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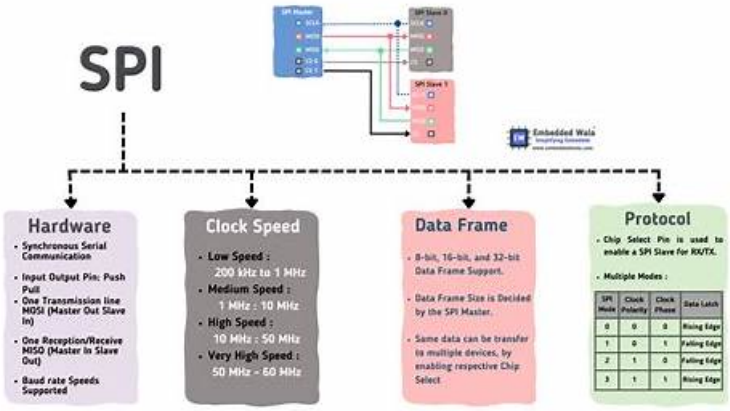

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ARDMS SPI Exam Syllabus Topics:

Topic	Details
Topic 1	• 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	• 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 3	• 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 4	• 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 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.

SPI Practice Materials & SPI Actual Exam & SPI Test Prep

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ARDMS Sonography Principles and Instrumentation Sample Questions (Q71-Q76):

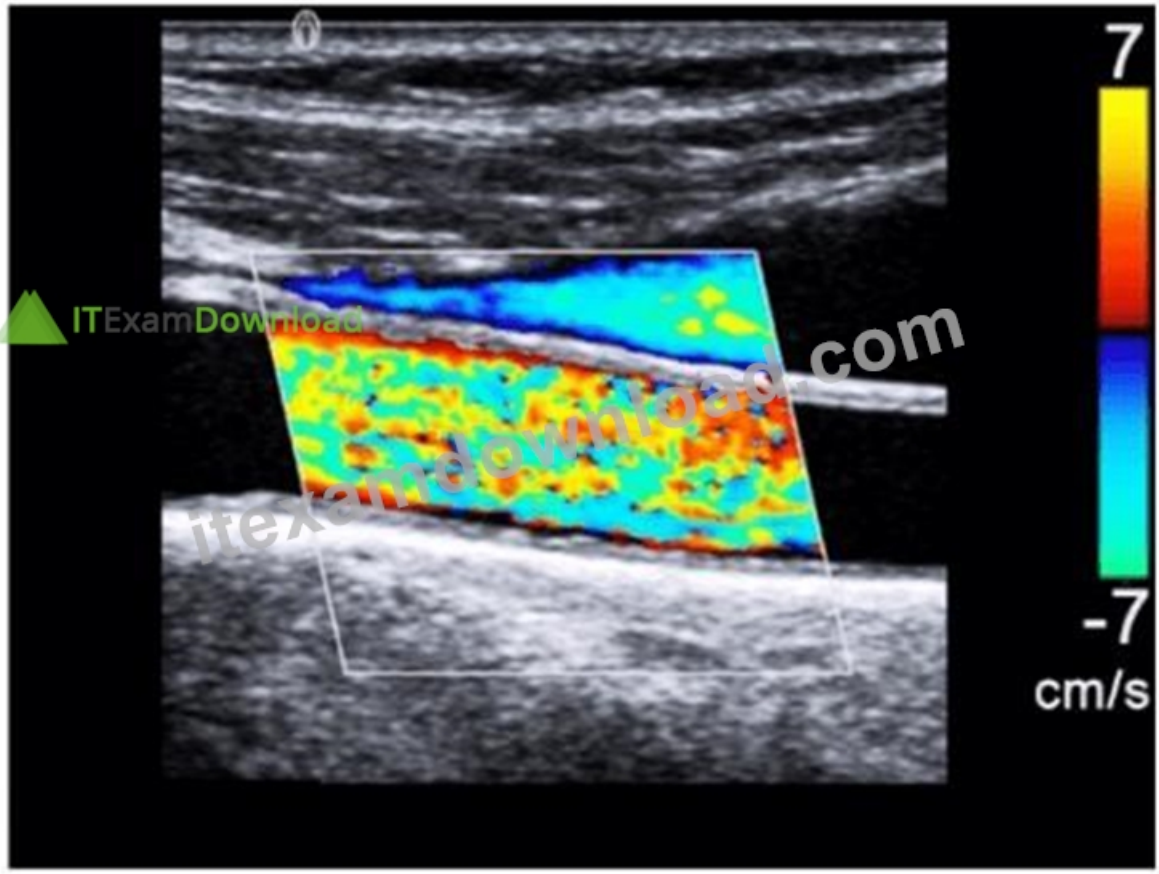
NEW QUESTION # 71
Which characteristic of ultrasound transmission is directly proportional to an increase in frequency?

- A. Attenuation
- B. Penetration
- C. Wavelength
- D. Pulse duration

Answer: A

Explanation:
Comprehensive and Detailed Explanation From Exact Extract:
As frequency increases, attenuation (energy loss due to absorption, scattering, and reflection) also increases. This limits penetration but improves resolution for superficial structures.
According to sonography instrumentation reference:
"Attenuation increases directly with frequency, limiting penetration but enhancing resolution in superficial imaging." Therefore, the correct answer is C: Attenuation.
-

NEW QUESTION # 72
What adjustment is needed to optimize the color in the image below?



- A. Increase pulse repetition frequency
- B. Decrease gain
- C. Decrease persistence
- D. Increase wall filter

Answer: A

Explanation:
* Increasing the pulse repetition frequency (PRF) helps to optimize the color Doppler imaging by reducing aliasing.
* Aliasing occurs when the PRF is too low to accurately sample the rapid blood flow velocities, leading to incorrect color representation.
* By increasing the PRF, the system can more accurately measure higher velocities without distortion, improving the overall quality of the color Doppler image.References:
* ARDMS Sonography Principles and Instrumentation guidelines on Doppler imaging and techniques to reduce aliasing.

NEW QUESTION # 73
Which resolution is improved by focusing?

- A. Contrast
- B. Axial
- C. Temporal
- D. Lateral

Answer: D

Explanation:
Focusing improves lateral resolution in ultrasound imaging. Lateral resolution refers to the system's ability to distinguish between two points that are side by side (perpendicular to the sound beam's path). By focusing the ultrasound beam, the width of the beam is narrowed at the focal point, enhancing the system's ability to resolve structures that are close together in the lateral plane. This results in clearer, more detailed images of the anatomical structures.
American Registry for Diagnostic Medical Sonography (ARDMS) Sonography Principles and Instrumentation study materials.

Diagnostic Ultrasound: Principles and Instruments by Kremkau, F. W. (latest edition).

NEW QUESTION # 74
What produces increased attenuation within soft tissue?

- A. Higher frequency of the ultrasound beam
- B. Higher intensity of the ultrasound beam
- C. Lower frequency of the ultrasound beam
- D. Lower intensity of the ultrasound beam

Answer: A

Explanation:
Attenuation refers to the reduction in the intensity of the ultrasound beam as it travels through tissue. Higher frequency ultrasound beams experience more attenuation because they are absorbed and scattered more than lower frequency beams. This is due to the fact that higher frequency waves have shorter wavelengths and interact more with the small particles in tissues, causing greater energy loss.
Reference: ARDMS Sonography Principles and Instrumentation, Chapter on Ultrasound Physics and Instrumentation.

NEW QUESTION # 75
For harmonic imaging, what must the overall transducer bandwidth contain?

- A. Fundamental and fourth harmonic frequencies
- B. Fundamental and second harmonic frequencies
- C. Fundamental and odd harmonic frequencies
- D. Fundamental and even harmonic frequencies

Answer: B

Explanation:
Comprehensive and Detailed Explanation From Exact Extract:
Harmonic imaging operates by transmitting at the fundamental frequency and receiving echoes at the second harmonic frequency (which is twice the fundamental frequency). Therefore, the transducer must have a broad enough bandwidth to include both frequencies.
According to sonography instrumentation reference:
"For harmonic imaging, the transducer bandwidth must accommodate both the transmitted fundamental frequency and the received second harmonic frequency." Therefore, the correct answer is A: Fundamental and second harmonic frequencies.
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NEW QUESTION # 76
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