. Which first step is essential before escalating drug therapy?

A. Exclude mechanical causes such as tube obstruction, kinking, or endobronchial intubation

B. Remove all oxygen because high oxygen concentration worsens bronchospasm

C. Assume asthma is the cause and ignore tube position

157. A child with status asthmaticus has severe expiratory flow limitation. Which ventilator strategy is appropriate?

A. Use a very high respiratory rate with short expiratory time

B. Allow prolonged expiratory time and accept some permissive hypercapnia to limit air trapping

C. Eliminate all positive end-expiratory pressure while forcing large tidal volumes

158. A child develops intraoperative hypoxemia with unilateral absent breath sounds after central line placement. Which diagnosis should be considered?

A. Procedure-related pneumothorax

B. Opioid withdrawal

C. Isolated metabolic alkalosis

159. A ventilated child has steadily rising peak inspiratory pressure but unchanged plateau pressure. What does this pattern suggest?

A. Decreased lung compliance from pulmonary edema or pneumothorax

B. Increased airway resistance such as bronchospasm or tube obstruction

C. Improved compliance from recruitment

160. A ventilated child has rising peak and plateau pressures with falling oxygen saturation. What physiology is most likely?

A. A capnography calibration issue without physiologic change

B. Isolated increase in tube resistance with unchanged lung mechanics

C. Reduced respiratory-system compliance such as atelectasis, edema, or pneumothorax

161. During laparoscopic surgery, end-tidal carbon dioxide gradually rises despite unchanged ventilation. What is the likely explanation?

A. Loss of all carbon dioxide production after insufflation

B. Systemic absorption of insufflated carbon dioxide

C. Acute hemoglobin desaturation without any change in carbon dioxide load

162. A child receives nitrous oxide during surgery for a known pneumothorax. Why is this undesirable?

A. Nitrous oxide has no differential solubility compared with nitrogen

B. Nitrous oxide can diffuse into closed gas spaces and enlarge the pneumothorax

C. Nitrous oxide rapidly leaves closed spaces and shrinks the pneumothorax

163. A child undergoing laser airway surgery requires general anesthesia. Which fire-risk principle is most important?

A. Use 100% oxygen continuously because oxygen suppresses airway combustion

B. Allow laser activation without announcing it because communication delays surgery

C. Use the lowest feasible inspired oxygen concentration and coordinate laser activation

164. A 20-kg child has acute hemorrhage. Which crystalloid bolus is a reasonable initial volume when blood loss is not yet massive?

A. No fluid at all until systolic pressure becomes unrecordable

B. A large fixed hypotonic-water bolus without reassessment

C. A carefully reassessed isotonic crystalloid bolus based on clinical status

165. A child has ongoing major hemorrhage with hemodynamic instability. Which resuscitation strategy is most appropriate?

A. Early balanced blood-component therapy with active warming and calcium monitoring

B. Use crystalloid resuscitation until laboratory coagulation results are available, then begin blood components

C. Delay red-cell transfusion until profound hypotension and cardiac arrest occur

166. A child receives rapidly transfused stored red blood cells and develops peaked T waves. Which complication is most likely?

A. Isolated hypernatremia

B. Hypoglycemia from citrate alone

C. Acute transfusion-related hyperkalemia

167. A child develops hypotension and wheeze minutes after an antibiotic. What is the first-line medication for suspected anaphylaxis with cardiovascular compromise?

A. Intravenous epinephrine

B. Diphenhydramine alone

C. Hydrocortisone alone

168. A child with local-anesthetic systemic toxicity develops seizures and ventricular arrhythmias. Which treatment is specifically indicated?

A. Intravenous lipid emulsion along with standard resuscitative measures

B. Treat ventricular arrhythmias primarily with calcium-channel blockade before considering lipid therapy

C. Large additional doses of the same local anesthetic to terminate seizures

169. A child receiving a caudal block has sudden tachycardia immediately after a test dose containing epinephrine. What should be suspected?

A. Successful epidural placement without vascular uptake

B. Intravascular injection of the epinephrine-containing test dose

C. Subarachnoid block causing isolated tachycardia

170. A child undergoes caudal epidural analgesia. Which landmark region is used for needle entry?

A. The sacral hiatus between the sacral cornua

B. The thoracic paravertebral space at the surgical dermatome

C. Use a low lumbar interspace to obtain more reliable sacral epidural spread

171. A child receives an ultrasound-guided peripheral nerve block. What is the major safety advantage of ultrasound?

A. It allows visualization of anatomy, needle trajectory, and local-anesthetic spread

B. Ultrasound makes vascular puncture uncommon enough that incremental injection and aspiration add little safety

C. It eliminates the need to calculate a safe total local-anesthetic dose

172. A neonate receives a spinal anesthetic for a short lower-abdominal procedure. What is a major potential advantage?

A. Reliable anesthesia for prolonged upper-abdominal surgery without supplementation

B. Spinal anesthesia removes the need for postoperative apnea monitoring in former preterm infants

C. Avoidance of general anesthetic airway manipulation and reduced early respiratory depression in selected infants

173. A child has a femoral nerve block after knee surgery but still has posterior knee pain. What is the best explanation?

A. Femoral blockade should cover posterior knee pain because most articular sensory fibers travel anteriorly

B. The posterior knee receives important innervation outside the femoral distribution

C. Persistent posterior pain indicates regional techniques are unsuitable for major knee surgery

174. A child receives an interscalene block. Which respiratory effect should be considered?

A. Ipsilateral phrenic-nerve block can reduce diaphragmatic function

B. The block increases diaphragmatic excursion by stimulating the phrenic nerve

C. Phrenic function is usually preserved because the interscalene injection remains confined to distal brachial plexus fibers

175. A child with severe postoperative pain is receiving opioids. Which monitoring finding is an early warning of ventilatory depression?

A. Isolated hypertension with increasing alertness

B. Increasing sedation with declining respiratory drive

C. A rising level of activity and spontaneous conversation

176. A child has painful abdominal surgery. Which multimodal plan best reduces opioid requirement?

A. Avoid regional anesthesia because it invariably increases opioid consumption

B. Combine acetaminophen, an anti-inflammatory when appropriate, regional techniques, and limited opioids

C. Use opioids alone because nonopioid medications do not provide surgical analgesia

177. A child with OSA requires postoperative analgesia. Which opioid principle is most appropriate?

A. Use routine high-dose opioids because OSA reduces opioid sensitivity

B. Avoid monitoring once the child is awake because respiratory risk has ended

C. Use the lowest effective opioid dose with enhanced monitoring and nonopioid adjuncts

178. A child with neuropathic pain after limb injury has burning and allodynia. Which medication class may be useful as an adjunct?

A. A loop diuretic to reduce neuronal excitability

B. Gabapentinoid therapy in carefully selected patients

C. Use an anti-inflammatory alone because burning pain after trauma usually reflects ongoing tissue inflammation

179. A child receives ketamine for a painful procedure. Which property is often clinically useful?

A. Ketamine commonly causes substantial vasodilation and hypotension because sympathetic tone is suppressed

B. Analgesia with relative preservation of spontaneous ventilation and airway reflexes

C. Complete elimination of salivation and emergence phenomena

180. A child receives dexmedetomidine for sedation. Which adverse effect should be anticipated?

A. Bradycardia and hypotension, especially with rapid loading or hypovolemia

B. Universal respiratory arrest at usual sedative doses

C. Expect tachycardia and hypertension from direct sympathetic stimulation at usual sedative doses

181. A child receives propofol for deep sedation in a remote location. What safety standard applies?

A. Because propofol is short acting, airway rescue equipment is unnecessary

B. Pulse oximetry and intermittent respiratory observation are sufficient when spontaneous breathing is initially present

C. The team must be able to rescue the child from deeper-than-intended sedation and airway compromise

182. A child undergoing MRI sedation becomes obstructed and desaturates. What is the first priority?

A. Treat the monitor alarm without approaching the child inside the scanner

B. Continue imaging until the sequence ends because movement invalidates the study

C. Stop the scan as needed and restore airway patency, ventilation, and oxygenation

183. A child receives chloral-hydrate-like long-duration sedation and remains sleepy after a painless study. What is the discharge principle?

A. Discharge only after recovery to an appropriate baseline with stable airway and vital signs

B. Discharge immediately because the procedure itself was painless

C. Keep the child in prolonged observation solely because the sedative has a long half-life, even after full baseline recovery

184. A child develops masseter rigidity, tachycardia, rising end-tidal carbon dioxide, and hyperthermia during anesthesia. What should be done?

A. Treat hyperthermia first and observe the carbon dioxide trend before exposing the child to dantrolene

B. Stop triggering agents, give dantrolene, hyperventilate with oxygen, and treat complications

C. Continue volatile anesthesia while waiting for confirmatory genetic testing

185. A child emerges from anesthesia with inspiratory stridor and retractions. What is the first assessment?

A. Treat agitation and pain first because postoperative stridor is usually caused by distress-related hyperventilation

B. Determine whether upper-airway obstruction is present and support oxygenation and ventilation

C. Give a large opioid dose before evaluating the airway

186. A child has negative-pressure pulmonary edema after relief of severe laryngospasm. What is the mechanism?

A. Large inspiratory efforts against obstruction generate markedly negative intrathoracic pressure

B. A low respiratory effort causes hydrostatic edema without airway obstruction

C. High arterial oxygen tension directly forces fluid into the alveoli

187. A child is slow to awaken after anesthesia. Which approach is best?

A. Systematically assess residual drugs, ventilation, glucose, temperature, and neurologic status

B. Assume delayed emergence is normal in all children and do not investigate

C. Administer additional sedative medication to make the recovery smoother

188. A child in the PACU becomes agitated after sevoflurane anesthesia but has normal oxygenation and no obvious pain. What diagnosis is possible?

A. Opioid overdose despite normal ventilation and marked agitation

B. Malignant hyperthermia based on agitation alone

C. Emergence delirium after excluding physiologic causes

189. A child has severe postoperative nausea and vomiting risk. Which strategy is most effective?

A. Use multimodal prophylaxis and reduce emetogenic anesthetic and opioid exposure when feasible

B. Wait for repeated vomiting before giving any antiemetic therapy

C. Use nitrous oxide and high-dose opioids specifically to prevent nausea

190. A child develops postoperative urinary retention after neuraxial analgesia and opioids. What is the best management principle?

A. Assess bladder volume and treat retention while reviewing contributing medications

B. Give more opioid because it relaxes the bladder outlet

C. Ignore bladder distention because urinary retention is harmless in children

191. A child has severe shivering in the PACU after becoming hypothermic. Why is this concerning?

A. Shivering lowers oxygen consumption and protects against hypoxemia

B. Shivering has no physiologic effect beyond patient discomfort

C. Shivering substantially increases oxygen consumption and metabolic demand

192. A child has a postoperative temperature of 35°C after a long procedure. Which consequence is plausible?

A. Reduced risk of surgical-site infection in all cases

B. Delayed drug metabolism and impaired coagulation

C. Faster anesthetic elimination and enhanced platelet function

193. A 15-year-old understands an elective procedure and strongly objects while the parents want to proceed. What is the best ethical approach?

A. Proceed on parental permission alone because assent has limited practical weight for elective anesthesia

B. Ask the surgical team to sedate the patient before any discussion

C. Explore the adolescent's concerns and seek meaningful assent while addressing urgency and legal authority

194. A teenager asks to discuss a sensitive health issue without a parent present. What is the most appropriate response?

A. Promise absolute secrecy even if the teenager describes imminent serious harm

B. Provide developmentally appropriate confidentiality within applicable legal and safety limits

C. Require a parent to remain present because confidentiality should not alter perioperative history taking in minors

195. A child arrives with bruises in multiple stages of healing and a history inconsistent with the injuries. What is the clinician's responsibility?

A. Recognize possible abuse and follow mandatory reporting and institutional safeguarding procedures

B. Avoid documenting concerns unless a parent first agrees

C. Confront the caregiver aggressively and discharge the child without referral

196. Two syringes with different drugs look nearly identical on the anesthesia cart. Which systems intervention best reduces medication error?

A. Standardized labeling, separation, and barcode or independent verification processes

B. Remove all labels so clinicians must identify drugs by syringe size

C. Rely exclusively on memory and syringe position during urgent cases

197. A wrong-dose medication is given but the child remains stable. What should the anesthesiologist do after immediate clinical care?

A. Conceal the error because no harm has yet occurred

B. Change the record so the administered dose matches the intended dose

C. Disclose the event according to institutional policy and report it through safety systems

198. A quality-improvement team notes repeated perioperative hypothermia in infants. What is the best first improvement approach?

A. Measure the process, identify contributing steps, implement a targeted bundle, and reassess outcomes

B. Focus on individual compliance with warming practice before examining workflow, equipment, or environmental factors

C. Purchase new warming devices without measuring when hypothermia occurs

199. During a crisis, multiple team members are speaking and tasks are duplicated. Which communication technique is most helpful?

A. Unstructured simultaneous discussion so everyone can act independently

B. Silent task performance without acknowledging requests

C. Closed-loop communication with explicit task assignment and confirmation

200. A parent with limited English proficiency is asked to consent for a complex procedure. Which approach is best?

A. Use a qualified medical interpreter rather than relying on a young family member

B. Proceed with signature alone because written consent replaces verbal understanding

C. Ask an older sibling to interpret because family members know the patient best

Answers

1. B. Infants consume more oxygen per kilogram and have relatively little oxygen reserve in the lungs. The combination of high metabolic demand and low functional residual capacity produces rapid desaturation during apnea.

2. B. For laminar flow, Poiseuille's relationship makes resistance extremely sensitive to airway radius. Even modest edema or secretions can therefore cause a large increase in resistance in a small pediatric airway.

3. A. Fetal hemoglobin binds oxygen more avidly than adult hemoglobin because it interacts less with 2,3-DPG. This produces a left-shifted oxygen dissociation curve and a lower P50.

4. C. Neonatal myocardium is relatively noncompliant and has limited contractile reserve, so stroke volume cannot rise enough to compensate for bradycardia. Cardiac output therefore depends strongly on maintaining an adequate heart rate.

5. C. Neonates have a larger proportion of total body water and extracellular fluid than older children and adults. Water-soluble drugs may therefore have a larger apparent volume of distribution per kilogram.

6. B. Neonates have lower concentrations of several plasma binding proteins, including alpha-1 acid glycoprotein. A larger free fraction can increase pharmacologic effect and toxicity risk for highly protein-bound local anesthetics.

7. B. Amide local anesthetics are largely cleared by hepatic metabolism. Immature enzymatic capacity in neonates can prolong elimination, so repeated dosing requires particular caution.

8. C. Minimum alveolar concentration varies with age and is relatively high in infancy before gradually declining. This contributes to higher volatile anesthetic requirements in many infants than in older patients.

9. A. A low blood-gas solubility allows alveolar and brain partial pressures to change rapidly. That pharmacokinetic property contributes to relatively fast induction and emergence.

10. C. Succinylcholine distributes mainly in extracellular fluid, which is proportionally larger in infants. A larger weight-based dose is therefore often needed to achieve a comparable concentration at the neuromuscular junction.

11. C. Many nondepolarizing agents have prolonged action in neonates because elimination pathways are immature and neuromuscular physiology differs from that of older children. Drug choice and dosing should reflect these developmental factors.

12. A. Infants have a high surface-area-to-mass ratio and limited subcutaneous insulation, which promotes radiant and convective heat loss. Active warming and temperature monitoring are therefore important.

13. C. Neonates rely substantially on brown-fat metabolism for nonshivering thermogenesis. This process increases oxygen and glucose consumption and can worsen metabolic stress if the infant is cold.

14. B. The infant chest wall is highly compliant and functional residual capacity is relatively small. Under anesthesia, loss of tone can allow lung volume to approach closing capacity, favoring atelectasis and airway closure.

15. C. Young infants have fewer fatigue-resistant type I muscle fibers in the diaphragm than older children. Increased respiratory load can therefore lead to fatigue more quickly.

16. C. Renal blood flow and glomerular filtration are reduced at birth compared with later infancy. Drugs that depend heavily on renal elimination may therefore have prolonged half-lives in neonates.

17. B. Cerebral vessels dilate in response to hypercapnia, increasing cerebral blood flow. Hypocapnia has the opposite effect and can reduce cerebral perfusion.

18. A. Because absolute lung volumes are small, seemingly small volume errors can represent a large fraction of lung capacity. Weight-based ventilation and careful pressure monitoring are therefore essential.

19. B. Pulse oximetry estimates arterial hemoglobin oxygen saturation from pulsatile light absorption. It does not directly measure PaO2 or total arterial oxygen content.

20. B. Inspired carbon dioxide should be near zero in a properly functioning circle system. A rising inspired value suggests rebreathing from exhausted absorbent, valve dysfunction, or insufficient washout.

21. A. Flow resistance in a narrow tube rises markedly as radius decreases. Small pediatric tubes can therefore contribute substantial resistance, especially at high flow rates.

22. A. Cuff pressure should be the minimum that provides an adequate seal, with measurement when feasible. Excess pressure can impair tracheal mucosal perfusion and cause postoperative airway injury.

23. C. Children can compensate for blood loss with tachycardia and increased vascular tone, maintaining blood pressure until significant depletion has occurred. Hypotension is therefore a late and concerning sign.

24. B. Citrate anticoagulant in blood products binds ionized calcium. During rapid or massive transfusion, citrate delivery can outpace metabolism and produce clinically important hypocalcemia.

25. A. High metabolic demand and limited energy reserves make neonates more susceptible to hypoglycemia and rapid oxygen depletion. Perioperative fasting and thermal stress therefore have greater physiologic consequences.

26. B. Bupivacaine binds cardiac sodium channels avidly and can cause conduction slowing, ventricular arrhythmias, and cardiovascular collapse. Recognition and lipid-emulsion therapy are central to management of severe local-anesthetic systemic toxicity.

27. C. The Henderson-Hasselbalch relationship describes how pH and pKa determine the ionized and non-ionized fractions of weak acids and bases. Ionization influences membrane passage and drug distribution.

28. B. Higher alveolar ventilation speeds replacement of alveolar gas and therefore accelerates the rise in anesthetic partial pressure. High blood solubility or greater uptake tends to slow the rise.

29. B. With a right-to-left shunt, a portion of systemic blood bypasses the lungs and does not acquire inhaled anesthetic. This slows the rise of arterial and brain partial pressure during inhalational induction.

30. A. Left-to-right shunts generally have less dramatic effects on intravenous induction than right-to-left shunts have on inhalational induction. Changes depend on shunt size and circulation, but major delay is not typical.

31. C. Qualitative twitch assessment can miss clinically important residual neuromuscular block. Quantitative monitoring is preferred when available because recovery requires an adequate train-of-four ratio, not simply four visible responses.

32. B. When nitrogen is washed out, oxygen becomes the predominant alveolar gas and can be rapidly absorbed into blood. Poorly ventilated units may then lose volume and collapse.

33. B. Fever, purulent secretions, and wheezing suggest more than a mild uncomplicated URI and increase perioperative respiratory adverse events. Elective surgery is generally deferred until the child has clinically recovered.

34. A. Sevoflurane is a potent bronchodilator and is relatively nonirritating to the airway. Management also includes deepening anesthesia, excluding mechanical obstruction, and administering inhaled beta-agonist as appropriate.

35. B. Children with severe OSA can be especially sensitive to opioid-induced ventilatory depression and may obstruct postoperatively. Opioid-sparing analgesia and appropriate monitoring are important.

36. B. Agitation can convert partial obstruction into complete obstruction in epiglottitis. Airway management should be controlled, with expert help and preservation of spontaneous breathing until the airway can be secured.

37. C. Positive airway pressure can stent a collapsible intrathoracic airway open. Loss of tone and forceful expiration may worsen dynamic airway collapse.

38. C. Rigid bronchoscopy is the standard therapeutic approach for most significant aspirated airway foreign bodies in young children. Anesthesia must support oxygenation while preserving access for the bronchoscopist.

39. B. Hypoxemia, hypercarbia, acidosis, pain, and agitation can raise pulmonary vascular resistance and precipitate a pulmonary hypertensive crisis. Avoiding these triggers is a core anesthetic goal.

40. C. Mask ventilation can inflate intrathoracic bowel and worsen lung compression in congenital diaphragmatic hernia. Intubation, gentle ventilation, and gastric decompression are preferred during stabilization.

41. C. Bronchopulmonary dysplasia may combine heterogeneous compliance with obstructive physiology. Lung-protective ventilation and sufficient exhalation time help limit barotrauma and air trapping.

42. A. Cystic fibrosis produces thick secretions and chronic airway disease. Preoperative pulmonary optimization, airway clearance, hydration, humidification, and careful suctioning reduce perioperative respiratory complications.

43. C. Postextubation stridor usually reflects upper-airway narrowing from edema or injury. Because pediatric airways are small, a small decrease in radius can create a large increase in resistance.

44. B. Orthopnea, positional symptoms, and significant tracheobronchial or cardiovascular compression predict high risk during anesthesia. Loss of spontaneous ventilation or muscle tone can worsen obstruction.

45. B. Tet spells worsen when right-to-left shunting increases. Raising systemic vascular resistance, supporting preload, oxygenation, and reducing infundibular spasm help improve pulmonary blood flow.

46. A. Prostaglandin E1 relaxes ductal smooth muscle and maintains or reopens ductal patency in ductal-dependent congenital heart disease. Apnea is an important adverse effect requiring airway readiness.

47. C. Apnea is a well-recognized adverse effect of prostaglandin E1, especially in neonates. Ventilatory support may be required while the infusion is continued for ductal-dependent circulation.

48. B. Left-to-right shunt magnitude depends on the relationship between systemic and pulmonary vascular resistance. Lower pulmonary resistance favors increased pulmonary blood flow and can worsen overcirculation.

49. A. Glenn circulation depends on low pulmonary vascular resistance for passive venous flow into the lungs. Hypercarbia, hypoxemia, and high intrathoracic pressure can impede that flow.

50. B. Fontan circulation lacks a pumping ventricle between the systemic veins and pulmonary arteries. Adequate preload, low pulmonary vascular resistance, and favorable intrathoracic pressure are therefore essential for cardiac output.

51. C. In complete transposition, pulmonary and systemic circulations run in parallel. Survival depends on mixing through an atrial communication, ventricular defect, or patent ductus until definitive repair.

52. C. Upper-extremity pressure reflects perfusion proximal to a typical juxtaductal coarctation and is relevant to cerebral and coronary circulation. Distal pressures may be substantially lower.

53. B. Fixed outflow obstruction requires adequate preload and coronary perfusion pressure, with time for diastolic filling. Tachycardia and hypotension can compromise myocardial oxygen balance.

54. A. Right-ventricular outflow obstruction is worsened by factors that raise pulmonary vascular resistance or impair right-ventricular perfusion. Hypoxemia, hypercarbia, acidosis, and excessive airway pressures should be avoided.

55. A. Dilated cardiomyopathy is characterized by impaired contractility and sensitivity to loading conditions. Avoiding abrupt afterload increases and maintaining adequate but not excessive preload helps support forward flow.

56. C. Dynamic outflow obstruction worsens with reduced ventricular volume, reduced afterload, increased contractility, and tachycardia. Management generally emphasizes preload, afterload, and controlled heart rate.

57. A. In Eisenmenger physiology, a drop in systemic vascular resistance can increase right-to-left shunting and worsen hypoxemia. Maintaining systemic pressure and avoiding increases in pulmonary vascular resistance are key goals.

58. A. Chronic high pulmonary flow and pressure can produce irreversible pulmonary vascular remodeling. When pulmonary resistance approaches or exceeds systemic resistance, shunt direction may reverse and cyanosis develops.

59. B. Hypocalcemia after transfusion and bypass can contribute to hypotension and myocardial dysfunction. Calcium replacement is appropriate when ionized calcium is low and clinically significant.

60. B. Tamponade restricts filling, so cardiac output depends on venous return, heart rate, and sympathetic compensation. Induction that causes vasodilation, myocardial depression, or high intrathoracic pressure can precipitate collapse.

61. C. Myocarditis can impair contractility and create an electrically unstable myocardium. Anesthetic plans should minimize myocardial depression and be prepared for rapid hemodynamic deterioration.

62. A. Congenital long-QT syndromes predispose to torsades de pointes. Avoiding QT-prolonging drugs, electrolyte abnormalities, and abrupt sympathetic stimulation reduces arrhythmic risk.

63. B. Stable narrow-complex SVT is commonly approached first with vagal maneuvers and then adenosine when appropriate. Unstable patients require synchronized cardioversion rather than unsynchronized defibrillation.

64. C. Hypercarbia causes cerebral vasodilation and increases cerebral blood flow and intracranial blood volume. Preventing hypoventilation is therefore important when intracranial pressure is elevated.

65. B. Headache, vomiting, and altered mental status in a child with a VP shunt raise concern for obstruction, infection, or other shunt failure with increased intracranial pressure. Urgent evaluation is required.

66. B. Children with spina bifida and repeated surgical exposure have a high prevalence of latex sensitization. Latex-free precautions are important when caring for these patients.

67. C. Succinylcholine can cause dangerous hyperkalemia and rhabdomyolysis in Duchenne muscular dystrophy. Volatile anesthetics may also be associated with anesthesia-induced rhabdomyolysis, so an individualized plan is required.

68. C. Abrupt interruption of antiepileptic therapy can increase seizure risk. Perioperative dosing should be continued or substituted by an appropriate route whenever feasible.

69. B. Cerebral palsy may be associated with impaired swallowing, reflux, secretions, scoliosis, and respiratory disease. Airway protection and pulmonary risk assessment should be tailored to the individual child.

70. B. Low albumin can increase the unbound fraction of highly protein-bound medications. Total plasma concentration may therefore underestimate the pharmacologically active fraction.

71. A. Hyperkalemia can produce life-threatening conduction disturbances. Significant elevation should be assessed and treated before elective anesthesia, with attention to ECG changes and the underlying cause.

72. B. Morphine metabolites, particularly morphine-6-glucuronide, depend on renal elimination and can accumulate in renal dysfunction. Opioid choice and dosing should account for this risk.

73. A. Chronic obstructive uropathy can produce renal impairment, electrolyte abnormalities, anemia, and hypertension. Preoperative evaluation should establish current renal and cardiovascular status.

74. A. Loss of gastric hydrochloric acid produces hypochloremic metabolic alkalosis, often with potassium depletion. Pyloric stenosis is a medical resuscitation problem before it is a surgical emergency.

75. C. Gastroschisis exposes bowel directly to the environment, causing substantial evaporative fluid and heat loss. Warmth, bowel protection, decompression, and appropriate fluid resuscitation are central priorities.

76. C. Omphalocele is frequently associated with other congenital abnormalities, including cardiac, chromosomal, and syndromic conditions. A careful preoperative assessment for associated disease is essential.

77. A. Advanced liver disease can impair synthesis of clotting factors and can coexist with vitamin K deficiency and thrombocytopenia. Coagulation assessment should be interpreted in the broader clinical context.

78. C. Sickling is promoted by hypoxemia, acidosis, dehydration, hypothermia, and stasis. Perioperative management aims to prevent these triggers while using transfusion selectively according to procedure and disease severity.

79. C. Hemophilia A is caused by factor VIII deficiency. Major surgery requires coordination with hematology for factor replacement, monitoring, and postoperative hemostatic planning.

80. A. Desmopressin can raise circulating von Willebrand factor and factor VIII in selected forms of von Willebrand disease. Suitability depends on disease subtype and prior response.

81. A. Massive hemorrhage and resuscitation can dilute platelets and coagulation factors, while consumption and hypothermia worsen coagulopathy. Goal-directed replacement should be based on clinical bleeding and available testing.

82. B. Chronic steroid therapy or adrenal insufficiency can impair the normal cortisol stress response. Perioperative glucocorticoid coverage should be individualized according to baseline therapy and surgical stress.

83. C. Children with type 1 diabetes require basal insulin to prevent ketosis even when fasting. Perioperative plans balance insulin, glucose supply, monitoring, and surgical timing.

84. A. Uncontrolled hyperthyroidism increases the risk of tachyarrhythmia and thyroid storm during perioperative stress. Elective surgery should generally await adequate control when possible.

85. B. Mitochondrial disorders are heterogeneous, but patients can be vulnerable to fasting, hypoglycemia, hypothermia, and metabolic stress. Planning should be individualized to the specific disorder and clinical manifestations.

86. C. Former premature infants remain at increased risk of postoperative apnea for a period that depends on postmenstrual age, anemia, and comorbidity. Monitoring and disposition should reflect those factors.

87. C. Anemia is a recognized risk factor for postoperative apnea in former premature infants. It should be considered with gestational and postmenstrual age when planning postoperative observation.

88. A. Necrotizing enterocolitis can cause severe sepsis, third spacing, acidosis, and circulatory collapse. Resuscitation and invasive monitoring as appropriate should proceed in parallel with urgent surgical management.

89. A. Ventilation through a distal fistula can distend the stomach and impair ventilation. Tube position and ventilatory strategy aim to deliver gas to the lungs while limiting fistula flow until surgical control.

90. B. Modern management prioritizes cardiopulmonary stabilization before repair. Pulmonary hypoplasia and pulmonary hypertension drive early physiology more than the presence of the defect itself.

91. A. Tight closure of a large abdominal-wall defect can increase intra-abdominal pressure, reduce diaphragmatic excursion, and impair venous return. Staged closure may be needed when primary closure is physiologically intolerable.

92. B. Even after correction of metabolic abnormalities, the stomach may contain retained contents. Gastric decompression and an induction strategy that accounts for aspiration risk are appropriate.

93. C. Neonates lose heat rapidly and hypothermia worsens coagulopathy, drug metabolism, and metabolic stress. Active warming and temperature monitoring are routine components of neonatal anesthesia.

94. A. Infants with retinopathy of prematurity often have a history of extreme prematurity and associated bronchopulmonary or neurologic disease. Postprocedural apnea and cardiorespiratory instability may influence anesthetic technique and monitoring.

95. B. Exposed bowel should be protected with sterile, noncompressive material while the infant is warmed and resuscitated. Preventing heat and fluid loss is a major early priority.

96. A. Pulmonary blood flow in tetralogy depends on the balance between systemic and pulmonary circuits and the degree of outflow obstruction. Supporting systemic vascular resistance and avoiding high pulmonary resistance reduce right-to-left shunting.

97. C. In parallel single-ventricle physiology, excessive pulmonary vasodilation can drive too much flow to the lungs at the expense of systemic circulation. Balanced Qp:Qs, rather than maximal saturation, is the goal.

98. C. Glenn pulmonary blood flow is passive and sensitive to both pulmonary vascular resistance and intrathoracic pressure. Excessive positive pressure can impede venous flow to the lungs.

99. B. Pneumoperitoneum can reduce venous return, increase vascular resistance, and alter ventilation. Fontan patients depend heavily on favorable venous pressure and low pulmonary vascular resistance, so insufflation should be carefully managed.

100. C. Junctional ectopic tachycardia can impair filling through tachycardia and loss of AV synchrony, particularly in postoperative hearts with limited reserve. Management includes correcting triggers, cooling, sedation, pacing strategies, and antiarrhythmics as indicated.

101. B. Hypothermia reduces enzymatic activity and can prolong the effects of many anesthetic and neuromuscular blocking drugs. Temperature also affects coagulation and oxygen handling.

102. B. Low cardiac output after congenital heart surgery can arise from multiple interacting causes. A structured evaluation of rhythm, filling, ventricular function, vascular resistance, and residual anatomy guides treatment.

103. C. Children with repaired congenital heart disease may have residual shunts, obstruction, ventricular dysfunction, arrhythmias, or pulmonary hypertension. Current physiology matters more than the label of the original lesion.

104. C. Children with OSA are vulnerable to postoperative airway obstruction and opioid-related ventilatory depression. Multimodal analgesia reduces opioid exposure while maintaining pain control.

105. B. Post-tonsillectomy hemorrhage combines aspiration risk from swallowed blood with possible hypovolemia. Preparation should include suction, difficult-airway readiness, vascular access planning, and blood availability as appropriate.

106. B. Short otologic procedures in healthy children are often managed with inhalational induction and a simple airway technique. The plan should still account for fasting status, comorbidity, and postoperative nausea or pain.

107. C. Difficult pediatric airways require deliberate planning for oxygenation, intubation, rescue supraglottic ventilation, and surgical assistance when appropriate. Loss of oxygenation is more dangerous than failure of a single intubation technique.

108. A. Persistent complete laryngospasm threatens rapid hypoxemia. If airway maneuvers and positive pressure fail, deepening anesthesia and prompt neuromuscular relaxation can be lifesaving.

109. C. Micrognathia and glossoptosis can obstruct the upper airway and make direct laryngoscopy difficult. Maintaining spontaneous ventilation until a secure plan is established may be appropriate in high-risk cases.

110. A. Cleft palate surgery involves the upper airway and can be followed by obstruction from swelling, secretions, blood, or tongue position. Careful extubation and postoperative monitoring are important.

111. A. Treacher Collins syndrome commonly includes mandibular and midface hypoplasia, which can complicate airway management. A difficult-airway plan and appropriate equipment should be available.

112. B. Craniofacial abnormalities and OSA increase the risk of postoperative airway obstruction, especially after long procedures with edema. Monitoring intensity should match airway and respiratory risk.

113. B. Sitting neurosurgical positions can create a pressure gradient that entrains air into open venous channels. Monitoring and immediate management plans for venous air embolism are essential when this position is used.

114. C. Cerebral perfusion pressure depends on systemic pressure and intracranial pressure. Hypoxemia, hypotension, and hypercarbia can worsen brain injury or intracranial hypertension.

115. C. Many anesthetic agents influence epileptiform activity and cortical signals. The anesthetic plan should be coordinated with the neurophysiology and surgical teams to preserve the information needed for mapping.

116. A. Severe scoliosis can produce restrictive physiology, weak cough, sleep-disordered breathing, and reduced respiratory reserve. Preoperative assessment helps determine extubation and postoperative respiratory planning.

117. C. Duchenne muscular dystrophy carries risk of severe hyperkalemia with succinylcholine and anesthesia-induced rhabdomyolysis with volatile agents. Many centers favor a nontriggering anesthetic strategy.

118. C. Motor-evoked potentials depend on intact neuromuscular transmission. Significant neuromuscular blockade can abolish responses, so its use must be coordinated with monitoring needs.

119. B. Tourniquet release returns accumulated metabolites from the ischemic limb to the circulation. Transient acidosis, hyperkalemia, hypotension, and other changes are possible, especially after prolonged inflation.

120. B. Osteogenesis imperfecta causes bone fragility and may coexist with airway, cardiac, and bleeding issues. Gentle handling, padding, and careful positioning reduce risk of iatrogenic fracture.

121. A. Caudal epidural anesthesia can provide useful analgesia for infraumbilical and perineal surgery. It is commonly used as part of multimodal analgesia in pediatric urologic procedures.

122. C. Posterior urethral valves can lead to chronic kidney disease, electrolyte disturbances, and hypertension. Current renal function materially influences fluid and medication management.

123. A. Large renal tumors can be vascular and may involve major vessels. Preparation for hemorrhage, including appropriate access and blood availability, is prudent.

124. B. Chronic aspiration can produce wheeze, recurrent pneumonia, and impaired pulmonary reserve. Fasting does not reverse established lung disease or eliminate all aspiration risk.

125. A. Chronic glucocorticoid exposure can suppress the hypothalamic-pituitary-adrenal axis. Steroid planning, infection risk, anemia, nutrition, and thrombotic risk may all be relevant.

126. B. Long-term parenteral nutrition and central access can be associated with line infection, thrombosis, liver disease, and electrolyte disturbances. Current laboratory and line status should be reviewed.

127. A. Rapid peritoneal stretch can trigger a vagal reflex and bradycardia, particularly in children. Temporarily stopping insufflation and treating hemodynamic compromise are appropriate.

128. B. Pediatric hemorrhagic shock requires early recognition, vascular access, warming, and blood-based resuscitation when significant bleeding is present. Hemorrhage control and correction of the lethal triad are priorities.

129. B. After major burns, upregulation of extrajunctional acetylcholine receptors increases potassium release after succinylcholine. The risk develops after the acute period and can persist for months.

130. A. Major burns produce capillary leak, third spacing, edema, and substantial evaporative heat loss. Resuscitation and temperature management are key early priorities.

131. C. Secondary brain injury is worsened by hypotension and hypoxemia. Maintaining adequate systemic pressure is essential to support cerebral perfusion.

132. A. Transplant recipients may have graft dysfunction, renal impairment, infection susceptibility, and important drug interactions. Immunosuppressive therapy usually requires coordinated continuation rather than routine interruption.

133. B. MRI limits physical access and requires compatible equipment. High-risk airway cases demand a plan for monitoring, rescue, and rapid removal from the scanner if necessary.

134. A. Tracheostomy management depends on stoma maturity, tube type and size, underlying airway anatomy, and ventilatory dependence. A clear rescue plan and appropriate replacement tubes should be available.

135. A. Children with repaired esophageal atresia and tracheoesophageal fistula may have tracheomalacia, dysmotility, reflux, aspiration, and recurrent respiratory infections. These sequelae can affect anesthetic risk years later.

136. C. Down syndrome is associated with upper-airway obstruction, OSA, hypotonia, and potential cervical spine instability. Evaluation should be symptom-driven and positioning should avoid unnecessary cervical stress.

137. C. Mucopolysaccharidoses can cause progressive macroglossia, upper-airway narrowing, limited neck motion, and cervical abnormalities. Repeated prior easy anesthetics do not guarantee future airway ease.

138. A. Contemporary fasting guidance generally permits clear liquids until about two hours before anesthesia in healthy elective patients. Institutional policy and individual aspiration risk still apply.

139. A. Abrupt clonidine withdrawal can cause rebound sympathetic activity and hypertension. Continuing the established regimen is usually preferable unless a specific contraindication exists.

140. C. Obesity and severe OSA can increase difficulty with ventilation, oxygen reserve limitations, and postoperative respiratory events. Procedure selection and postoperative disposition should match the child's risk profile.

141. A. A recent URI increases airway reactivity, but not every mild case requires cancellation. Risk is individualized using symptoms, age, airway instrumentation, surgery type, and comorbidities.

142. B. Perioperative management of cardiac implantable electronic devices depends on device function, pacing dependence, surgical site, and electromagnetic interference. A specific plan should be established before surgery.

143. C. A credible family history warrants management as MH susceptibility until clarified. Triggering volatile anesthetics and succinylcholine are avoided, and the anesthesia machine is prepared for a nontriggering technique.

144. A. Strict avoidance is the most effective prevention of latex reactions. The team should identify latex-containing products and establish a latex-safe perioperative environment.

145. C. A difficult-airway plan should prioritize oxygenation and specify sequential options, personnel, equipment, and rescue pathways. Team briefing reduces delay when the primary technique fails.

146. A. Inhalational induction is widely used for young children without IV access when aspiration and airway risks are acceptable. Sevoflurane's nonpungency and rapid uptake make it useful for this purpose.

147. B. Immediate treatment focuses on eliminating stimulation, opening the airway, delivering oxygen with positive pressure, and deepening anesthesia. Persistent severe spasm may require neuromuscular relaxation.

148. C. Right mainstem intubation is common when a pediatric tracheal tube is advanced too far because the trachea is short. Withdrawal under clinical confirmation should restore bilateral ventilation if no other problem exists.

149. B. When ventilation is adequate, there is time to preserve oxygenation and change strategy rather than create trauma through repeated attempts. Escalation should follow the preplanned difficult-airway pathway.

150. A. Failure to oxygenate is the life-threatening endpoint of a difficult airway. Emergency front-of-neck or surgical airway rescue may be required, with technique depending on age, anatomy, and available expertise.

151. A. Rapid-sequence principles aim to reduce aspiration risk while maintaining oxygenation. Pediatric practice may use gentle ventilation when needed because hypoxemia can develop quickly.

152. C. Loss of capnography with desaturation strongly suggests absent or severely impaired ventilation. Airway position, mask seal, obstruction, laryngospasm, and equipment should be assessed immediately.

153. B. Airway-opening maneuvers, appropriate positioning, and adjuncts can relieve soft-tissue obstruction. They are foundational while more advanced airway techniques are prepared.

154. C. Excessive cuff pressure can compromise tracheal mucosal perfusion. The cuff should be adjusted to the lowest effective sealing pressure.

155. A. Awake extubation restores airway reflexes and tone before the tube is removed, which can be advantageous when aspiration or obstruction risk is high. Deep extubation is reserved for selected patients and procedures.

156. A. A sudden increase in airway pressure can be caused by equipment or tube problems as well as bronchospasm. Mechanical causes should be rapidly excluded while oxygenation and ventilation are supported.

157. B. Obstructive physiology requires time for exhalation to reduce dynamic hyperinflation and auto-PEEP. Lower rates and controlled tidal volumes may necessitate permissive hypercapnia.

158. A. Pneumothorax is a recognized complication of central venous access and can cause abrupt hypoxemia with unilateral breath-sound reduction. Bedside imaging or ultrasound can confirm the diagnosis when time permits.

159. B. Peak pressure reflects both resistive and elastic components, whereas plateau pressure mainly reflects alveolar pressure and compliance. A rising peak with stable plateau points toward increased airway resistance.

160. C. When both peak and plateau pressures rise, the problem is more consistent with reduced compliance than isolated airway resistance. Atelectasis, edema, abdominal insufflation, and pneumothorax are examples.

161. B. Carbon dioxide is absorbed from the peritoneal cavity during laparoscopy and can increase $PaCO_2$ and end-tidal CO_2. Minute ventilation often needs adjustment.

162. B. Nitrous oxide enters closed gas spaces faster than nitrogen leaves, causing expansion. It is generally avoided with pneumothorax, bowel obstruction, intracranial air, or other problematic closed spaces.

163. C. Airway fire risk increases when an ignition source, oxidizer, and fuel are present. Lowering oxidizer concentration and explicit team communication are key preventive steps.

164. C. Initial volume therapy should use isotonic fluid and frequent reassessment, while early blood products are appropriate when significant hemorrhage is evident. Fixed excessive crystalloid can worsen dilution and edema.

165. A. Major pediatric hemorrhage requires timely blood-based resuscitation, hemorrhage control, warming, and attention to calcium and coagulation. Excessive crystalloid can worsen dilutional coagulopathy.

166. C. Stored red cells accumulate extracellular potassium, and rapid transfusion can deliver a large potassium load. Infants and children with low cardiac output may be particularly vulnerable to transfusion-associated hyperkalemia.

167. A. Epinephrine is the first-line treatment for anaphylaxis because it addresses vasodilation, capillary leak, bronchospasm, and cardiovascular collapse. Antihistamines and corticosteroids are adjuncts, not substitutes in severe reactions.

168. A. Severe local-anesthetic systemic toxicity is treated with airway support, seizure control, modified resuscitation, and intravenous lipid emulsion. The offending local anesthetic is stopped immediately.

169. B. A prompt heart-rate or ECG change after an epinephrine-containing test dose can indicate intravascular injection. Test dosing is imperfect, so aspiration, incremental dosing, and monitoring remain important.

170. A. Caudal epidural access is obtained through the sacral hiatus, usually identified between the sacral cornua. Careful technique is required to avoid intravascular or intrathecal injection.

171. A. Ultrasound improves anatomic visualization and can guide needle and injectate placement. It does not eliminate toxicity risk, so dose calculation, aspiration, incremental injection, and monitoring remain necessary.

172. C. Spinal anesthesia can be useful for selected short infraumbilical procedures in high-risk infants and may reduce exposure to airway manipulation and systemic anesthetics. It does not abolish all risk of postoperative apnea.

173. B. Knee innervation is complex and includes contributions from sciatic and obturator pathways as well as the femoral nerve. A single femoral block may not cover all posterior pain.

174. A. Interscalene blockade frequently affects the phrenic nerve and can reduce ipsilateral diaphragmatic excursion. This may be clinically important in children with limited respiratory reserve.

175. B. Sedation often precedes clinically significant opioid-related respiratory depression. Repeated assessment of consciousness, ventilation, and oxygenation is therefore essential.

176. B. Multimodal analgesia targets different pain pathways and can improve analgesia while reducing opioid exposure. Choice of components depends on contraindications and procedure.

177. C. OSA increases the risk of opioid-related airway obstruction and ventilatory depression. Opioid-sparing multimodal therapy and appropriate observation are important.

178. B. Neuropathic pain may respond to agents that modulate neuronal excitability, including gabapentinoids in selected patients. Therapy should be individualized with attention to sedation and other adverse effects.

179. B. Ketamine provides analgesia and dissociative sedation while often preserving spontaneous ventilation better than many alternatives. Airway events can still occur, so full monitoring and rescue capability remain necessary.

180. A. Dexmedetomidine is an alpha-2 agonist that can produce bradycardia and hypotension. It generally causes less respiratory depression than many sedatives but still requires standard monitoring.

181. C. Propofol can rapidly produce apnea and loss of airway tone. Deep sedation requires personnel, monitoring, and equipment capable of rescuing a patient who enters general anesthesia.

182. C. Patient rescue takes precedence over completing imaging. Remote-location sedation requires immediate access to airway equipment and a plan for rapid extraction when necessary.

183. A. Sedation discharge criteria focus on physiologic recovery, airway stability, consciousness appropriate for the child, and safe supervision. Procedure pain does not determine readiness for discharge.

184. B. Malignant hyperthermia is a clinical emergency characterized by hypermetabolism, rising CO2, rigidity, acidosis, hyperkalemia, and later hyperthermia. Immediate dantrolene and trigger discontinuation are essential.

185. B. Postanesthetic stridor suggests upper-airway narrowing or laryngospasm and requires immediate airway assessment. Oxygenation and ventilation take priority over treating pain or agitation.

186. A. Forceful inspiration against a closed glottis can create very negative intrathoracic pressure, increasing pulmonary transvascular forces. Treatment includes oxygen, positive pressure when needed, and supportive care.

187. A. Delayed emergence has multiple causes, including residual anesthetics, hypoventilation, hypoglycemia, hypothermia, and neurologic events. A structured evaluation identifies reversible problems.

188. C. Emergence delirium is common in young children after volatile anesthesia, particularly sevoflurane, but is a diagnosis made after excluding pain, hypoxemia, bladder distention, and other causes.

189. A. PONV prevention is more effective when risk factors are addressed prospectively. Combining antiemetics with opioid-sparing and reduced volatile or nitrous exposure can lower risk.

190. A. Neuraxial techniques and opioids can impair bladder emptying. Bladder assessment and timely catheterization when indicated prevent pain and overdistention.

191. C. Shivering can markedly increase oxygen consumption and carbon dioxide production. Rewarming and treating underlying hypothermia reduce this metabolic burden.

192. B. Hypothermia can prolong anesthetic drug effects, impair coagulation, increase metabolic stress, and worsen recovery. Active prevention and treatment are important.

193. C. Pediatric consent usually involves parental permission, but developmentally capable children and adolescents should be involved through assent. Their objection deserves careful exploration, especially for nonurgent procedures.

194. B. Adolescents benefit from confidential communication, but confidentiality has legal and safety exceptions. The clinician should explain those limits clearly and follow local law and policy.

195. A. Healthcare professionals are mandated reporters in many jurisdictions when child abuse is suspected. Objective documentation and established safeguarding pathways protect the child while avoiding unsupported accusations.

196. A. Medication safety is improved by forcing functions and standardized systems rather than memory alone. Clear labeling, organized storage, and verification reduce look-alike and wrong-syringe errors.

197. C. Patient safety culture requires accurate documentation, appropriate disclosure, and event reporting after medication errors. Reporting supports system learning even when no lasting harm occurs.

198. A. Quality improvement uses measurement to understand the process, tests targeted interventions, and reassesses performance. A systems approach is more reliable than blame or unmeasured change.

199. C. Closed-loop communication assigns a task to a named person, requires acknowledgment, and confirms completion. It reduces ambiguity and duplicated or missed actions during high-stress events.

200. A. Valid informed permission requires understandable communication. Qualified interpreters improve accuracy, confidentiality, and the parent's ability to ask questions and make an informed decision.