



ANSWERS TO THE AANA JOURNAL COURSE No. 23 EXAMINATION UPDATE FOR NURSE ANESTHETISTS

Here are the correct answers to the examination conducted as part of the *AANA Journal's* 23rd course: Update for Nurse Anesthetists. The course consists of a 6-part series, beginning in the April 2003 issue and concluding in the February 2004 issue. The actual examination, which is reprinted here in total to provide readers with a convenient reference and an additional learning tool, was published in the April 2004 issue and on the AANA website.

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 (80%); a total of 6 CE hours will be awarded for this successful completion. By August 31, 2004, notification will be 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 AANA.

Again, we hope that this 23rd *Journal* course has proved to be of value to you.

Antiemetic prophylaxis: Pharmacology and therapeutics

1. Motion-induced nausea and vomiting results from stimulation of:
 1. dopaminergic and muscarinic receptors in the gut
 - 2. histamine and acetylcholine receptors of the labyrinthine
 3. serotonin receptors in the vestibular apparatus
 4. chemoreceptor trigger zone receptors in the fourth ventricle
2. Nausea and vomiting may be elicited by stimulation from:
 1. receptors in the myocardium
 2. receptors located on the spinal cord
 - 3. vomiting center stimulation from serotonin, opioid, histamine, and muscarinic and dopamine receptors
 4. dopamine receptors located on the kidney
3. The mechanism of action of corticosteroids to augment antiemetics and minimize postoperative nausea and vomiting is due to:
 1. inhibiting the synthesis of prostaglandins
 2. preventing the release of serotonin in the gastrointestinal tract
 3. sensitizing antiemetic pharmacotherapy receptors
 - 4. all of the above
4. Droperidol may cause torsades de pointes arrhythmias if combined with:
 1. class Ia antiarrhythmics including lidocaine, disopyramide, procainamide, and quinidine
 - 2. concomitant antiemetics such as corticosteroids, phenothiazines, or dolasetron
 3. desflurane or sevoflurane
 4. tricyclic antidepressants or monoamine oxidase inhibitors
5. Metoclopramide is contraindicated in patients with:
 - 1. intestinal obstruction, breast cancer, pheochromocytoma, or pharmacotherapy for seizures, Parkinson disease, or depression
 2. renal failure or insufficiency
 3. gastrointestinal spasm, biliary colic, uterine cramping, or prostaglandin-induced pregnancy termination
 4. patients with pseudocholinesterase deficiency
6. What drug can prolong the P-R and Q-Tc intervals and widen the QRS interval by sodium-channel blockade?
 - 1. dolasetron
 2. dexamethazone
 3. prochlorperazine
 4. serotonin
7. The patient at highest risk for postoperative nausea and vomiting is:
 1. a 64-year-old male smoker with chronic alcoholism for orthopedic surgery
 - 2. an anxious, menstruating, 17-year-old obese female nonsmoker for breast augmentation
 3. a 67-year-old woman having a bunionectomy under regional anesthesia
 4. a 57-year-old male smoker for emergency craniotomy who ate 4 hours prior to surgery
8. The least emetogenic drug is:
 1. morphine
 2. meperidine
 3. fentanyl
 - 4. local anesthetic
9. Nitrous oxide's emetogenic effect may be due to:
 1. stimulating the chemoreceptor trigger zone
 2. stimulating opiate-like receptors
 3. expanding gut or middle ear closed gas spaces
 - 4. all of the above
10. A simple approach to reducing PONV is:
 1. ensuring adequate hydration
 2. avoiding unnecessary hypotension
 3. using high inspired oxygen concentrations
 - 4. all of the above

Parkinson disease

11. The classic symptoms of Parkinson disease (PD) include all of the following EXCEPT:
 1. slowness in movement and difficulty initiating movement
 2. tremor of the limbs at rest
 3. shuffling during ambulation and postural instability

- 4. flaccid extremities
- 12. Levodopa can cause:
 - 1. coagulopathy
 - 2. orthostatic hypotension and cardiac irritability
 - 3. respiratory depression
 - 4. fever
- 13. PD is a disorder that is characterized by which of the following?
 - 1. a deficiency of acetylcholine (Ach)
 - 2. an inappropriate accumulation of dopamine in the central nervous system (CNS)
 - 3. selective destruction of dopamine-producing fibers in the CNS
 - 4. an abundance of superoxide dismutase
- 14. Stress from environmental toxins is thought to play a role in selective destruction of dopamine neurons. This hypothesis is supported by:
 - 1. genetic links have been found on chromosome #4 in some patients with PD
 - 2. age being inversely related to the incidence of PD
 - 3. the substantia nigra has an intrinsically low ability to neutralize oxygen free radicals
 - 4. cigarette smoking increases the incidence of PD
- 15. All of the following may contribute to the development of PD EXCEPT:
 - 1. dietary intake of excess animal fat
 - 2. the recreational use of Ecstasy
 - 3. caffeine consumption
 - 4. working in a factory that produces agricultural pesticides
- 16. Dopamine-related medications include all of the following EXCEPT:
 - 1. levodopa/carbidopa combinations (Sinemet)
 - 2. amantadine (Symadine, Symmetrel)
 - 3. bromocriptine (Parlodel)
 - 4. benzotropine (Cogentin)
- 17. During the preanesthetic interview, the anesthetist notes that the only PD drug prescribed for the patient is bromocriptine. It is likely that the patient is being treated for which of the following?
 - 1. advanced PD
 - 2. the initial stages of PD
 - 3. severe bradykinesia and tremor
 - 4. neurologic symptoms prior to deep brain stimulation
- 18. The eventual failure of pharmacological agents for PD has led to a renewed interest in:
 - 1. ablative therapies
 - 2. deep brain stimulation
 - 3. transplantation procedures
 - 4. all of the above
- 19. Which agent should be avoided in the patient with PD?
 - 1. sevoflurane
 - 2. fentanyl
 - 3. vecuronium
 - 4. ketamine
- 20. A relatively safe approach to pharmacologically managing postoperative tremor in the PD patient is:
 - 1. thiopental
 - 2. droperidol, haldoperidol, and ketamine
 - 3. diphenhydramine
 - 4. succinylcholine

Aspiration prophylaxis: Is it time for changes in our practice?

- 21. Nonparticulate acid aspirates that enter the lung begin producing damage:
 - 1. immediately
 - 2. in 30 to 60 minutes
 - 3. in 1 to 2 hours
 - 4. in 4 to 6 hours
- 22. Use of a laryngeal mask airway results in:
 - 1. greater incidence of aspiration than a face mask
 - 2. a lower incidence of aspiration than a face mask
 - 3. a lower incidence of aspiration than endotracheal intubation
 - 4. about the same incidence of aspiration as a face mask
- 23. Cricoid pressure:
 - 1. is always effective in lowering aspiration risk
 - 2. may make it more difficult to secure the airway
 - 3. causes collapse of the trachea
 - 4. increases esophageal sphincter tone
- 24. Which of the following classes of drugs have no benefit in aspiration prophylaxis?
 - 1. antacids
 - 2. antiemetics
 - 3. anticholinergics
 - 4. gastric stimulants
- 25. New fasting guidelines, recently published by a task force of the American Society of Anesthesiologists, suggest that fasting time for a healthy patient who is undergoing an elective procedure and has ingested a clear liquid is:
 - 1. 2 hours
 - 2. 4 hours
 - 3. 6 hours
 - 4. 8 hours
- 26. Preoperative gastric fluid volumes of more than 0.4 mL/kg with a pH of less than 2.5:
 - 1. remain important surrogate markers of aspiration risk
 - 2. should be aggressively pursued
 - 3. should be pursued in obese patients only
 - 4. are no longer a major focus
- 27. Most aspirations occur:
 - 1. upon surgical incision
 - 2. in postanesthesia recovery
 - 3. during intubation and extubation
 - 4. during the surgical procedure
- 28. Patients who experience aspiration and remain asymptomatic for at least 2 hours postoperatively:

- ▶ 1. may be discharged
 - 2. should receive supplemental oxygen for 8 hours
 - 3. should be observed for 24 hours
 - 4. should receive antibiotics
29. All of the following are common risk factors for aspiration EXCEPT:
- 1. emergency surgery
 - 2. full stomach
 - ▶ 3. outpatient surgery
 - 4. obstetrics
30. Light ventilation during rapid sequence induction:
- 1. always increases aspiration risk
 - 2. should only be used in pediatric patients
 - 3. should only be used in head injury patients
 - ▶ 4. does not increase aspiration risk

Neuroleptic malignant syndrome

31. Most studies suggest that neuroleptic malignant syndrome (NMS) is the result of what physiologic problem?
- 1. blocked reuptake of norepinephrine
 - 2. lack of the dystrophin gene
 - ▶ 3. dopaminergic blockade in the central nervous system
 - 4. excess aldosterone production by the zona glomerulosa
32. Which patient group is most likely to be receiving neuroleptic medications preoperatively?
- ▶ 1. psychiatric patients
 - 2. dialysis patients
 - 3. type II diabetics
 - 4. postmenopausal women
33. Which of the following clinical manifestations is most commonly associated with NMS?
- 1. tremors
 - 2. pericarditis
 - 3. diarrhea
 - ▶ 4. hyperthermia
34. NMS can mimic which of the following conditions?
- 1. Turner syndrome
 - ▶ 2. malignant hyperthermia
 - 3. beta-thalassemia
 - 4. Horner syndrome
35. Treatment of NMS includes which of the following:
- 1. immediate discontinuation of the neuroleptic medication
 - 2. dantrolene
 - 3. bromocriptine
 - ▶ 4. all the above
36. What initial intravenous dose of dantrolene should be given to the NMS patient?
- 1. 8 µg/kg
 - 2. 0.60 mg/kg
 - ▶ 3. 2 to 3 mg/kg
 - 4. 40 mg/kg

37. During dantrolene administration, anesthesia providers should monitor the patient for which side effects?
- 1. pleural effusions
 - 2. decreased blood pressure
 - 3. pneumonitis
 - ▶ 4. all the above
38. Treatment goals for NMS include which of the following?
- 1. restore dopaminergic balance in the central nervous system
 - 2. reduce muscular rigidity
 - 3. prevent organ failure
 - ▶ 4. all the above
39. Which antiemetic medication is best suited for a patient at risk for NMS?
- 1. droperidol (Inapsine)
 - 2. promethazine (Phenergan)
 - ▶ 3. dolasetron (Anzemet)
 - 4. prochlorperazine (Compazine)
40. Which of the following is a neuroleptic medication:
- 1. metoclopramide (Reglan)
 - ▶ 2. prochlorperazine (Compazine)
 - 3. granisetron (Kytril)
 - 4. triamterene (Dyrenium)

Epidural analgesia using loss of resistance with air versus saline: Does it make a difference? Should we reevaluate our practice?

41. Currently, the choice of air or saline as the injectate used during the loss of resistance (LOR) technique is based on:
- 1. proven scientific data
 - ▶ 2. provider's personal preference
 - 3. patient safety concerns
 - 4. past litigation results
42. The occurrence of a sudden and usually severe headache in a parturient during the insertion of an epidural in the sitting position, just after a loss of resistance with air, is likely due to:
- 1. nerve root compression
 - 2. an epidural hematoma
 - ▶ 3. air ascending to the ventricles
 - 4. subcutaneous emphysema
43. The primary concern for a provider's decision to avoid saline as the injectate during the LOR technique is:
- 1. preservative contained in normal saline
 - 2. chemical interaction with the local anesthesia molecules
 - 3. inability to detect an LOR with saline
 - ▶ 4. the dilution of the local anesthesia concentration
44. The primary concern for the provider to avoid air as the injectate during the LOR technique is:
- ▶ 1. its action as a possible barrier impeding absorption of the local anesthetic
 - 2. frequent occurrence of venous air embolisms

3. frequent occurrence of pneumocephalus
 4. frequent occurrence of scar tissue
45. Air has been found to remain in the peridural area for up to:
1. 1 to 3 hours
 2. 5 to 10 hours
 - 3. several days
 4. it is always absorbed instantly
46. A summary of the frequency of occurrence of side effects for both air and saline indicate that they are:
- 1. related to volume injected
 2. related to local anesthetic concentration
 3. size of the epidural needle used
 4. the time the epidural is in place
47. One study cited the use of intentionally injecting 10 mL of air after the loss of resistance using air resulted in:
1. inadequate onset and quality of analgesia
 - 2. a reduction of paresthesias during catheter insertion
 3. an increase in the incidence of back pain
 4. an increased incidence of venous air embolisms
48. A case report citing neurological damage due to peridural air injected during the LOR technique occurred with what type of surgical procedure?
1. craniotomy
 2. laparoscopic operative cholangiogram
 - 3. extracorporeal shock wave lithotripsy
 4. femoral-popliteal bypass
49. A common side effect encountered during routine epidural is:
- 1. backache
 2. paralysis
 3. seizures and respiratory arrest
 4. spinal hematoma
50. Recent anesthesia literature has recommended the following choice of injectate during the LOR technique:
- 1. air only
 2. saline only
 3. pressure transducer method
 4. hanging drop technique

Rave drugs: Pharmacological considerations

51. Ingestion of which of the following substances is not usually popular at “raves”?
1. Ecstasy
 2. gamma hydroxybutrate (GHB)
 - 3. alcohol
 4. ketamine
52. Rohypnol has an elimination half-life of:
1. 4 to 6 hours
 2. 8 to 12 hours
 - 3. 19 to 23 hours
 4. more than 24 hours
53. A telltale sign of GHB toxicity is:
1. lack of inhibition and sexual arousal
 2. intoxicated-like appearance
 3. a trance-like state mimicking sleep
 - 4. body jerking with head snap
54. Fry is an altered form of marijuana that is laced with phencyclidine (PCP) and soaked in:
- 1. embalming fluid
 2. antifreeze
 3. paint thinner
 4. ketamine
55. A major physiologic effect of methamphetamine is up-regulation of the sympathetic nervous system, which results in:
1. decreased catecholamine release
 2. increased reuptake of endogenous catecholamines
 - 3. decreased reuptake of endogenous catecholamines
 4. decreased release of dopamine and serotonin
56. Lysergic acid diethylamide (LSD) is chemically similar to:
1. gamma-aminobutyric acid (GABA)
 - 2. serotonin
 3. dopamine
 4. acetylcholine
57. Acute water intoxication from methylenedioxyamphetamines (MDMA) ingestion will cause:
- 1. hyponatremia, seizures, and cerebral edema
 2. hypernatremia and pulmonary embolus
 3. hypernatremia, dehydration, and bradycardia
 4. hypernatremia and hypothermia
58. In a person predisposed to malignant hyperthermia, which of the following rave drugs may trigger a hyperthermic attack?
1. GHB
 2. LSD
 3. Fry
 - 4. MDMA
59. Methamphetamine, LSD, and MDMA have the following similar physiological effects:
1. decreased dopamine and norepinephrine release, hypotension
 - 2. up-regulation of the sympathetic nervous system, increased dopamine release, increased heart rate and increased blood pressure
 3. hyponatremia, water intoxication, and fulminant liver failure
 4. hypernatremia, hypothermia, decreased cerebral metabolic rate
60. The following statements about GHB are true EXCEPT:
1. GHB increases dopamine, serotonin, and acetylcholine levels in the brain
 - 2. GHB up-regulates the sympathetic nervous system and causes increased systemic catecholamine levels
 3. GHB produces deep, reversible depression of cerebral metabolism, inducing hypothermia
 4. GHB exhibits nonlinear elimination