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Which term describes blood flow changes in response to respiration?

- A. Phasic
- B. Parabolic
- C. Spontaneous
- D. Pulsatile - ANSWER Phasic

What is demonstrated in this image produced by a linear array to placed on a uniform tissue-mimicking phantom?

- A. Time gain compensation not set properly.
- B. System has low dynamic range.
- C. Transducer crystals are damaged.
- D. Focus control is malfunctioning. - ANSWER Transducer crystals are damaged

What is dynamic aperture?

- A. Aperture that varies with transmit frequency
- B. Aperture that decreases as a function of time
- C. Aperture that increases with increasing focal length

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ARDMS Sonography Principles and Instrumentation Sample Questions (Q20-Q25):

NEW QUESTION # 20

According to Poiseuille's law, a change in which parameter would have the greatest influence on blood flow?

- A. Vessel radius
- B. Length of vessel
- C. Viscosity of the fluid
- D. Pressure gradient

Answer: A

Explanation:

According to Poiseuille's law, the flow rate of a fluid through a vessel is directly proportional to the fourth power of the vessel's radius. Therefore, a small change in the radius of the vessel has a much larger effect on blood flow compared to changes in pressure gradient, length of the vessel, or viscosity of the fluid.

Reference:

ARDMS Sonography Principles and Instrumentation guidelines
Poiseuille's law in medical physics and hemodynamics literature.

NEW QUESTION # 21

Which adjustment can maintain the same frame rate when the depth is increased?

- A. Increase frequency
- B. Decrease persistence
- C. Increase number of focal zones
- D. Decrease image width

Answer: D

Explanation:

When the depth of imaging is increased, the time it takes for the ultrasound pulses to travel to and from the deeper structures also increases, which can reduce the frame rate. To maintain the same frame rate, one effective adjustment is to decrease the image width. Narrowing the image width reduces the number of scan lines required to create each frame, allowing the system to maintain a higher frame rate despite the increased depth.

ARDMS Sonography Principles and Instrumentation guidelines

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

NEW QUESTION # 22

What is the function of M-mode?

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

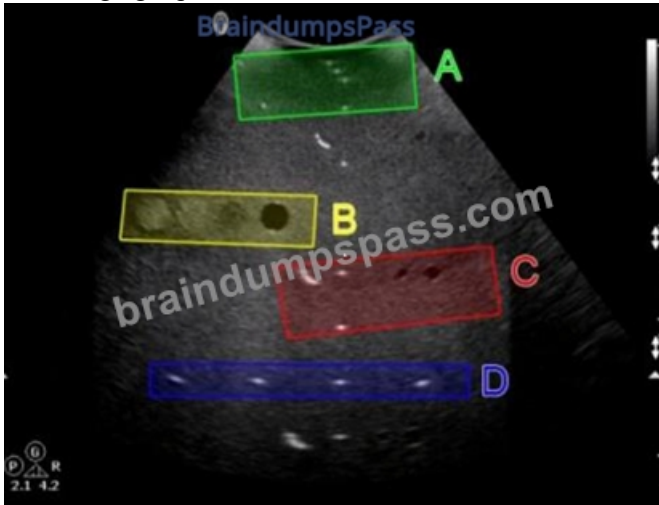
This mode is particularly useful in cardiac imaging to assess the motion of heart walls and valves.

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. Reference:

NEW QUESTION # 23

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



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

Answer: D

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 # 24

Which factor improves axial resolution?

- A. Greater depth of field
- B. Wider beam
- C. Increased aperture size
- **D. Shorter wavelength**

Answer: D

Explanation:

Axial resolution refers to the ability of an ultrasound system to distinguish between two structures that are close to each other along the path of the ultrasound beam. It is primarily determined by the spatial pulse length, which is the product of the wavelength and the number of cycles in a pulse. Shorter wavelengths result in shorter spatial pulse lengths, thereby improving axial resolution. This is because shorter wavelengths (which correspond to higher frequencies) allow for better differentiation between closely spaced structures along the beam's axis.

American Registry for Diagnostic Medical Sonography (ARDMS). Sonography Principles and Instrumentation (SPI) Examination Review Guide.

