AANA Journal Course No. 3 Examination

A case approach: The anesthetic management of the patient

Here are the correct answers to the examination conducted as part of the AANA Journal's third course on "A Case Approach: The Anesthetic Management of the Patient." The course consisted of a six-part series, beginning in the April, 1983 issue and concluding in the February, 1984 issue. The actual examination, which is reprinted here in total to provide readers with a convenient reference and an additional learning tool, was initially published in the April, 1984 issue.

For those of you who took the examination, we suggest that you compare your recorded answers with our correct answers to see how you scored. We also suggest that you keep the examination and correct answers for future reference and review.

To have successfully completed the course, you must have had 42 out of the 60 questions correct (70%); a total of 6 CE hours will be awarded for this successful completion. Prior to July 31, 1984, notification was mailed to those who have passed the examination and thus successfully completed the course. Of these individuals, AANA members automatically have their 6 CE credits recorded for them, as do individuals with record-keeping contracts through the AANA.

Again, we hope that this third Journal course has proved to be of value to you.

Regional anesthesia for the juvenile patient

1. When administering a brachial plexus block to a juvenile, the appropriate volume of local anesthetic to inject is determined as:
   1. 1/2 the patient's body weight (in kg)
   2. 7 mg/kg body weight
   3. 1/2 the patient's height (in inches)
   4. 1/2 the patient's age

2. In the average adult, the volume of the brachial plexus sheath is:
   1. 1/2 the patient's weight (in kg)
   2. 40-50 cc
   3. 1/2 the patient's height (in inches)
   4. 1/2 the patient's age

3. When using a "B" bevel needle in the axillary approach to brachial plexus block, explain the "click" or "pop" encountered immediately below the subcutaneous tissue:
   1. the axillary artery has been entered
   2. the brachial plexus sheath has been entered
   3. the nerves of the brachial plexus have been entered
   4. the periosteum of the humerus has been entered

4. Intravascular injection of a small amount of local anesthetic “tagged” with dilute epinephrine (1:200,000) will result in:
   1. cardiac arrest
   2. tachycardia
   3. tachypnea
   4. seizure

5. The need for intermittent inflation and deflation of an upper arm tourniquet in the case presented would obviate the use of:
   1. a brachial plexus block-axillary approach
   2. a brachial plexus block-interscalene approach
   3. an intravenous regional anesthesia-Bier block
   4. a wrist block

6. 0.5% bupivicaine HCl (Marcaine®) as used in the case presentation, can be expected to produce:
   1. good motor and poor sensory block
   2. poor motor and poor sensory block
   3. poor motor and good sensory block
   4. good motor and good sensory block

7. The approximate volume of local anesthetic agent for an axillary block in a ten-year-old juvenile (weight 40 kg, height 50 inches) is:
   1. 25 cc
   2. 40 cc
   3. 50 cc
   4. volume is not critical

8. Premedication with sedative doses of_______ can significantly increase the “seizure threshold” of local anesthetic agents used in plexus anesthesia.
   1. butorphanol
   2. diazepam
   3. pentobarbital
   4. droperidol
9. The _______ nerve provides sensory innervation to the upper-inner aspect of the arm. This important nerve is not a part of the brachial plexus and thus must be blocked separately if a tourniquet is to be used.
   1. radial
   2. musculocutaneous
   3. ulnar
   ▶ 4. intercostobrachial (T2)

10. Regional anesthesia is absolutely contraindicated in patients whose age is less than:
   1. 8 years
   2. 12 years
   3. 16 years
   ▶ 4. none of the above

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Pathophysiology of thyroid storm

11. Which of the following antithyroid drugs inhibits the release of preformed thyroxine?
   ▶ 1. sodium iodide
   2. propylthiouracil
   3. methimazole
   4. levothyroxine

12. Which of the following anesthetic agents is contraindicated in any patient with a history of thyrotoxicosis?
   1. N₂O
   2. thiopental
   ▶ 3. ketamine
   4. enflurane

13. Thyroid storm is most likely to appear _______ hours postoperatively.
   1. 1-2
   2. 2-6
   ▶ 3. 6-18
   4. 48-72

14. All of the following are useful in the management of thyroid storm except:
   1. propylthiouracil
   2. sodium iodide
   3. propranolol
   ▶ 4. liothyronine

15. Which of the following drugs blocks the uptake and organification of iodine from the blood?
   1. cortisol
   ▶ 2. methimazole
   3. propranolol
   4. sodium iodide

16. Preoperative preparation with propylthiouracil requires how much time to render the patient euthyroid?
   1. 1-2 days
   2. 7-10 days
   ▶ 3. 2-7 weeks
   4. 2-3 months

17. Which of the following drugs is known to have an antithyroid action?
   ▶ 1. thiopental
   2. ketamine
   3. diazepam
   4. isoflurane

18. Malignant hyperthermia is a hypermetabolic crisis induced by an increased and sustained release of _______ in the muscle.
   1. K⁺
   2. Na⁺
   ▶ 3. Ca⁴⁺
   4. Mg⁺

19. Propranolol is contraindicated in which of the following conditions?
   ▶ 1. asthma
   2. tachycardia
   3. congestive heart failure secondary to high cardiac output
   4. atrial fibrillation

20. Which of the following vitamins should be given to patients with thyroid storm?
   1. A
   ▶ 2. B
   3. D
   4. K

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Anesthetic techniques for free tissue transfer and extremity replantation

21. In dealing with free tissue transfer procedures, what is the one essential surgical need that anesthesia can provide?
   1. decreased blood flow to operative site
   ▶ 2. maximal perfusion to operative site
   3. vasoconstriction of microvasculature
   4. arterial hypotension

22. Which of the following benefits are provided by plexus block utilizing a long-acting anesthetic agent?
   1. denervate the extremity
   2. provide surgical anesthesia
   3. reduce the body's metabolic sequelae to stress
   ▶ 4. all of the above
23. In preparation for administering a continuous axillary block, the correct position of the extremity to be blocked is:
   - ✷ 1. 90° abduction and external rotation of the shoulder with 90° elbow flexion
   - ✷ 2. 90° abduction and internal rotation of the shoulder with 45° elbow flexion.
   - ✷ 3. 90° abduction and external rotation of the shoulder with 90° elbow flexion
   - ✷ 4. none of the above

*Note: Either answer is correct.

24. In the pediatric patient a plexus block can still be advantageous when administered:
   1. before induction of general anesthesia
   2. during induction of general anesthesia
   - ✷ 3. after induction of general anesthesia
   4. at the termination of the procedure

25. The subcutaneous injection of lidocaine 1% during a continuous axillary block is utilized to anesthetize the:
   - ✷ 1. posterior brachial intercostal nerve
   2. ulnar nerve
   3. axillary artery
   4. site for indwelling axillary catheter

26. For the free tissue transfer procedure, regional anesthesia via continuous axillary block is contraindicated because:
   1. the procedure lasts longer
   - ✷ 2. inability to anesthetize the donor site
   3. perfusion to the operative site is decreased
   4. all of the above

27. In seeking a volatile anesthetic agent with the least biotransformation, the most likely choice is:
   1. halothane
   2. enflurane
   - ✷ 3. isoflurane
   4. methoxyflurane

28. Because of the body’s response to injury, administering glucose containing solutions could lead to:
   - ✷ 1. osmotic diuresis
   2. hypoglycemia
   3. hypernatremia
   4. decreased plasma osmolality

29. The use of packed red blood cells is important to keep the hematocrit between 30-40% and to provide:
   1. minimal need for crystalloid solutions
   2. adequate blood volume
   3. decreased incidence of transfusion reaction
   - ✷ 4. maximal oxygen delivery to tissue in the re-planted extremity

30. Another regional technique that can be used post-operatively following a general anesthetic to facilitate maximal vasodilation and blood flow to the extremity would be:
   - ✷ 1. stellate ganglion block
   2. Bier block
   3. supraclavicular block
   4. none of the above

31. In steady state, how do serum creatinine concentrations and blood urea nitrogen values correlate with glomerular filtration rate?
   1. directly
   2. inversely
   - ✷ 3. linearly
   4. differentially

32. In normal pregnancy, glomerular filtration rate:
   1. remains stable
   2. decreases 50%
   - ✷ 3. increases 50%
   4. declines in the second trimester

33. Maintenance of pregestational values of serum creatinine and blood urea nitrogen in the pregnant renal transplant recipient frequently reflect:
   1. the absence of toxemia
   2. the presence of toxemia
   3. optimal glomerular filtration rate
   - ✷ 4. impaired glomerular filtration rate

34. To aid in distinguishing pre-eclampsia from the effects of hypertension or renal impairment in the pregnant renal transplant recipient, which of the following may be monitored?
   1. serum creatinine
   - ✷ 2. serum uric acid
   3. blood urea nitrogen
   4. creatinine clearance

35. The humoral nature of hypertension in pre-eclampsia appears to be independent of:
   - ✷ 1. autonomic sympathetic function
   2. angiotensin II
   3. pregnancy induced hypertension
   4. prostaglandins

36. A major objective in the management of hypertension in the pregnant renal transplant recipient is:
   1. severe control
   - ✷ 2. consistent control
   3. absolute control
   4. chemical control
37. Diuretic therapy in the pregnant renal transplant recipient may mask and aggravate:
   ▶ 1. hypovolemia
   2. angiotensin II levels
   3. insulin resistance
   4. sympathetic blockade

38. In pregnancy, as opposed to Type I diabetes, the Type II diabetic demonstrates abnormal metabolic usage of:
   1. fats
   2. amino acids
   3. glucose
   ▶ 4. all of the above

39. Ketoacidosis in the diabetic pregnant renal transplant recipient begins at _____ levels of maternal hyperglycemia than in the non-diabetic patient.
   1. similar
   ▶ 2. lower
   3. higher
   4. equal

40. The vasopressor of choice in the management of hypotension secondary to induced sympathetic blockade in the pregnant renal transplant recipient is:
   1. methoxamine
   2. metaraminol
   ▶ 3. ephedrine
   4. epinephrine

41. The anastomosis of the basilar artery terminal branches and two internal carotid arteries form:
   1. the aortic arch
   ▶ 2. the Circle of Willis
   3. the common carotid artery
   4. the vertebral arteries

42. Approximately 78% of the “new strokes” that occur in patients are due to:
   1. atherosclerotic plaques
   2. hematologic disorders
   ▶ 3. thromboembolism
   4. vessel wall weakness

43. The intrinsic ability of the cerebral circulation to alter its resistance in order to maintain a constant cerebral blood flow despite changes in perfusion pressure is:
   1. the inverse steal phenomenon
   2. luxury perfusion
   3. the steal phenomenon
   ▶ 4. autoregulation

44. Autoregulation in non-pathologic states is effective between mean arterial pressures of:
   1. 40-100 mmHg
   2. 50-80 mmHg
   ▶ 3. 50-150 mmHg
   4. 80-120 mmHg

45. The ideal PaCO₂ for patients undergoing carotid surgery should be:
   1. 50-100 mmHg
   2. 40-50 mmHg
   ▶ 3. 35-40 mmHg
   4. 25-30 mmHg

46. A rapid emergence is desirable following carotid endarterectomy because it:
   1. lessens the length of stay in the recovery room
   2. promotes a return of autoregulation
   3. assures avoidance of postoperative hypotension
   ▶ 4. facilitates neurological assessment

47. The main advantage of using thiopental for induction is that it:
   ▶ 1. decreases the CMRO₂
   2. increases the CMRO₂
   3. protects the brain when used in small doses
   4. promotes cardiovascular stability

48. An advantage of regional anesthesia for carotid surgery as opposed to general anesthesia is:
   1. increased ability to maintain cerebral protection
   ▶ 2. better assessment of cerebral function during clamping
   3. lowered cerebral metabolism
   4. can be used in patients with varied cardiovascular diseases

49. During general anesthesia for carotid endarterectomy, blood gases are obtained and the results are: pH 7.50, PaO₂ 150, PaCO₂ 42. Appropriate intervention would include:
   ▶ 1. increase the ventilatory rate to decrease PaCO₂
   2. present ventilatory settings remain unchanged
   3. decrease the ventilation increasing PaCO₂
   4. raise the FIO₂ and lessen ventilatory rate

50. The major criteria that must be met when choosing drugs for maintenance of general anesthesia must include all of the following except:
   1. prevention of hypotension
   ▶ 2. drugs must increase cerebral CMRO₂
   3. rapid emergence from anesthesia
   4. premedication should be minimal

Anesthetic management of carotid endarterectomy

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Anesthetic implications of cancer chemotherapy

51. The site of action of most chemotherapeutic agents occurs at the:
   1. cell membrane
   2. cyclic AMP system
   ▶ 3. the DNA or RNA molecule
   4. cytoplasmic organelles

52. Chemotherapeutic agents have their most profound effect on:
   1. slow proliferating tumors
   ▶ 2. fast proliferating tumors
   3. normal tissue
   4. epidermis

53. The agent whose use can result in an increased susceptibility to oxygen toxicity is:
   1. methotrexate
   2. 5-FU
   ▶ 3. bleomycin
   4. adriamycin

54. The chemotherapeutic agent associated with major lesions of the GI tract resulting in intestinal perforation is:
   ▶ 1. methotrexate
   2. chlorambucil
   3. thiopeta
   4. bleomycin

55. Congestive heart failure and dysrhythmias are associated with the use of:
   1. methotrexate
   2. bleomycin
   3. thiopeta
   ▶ 4. doxorubicin

56. Loss of deep tendon reflexes and the presence of parasthesias contraindicate the use of regional anesthesia for patients currently on:
   ▶ 1. vincristine
   2. L-asparaginase
   3. doxorubicin
   4. 6-mercaptopurine

57. A preoperative chest x-ray and arterial blood gas values are indicated for patients on:
   1. daunorubicin
   ▶ 2. bleomycin
   3. methotrexate
   4. L-asparaginase

58. Reductions in pseudocholinesterase activity result from the use of:
   ▶ 1. cyclophosphamide
   2. methotrexate
   3. busulfan
   4. doxorubicin

59. A preoperative coagulation study may be indicated for the patient receiving:
   ▶ 1. mechlorethamine
   2. bleomycin
   3. vincristine
   4. methotrexate

60. Current theory concerning O₂ toxicity and lung damage places the cause as:
   1. destruction of the alveolar capillary membrane by proteolytic enzymes
   ▶ 2. production of increased extracellular and intracellular oxygen free radicals
   3. decreased perfusion to superoxygenated alveoli
   4. changes in alveolar tethering.