

# **College Admission Medical-Surgical-Nurse Medical-Surgical-Nurse Certification Exam**



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## Question: 1

An embolus is what?

- A. A small spot caused by bleeding in the skin or mucous membrane, causes a purplish patch.
- B. A clot carried by blood from a larger vessel to a smaller vessel.
- C. A tiny red spot caused by a minor amount of blood.
- D. A solid mass of clotted blood in a vessel or the heart.

**Answer: B**

Explanation:

An embolus is essentially a traveling clot that moves through the bloodstream until it reaches a vessel too small to pass through, at which point it blocks the vessel. This blockage can lead to various health complications depending on where it occurs in the body. Emboli can originate from different materials such as blood (thrombus), air, fat, or even tumor cells, but the most common type is a blood clot.

The process begins typically within larger blood vessels, where a clot forms and then breaks free. This free-floating clot is referred to as an embolus. As it travels through the circulatory system, it eventually reaches a point where the diameter of the blood vessel becomes too small for it to continue, leading to the occlusion of that vessel. The site and size of the embolus determine the severity of the blockage and the potential for serious health issues.

For instance, if an embolus blocks an artery in the lungs, it causes what is known as a pulmonary embolism, a serious condition that can lead to difficulty breathing, chest pain, and even death. Similarly, if the blockage occurs in the brain, it results in an ischemic stroke, which can cause brain damage due to a lack of oxygen.

The treatment and management of an embolism depend on its location and severity. Immediate medical intervention often involves medication to dissolve the clot or surgical procedures to remove it, aiming to restore normal blood flow and prevent further damage to tissues and organs. Preventative measures can include medication to reduce clotting for individuals at high risk, lifestyle changes, and management of underlying conditions that contribute to clot formation.

## Question: 2

A hold order may be ordered for patients on insulin therapy if the glucose threshold is what?

- A. <110 mg/dL.
- B. <100 mg/dL.
- C. <105 mg/dL.
- D. <115 mg/dL.

**Answer: B**

Explanation:

\*In the context of diabetes management, particularly for patients on insulin therapy, a "hold order" is a directive used in clinical settings to temporarily stop insulin administration under specific circumstances. This protocol is crucial to prevent hypoglycemia, a condition where blood glucose levels drop too low, posing serious health risks to the patient. Hypoglycemia can cause symptoms such as shaking, confusion, dizziness, or even more severe complications like loss of consciousness or seizures. \*

\*Insulin, while essential for controlling high blood sugar, can sometimes lower glucose levels excessively. To mitigate this risk, medical professionals set glucose thresholds that trigger a hold on insulin administration. If a patient's blood glucose level falls below this predefined threshold, insulin doses are withheld to allow glucose levels to stabilize and prevent further drop. \*

\*The threshold for a hold order can vary based on the patient's individual health profile, the type of insulin being used, and other factors. However, it is commonly set at less than 100 mg/dL. This level is chosen based on clinical guidelines and empirical evidence which suggest that glucose levels below 100 mg/dL increase the risk for hypoglycemia, especially if trending downwards. \*

\*It is important for healthcare providers to closely monitor blood glucose levels in patients receiving insulin therapy and adjust the treatment protocol as necessary. This includes issuing hold orders when appropriate to safeguard against hypoglycemia, thus balancing the need to manage high blood sugar with the risk of pushing glucose too low. Regular review and adjustment of the glucose threshold for hold orders ensure that the management of diabetes remains both effective and safe.

### Question: 3

What is surgical conscience?

- A. An invasive incision into the body tissues for therapeutic or diagnostic purposes.
- B. A caregiver's awareness based on understanding the need for strict adherence to principles of aseptic and sterile techniques.
- C. A caregiver's application of knowledge into observable, measurable, and quantifiable performance.
- D. A caregiver's application of knowledge, skills, and interpersonal abilities to provide quality patient care.

**Answer: B**

Explanation:

Surgical conscience refers to the ethical and professional awareness that healthcare providers, particularly those involved in surgical and perioperative settings, must maintain to ensure patient safety and optimal outcomes. This concept is fundamental in maintaining a sterile environment, preventing infections, and adhering strictly to surgical protocols and procedures.

The term encompasses more than just following rules; it implies a deep-seated moral responsibility to uphold the principles of asepsis and sterility at all times. This means that every action, from hand-washing to using sterilized instruments, is performed with the utmost care and attention to detail, understanding that the smallest lapse can lead to significant complications for the patient.

Moreover, surgical conscience involves self-discipline, as it requires healthcare workers to constantly monitor their own practices and be willing to correct themselves or speak up if they observe breaches in protocol. This self-regulation is crucial in fast-paced environments where the risk of infection is high.

In summary, surgical conscience is not just about following a set of rules; it is about internalizing those rules as part of a professional and ethical commitment to patient care. It is about being vigilant and proactive in maintaining cleanliness, sterility, and asepsis to protect patients from potential harm during surgical procedures.

This commitment must be evident in every action taken by the surgical team, from the surgeon to the support staff, ensuring a culture of safety and excellence in patient care.

### Question: 4

Which of the following types of hepatitis is transmitted via the fecal-oral route?

- A. Hepatitis D
- B. Hepatitis C
- C. Hepatitis B
- D. Hepatitis A

**Answer: D**

Explanation:

Hepatitis A is known to be transmitted primarily through the fecal-oral route. This mode of transmission occurs when an uninfected person ingests food or water that has been contaminated with the feces of an infected person. This can commonly happen in areas with poor sanitation or during travel to regions where hepatitis A is prevalent. Examples of such transmission include consuming contaminated water, ice, or shellfish from contaminated water, and even from person-to-person contact if hygiene practices are inadequate. In contrast, other types of hepatitis, such as Hepatitis B, C, and D, are typically spread through different pathways. Hepatitis B is primarily transmitted through contact with infected bodily fluids such as blood, semen, or vaginal secretions, often through sexual contact or the use of contaminated needles and syringes. Hepatitis C is similarly transmitted primarily through blood-to-blood contact, with common transmission routes including sharing needles, syringes, or other equipment to inject drugs. Hepatitis D, which requires the hepatitis B virus to already be present to infect a person, is also spread through direct contact with infected blood. Understanding these routes of transmission is crucial for implementing appropriate preventive measures. For Hepatitis A, ensuring access to clean water and proper sanitation, practicing good personal hygiene, and vaccination are key preventive strategies. For Hepatitis B, C, and D, preventive measures include safe sexual practices, careful handling of blood and bodily fluids, and vaccination (for Hepatitis B, which also provides protection against Hepatitis D). Thus, when considering the transmission routes of various hepatitis viruses, it is clear that Hepatitis A uniquely follows the fecal-oral route, distinguishing it from the other types listed, which are transmitted through more direct contact with infected bodily fluids.

### Question: 5

Nursing supervision generally involves all of the following EXCEPT for:

- A. Conducting in-services and continuing education.
- B. Discussing policies and procedures.
- C. Conducting performance appraisals.
- D. Providing licensure or certification for nurses.

**Answer: D**

Explanation:

The question asks which of the listed activities is not typically a responsibility of nursing supervision. The correct answer is "Providing licensure or certification for nurses."

Nursing supervision encompasses a variety of responsibilities which are crucial for maintaining the standards and efficiency of nursing services in healthcare facilities. These responsibilities traditionally include conducting in-services and continuing education programs, discussing policies and procedures, and conducting performance appraisals. Each of these activities plays a vital role in ensuring that nursing staff are well-informed, competent, and aligned with the goals and regulations of the healthcare institution.

Conducting in-services and continuing education is a fundamental aspect of nursing supervision. These educational sessions ensure that nursing staff are up-to-date with the latest medical practices, healthcare technologies, and regulatory requirements. It helps in maintaining a knowledgeable and skilled nursing workforce capable of providing high-quality patient care.

Discussing policies and procedures is another essential responsibility. By regularly communicating these guidelines, nursing supervisors ensure that all staff members understand their roles and responsibilities. This clarity helps in preventing errors and ensuring that the care provided is safe, ethical, and compliant with legal standards.

Conducting performance appraisals is critical in managing a nursing team effectively. These appraisals help supervisors assess the performance of nurses, provide constructive feedback, and identify areas for improvement. It also serves as a basis for career development, motivating nurses by recognizing their hard work and helping them achieve their professional goals.

However, providing licensure or certification for nurses is not within the scope of responsibilities handled by nursing supervisors. Licensure and certification are typically managed by state boards of nursing or professional regulatory bodies. These entities ensure that nurses meet specific educational and professional standards before they are allowed to practice. While nursing supervisors can support nurses in preparing for licensure or certification exams, they do not have the authority to grant these credentials themselves.

Therefore, it is clear that among the listed options, "Providing licensure or certification for nurses" is the activity that nursing supervision does not involve. This understanding is crucial for anyone involved in or aspiring to enter the field of nursing supervision, as it delineates the boundaries and focuses of the role in the context of broader healthcare management.

### Question: 6

A condition in which the heart muscles are stiff and thus cannot fill with blood well is known as what?

- A. Systolic heart failure.
- B. Diastolic heart failure.
- C. Congestive heart failure.
- D. Aortic regurgitation.

**Answer: B**

Explanation:

The condition described in the question refers to diastolic heart failure. This is a type of heart failure where the heart muscles become stiff, limiting the heart's ability to relax and fill with blood during the diastolic phase (when the heart relaxes). This stiffness impedes the normal influx of blood, leading to inadequate filling of the heart chambers and consequently, a reduction in the blood volume pumped to the rest of the body during each heartbeat.

Diastolic heart failure contrasts with systolic heart failure, where the heart's problem lies in the contraction phase. In systolic heart failure, the heart muscle is weak and cannot pump forcefully enough to circulate blood adequately through the body. Thus, while diastolic failure is a problem with relaxation and filling, systolic failure is a problem with contraction and pumping.

It's important to differentiate between these types of heart failure because their management and treatments can vary. For instance, diastolic heart failure often requires control of blood pressure and heart rate, whereas systolic failure might be managed with medications that improve the heart's pumping efficacy.

Congestive heart failure (CHF) is a broader term that can include both systolic and diastolic heart failure. It refers to the condition where fluid builds up around the heart, causing it to pump inefficiently. Aortic regurgitation, another condition listed, involves the backflow of blood from the aorta into the left ventricle due to a defect in the aortic valve; this is distinct and not directly related to the failure of the heart muscle's ability to relax or contract.

Understanding these distinctions is crucial for appropriate diagnosis and treatment, which can significantly influence the quality of life and prognosis for patients suffering from heart-related ailments.

### Question: 7

Which of the following is a danger if intrapleural pressure is not maintained?

- A. Myocardial infarction.
- B. Pericardial effusion.
- C. Hemothorax.
- D. Lung collapse.

**Answer: D**

Explanation:

The intrapleural pressure is a crucial aspect of pulmonary physiology that helps keep the lungs expanded within the thoracic cavity. Normally, this pressure is slightly negative relative to atmospheric pressure, which helps in maintaining the lungs in an inflated state. If this pressure balance is disrupted, it can lead to a condition known as lung collapse or pneumothorax.

Lung collapse occurs when air or gas enters the pleural space, the thin fluid-filled space between the two pulmonary pleurae of each lung. Under normal circumstances, the negative intrapleural pressure relative to atmospheric pressure keeps the lungs expanded against the chest wall. However, if air enters the pleural space, it can cause the intrapleural pressure to become less negative or even positive relative to the outside air pressure. This loss of negative pressure causes the lung to recoil and collapse because the lung's elastic nature drives it to occupy a smaller volume.

This condition can arise from traumatic injuries such as rib fractures, from medical procedures, or spontaneously without an apparent cause. Symptoms typically include sudden chest pain and shortness of breath. On the physiological level, lung collapse reduces the efficiency of gas exchange because part or all of the lung is not available for ventilation, leading to reduced oxygen levels in the blood.

To treat or prevent a lung collapse, especially in cases where it affects a significant portion of the lung or poses severe symptoms, medical intervention is required. One common method to re-establish the correct intrapleural pressure and re-expand the lung is the placement of a chest tube. This tube is inserted into the pleural space to remove the air or gas, thereby restoring the negative pressure needed to re-inflate the lung.

While other conditions such as myocardial infarction, pericardial effusion, and hemothorax are serious health issues, they are not directly related to the maintenance of intrapleural pressure. Myocardial infarction (heart

attack) involves the heart muscle and is primarily related to coronary artery blockage. Pericardial effusion involves fluid accumulation in the pericardial sac surrounding the heart, and hemothorax involves blood accumulation in the pleural space, often due to trauma or injury, but does not directly relate to the mechanics of lung collapse due to disrupted intrapleural pressure. Hence, the direct consequence of not maintaining intrapleural pressure is primarily the risk of lung collapse.

### Question: 8

The Mantoux test is used to test for which of the following?

- A. hepatitis
- B. tuberculosis
- C. HIV
- D. cervical cancer

**Answer: B**

Explanation:

The Mantoux test, also known as the Mantoux tuberculin skin test, is specifically designed to detect latent or active tuberculosis (TB) infections. It does not test for hepatitis, HIV, or cervical cancer.

The procedure involves injecting a small amount of tuberculin purified protein derivative (PPD) into the skin of the forearm. The site of injection is then observed for a reaction, which is typically read 48-72 hours after the administration of the test. The presence of a raised, hard area or swelling at the injection site can indicate an immune response suggesting exposure to the TB bacteria.

Tuberculosis is a serious bacterial infection caused by *Mycobacterium tuberculosis*. It primarily affects the lungs but can also impact other parts of the body. The Mantoux test is an essential tool in TB control strategies, helping identify individuals who may need further testing or treatment to prevent the spread of tuberculosis.

It is important to note that the Mantoux test requires proper interpretation by a healthcare professional. Factors such as the size of the induration (the raised, hardened area), the patient's risk factors, and history of Bacillus Calmette-Guérin (BCG) vaccination can influence the results. A positive test result suggests TB exposure, but it does not confirm active disease. Additional tests, such as a chest X-ray or a sputum test, are required to diagnose active tuberculosis.

In summary, the Mantoux test is a diagnostic tool used exclusively for tuberculosis and not for other conditions like hepatitis, HIV, or cervical cancer. Its role in public health is critical for the early detection and management of tuberculosis, thereby reducing its transmission and impact on public health.

### Question: 9

Which of the following is a contraindication for Propofol?

- A. Allergy to soybeans.
- B. Brain tumor.
- C. Diverticulitis.
- D. Hypothermia.

**Answer: A**

Explanation:

Propofol is a widely used intravenous agent for the induction and maintenance of general anesthesia, as well as for sedation in various medical procedures. It is known for its rapid onset and relatively short duration of action. However, like all medications, propofol has specific contraindications that must be considered to ensure patient safety.

One significant contraindication for the use of propofol is an allergy to soybeans. Propofol formulations contain soybean oil, which provides the lipid base necessary for the emulsion in which propofol is delivered. Patients who have a known allergy to soybeans are at risk of experiencing allergic reactions, which can range from mild hypersensitivity to severe anaphylaxis, a potentially life-threatening condition. Therefore, it is crucial to screen patients for soy and egg allergies (as some formulations may also contain egg lecithin) before administering propofol.

In the context of the question provided, the correct answer is indeed an allergy to soybeans. This is because individuals with this allergy would be exposed to the allergen contained within the propofol formulation, posing a significant risk of an allergic reaction. Other options listed such as brain tumor, diverticulitis, and hypothermia, while important clinical considerations in the broader management of the patient, are not contraindications for the use of propofol in the same direct way as a soybean allergy is.

It's important for healthcare providers to thoroughly review a patient's allergy history and understand the components of medications, including propofol, to avoid preventable adverse reactions. This ensures the safety and efficacy of anesthesia management during surgical and diagnostic procedures.

### Question: 10

The setting for inspiratory time needs to be maintained at a ratio of \_\_\_\_ or higher.

- A. 1:4
- B. 1:5
- C. 1:2
- D. 1:3

**Answer: C**

Explanation:

The setting for inspiratory time in mechanical ventilation is crucial for ensuring adequate gas exchange and patient comfort. Inspiratory time is the portion of the ventilatory cycle during which air is actively being delivered to the patient's lungs. This is followed by the expiratory time, when air exits the lungs. The ratio of inspiratory time to expiratory time (I:E ratio) is a key parameter in ventilator settings.

An I:E ratio of 1:2 or higher is typically recommended. This means that the expiratory time should be at least twice as long as the inspiratory time. For example, if the inspiratory time is set at 1 second, the expiratory time should be at least 2 seconds. This ratio helps in preventing air trapping, auto-PEEP (positive end-expiratory pressure), and ensures adequate time for the lungs to expel carbon dioxide.

In certain clinical situations such as severe obstructive lung disease, a higher I:E ratio (e.g., 1:3, 1:4) might be necessary to allow more time for exhalation, preventing airway collapse and gas trapping. Conversely, in cases where rapid ventilation is needed (like in some cases of metabolic acidosis), the I:E ratio might be adjusted to allow for a shorter expiratory phase.



It's important to adjust the I:E ratio based on the patient's respiratory mechanics and gas exchange needs, continuously monitoring their response to the ventilatory support. Adjustments should be made in consultation with respiratory therapists and based on arterial blood gas analyses and other clinical indicators.

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