Pediatric Sedation Rotation Examination

1. Which of the following medical conditions would NOT place a child at significantly greater risk to receive sedation?
   a. History of obstructive sleep apnea
   b. Age younger than 1 year
   c. ASA level III
   d. Well-controlled seizure disorder

2. Which patient is at LOWEST risk of experiencing an adverse sedation event?
   a. A 6-week-old infant with a seizure disorder undergoing a head MRI scan
   b. A 6-year-old child with ALL in remission, requiring a lumbar puncture
   c. A 4-year-old child with congenital hydrocephalus requiring a head CT scan to rule out shunt malfunction
   d. A 3-year-old with a temperature of 104° F. requiring a lumbar puncture
   e. A 10-year-old with pneumococcal pneumonia requiring a pleurocentesis

3. Ideally in elective moderate sedation and deep sedation cases, pediatric patients should meet the following NPO guidelines:
   • Four hours for milk/solids (< 6 months of age)
   • Six hours for milk/solids (> 6 months of age)
   • Four hours for breast milk (all ages)
   • Two hours for clear liquids (all ages)
   a. True
   b. False

4. Which of the following statements is FALSE when considering pulse oximetry?
   a. Required during sedation
   b. Not needed during patient transfer between sites when sedated
   c. Below 90% is indicative of clinically relevant hypoxemia
   d. Time lag exists between oxygen desaturation detected by pulse oximetry and arterial oxygen desaturation
   e. Can give false readings in presence of vasoconstriction

5. The following are characteristics of midazolam EXCEPT:
   a. Poor hypnotic agent (sleeper)
   b. Can be administered oral, rectal, IV
   c. Rapid onset with short duration of action intravenously
   d. Approximately 2-3 times more potent than diazepam
   e. Effective analgesic properties when used in high doses

6. The primary difference among opioid agonists at equipotent doses is:
   a. Degree of respiratory depression
   b. Analgesic effects
   c. Pharmacokinetic profile
   d. Amnestic effects
   e. Reversibility of clinical effects with naloxone
7. Naloxone reverses which of the following opioid effects?
   a. Analgesia
   b. Respiratory depression
   c. Sedation
   d. Miosis
   e. All of the above

8. Ketamine is relatively contraindicated in the patient populations described below EXCEPT:
   a. Child with increased intracranial pressure
   b. Adolescent with schizophrenia
   c. Patient with asthma
   d. Child with severe systemic hypertension
   e. Child with visual disturbances

9. Considerations with the administration of naloxone (Narcan) include all of the following EXCEPT:
   a. Appropriate as a reversal agent for midazolam (Versed)
   b. Onset of action is 1-2 min
   c. Duration of action is shorter than most opioid agonists
   d. High doses may cause pulmonary edema, arrhythmias, hypertension, or tachycardia

10. The most appropriate graded sequence of actions that should occur in a child who experiences complete airway obstruction and progressive decline in oxygen saturation during sedation is:
    a. Oxygen administration, airway positioning, application of a mask and flow-inflation bag, and bag mask ventilation
    b. Application of anesthesia mask and bag, airway positioning, and bag mask ventilation
    c. Bag mask ventilation, airway positioning, and application of anesthesia mask to airway
    d. Airway positioning with oxygen administration, application of mask anesthetic bag, positive pressure ventilation

11. Which statement best describes Moderate Sedation?
    a. Controlled state of unconsciousness with loss of pain response
    b. Complete loss of airway reflexes
    c. Blunted response to “light” tactile physical and/or verbal stimulation
    d. Pediatric sedation score of 5

12. Which of the following monitoring tools is absolutely required to continuously monitor the patient during Moderate Sedation?
    a. EKG
    b. Pulse oximetry
    c. Blood pressure monitor
    d. End tidal CO₂ monitor
13. What part of the pediatric airway decreases in anterior-posterior diameter and is the most likely area of obstruction in a deeply sedated child with airway obstruction?
   a. Soft palate to posterior pharynx
   b. Base of tongue to posterior pharynx
   c. Nasopharynx
   d. Subglottic area

14. The most common serious adverse event associated with intravenous ketamine administration in an otherwise healthy child is:
   a. Laryngospasm
   b. Seizures
   c. Increased intracranial pressure
   d. Hypotension
   e. Bradycardia

15. Which ABG best describes an otherwise healthy child who is deeply sedated with an SPO₂ of 90% on room air?
   a. 7.40/40/60
   b. 7.25/55/65
   c. 7.25/45/47
   d. 7.45/50/70

16. In pediatric procedural sedation, benzodiazepines are typically used to:
   a. Promote amnesia
   b. Provide anxiolysis
   c. Induce sleep
   d. Enhance muscle relaxation (not paralysis)
   e. a, b, and c
   f. a, b, and d

17. The Therapeutic Window describes the relationship between the drug concentration and its therapeutic and adverse effects.
   a. True
   b. False

18. Factors determining the most effective loading dose for a sedative drug include all of the following EXCEPT:
   a. Desired clinical effect
   b. Volume of distribution
   c. Desired plasma concentration
   d. Drug clearance

19. Which of the following is NOT correct for chloral hydrate?
   a. Active metabolite is trichloroethanol
   b. Elimination half-life is 7 to 11 hours
   c. Has no respiratory depressant effects
   d. Requires first-pass hepatic metabolism to be effective
   e. Tastes bad
20. What part of the physical exam is required prior to sedative administration?
   a. Weight in kilograms
   b. Airway assessment
   c. Baseline pain assessment
   d. Brief neurological exam
   e. All of the above

21. Parental (patient) education prior to sedation includes discussion of all of the following EXCEPT:
   a. Potential adverse events
   b. Anticipated sedative effects
   c. Specific procedure options
   d. Sedative options for the procedure

22. Phase 1 discharge criteria include assessment of all of the following EXCEPT:
   a. Oxygen saturation
   b. Activity level
   c. Ability to resume oral intake
   d. Level of consciousness

23. Which pharmacologic property is the most important factor determining a sedative drug’s onset and duration of action?
   a. Lipid solubility
   b. Degree of ionization
   c. Receptor affinity
   d. Degree of protein binding

24. Fentanyl is more effective than morphine for acute procedural pain control because:
   a. Fentanyl has a shorter elimination half-life
   b. Fentanyl is more potent
   c. Fentanyl has a more rapid onset of action
   d. Fentanyl has fewer respiratory depressant effects

25. Which drug and drug receptor system do not match?
   a. Midazolam – gamma aminobutyric acid (GABA<sub>A</sub>) receptor
   b. Fentanyl – µ-opioid receptors
   c. Clonidine – acetylcholine receptors
   d. Ketamine – N-methyl-D-aspartate (NMDA) receptor

26. Poor outcome following an adverse sedation event is NOT associated with:
   a. Inadequate monitoring
   b. Intravenous sedation
   c. Incomplete patient assessment
   d. Insufficient practitioner education

27. Which statement is not consistent with an otherwise healthy, deeply sedated 4-year-old with an EtCO<sub>2</sub> 52 and SpO<sub>2</sub> 99% on “blow-by” oxygen?
   a. The child is hypoventilating
   b. The arterial pCO<sub>2</sub> is 56
   c. The child has a mild degree of upper airway obstruction
   d. The arterial pO<sub>2</sub> is 45
28. The most probable pharmacokinetic cause of inadequate clinical effect and low total serum concentration of a sedative following a loading dose is:
   a. Large volume of distribution (V_D)
   b. Increased renal excretion
   c. Reduced hepatic clearance
   d. High protein binding

29. Which of the following is not true of a deeply sedated child?
   a. Reduced pharyngeal muscle tone
   b. Decreased ventilatory response to CO_2
   c. Easily arouses to verbal commands
   d. May be hypotensive

30. Which of the following is required PRIOR to sedation?
   a. Documentation of consent
   b. Presedation history and physical exam
   c. A “time out”
   d. Parent/patient counseling explaining risks and options
   e. All of the above

31. The Pediatric Sedation Policy and Procedure applies to which of the following situations?
   a. Chest tube insertion following intravenous fentanyl and midazolam
   b. Postoperative morphine administration
   c. Intravenous ketorolac for postoperative pain
   d. Propofol administration in OR for tonsillectomy

32. A 2-year-old is receiving a propofol infusion for an MRI scan. Which answer is most consistent with hypoventilation?
   a. EtCO_2 60, P_aCO_2 64, SpO_2 89%, RR 18
   b. EtCO_2 40, P_aCO_2 44, SpO_2 97%, RR 16
   c. EtCO_2 60, P_aCO_2 34, SpO_2 90%, RR 24
   d. EtCO_2 30, P_aCO_2 45, SpO_2 96%, RR 30

33. Goals of pediatric procedural sedation include all of the following EXCEPT:
   a. Control of physical discomfort or pain
   b. Maintenance of patient safety
   c. Timely reporting of diagnostic results
   d. Provision of conditions that promote valid procedural results

34. Which statement is not true when comparing midazolam to lorazepam?
   a. Both drugs are highly protein bound
   b. Both drugs are conjugated to active metabolites
   c. Both drugs work through the GABA receptor system
   d. Lorazepam has a longer elimination half-life than midazolam