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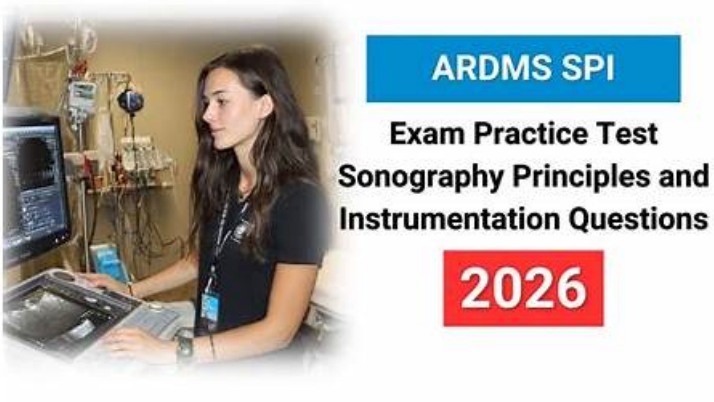

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ARDMS SPI Exam Syllabus Topics:

Topic	Details
Topic 1	• 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 2	• 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 3	• 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.
Topic 4	• 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 5	• 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 • 4D and contrast imaging concepts, identify and correct artifacts, and follow confidentiality and privacy standards throughout the scanning process.

ARDMS Sonography Principles and Instrumentation Sample Questions (Q115-Q120):

NEW QUESTION # 115
What is a potential negative consequence of using a high wall filter?

- A. Desired signal may be eliminated
- B. Aliasing could occur
- C. Too much noise may appear on the image
- D. Penetration is reduced

Answer: A

Explanation:
A high wall filter is used in Doppler ultrasound to eliminate low-frequency signals that may be attributed to vessel wall motion or other low-velocity flows. However, if the wall filter is set too high, it can inadvertently eliminate desired low-frequency Doppler signals that represent real blood flow, particularly in smaller vessels or those with slower flow velocities. This results in a loss of valuable diagnostic information.
References:ARDMS Sonography Principles and Instrumentation (SPI) Review, Doppler Ultrasound section.

NEW QUESTION # 116
Which artifact is seen as a result of an increase in echo amplitude in the tissue located distal to an anechoic structure?

- A. Comet tail
- B. Reverberation
- C. Mirror image
- D. Enhancement

Answer: D

Explanation:
Enhancement artifact occurs when an anechoic (or low-attenuation) structure, such as a cyst or fluid-filled structure, allows the ultrasound beam to pass through it with minimal attenuation. As a result, the tissues located distal to this anechoic structure appear brighter (increased echo amplitude) on the ultrasound image because the sound waves are less attenuated by the anechoic structure, leading to higher intensity echoes returning from the distal tissue. This increased brightness beyond the anechoic area is known as enhancement.
ARDMS Sonography Principles and Instrumentation guidelines
Kremkau, F. W. (2015). Diagnostic Ultrasound: Principles and Instruments. Elsevier.

NEW QUESTION # 117
What causes color flash artifact?

- A. High velocity blood flow
- B. Strong reflector
- C. Aliasing
- D. Tissue motion

Answer: D

Explanation:
Color flash artifact occurs due to tissue motion. This artifact is a type of color Doppler artifact that happens when there is movement of tissue or transducer, which causes the Doppler system to incorrectly interpret the motion as blood flow. This results in a flash of color appearing on the image where there is actually no flow.
Tissue motion affects the Doppler signal, leading to misinterpretation by the system, and hence the artifact appears as a flash of color.
References
* ARDMS Sonography Principles and Instrumentation (SPI) Exam Study Guide
* "Diagnostic Ultrasound: Principles and Instruments" by Frederick W. Kremkau

NEW QUESTION # 118
Which settings will lead to the highest temporal resolution?

- A. 60-degree sector width, 5 cm scan depth, color Doppler on
- B. 45-degree sector width, 4 cm scan depth, color Doppler off
- C. 60-degree sector width, 5 cm scan depth, color Doppler off
- D. 45-degree sector width, 4 cm scan depth, color Doppler on

Answer: B

Explanation:
The settings that lead to the highest temporal resolution are those that reduce the amount of information that the ultrasound system needs to process, allowing for a higher frame rate. A smaller sector width and shallower scan depth reduce the area that needs to be imaged, enabling faster data acquisition. Turning off color Doppler further reduces processing demands, as the system no longer needs to compute and display color flow information. Therefore, a 45-degree sector width, 4 cm scan depth, and color Doppler off will provide the highest temporal resolution.
Reference:
ARDMS Sonography Principles and Instrumentation (SPI) Exam Study Guide
"Diagnostic Ultrasound: Principles and Instruments" by Frederick W. Kremkau

NEW QUESTION # 119
Based on the table in this image, what is the sensitivity?

- A. 45/46
- B. 45/48
- C. 32/33
- D. 32/35

Answer: D

Explanation:
Comprehensive and Detailed Explanation From Exact Extract:
Sensitivity measures the test's ability to correctly identify true positives. It is calculated using the formula:
Sensitivity = True Positives / (True Positives + False Negatives)
From the table:
True Positives (TP) = 32 (Noninvasive test positive & Gold Standard positive) False Negatives (FN) = 3 (Noninvasive test negative

but Gold Standard positive) Thus:
Sensitivity = 32 / (32 + 3)
Sensitivity = 32 / 35
According to sonography instrumentation reference:
"Sensitivity represents the proportion of actual positive cases correctly identified by the test." Therefore, the correct answer is B: 32/35.

NEW QUESTION # 120
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