The Cerebral Oximeter: What Is the Efficacy?

1. Select the true statement about oxygen consumption and perfusion to the brain.
   1. the brain consumes approximately 50% of the body's total oxygen
   2. cerebral blood flow averages 50 mL/100 g per minute in the brain
   3. autoregulation alters cerebral perfusion as systemic blood pressure changes
   4. the average adult cerebral metabolic rate is 100 mL/min

2. Irreversible cell injury can occur in the brain if cerebral perfusion is not reestablished within:
   1. 10 seconds
   2. 1 to 2 minutes
   3. 3 to 8 minutes
   4. 10 to 12 minutes

3. The primary disadvantage associated with the transcranial Doppler, electroencephalogram, and jugular venous bulb oximetry monitors is that these monitoring modalities:
   1. are invasive monitoring methods
   2. can only provide delayed-time measures of cerebral perfusion
   3. measure blood velocity rather than actual blood flow
   4. provide global measures of cerebral perfusion

4. Continuous measures of velocity of blood flow within the circle of Willis are obtained by:
   1. jugular venous bulb oximetry
   2. nonquantitative cerebral oximetry
   3. transcranial Doppler sonography
   4. bispectral index monitor

5. The function of the quantitative concentration measurements monitor is to:
   1. evaluate the mixed venous oxygen saturation of blood leaving the brain
   2. express the measured ratio of oxyhemoglobin to total hemoglobin as a number
   3. use sound waves reflected off blood cells traveling through intracranial vessels
   4. use 2 wavelengths of light to measure oxyhemoglobin

6. The cerebral oximeter provides which of the following?
   1. an absolute measure of brain oxygen saturation
   2. an indirect method to assess oxygen levels in the brain
   3. a measure of changes in regional cerebral oxygen saturation (rSO₂)
   4. a measure of blood flow circulating through the circle of Willis

7. An advantage associated with the cerebral oximeter is:
   1. it provides real-time information about brain oxygen supply and demand
   2. it reflects the amount of intracellular oxygen that is available
   3. the sensors are placed on the forehead
   4. its resistance to outside electrical interference

8. A limitation of the cerebral oximeter in clinical practice is:
   1. it is an invasive monitor
   2. the expense of the equipment
   3. all areas of the brain are not monitored
   4. it requires the presence of an experienced ultrasonographer

9. Evidence suggests that the cerebral oximeter:
   1. allows early intervention to restore rSO₂ to desired levels
   2. is the gold standard for monitoring cerebral oxygenation
   3. is not an appropriate monitor in the pediatric patient
   4. is only effective for patients undergoing general anesthesia

10. There is research evidence that suggests the use of the cerebral oximeter:
1. provides information about the exact cause of the ischemia
   ➢ 2. may decrease postoperative recovery time
   3. is not at all beneficial in preventing postoperative neurologic deficits
   4. is only useful in patients undergoing carotid endarterectomies

Semmelweis Revisited: Hand Hygiene and Nosocomial Disease Transmission in the Anesthesia Workstation

11. Semmelweiss was a physician who pioneered hand washing strategies that dramatically decreased the morbidity and mortality associated with what condition?
   1. typhoid fever
   2. syphilis
   3. gas gangrene
   ➢ 4. childbirth fever

12. Nosocomial infections are believed to afflict approximately how many patients in US hospitals?
   ➢ 1. 1 in 10
   2. 1 in 100
   3. 1 in 1,000
   4. 1 in 10,000

13. In Maslyk’s study of anesthesia machine microorganism contamination, what was found?
   1. no microorganisms were cultured
   2. only nonpathogenic organisms were cultured; no patient threat was cited
   3. only Staphylococcus aureus was cultured; minimal patient threat was cited
   ➢ 4. a wide variety of pathogenic and nonpathogenic organisms were cultured; a significant threat to patient and staff alike was cited

14. Regarding the cited study of anesthetic workstation contamination involving 61 random first cases of the day at an academic center, select the true statement:
   ➢ 1. 32% of intravenous stopcock lumens became contaminated with pathogenic bacteria
   2. only ASA physical status III patients were associated with contaminated equipment
   3. it was noted that consistent, aseptic practice occurred in all 61 cases
   4. it concluded there was no risk to patients due to nosocomial infection

15. In the observational study of 3,143 patient care activities in a postanesthesia care unit, average compliance with hand cleansing when a new patient was received was _______ and declined to _______ with subsequent hand cleansing during the subsequent care of the patient.

16. The Agency for Healthcare Research Quality identifies what intervention as a top research agenda item for patient safety?
   1. increasing the use of heparin in the hospital setting
   ➢ 2. hand washing
   3. decreasing the rate of overnight admission following appendectomy
   4. increasing family presence in the postanesthesia care unit

17. The American Association of Nurse Anesthetists mandates that:
   1. hands be washed before and after all patient or specimen contact
   2. hands be thoroughly washed before and after handling body substances or articles possibly contaminated with body substances
   3. hands should be thoroughly washed after removing gloves at the completion of a task or procedure
   ➢ 4. all of the above

18. A very common biofilm disease is:
   1. Parkinson disease
   2. diabetes
   ➢ 3. dental plaque
   4. multiple sclerosis

19. Research describing why healthcare workers fail to wash their hands reveals:
   1. patient care is distracting to hand washing
   2. belief that because hands do not look dirty means washing is unnecessary
   3. providers are too busy
   ➢ 4. all of the above

20. A recent study from the University of Colorado examining gender-based hand bacterial contamination revealed:
   1. men had greater concentrations; 507 bacterial species were identified in all
   ➢ 2. women had greater concentrations; 4,742 bacterial species were identified in all
   3. men had greater concentrations; 4,742 bacterial species were identified in all
   4. women had greater concentrations; 507 bacterial species were identified in all

New Drug, Fospropofol Disodium: A Propofol Prodrug

21. Which of the following is NOT a concern with lipid-based propofol formulations?
   1. bacterial supportive environment
   2. elevates serum cholesterol and triglycerides
3. hyperkalemia
4. allergic reactions

22. When is the prodrug fospropofol activated?
1. upon swallowing
2. following digestion by gastric acid
3. after moving through the heart into the lungs
4. after structural alteration by enzymes

23. Fospropofol is prepared as which of the following formulations for administration?
1. aqueous (water soluble) solution
2. emulsion
3. colloid
4. inorganic volatile liquid

24. How does fospropofol differ in chemical structure from propofol?
1. fospropofol has a methyl phosphate group substituted at the first carbon hydroxyl on the base benzene structure
2. fospropofol has 2 phosphate groups substituted for each isopropyl group
3. fospropofol has a phosphate group substituted for the phenyl group
4. fospropofol and propofol are structurally identical; the formulation diluent is all that differs

25. The slowed onset and lessened sedative effects of fospropofol are directly related to which of the following?
1. lower administered dose of fospropofol
2. different active drug agent causing central gamma-aminobutyric acid (GABA) modulation
3. need for hepatic microsomal enzyme phosphorylation
4. formulation as an inactive prodrug requiring enzymatic conversion to the active drug agent

26. Diisopropyl phenol molecules liberated from fospropofol compared to diisopropyl phenol molecules of lipid-based formulations appear to be which of the following?
1. less potent
2. equipotent
3. more potent
4. nonpotent

27. The frequent intravenous re-bolusing of a prodrug that undergoes a metabolic or enzymatic conversion in the body over a given amount of time may promote which of the following?
1. underdosing
2. overdosing
3. perfect dose
4. microdosing

28. Which of the following is a unique side effect associated with fospropofol in clinical trials?
1. muscle rigidity
2. opisthotonos
3. perineal itching
4. hiccups

29. The pharmacokinetic and pharmacodynamic properties of fospropofol make it a likely candidate drug for which of the following?
1. sedation
2. induction agent
3. general anesthetic
4. dissociative amnestic

30. Which scale is useful to determine sedation effectiveness with fospropofol?
1. State Trait Anxiety Inventory (STAI)
2. Modified Observer’s Assessment of Alertness/Sedation Scale (MOAA/S)
3. Snow Personal Control Inventory (SPCI)
4. Multifactorial Observer’s Assessment of Alertness/Sedation Scale (MOAA/S)

31. Drug eluting stents have gained in popularity because they are associated with:
1. less thrombus formation
2. less of a need to use antiplatelet medications
3. the ability to inhibit cellular proliferation on the stent wall
4. more rapid endothelization than bare metal stents

32. Select the true statement regarding sirolimus and paclitaxel stents:
1. sirolimus is a powerful antithrombotic and replaces dual antiplatelet drugs
2. paclitaxel is a powerful antithrombotic and can replace aspirin therapy
3. sirolimus and paclitaxel are cytostatic and cytotoxic drugs, respectively
4. sirolimus and paclitaxel deactivate platelets by an anti-ATP mechanism

33. Which physiological response is seen with surgical stress?
1. a decrease in coagulability
2. inhibition of neuroendocrine hormone release
3. inhibition of the inflammatory response
4. a reduced fibrinolytic activity

34. The strongest predictor of stent thrombosis is:
1. premature discontinuation of antiplatelet therapy
2. major surgery in a closed space
3. multivessel stent placement
4. length of the stents

35. Thrombosis of a cardiac vessel acutely manifests as:
36. Initial derangements associated with the Trendelenburg position include:
1. elevated hydrostatic pressure at the baroreceptors
2. increase in central organ perfusion
3. initial and generalized vasoconstriction
4. decrease in myocardial oxygen consumption

37. Physiological derangements associated with pneumoperitoneum include:
1. expansion of the lung bases with insufflation
2. increases in renal blood flow
3. increases in gastrointestinal and mesenteric blood flow
4. decreased aortic diameter

38. One of the primary neurohormones released during surgical stress includes:
1. serotonin
2. dopamine
3. norepinephrine
4. histamine

39. The case report of the patient undergoing robotic prostatectomy was complicated by which of the following issues?
1. coronary artery disease
2. uncontrolled diabetes mellitus
3. multiple sclerosis
4. myasthenia gravis

40. Venous congestion associated with the extreme head-down position is related to which of the following?
1. carbon dioxide embolus
2. decrease in gastric pH
3. compacting of the lung bases
4. conjunctival edema

41. There is growing evidence that _________ alone is not a reliable marker of morbidity or of mortality.
1. biological age
2. functional status
3. chronological age
4. mental status

42. What percentage of noncardiac surgical patients age 70 and older will have one or more postoperative adverse outcomes?
1. 10%
2. 21%
3. 30%
4. 41%

43. The most common cardiac complication and the leading cause of death in the postoperative period is:
1. myocardial infarction
2. renal failure
3. pulmonary dysfunction
4. severe hypothermia

44. In addition to achieving specific assessment objectives, the preanesthesia evaluation should also complement the:
1. surgeon's plan
2. family's requests
3. personal interview
4. hospital booking schedule

45. Hypertension has been shown to be a risk factor for perioperative complications with this risk doubling for every ______________ increase in blood pressure measurement.
1. 5 mm Hg systolic/10 mm Hg diastolic
2. 10 mm Hg systolic/5 mm Hg diastolic
3. 10 mm Hg systolic/20 mm Hg diastolic
4. 20 mm Hg systolic/10 mm Hg diastolic

46. Aging is associated with:
1. a decreased vital capacity and forced expiratory volume in 1 second
2. a decrease in residual volume
3. an increase in arterial oxygen tension
4. an increase in lung volume

47. The incidence of postoperative respiratory complications is increased ________ in persons who smoke.
1. 1- to 2-fold
2. 3- to 6-fold
3. 6- to 8-fold
4. minimal

48. Changes that occur in the central nervous system of the older patient cause:
1. a decreased sensitivity to anesthetic agents
2. a moderate risk of delirium during the immediate postoperative period
3. an increased risk for cognitive dysfunction
4. no marked changes in the healthy older patient

49. Which of the following further increases the risk for adverse reactions in patients with cardiovascular disease and increases the risk of perioperative complications?
1. inadequate insulin control
2. surgery longer than 2 hours
3. omitting preoperative beta blockers
4. increase in nerve conduction velocity
50. The preanesthesia evaluation allows for the:
1. appraisal of processes unrelated to aging
2. repair of anatomic limitations that go unreported
3. detection of abnormalities related to concomitant illnesses
4. elimination of the personal interview to assess the patient

Lipid Infusion as a Treatment for Local Anesthetic Toxicity: A Literature Review

51. Rates of local anesthetic toxicity have declined in the past 25 years mostly due to:
1. improved general anesthesia techniques
2. availability of less toxic local anesthetics
3. improved screening of patients to identify those at higher risk
4. declining popularity of regional anesthesia in the healthcare community

52. Any incident of local anesthetic toxicity should be considered a relevant event because:
1. of the potentially catastrophic nature of a toxic local anesthetic response
2. the hospital/facility must be notified of all nonstandard outcomes
3. of the potential for liability on the part of the anesthesia provider
4. all cases of local anesthetic toxicity must be reported to the website www.lipidrescue.org

53. The “lipid sink” theory postulates that infusion of a lipid emulsion:
1. creates a fatty barrier that keeps local anesthetic from entering the bloodstream
2. gives additional energy to the myocardial tissue, thereby allowing it to process toxic levels of local anesthetics at a higher metabolic rate
3. creates a separate lipid compartment within the plasma into which local anesthetics are drawn
4. causes local anesthetics to become inert

54. According to the “lipid sink” theory, which of the following overdoses may NOT be treatable with an infusion of lipid emulsion?
1. bupropion
2. lamotrigine
3. ropivacaine
4. clomipramine

55. Several brands of lipid formulations are on the market. Intralipid contains what combination of fats and oils?
1. oil as soybean oil; triglycerides, 200 g/L; phospholipids, 12 g/L; glycerol, 22 g/L
2. oil as safflower oil; triglycerides, 100 g/L; phospholipids, 10 g/L; glycerol, 10 g/L
3. oil as olive oil; triglycerides, 100 g/L; phospholipids, 10 g/L; glycerol, 10 g/L
4. oil as soybean oil; triglycerides, 150 g/L; phospholipids, 50 g/L; glycerol, 10 g/L

56. Dogs that received lipid infusion treatment for a toxic dose of bupivacaine:
1. were unable to achieve return of spontaneous circulation
2. reestablished a normal sinus rhythm within 5 minutes of receiving the treatment
3. experienced a decrease in the pH of the myocardial tissue
4. experienced a decrease in the partial pressure of myocardial oxygen

57. Symptoms of local anesthetic toxicity include all of the following EXCEPT:
1. tonic-clonic seizure
2. widening QRS morphology
3. asystole
4. bradycardia

58. Symptoms of local anesthetic toxicity usually occur how long after introduction of a toxic dose into the circulation?
1. seconds to minutes
2. about 1 hour
3. in 1 to 2 hours
4. 10 to 12 hours

59. Long-term treatment with lipid emulsion is contraindicated for patients:
1. with a compromised immune system
2. with a body mass index greater than 40
3. over the age of 65
4. with a compromised ability to metabolize fat

60. Possible reasons for contradictory study findings regarding the effectiveness of lipid infusion in the treatment of local anesthetic toxicity include all of the following EXCEPT:
1. interspecies differences between sample groups
2. differences in the types of measuring equipment being used
3. differences in the types of cardiopulmonary resuscitation being used
4. differences in the dosages of vasopressors used in concurrence with lipid infusion