Patient positioning for CT IQ Optimization

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Disclosures

• No financial disclosures of conflicts of interest.

Outline

• Optimal standard positioning
• Positioning tricks to improve imaging
• Poor positioning compensation
Optimal Standard Positioning

- Position in scanner
- Orientation in scanner
- Limb positioning
- Exogenous materials

Position in scanner

- Isocenter in scanner!
  - Radiation dose
  - Image signal
  - Relative tissue attenuation

Above isocenter
Isocenter
Below isocenter

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 Orientation in scanner

- Supine
- Straight
  - No rotation
  - No bending
- Arms
  - At sides – Head & Neck
  - Above head – Thorax & Upper Ext
Hounsfield Alteration

Average HU = 30
STD = 10

Overlying materials

- Clothing
  - Jewelry, watches, keys
- Medical equipment
  - Braces, back board, monitor wires, casting material

Jewelry - Earrings
Tricks for Suboptimal Positioning

• Decubitus positioning
• Alternative arm positions
• Lower extremity bending/elevation
• Head tilt/neck traction

Lateral Decubitus

Arm positioning
Arm positioning

Bent Arm Position

Leg positioning
Gantry Tilt

Increase Radiation Dose

CTDI = 17.3

CTDI = 52.3
Take-home Points

- **Position: Isocenter is vital!**

- **Straight & Extended in scanner**
  - Reformats can't fix everything

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Take-home Points

- **Arms/External materials/LE hardware**
  - Out of imaging plane is possible
  - Otherwise elevate and displace
  - Minimize volume on each slice

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Take-home Points

- **Gantry tilt to move hardware out of FoV**

- **Don’t be afraid to use appropriate radiation dose**