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ARDMS SPI Exam Syllabus Topics:

Topic	Details

Topic 1	<ul style="list-style-type: none"> • Manage Ultrasound Transducers: This section of the exam measures skills of Ultrasound Technicians and focuses on the management and proper use of different types of transducers. It evaluates knowledge of transducer components, frequency selection, and application of various 2D, 3D, 4D, and nonimaging transducer concepts. Candidates must show they can choose the appropriate transducer for specific examinations and make necessary frequency adjustments to ensure image quality.
Topic 2	<ul style="list-style-type: none"> • Apply Doppler Concepts: This section of the exam measures skills of Vascular Sonographers and evaluates understanding and application of Doppler ultrasound principles. It includes knowledge of Doppler angle, flow dynamics, and color and spectral Doppler imaging. The section also covers eliminating aliasing, interpreting waveforms, applying continuous and pulsed wave Doppler, and optimizing Doppler gain and scale to accurately measure blood flow and velocity within vessels.
Topic 3	<ul style="list-style-type: none"> • Optimize Sonographic Images: This section of the exam measures skills of Diagnostic Medical Sonographers and assesses their ability to enhance image quality using advanced optimization techniques. It includes understanding axial, lateral, elevational, and temporal resolution, as well as manipulating gain, depth, magnification, and dynamic range. Examinees are expected to apply harmonic imaging, spatial compounding, and gray-scale techniques to produce clear, accurate diagnostic images.
Topic 4	<ul style="list-style-type: none"> • Perform Ultrasound Examinations: This section of the exam measures skills of Sonographers and covers how to conduct ultrasound procedures while ensuring patient safety and diagnostic accuracy. It includes understanding of imaging protocols, ergonomics, patient care, and the interaction between sound and tissue. Candidates are expected to demonstrate abilities to manage patient encounters, apply 3D and 4D and contrast imaging concepts, identify and correct artifacts, and follow confidentiality and privacy standards throughout the scanning process.
Topic 5	<ul style="list-style-type: none"> • Provide Clinical Safety and Quality Assurance: This section of the exam measures skills of Clinical Ultrasound Supervisors and focuses on maintaining safety and quality standards in ultrasound practice. It includes infection control protocols, transducer and machine integrity checks, and quality assurance testing using tissue-mimicking phantoms. The section also requires familiarity with statistical parameters like sensitivity and specificity to evaluate diagnostic performance and ensure consistent, reliable imaging outcomes.

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The Sonography Principles and Instrumentation SPI certification offers a great opportunity for beginners and professionals to demonstrate their skills and abilities to perform a certain task. For the complete, comprehensive, for Sonography Principles and Instrumentation SPI Exam Preparation you can get assistance from Sonography Principles and Instrumentation Exam Questions.

ARDMS Sonography Principles and Instrumentation Sample Questions (Q104-Q109):

NEW QUESTION # 104

What is the primary factor that improves lateral resolution?

- A. Frequency
- B. Frame rate
- C. Propagation speed
- **D. Beamwidth**

Answer: D

Explanation:

Lateral resolution refers to the ability of the ultrasound system to distinguish two structures that are side by side, perpendicular to the direction of the sound beam. This resolution is primarily improved by reducing the beamwidth. A narrower beamwidth allows for better differentiation between adjacent structures, enhancing the lateral resolution. Higher frequency transducers can also help

achieve a narrower beamwidth, but beamwidth is the primary factor.

References:

ARDMS Sonography Principles & Instrumentation Guidelines

Hagen-Ansert SL. Textbook of Diagnostic Ultrasonography. 8th ed. St. Louis, MO: Mosby; 2017.

NEW QUESTION # 105

Which method of sanitizing the transducer would damage piezoelectric crystals?

- A. Glutaraldehyde
- B. Bleach
- C. Alcohol
- D. Autoclave

Answer: D

Explanation:

Autoclaving involves high-pressure steam at high temperatures, which can damage the delicate piezoelectric crystals within the ultrasound transducer. These crystals are responsible for converting electrical energy into sound waves and vice versa. Exposure to the extreme conditions of an autoclave can cause thermal and mechanical damage to the crystals, rendering the transducer ineffective.

Reference:

ARDMS Sonography Principles and Instrumentation guidelines

Zagzebski, J. A. (1996). Essentials of Ultrasound Physics.

NEW QUESTION # 106

Which spectral Doppler finding can occur when using a low pulse repetition frequency setting?

- A. Spectral broadening
- B. Dropout
- C. Range ambiguity
- D. Aliasing

Answer: D

Explanation:

Comprehensive and Detailed Explanation From Exact Extract:

Low PRF reduces the Nyquist limit, making the system more susceptible to aliasing when Doppler shift frequencies exceed this limit.

Principles and Instrumentation state:

"Aliasing occurs when Doppler shifts exceed half the PRF (Nyquist limit). Lowering PRF increases aliasing susceptibility."

* Spectral broadening (A) results from turbulence or poor angle.

* Range ambiguity (B) occurs at high PRF.

* Dropout (D) refers to signal loss, not aliasing.

Therefore, the correct answer is C: Aliasing.

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NEW QUESTION # 107

What is the result of increasing the wall filter setting during Doppler sampling?

- A. Decreased bandwidth
- B. Diminished aliasing
- C. Creation of spectral broadening
- D. Reduced display of low-frequency shifts

Answer: D

Explanation:

Comprehensive and Detailed Explanation From Exact Extract:

The wall filter in Doppler ultrasound is designed to eliminate low-frequency signals, typically associated with motion artifacts such as

vessel wall or tissue motion. These low-frequency signals are not part of the desired blood flow signal and can interfere with accurate Doppler display.

When the wall filter setting is increased, it removes these low-frequency signals from the Doppler spectrum. However, increasing the wall filter too much can also eliminate true low-velocity flow information, leading to a loss of clinically relevant data.

This principle is described in official sonography Principles and Instrumentation references:

"Increasing the wall filter will reduce the display of low-frequency Doppler shifts, which are typically associated with slow-moving structures. These low-frequency signals can represent either slow blood flow or tissue motion artifacts." Therefore, the correct answer is D: Reduced display of low-frequency shifts.

NEW QUESTION # 108

Which is a method to reduce noise?

- A. Decrease beam width
- B. Increase frequency
- C. Increase persistence
- D. Decrease depth

Answer: C

Explanation:

Comprehensive and Detailed Explanation From Exact Extract:

Persistence averages multiple frames to smooth out random noise fluctuations, reducing the appearance of noise in the image and improving image quality.

According to sonography instrumentation reference:

"Persistence reduces noise by averaging data from consecutive frames, improving signal-to-noise ratio and producing a smoother image." Therefore, the correct answer is D: Increase persistence.

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NEW QUESTION # 109

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