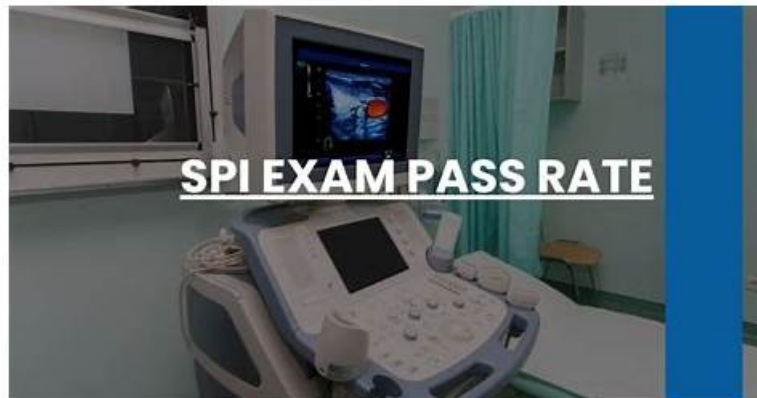


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## ARDMS SPI Exam Syllabus Topics:

Topic	Details
Topic 1	<ul style="list-style-type: none"><li>• Perform Ultrasound Examinations: This topic discusses patient care, sonographic ergonomic techniques, echogenicity, reverberation, and potential bioeffects. It also discusses beam steering concepts, panoramic imaging, 3D</li><li>• 4D concepts, and contrast imaging concepts.</li></ul>
Topic 2	<ul style="list-style-type: none"><li>• Optimize Sonographic Images: The topic focuses on optimization of axial resolution concepts, optimization of lateral resolution concepts, optimization of elevational resolution concepts, optimization of temporal resolution concepts, and magnification techniques.</li></ul>
Topic 3	<ul style="list-style-type: none"><li>• Apply Doppler Concepts: It discusses Doppler wall filter concepts, Doppler sample gate concepts, y color priority over gray scale concepts, and concepts related to color Doppler map. Furthermore, it discusses concepts to eliminate aliasing, continuous wave Doppler concepts, and color Doppler scale concepts.</li></ul>
Topic 4	<ul style="list-style-type: none"><li>• Provide Clinical Safety &amp; Quality Assurance: This topic covers universal infection control protocols, QA check on ultrasound machine, transducer integrity, ultrasound machine integrity, and statistical parameter concepts.</li></ul>
Topic 5	<ul style="list-style-type: none"><li>• Manage Ultrasound Transducers: It delves into 2D array transducer concepts, 3D</li><li>• 4D transducer concepts, and nonimaging transducer concepts.</li></ul>

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### ARDMS Sonography Principles and Instrumentation Sample Questions (Q75-Q80):

#### NEW QUESTION # 75

What is the primary reason to use compression?

- A. Increase line density
- B. Improve the axial resolution
- C. Adjust the contrast resolution
- D. Reduce the focal region

**Answer: C**

Explanation:

- \* Compression in ultrasound imaging adjusts the range of grayscale displayed, affecting the contrast resolution.
- \* This function allows sonographers to enhance the differentiation between structures of varying echogenicities.
- \* By modifying the contrast resolution, sonographers can better visualize subtle differences in tissue composition and improve the diagnostic quality of the images.
- \* Increasing contrast resolution is particularly important in differentiating between fluid-filled cysts and solid masses.
- \* ARDMS Sonography Principles and Instrumentation guidelines on image processing and contrast resolution.

#### NEW QUESTION # 76

What is the primary reason to use compression?

- A. Increase line density
- B. Improve the axial resolution
- C. Adjust the contrast resolution
- D. Reduce the focal region

**Answer: C**

Explanation:

Compression in ultrasound imaging adjusts the range of grayscale displayed, affecting the contrast resolution. This function allows sonographers to enhance the differentiation between structures of varying echogenicities. By modifying the contrast resolution, sonographers can better visualize subtle differences in tissue composition and improve the diagnostic quality of the images. Increasing contrast resolution is particularly important in differentiating between fluid-filled cysts and solid masses. Reference: ARDMS Sonography Principles and Instrumentation guidelines on image processing and contrast resolution.

#### NEW QUESTION # 77

Which function is the purpose of the matching layer?

- A. Reduce ringing of the crystals
- B. Convert acoustic to electrical energy
- C. Increase sound transmission
- D. Allow sequential firing of elements

**Answer: C**

Explanation:

Comprehensive and Detailed Explanation From Exact Extract:

The matching layer is placed between the transducer's piezoelectric element and the patient's skin. Its primary function is to improve the transmission of sound energy into the body by reducing the acoustic impedance mismatch between the crystal and tissue, minimizing reflection at the transducer surface.

According to sonography instrumentation reference:

"The matching layer improves transmission of ultrasound energy by reducing impedance mismatch between the transducer and soft tissue, thus increasing the efficiency of sound energy transfer." Therefore, the correct answer is D: Increase sound transmission.

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#### NEW QUESTION # 78

What is effected by increasing the color scale?

- A. The Nyquist limit is increased
- B. More colors are displayed
- C. The color priority decreases
- D. The color box width decreases

**Answer: A**

Explanation:

The Nyquist limit, which is the maximum detectable velocity before aliasing occurs, is directly related to the pulse repetition frequency (PRF). Increasing the color scale on the ultrasound machine effectively increases the PRF. When the PRF is increased, the Nyquist limit is also increased, allowing for the measurement of higher velocities without aliasing.

Reference:

ARDMS Sonography Principles and Instrumentation guidelines

Krenkau, F. W. (2015). Diagnostic Ultrasound: Principles and Instruments. Elsevier.

#### NEW QUESTION # 79

What is the primary determining factor of a pulsed wave transducer's fundamental frequency?

- A. Element thickness
- B. Tissue propagation speed
- C. Aperture size
- D. Transducer type

**Answer: A**

Explanation:

Comprehensive and Detailed Explanation From Exact Extract:

In pulsed-wave transducers, the thickness of the piezoelectric element primarily determines the fundamental operating frequency. Thinner elements produce higher frequencies, while thicker elements produce lower frequencies.

According to sonography instrumentation reference:

"The operating frequency of a pulsed-wave transducer is primarily determined by the thickness of the piezoelectric crystal. Thinner crystals vibrate at higher frequencies." Therefore, the correct answer is A: Element thickness.

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#### NEW QUESTION # 80

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