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# **Healthcare**

## **CCI-RCIS**

**CCI Registered Cardiovascular Invasive Specialist (RCIS)**



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# Latest Version: 6.1

## Question: 1

Where would the post-procedural PTCA patient more than likely be transferred to?

- A. Medical floor
- B. Step-down floor
- C. CCU
- D. Both B and C

## Answer: D

Explanation:

PTCA, or percutaneous transluminal coronary angioplasty, is a minimally invasive procedure used to open up blocked coronary arteries to improve blood flow to the heart muscle. This is typically done by inflating a small balloon at the site of the blockage. After the procedure, the patient's immediate recovery is crucial and requires careful monitoring.

Initially, the patient is often taken to the Cardiac Catheterization Lab (CCL) where the procedure is performed. Following this, the patient's next location for continued care depends on several factors including the complexity of the procedure, the patient's medical history, and how they respond to the PTCA.

Typically, patients are moved to either a step-down unit or the Cardiac Care Unit (CCU). A step-down unit is a transitional care unit where patients who do not require intensive care but still need close monitoring can be observed. It's designed for patients who are stable but still need nursing care and frequent monitoring of vital signs.

The CCU, on the other hand, provides more intensive monitoring and care. It is equipped for patients who may have had a complicated procedure, or those with potential for serious heart conditions that might require immediate medical attention. Here, patients can be closely monitored for any signs of complications like arrhythmia, heart failure, or recurrent chest pain.

The decision to transfer a patient to either a step-down unit or the CCU is usually made by the attending cardiologist, based on the patient's overall stability, the presence of any complications during or after the procedure, and the anticipated need for further immediate medical interventions.

Therefore, when the question asks where a post-procedural PTCA patient is more than likely to be transferred, the correct answer would be "Both B and C," referring to both the step-down floor and the CCU. This acknowledges that care level needs can vary significantly among patients following PTCA, and the facility must be prepared to accommodate these varying requirements efficiently to promote the best outcomes for the patient.

## Question: 2

Which of the following would the cardiac catheterization laboratory staff not need to be certified in?

- A. Med-surg

- B. BCLS
- C. PALS
- D. ACLS

**Answer: A**

**Explanation:**

In understanding the certifications necessary for staff in a cardiac catheterization laboratory, it is important to note that certain certifications are crucial due to the nature of the work, which involves dealing with patients who are undergoing heart-related diagnostic and interventional procedures. These procedures can be critical and may require immediate life support intervention, which is why certifications in life support techniques are mandatory.

The staff in a cardiac catheterization laboratory typically need to be certified in Advanced Cardiac Life Support (ACLS) and Basic Cardiac Life Support (BCLS). ACLS certification is important because it equips staff with the skills necessary to manage and respond to severe cardiac conditions like cardiac arrest or other cardiopulmonary emergencies. BCLS, or CPR for healthcare providers, is also essential as it covers fundamental life-saving techniques to be used in emergencies until further medical care is available.

If the facility handles pediatric patients, Pediatric Advanced Life Support (PALS) certification will also be required for the staff. PALS training focuses on acute management and life support for children and infants, which involves different approaches and considerations compared to adults.

However, Med-Surg, or Medical-Surgical Nursing certification, typically is not required for cardiac catheterization laboratory staff. Med-Surg certification is more relevant for nurses working on general medical floors where a broad range of medical conditions are managed, rather than specialized environments like a cardiac catheterization lab. While Med-Surg knowledge can be beneficial broadly in nursing, it does not specifically address the acute scenarios and technical skills required in a cardiac cath lab setting.

In summary, while ACLS, BCLS, and possibly PALS, are essential certifications for cardiac catheterization laboratory staff, Med-Surg certification is not typically required. Staff in these labs must be prepared to handle specific cardiac emergencies and interventions, which are outside the general scope of Med-Surg nursing.

### **Question: 3**

Of the following statements, which would not be correct for the maintenance of a sterile field?

- A. The scrubbed personnel should consider themselves sterile from their waist to their chest in front and from their fingertips to their elbows.
- B. The scrubbed personnel should hold their hands at chest level when they aren't performing a task.
- C. The scrubbed personnel should not touch any item that is not sterile.
- D. The edges of the sterile field are also considered sterile.

**Answer: D**

**Explanation:**

To address the question of which statement would not be correct for the maintenance of a sterile field, it's important to understand the guidelines and practices that ensure sterility during medical

procedures. Sterile fields are crucial in preventing infection and maintaining patient safety. Here's an expanded explanation:

The first statement, "The scrubbed personnel should consider themselves sterile from their waist to their chest in front and from their fingertips to their elbows," is correct. This guideline is crucial because it defines the area that is considered sterile on a person who is directly involved in the sterile field, such as a surgeon or surgical assistant. Maintaining sterility in this zone prevents the introduction of pathogens to the surgical site.

The second statement, "The edges of the sterile field are also considered sterile," would not be correct. This is the statement that does not align with standard sterile practices. Typically, the edges of any sterile field, such as the edges of sterile drapes or the outermost boundaries of a set-up sterile table, are considered non-sterile. This is because these areas are more likely to come into contact with non-sterile surfaces or objects, thus compromising their sterility. It's standard practice to consider a margin around the sterile field as non-sterile to ensure there is a buffer zone, preventing inadvertent contamination.

The third statement, "The edges of the sterile field are not considered sterile. During preparation, if a sterile field is left unattended, then the whole table is no longer deemed sterile," is correct and reinforces the importance of continuous vigilance and monitoring of the sterile field. Leaving a sterile field unattended can lead to uncertainty about whether it has been compromised. The integrity of the sterile environment must be maintained at all times, and any doubt about contamination typically leads to treating the area as non-sterile for safety reasons.

Additional correct practices for maintaining a sterile field include: scrubbed personnel keeping their hands at chest level to avoid contact with lower, potentially non-sterile areas; and the avoidance of touching any non-sterile item, as this would immediately compromise the sterility of the person's gloves and potentially the entire sterile field.

Understanding and adhering to these sterile field principles is essential for all healthcare providers involved in surgical or other aseptic procedures to minimize infection risks and ensure patient safety. The maintenance of a sterile field is a fundamental aspect of surgical asepsis, requiring strict discipline and adherence to established protocols.

## Question: 4

When a patient is admitted to the hospital in anticipation of having a cardiac procedure, when should the nursing staff start their education?

- A. The night prior to their procedure
- B. When the patient is admitted
- C. After the physician talks with the patient
- D. After the informed-consent is signed

**Answer: B**

Explanation:

The correct answer to when the nursing staff should start their education for a patient scheduled for a cardiac procedure is: when the patient is admitted. This timing is crucial for several reasons, primarily because it allows the patient to receive comprehensive care that integrates education, preparation, and psychological support from the very beginning of their hospital stay.

Upon admission, the patient is often feeling anxious or uncertain about the upcoming procedure. Starting education immediately can help alleviate some of these fears by providing clear and detailed

information about what to expect. The assigned nurse plays a pivotal role in this initial education phase. They are not only responsible for the clinical care of the patient but also for ensuring that the patient understands every aspect of their upcoming procedure and post-procedure care.

The scope of this education typically covers several important areas: 1. **Medications**: The patient needs to know what medications they will be taking before, during, and after the procedure, including any adjustments to their existing medication regimen. 2. **Diet**: Dietary instructions may be necessary, especially if the procedure requires any specific nutritional preparations or restrictions. 3. **IV Therapy**: Information about any intravenous treatments that will be administered during the hospital stay. 4. **Post-Procedure Expectations**: This includes details about recovery times, potential side effects, pain management, and the length of expected bedrest. Also, information regarding follow-up visits and lifestyle modifications post-discharge.

Educating a patient from the moment they are admitted not only helps in building a trusting relationship but also empowers the patient. It makes them an active participant in their own healthcare, which can lead to better outcomes. This educational process should be viewed as a continuous dialogue rather than a one-time event, with the nurse answering questions and providing reassurances as needed throughout the patient's stay.

In contrast, waiting until the night before the procedure, after the physician consults, or after the informed consent is signed, might not give the patient sufficient time to fully understand or digest the information, thereby increasing their anxiety or potentially leading to misinformation. Starting education right at admission ensures that there is ample time to cover all necessary topics in depth, revisit any complex information, and accommodate the patient's processing speed and emotional state. In conclusion, immediate and ongoing patient education upon admission is essential for effective care and preparation for a cardiac procedure. It supports better patient outcomes through informed, collaborative, and proactive care planning.

## Question: 5

Of the following, which statement would be considered correct regarding the importance of the IV access during a cardiac catheterization?

- A. IV access could be used for the administration of emergency medications to help counteract such conditions as vagal reactions.
- B. IV access can be used to hydrate the patient during the catheterization.
- C. IV access cannot be used for the administration of emergency medications.
- D. Both A and B

## Answer: D

Explanation:

Intravenous (IV) access during a cardiac catheterization is crucial for several reasons, making it effectively a "second lifeline" for the patient. This importance stems from the multiple functions that the IV line serves during the procedure.

Firstly, IV access allows for the administration of emergency medications. During a cardiac catheterization, various complications can arise that may require immediate medical intervention. For example, a patient might experience a vagal reaction, which can lead to symptoms like sudden bradycardia (slow heart rate), hypotension (low blood pressure), and even cardiac arrest. Emergency

medications, such as atropine to counteract bradycardia, or other critical drugs, can be administered swiftly and effectively through the IV line.

Secondly, IV access is used for hydration of the patient. Maintaining proper hydration is crucial, as it helps ensure stable blood pressure and adequate kidney function, which is especially important when contrast material is used during the procedure. The contrast material can be nephrotoxic, and adequate hydration helps in preventing renal complications.

Therefore, the correct statement regarding the importance of IV access during a cardiac catheterization would be: "During a cardiac catheterization, the second lifeline for the patient is considered an IV access. This access can be used for the administration of emergency medications and to hydrate the patient."

This statement emphasizes that both administration of emergency medications and patient hydration are critical uses of IV access, underscoring its dual function as a lifeline during the procedure.

Statements suggesting that IV access cannot be used for administering emergency medications are incorrect, as this is one of the primary purposes of establishing IV access in such settings.

## Question: 6

If a local anesthesia is being administered, what would be the size of the needle that would be used for a subcutaneous injection?

- A. 18 gauge
- B. 12 gauge
- C. 25 gauge
- D. None of the above

## Answer: C

Explanation:

When administering a subcutaneous injection, the size of the needle is an important consideration to ensure proper delivery of the medication and minimize discomfort to the patient. The gauge of a needle refers to its diameter; the larger the gauge number, the smaller the diameter of the needle. Commonly, subcutaneous injections require needles that are thin enough to easily pass through the skin but wide enough to administer the medication effectively.

For a subcutaneous injection, such as one involving local anesthesia before a procedure like catheterization, a 25 gauge needle is typically used. This size is preferred because it is large enough to allow the anesthesia to be administered smoothly, yet small enough to minimize pain and tissue damage at the injection site. A 25 gauge needle strikes a balance between ease of injection and patient comfort. Occasionally, if the injection needs to reach deeper subcutaneous tissues, a slightly larger needle, such as a 22 gauge, may be chosen. This is somewhat thicker and can be beneficial for delivering the medication to a slightly deeper layer without requiring an intramuscular injection, which would need an even larger needle.

In contrast, needles like the 18 gauge or 12 gauge are significantly larger and are generally used for other purposes such as drawing blood or administering intravenous therapies, where larger veins are targeted, and faster fluid flow is required. These sizes would be inappropriate and potentially harmful for subcutaneous injections due to their large diameter, which could cause excessive pain and tissue damage.

Therefore, for a subcutaneous injection involving local anesthesia, a 25 gauge needle is the most appropriate choice due to its adequate size for medication delivery while maintaining patient comfort.

## Question: 7

Morphine and which of the following would be considered as first-line medications that would be used for conscious sedation during a cardiac catheterization?

- A. Furosemide
- B. Lisinopril
- C. Ativan
- D. Midazolam

## Answer: D

Explanation:

The question you've provided is asking about the first-line medications used for conscious sedation during a cardiac catheterization. Conscious sedation is a medical procedure that uses medication to help a patient relax (sedation) and to block pain (analgesia) during a medical or dental procedure. A patient under conscious sedation is awake and able to respond to commands, but is simultaneously relieved from pain and discomfort.

For the procedure like cardiac catheterization, which involves the insertion of a catheter into a chamber or vessel of the heart, both sedation and pain control are crucial. This is because the procedure can cause significant anxiety and discomfort. The medications listed in the question are used to achieve this dual requirement.

Among the options you provided: - Morphine is a potent opiate used primarily for pain relief. It is effective in lowering the perception of acute pain and can also induce a sense of well-being, which helps in reducing anxiety indirectly. - Midazolam is a benzodiazepine that is commonly used for its sedative, anxiety-reducing, and muscle-relaxing properties. It's very effective in inducing a state of amnesia, which is beneficial for patients as it helps them to forget any unpleasantness associated with the procedure.

Other medications listed like Furosemide, Lisinopril, and Ativan (lorazepam) serve different primary purposes: - Furosemide is a diuretic, mostly used to treat fluid build-up due to heart failure, liver scarring, or kidney disease. - Lisinopril is an ACE inhibitor, used to treat high blood pressure and heart failure. - Ativan (lorazepam), another benzodiazepine similar to midazolam, could technically be used for sedation, but is not as commonly chosen for this specific setting as midazolam.

From the options provided: - Demerol (meperidine) and Fentanyl are other narcotics that can be used for pain control during medical procedures. They are similar to morphine but have different profiles in terms of duration of action and side effects.

The best answer to the question, considering typical medical practice for conscious sedation during a cardiac catheterization, would be Morphine and Midazolam. These medications provide both the necessary analgesic and sedative effects required for such a procedure. They are widely used and are considered first-line agents for managing pain and anxiety during invasive procedures like a cardiac catheterization.

## Question: 8

Of the following, which would be considered correct for why a cardiac catheterization is performed?

- A. Check how well the patient's heart action is
- B. Check the lung damage
- C. Locate any congenital heart defects
- D. Both A and C

**Answer: D**

Explanation:

Cardiac catheterization is a medical procedure used to diagnose and treat certain cardiovascular conditions. The primary purposes for which this procedure is performed include assessing the heart's function, identifying congenital heart defects, evaluating the heart's pumping action, checking the functioning of heart valves, detecting blockages, and measuring blood flow and blood pressure within the heart chambers.

The procedure involves the insertion of a catheter, which is a thin, flexible tube, into a blood vessel that leads to the heart. This allows doctors to perform diagnostic tests and treatments directly within the heart and its associated structures. For instance, through cardiac catheterization, physicians can use imaging techniques to visualize the heart's chambers, valves, and coronary arteries. This is crucial for diagnosing conditions such as coronary artery disease, heart valve disease, or congenital heart defects. Additionally, cardiac catheterization can measure the pressure and blood flow in the heart's chambers.

This measurement helps in assessing the overall efficiency of the heart's pumping mechanism.

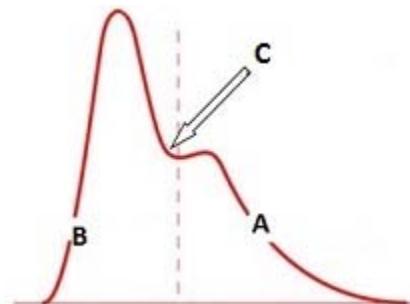
Moreover, if blockages are detected, procedures such as angioplasty can be performed during catheterization to open up the arteries and restore normal blood flow to the heart muscle.

However, it's important to note that cardiac catheterization does not serve the purpose of checking for lung damage. Assessment of lung function and damage typically involves different procedures, such as pulmonary function tests or imaging studies like chest X-rays or CT scans, which are not part of cardiac catheterization.

Thus, in the context of the given question, the correct answer would be "Both A and C" because cardiac catheterization is indeed performed to check how well the patient's heart action is and to locate any congenital heart defects. It is not used to check lung damage, making options suggesting this incorrect.

### Question: 9

On the image above, which of the following indicates the diastolic phase of a normal arterial pulsation wave form?



- A. Arrow

- B. A
- C. B
- D. None of the above

**Answer: B**

**Explanation:**

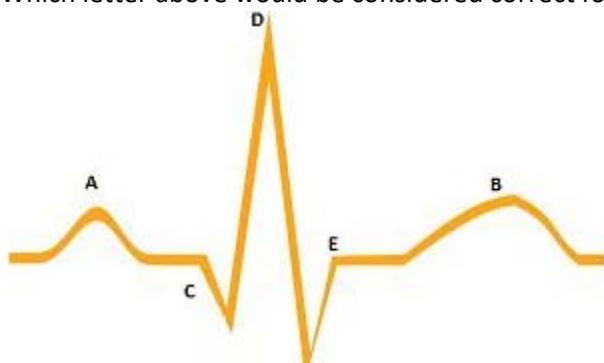
The correct identification of different phases of the arterial pulse waveform is crucial for understanding cardiovascular function and health. In a typical arterial pulse waveform captured on devices such as pulse oximeters or during an arterial line monitoring, there are distinct phases that correspond to different events in the cardiac cycle.

To answer the question correctly, it's essential to recognize what each label or indicator on the waveform represents: - **Letter B**: This typically indicates the peak of the waveform, which corresponds to the systolic phase of the cardiac cycle. During systole, the heart's ventricles contract and pump blood into the arteries. This phase is characterized by the highest pressure in the arteries as the blood is being actively pushed through them. - **The Arrow**: Often, the arrow points to a specific feature on the waveform known as the dicrotic notch. The dicrotic notch occurs shortly after the peak systolic phase. It represents a brief rise in arterial pressure caused by the closure of the aortic valve. When the valve closes, there is a slight rebound of blood against the closed valve, which results in this small upward deflection in the waveform. - **Letter A**: This letter is typically positioned after the dicrotic notch and before the waveform rises again toward the next systolic peak. This part of the waveform indicates the diastolic phase of the cardiac cycle. During diastole, the heart's ventricles relax and the heart fills with blood, leading to a decrease in arterial pressure. This phase is represented by the lower portion of the waveform, between the end of one systolic peak (including the dicrotic notch) and the rise to the next systolic peak.

In summary, the diastolic phase of a normal arterial pulsation waveform is most accurately indicated by Letter A, which falls after the dicrotic notch and before the rise of the next systolic peak. Understanding these phases is essential for accurately interpreting arterial blood pressure measurements and assessing cardiovascular health.

## Question: 10

Which letter above would be considered correct for the S wave?



- A. A
- B. D
- C. E

- D. B
- E. C

**Answer: C**

**Explanation:**

It appears that your question is related to the identification of specific waves on an electrocardiogram (ECG or EKG). An ECG is a medical test that detects cardiac (heart) abnormalities by measuring the electrical activity generated by the heart as it contracts. The test is represented graphically as a series of waves: P wave, QRS complex (consisting of the Q wave, R wave, and S wave), and the T wave. Let me explain each briefly:

**\*\*P wave:\*\*** This is the first short upward movement of the ECG tracing. It represents the electrical depolarization of the atria, which leads to the contraction of the atria and pumps blood into the ventricles.

**\*\*QRS complex:\*\*** This is a series of waves following the P wave and includes the Q wave, R wave, and S wave. This complex represents the rapid depolarization of the right and left ventricles. Since the ventricles are larger muscles than the atria, the QRS complex is larger than the P wave. - **\*\*Q wave\*\*** is the first negative deflection after the P wave but may be absent in a normal ECG. - **\*\*R wave\*\*** follows the Q wave; it is the first upward deflection in the QRS complex and represents ventricular depolarization. - **\*\*S wave\*\*** follows the R wave and is a downward deflection representing the final depolarization of the ventricles, specifically the base of the left ventricle.

**\*\*T wave:\*\*** This wave follows the QRS complex and represents the repolarization (or recovery) of the ventricles. Given your question, "Which letter above would be considered correct for the S wave?", and the options provided within your question, you are asked to identify which letter corresponds to the correct description of the S wave. Based on the standard description of an ECG: - The P wave is indicated by the letter "A." - The R wave is indicated by the letter "D." - The T wave is indicated by the letter "B." - The S wave, therefore, should be indicated by the letter "E." This is because each wave is represented by a specific letter in your descriptions, matching the typical ECG interpretation. Hence, the correct answer for the S wave would be the letter "E."

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