

# Nursing

AANA-CRNA  
*Certified Registered Nurse Anesthetist*

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## Question: 1

All the following are acceptable intravenous fluids to give a neurosurgical patient except:

- A. platelets.
- B. dextrose 5% and water.
- C. normal saline.
- D. Lactated Ringer's.

**Answer: B**

Explanation:

Correct answer: dextrose 5% and water.

Dextrose 5% and water should not be given to neurosurgical patients because once the dextrose is utilized by the body, only the water is left and brain swelling may occur. All other fluid choices listed can be given to neurosurgical patients.

## Question: 2

In which of the following is the rate of viral infectivity the greatest in the North America blood supply?

- A. West Nile virus
- B. Hepatitis B
- C. Hepatitis C
- D. Human immunodeficiency virus type 1

**Answer: B**

Explanation:

Correct answer: Hepatitis B

Hepatitis B currently occurs in approximately 1 in 269,000 donor exposures, making it the greatest viral infectivity risk.

Hepatitis C currently occurs in approximately 1 in 1,900,000 donor exposures. Human immunodeficiency virus type 1 occurs in about 1 in 2,135,000 donor exposures, and West Nile virus occurs in approximately 1 in 350,000 donor exposures.

## Question: 3

Which of the following laryngoscope blades usually improves visualization for the insertion of a double-lumen bronchial tube?

- A. Phillips
- B. Macintosh
- C. Wisconsin
- D. Miller

**Answer: B**

Explanation:

Correct answer: Macintosh

Laryngoscopy with a curved (Macintosh) blade usually improves visualization.

Miller, Phillips, and Wisconsin blades are straight blades. Straight blades may be more useful if the larynx is anterior, but a Macintosh blade usually provides better visualization.

### Question: 4

Which of the following is the most common complication of attempted cannulation of the internal jugular vein?

- A. Thoracic duct damage
- B. Air embolism
- C. Pneumothorax
- D. Carotid artery puncture

**Answer: D**

Explanation:

Correct answer: Carotid artery puncture

Accidental trauma to either the right or left carotid is the biggest potential problem with any attempt at internal jugular cannulation.

A left internal jugular central line attempt has some increased risk for pneumothorax and potential damage to the thoracic duct. Air embolism can occur if the catheter is allowed to be open to the air; to prevent air aspiration, the practitioner should keep their finger over the hub when the guide wire is removed or a syringe is attached or removed.

### Question: 5

A critically ill septic patient in the intensive care unit (ICU) is being transferred to the operating suites for an emergent procedure. Which of the following statements about the use of etomidate in this scenario is most accurate?

- A. Etomidate should not be used in critically ill patients.
- B. Supplemental corticosteroid administration to a septic patient who has received etomidate is ineffective.

- C. Etomidate should not be used in septic patients.  
D. If etomidate is used in a septic patient, supplemental corticosteroids must also be administered.

**Answer: B**

Explanation:

Correct answer: Supplemental corticosteroid administration to a septic patient who has received etomidate is ineffective.

The intravenously administered induction agent etomidate may be used as an alternative to propofol without major concern of negative cardiorespiratory problems arising. However, etomidate has been well-studied for its suppression of adrenal cortex function and for this reason should be used cautiously in the critically ill patient. Studies have found that the administration of a corticosteroid for up to 48 hours following a dose of etomidate to a critically ill patient has effectively treated the adrenal insufficiency brought on by etomidate. Critically ill septic patients who have received etomidate do not show significant improvement in adrenal function from administration of corticosteroid prophylaxis and, for this reason, etomidate in the septic, critically ill patient should only be used with great caution.

### Question: 6

Which of the following terms describes the condition that occurs when the placenta implants completely through the myometrium?

- A. Placenta accreta  
B. Placenta increta  
C. Placenta percreta  
D. Placenta previa

**Answer: C**

Explanation:

Correct answer: Placenta percreta

Normally in pregnancy, the placenta implants into the endometrium; when it implants on or into the myometrium, separation of the placenta from the uterus becomes increasingly difficult and may result in hemorrhage at the time of attempted placental delivery. When the placenta implants completely through the myometrium, it is called placenta percreta.

In placenta accreta, the placenta is implanted on the myometrium; in placenta increta, the placenta is implanted into the myometrium. In placenta previa, the placenta is inserted partially or totally over the cervix.

### Question: 7

All the following statements are true related to multiple sclerosis except:

- A. administration of the flu shot is not believed to be a trigger in the exacerbation of multiple sclerosis.

- B. regional anesthesia may relieve some degree of respiratory compromise that occurs in multiple sclerosis patients.
- C. epidural anesthesia is believed to be related to an exacerbation of symptoms in multiple sclerosis patients.
- D. plasmapheresis is an appropriate treatment modality for patients who have multiple sclerosis.

**Answer: C**

Explanation:

Correct answer: epidural anesthesia is believed to be related to an exacerbation of symptoms in multiple sclerosis patients.

There is no documented evidence that ties any anesthesia technique to an exacerbation of Multiple Sclerosis (MS) symptoms.

Regional anesthesia may relieve some degree of respiratory compromise that occurs in MS patients. Plasmapheresis, or plasma exchange, is an appropriate treatment modality for MS patients. To date, there is no evidence to indicate that flu shots cause an exacerbation of MS symptoms; however, it is best to avoid the live (inactivated) virus nasal spray.

### Question: 8

All the following are required by the American Society for Testing and Materials for an anesthesia gas machine except:

- A. an oxygen supply failure alarm.
- B. cylinder pressure regulators.
- C. an oxygen flush capable of delivering 35 to 75 liters per minute flow that does not proceed through any vaporizers.
- D. only one common gas outlet with 15-millimeter outer diameter.

**Answer: D**

Explanation:

Correct answer: only one common gas outlet with 15-millimeter outer diameter.

The American Society for Testing and Materials (ASTM) requires the inner diameter of the common gas outlet be 15 Millimeters (mm) and the outer diameter be 22 mm to reduce the chance of accidental disconnection.

An oxygen flush capable of delivering 35 to 75 L/min flow that does not proceed through any vaporizers, an oxygen supply failure alarm, and cylinder pressure regulators are all required by ASTM.

### Question: 9

Which of the following conditions is most commonly associated with painless vaginal bleeding during pregnancy?

- A. Placenta accreta
- B. Placenta increta
- C. Placental abruption
- D. Placenta previa

**Answer: D**

Explanation:

Correct answer: Placenta previa

Placenta previa occurs when the placenta implants low in the uterus where it partially or totally covers the cervix. Painless vaginal bleeding is a common symptom of the condition.

Placenta accreta occurs when the placenta implants on the endometrium, rather than in the myometrium; placenta increta occurs when the placenta implants into the endometrium. These conditions can result in hemorrhage at the time of delivery of the placenta, rather than painless bleeding during pregnancy. Abruption of the placenta, or abruptio placentae, is premature separation of a normal placenta that causes painful vaginal bleeding.

### Question: 10

Which of the following statements is true related to norepinephrine?

- A. It only functions as a neurotransmitter, not as a hormone.
- B. It is the neurotransmitter for both the preganglionic and postganglionic fibers in the parasympathetic nervous system.
- C. It is released by adrenergic neurons.
- D. It binds to cholinergic receptors.

**Answer: C**

Explanation:

Correct answer: It is released by adrenergic neurons.

Structures of the body that are affected by norepinephrine or, in the case of neurons, release it, are said to be adrenergic.

Norepinephrine is one of several catecholamines produced by the body. It functions both as a hormone and as a neurotransmitter and binds to adrenergic, rather than cholinergic, receptors. Acetylcholine, not norepinephrine, is the neurotransmitter for both the preganglionic and postganglionic fibers in the parasympathetic nervous system.

### Question: 11

Which of the following statements is true related to the anesthetic approach for a child with hydrocephalus?

- A. Infants with hydrocephalus cannot be given nitrous oxide.

- B. Awake tracheal intubation is preferred.
- C. The major concerns are protection of the airway and control of intracranial pressure.
- D. Ketamine markedly increases intracranial pressure in preterm infants with hydrocephalus and is contraindicated.

**Answer: C**

Explanation:

Correct answer: The major concerns are protection of the airway and control of intracranial pressure.

Infants with hydrocephalus eventually have an increase in head size and often an increase in IntraCranial Pressure (ICP). Increases in ICP can result in vomiting; protection of the airway and control of ICP are major concerns.

Volatile drugs, nitrous oxide, and opioids are all reasonable choices for maintenance of anesthesia. Ketamine does not increase ICP in preterm infants as it does in adults. A rapid-sequence induction of anesthesia to control the airway and ICP is preferred; awake tracheal intubation can increase ICP.

## Question: 12

Hepatorenal syndrome is characterized by all the following symptoms except:

- A. organ failure.
- B. acute onset of ascites.
- C. azotemia.
- D. oliguria.

**Answer: B**

Explanation:

Correct answer: acute onset of ascites.

HepatoRenal Syndrome (HRS) is a syndrome of acute renal failure that occurs specifically in patients with a history of severe, advanced liver disease, including cirrhosis, chronic disease of the liver, and portal hypertension. It may result from complications associated with chronic liver disease, including GastroIntestinal (GI) hemorrhage, sepsis, or even from treatment with diuretics to treat ascites.

HRS is characterized by chronic progressive ascites, azotemia, oliguria, and multisystem organ failure.

## Question: 13

The administration of which of the following gases carries the greatest risk of severe carbon monoxide poisoning, even with a fully functioning proportioning system?

- A. Sevoflurane (Ultane, Sojourn)
- B. Halothane (Fluothane)
- C. Desflurane (Suprane)
- D. Isoflurane (Forane, Terrell)

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**Answer: C**

Explanation:

Correct answer: Desflurane (Suprane)

High concentrations of a less-potent volatile, such as desflurane, can result in a hypoxic vapor mixture, even with a fully functioning proportioning system. The high concentration of desflurane may become a higher percentage of the total gas flows, lowering inspired oxygen levels.

Carbon monoxide production is insignificant with sevoflurane and halothane, intermediate with isoflurane, and highest with desflurane.

### Question: 14

A coincidental viral upper respiratory tract infection within two to four weeks before general anesthesia and endotracheal intubation appears to place a pediatric patient at greatest risk for which of the following perioperative complications?

- A. Wheezing
- B. Atelectasis
- C. Laryngospasm
- D. Hypoxemia

**Answer: A**

Explanation:

Correct answer: Wheezing

A coincidental viral infection within two to four weeks prior to general anesthesia and endotracheal intubation seems to place the child at increased risk for perioperative pulmonary complications, such as wheezing (a 10-fold risk increase) and laryngospasm (a 5-fold risk increase). The risk for hypoxemia and atelectasis may also be increased.

### Question: 15

A four-month-old infant is being evaluated by the CRNA in preparation for repair of a ventricular septal defect (VSD). The infant weighs 6 kilograms and has a hematocrit of 40%. The lowest acceptable hematocrit for this patient is 30%. Using the formula for calculating maximum allowable blood loss, which of the following choices most accurately reflects the permissible blood loss for this patient?

- A. 75 mLs
- B. 112.5 mLs
- C. 450 mLs
- D. 131.5 mLs



**Answer: B**

Explanation:

Correct answer: 112.5 mLs

The maximum allowable blood loss, or permissible loss, should be calculated for each pediatric patient preparing to undergo surgery. This level is determined individually for each patient, taking into consideration their age, weight, current health status, and any cardiac or pulmonary complications. Normal, healthy children without any history of cardiac problems can typically tolerate lower hematocrit levels without the development of sequela.

The formula for determining maximum allowable blood loss is as follows:

$$ABL = (EBV \times (Ho - HL)) / Ho$$

ABL= allowable blood loss

EBV= estimated blood volume (The CRNA should know the estimated blood volume for an infant older than 3 months is 75 mL/kg.)

Ho= original hematocrit

HL= lowest acceptable hematocrit

Using the data provided in the scenario, the formula would be calculated as follows:

EBV for this patient is 75 mL/kg, so  $75 \times 6 \text{ kg} = 450 \text{ mLs}$

$$ABL = (450 \times (40 - 30)) / (40)$$

$$ABL = (450 \times 10) / (40)$$

$$ABL = 4500 / 40$$

$$ABL = 112.5 \text{ mLs}$$

## Question: 16

Regarding minimum alveolar concentration (MAC), which of the following statements is most accurate?

- A. Sevoflurane administered in combination with remifentanyl provides the greatest reduction of MAC.
- B. A substantial opioid dose in conjunction with an inhaled anesthetic is necessary to reduce MAC by at least 55%.
- C. Desflurane administered in combination with fentanyl provides the greatest reduction of MAC.
- D. Administering an opioid in conjunction with an inhaled anesthetic can reduce MAC by more than 75%.

**Answer: D**

Explanation:

Correct answer: Administering an opioid in conjunction with an inhaled anesthetic can reduce MAC by more than 75%.

The Minimum Alveolar Concentration (MAC) is a method of comparing how much amnesia is induced by, or how potent, the volatile anesthetic gases are. MAC can be reduced by several means, including the administration of opioids in conjunction with inhaled anesthetics. Depending upon the combination of inhaled gas and an opioid agent, MAC may be reduced by more than 75% in some instances.

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Small to moderate doses of opioid may be all that are necessary in some instances to significantly reduce MAC. While the reduction of MAC by the co-administration of an opioid may be significant, opioids alone cannot be used to induce complete anesthesia.

### Question: 17

A drug ending in the suffix "pril" is typically associated with which of the following types of medications?

- A. Calcium channel blockers
- B. Serotonin blockers
- C. Histamine-2 blockers
- D. Angiotensin-converting enzyme inhibitors

**Answer: D**

Explanation:

Correct answer: Angiotensin-converting enzyme inhibitors

The names of Angiotensin-Converting Enzyme (ACE) inhibitors often end with the suffix "pril." Examples include captopril, enalapril, and lisinopril.

Names of calcium channel blockers often end in the suffix "dipine." Examples include nifedipine, nicardipine, and nimodipine. Exceptions to this include verapamil and diltiazem. Histamine-2 blockers often end with the suffix "tidine." Examples include ranitidine, famotidine, and nizatidine. Names of serotonin blockers often end with the suffix "tron." Examples include ondansetron and dolasetron.

### Question: 18

All the following are common signs or symptoms of multiple sclerosis except:

- A. tremor.
- B. mild cognitive and memory difficulties.
- C. spasticity.
- D. multiple trigger points and widespread chronic pain.

**Answer: D**

Explanation:

Correct answer: multiple trigger points and widespread chronic pain.

Multiple trigger points and widespread chronic pain are characteristic of fibromyalgia, rather than multiple sclerosis.

Common symptoms of multiple sclerosis include the following:

- Fatigue
- Visual disorders
- Numbness
- Dizziness/vertigo

- Bladder and bowel dysfunction
- Weakness
- Tremor
- Impaired mobility
- Sexual dysfunction
- Slurred speech
- Spasticity
- Swallowing disorders
- Chronic aching pain
- Depression
- Mild cognitive and memory difficulties

### Question: 19

In which lung zone(s) is pulmonary capillary flow continuous and proportional to the arterial-venous pressure gradient?

- A. Zone I and III
- B. Zone III
- C. Zone I
- D. Zone I and II

**Answer: B**

Explanation:

Correct answer: Zone III

Each lung can be divided into three zones, based on alveolar, arterial, and venous pressures. Zone I is the upper zone and represents alveolar dead space because alveolar pressure continually occludes the pulmonary capillaries. In zone II, the middle zone, pulmonary capillary flow is intermittent and varies during respiration according to the arterial-alveolar pressure gradient.

Pulmonary capillary flow is continuous in zone III and is proportional to the arterial-venous pressure gradient.

### Question: 20

Which of the following drugs, if administered during cholangiogram, can result in a false-positive result?

- A. Halothane
- B. Morphine
- C. Glucagon
- D. Naloxone

**Answer: B**

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Explanation:

Correct answer: Morphine

All opioids can potentially cause spasm of the Sphincter of Oddi and increase biliary pressure. The use of intravenous opioids, such as morphine, fentanyl, meperidine, butorphanol, and nalbuphine can induce biliary colic or result in false-positive cholangiograms.

Halothane, naloxone, and glucagon are reported to relieve opioid-induced biliary spasms.

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