Ultrasound QA

Why, What, and How

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Why do Ultrasound QA?

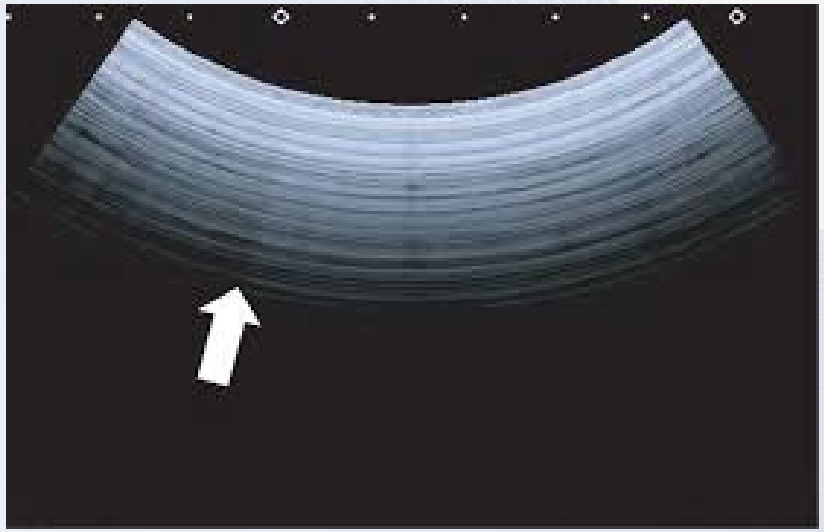
- Ultrasound is non-ionizing
- The only danger is a heating effect.
- As a critical diagnostic tool, the danger is poor image quality leading to misdiagnosis
- Users don't always notice degradation in image quality

What is Ultrasound QA?

- Ultrasound QA checks image quality
- It finds faults with probes and machines
- QA ensures acceptable image quality for the lifetime of the scanner

The How – Ultrasound QA

- **Tests you can do locally:**
  - Crystal Drop out
  - Uniformity
  - Signal-to-noise ratio
- **Settings must be consistent**



The How – Ultrasound QA

- **Tests you can do with a general-purpose ultrasound phantom:**
  - **Uniformity**
  - **Depth of Penetration**
  - **Beam Profile/ Focal Zone/ Lateral Response Width**
  - **Vertical Distance Measurement**
  - **Horizontal Distance Measurement**
  - **Axial and Lateral Resolution**
  - **Elevational Resolution**
  - **Contrast Resolution**
  - **Grayscale Contrast Sensitivity**
  - **Elasticity Sensitivity**
  - **Dead Zone Assessment**

The How – Ultrasound QA

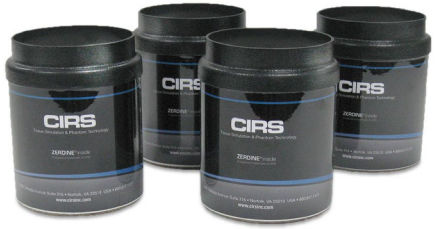
- Ultrasound tests are easy to do manually
- They can be automated with software, either made at home or with commercial software
- Allows you to send images to EBME/physics for remote analysis

The How – Doppler QA

- Doppler QA is more complex testing for probes that measure flow in cardiology, MSK, and other diagnostic tests
- Testing the flow rate ensures measurements are consistent and correct

Options for Specialist Testing

- Ultrasound is a wide field, and other options exist for more specialist testing
- Echocardiography
- Liver Fibrosis
- Small parts



Thank You

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