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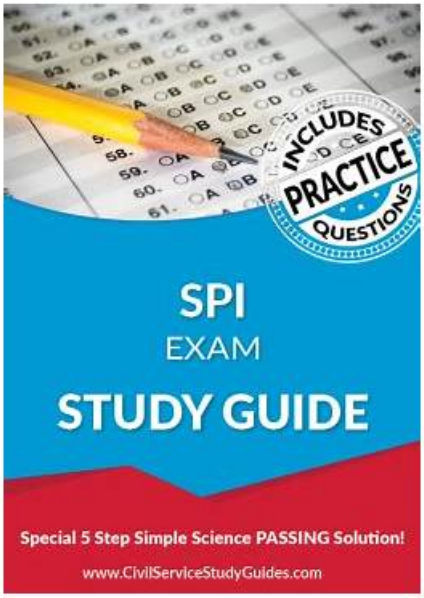

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ARDMS SPI Exam Syllabus Topics:

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	• 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.
Topic 3	• 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 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	• 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.

ARDMS Sonography Principles and Instrumentation Sample Questions (Q111-Q116):

NEW QUESTION # 111
What causes increased echogenicity distal to an anechoic structure?

- A. Reduced penetration through the structure
- B. Reduced attenuation through the structure
- C. Increased attenuation within the structure
- D. Increased attenuation distal to the structure

Answer: B

Explanation:
Comprehensive and Detailed Explanation From Exact Extract:
An anechoic structure (such as a cyst or fluid-filled space) allows ultrasound waves to pass through with minimal attenuation. As a result, more sound energy reaches tissues distal to the structure, producing a bright area known as posterior acoustic enhancement or increased echogenicity.
The sonography Principles and Instrumentation documents state:
"Posterior acoustic enhancement occurs distal to fluid-filled structures due to reduced attenuation through the anechoic medium, allowing increased beam intensity to reach deeper tissues."
* Reduced penetration (A) and increased attenuation (B or C) would not produce enhancement.
* Reduced attenuation (D) is the correct mechanism.

Therefore, the correct answer is D: Reduced attenuation through the structure.
-

NEW QUESTION # 112
Which factor determines elevational resolution?

- A. Beam thickness
- B. Beam width
- C. Beam depth
- D. Beam uniformity ratio

Answer: A

Explanation:
Comprehensive and Detailed Explanation From Exact Extract:
Elevational resolution (slice thickness resolution) refers to the ability to resolve structures perpendicular to the imaging plane and is directly determined by the beam's thickness in that plane.
Principles and Instrumentation state:
"Elevational resolution is governed by the slice thickness, which depends on the transducer's beam profile and focusing in the elevational dimension."
* Beam depth (A) affects penetration.
* Beam uniformity ratio (C) is not related.
* Beam width (D) affects lateral resolution.
Therefore, the correct answer is B: Beam thickness.
-

NEW QUESTION # 113
Which feature is a characteristic of write magnification?

- A. Decreased spatial resolution
- B. New data acquisition
- C. Post-processing
- D. Larger pixel size

Answer: B

Explanation:
Comprehensive and Detailed Explanation From Exact Extract:
Write magnification acquires new data over the smaller field of view with a higher number of scan lines, improving spatial resolution.
Principles and Instrumentation state:
"Write magnification rescans the selected region with new data acquisition, increasing the number of pixels and improving resolution."
Post-processing (A) applies to read magnification.
Larger pixel size (C) would decrease resolution.
Write magnification improves, not decreases (D), spatial resolution.
Therefore, the correct answer is B: New data acquisition.
-

NEW QUESTION # 114
What is the function of M-mode?

- A. Measure movement
- B. Visualize internal organs
- C. Create 3D images
- D. Monitor blood flow

Answer: A

Explanation:

* M-mode (Motion mode) is used in ultrasound to measure and display the movement of structures over time.
* This mode is particularly useful in cardiac imaging to assess the motion of heart walls and valves.
* M-mode provides a one-dimensional view of the motion of tissues and is often used in conjunction with 2D imaging for a comprehensive assessment.
* It is essential in evaluating the dynamic function of organs, especially in cardiology, where precise measurements of cardiac structures' movement are crucial.References:
* ARDMS Sonography Principles and Instrumentation guidelines on modes of ultrasound imaging and their clinical applications.

NEW QUESTION # 115
Which target group is used to evaluate transverse distance measurement accuracy in this tissue-mimicking phantom image?

- A. Option A
- B. Option C
- C. Option D
- D. Option B

Answer: C

Explanation:
In the tissue-mimicking phantom image, Option D (blue box) is used to evaluate transverse distance measurement accuracy. Phantoms are used to simulate human tissue and provide a standardized way to test the accuracy and precision of ultrasound machines. Transverse distance measurement accuracy is assessed by measuring known distances between targets in the phantom. The blue box (Option D) typically contains targets positioned to specifically test the accuracy of transverse measurements, ensuring that the ultrasound system provides reliable and precise distance readings.
Reference:
ARDMS Sonography Principles and Instrumentation (SPI) Exam Study Guide
"Quality Assurance for Ultrasound Imaging Systems" by AAPM (American Association of Physicists in Medicine)

NEW QUESTION # 116
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