

*Sites must meet the following criteria for the phantom portion of the CT Accreditation Program.*

**Table 1 (of Site Scanning Data Form)**

- Detector configuration must be correctly reported
- Pitch must be correctly reported
- Other scan parameters must appear correct

**SMPTE**

- SMPTE or other video test pattern must be present in the first box of each film sheet
- The 95% square must be visible (whites must not be saturated)
- The 5% square must be visible (blacks must not be saturated)
- No aliasing of bar patterns or other artifacts

**Phantom and scanner alignment – Module 1 and 4**

- Image thickness must be 2 mm or less
- All four BBs must be seen in one image and have similar appearance
- Longest wire must be centrally located (+/- 1 wire) on both top and bottom ramp

**Module 1 – CT Number Calibration and Slice Thickness**

**CT Number Calibration**

- ROIs must be placed within the cylinders
- Polyethylene mean CT number must be between -107 and -87 HU
- Water mean CT number must be between -7 and +7 HU ( $\pm 5$  HU preferred)
- Acrylic mean CT number must be between +110 and +130 HU
- Bone mean CT number must be between +850 and +970 HU
- Air mean CT number must be between -1005 and -970 HU
- The adult abdomen protocol from Table 1 must be used

**Slice Thickness**

- Image data required for HRC, ~ 3, ~ 5, and ~ 7 mm slice thicknesses
- Water mean CT number must be between -7 and +7 HU ( $\pm 5$  HU preferred)
- The slice width must be within 1.5 mm of the prescribed width

**Water vs. kVp**

- Image data are required for all selectable kVp settings
- Water mean CT number must be between -7 and +7 HU ( $\pm 5$  HU preferred)

## Module 2 – Low Contrast Resolution

### Using the Adult Abdomen Protocol

- Adult abdomen protocol from Table 1 must be used
- Window width = 100
- Window level = 100
- All four cylinders of the 6-mm rods must be clearly visible

### Using the Adult Head Protocol

- Adult head protocol from Table 1 must be used
- Window width = 100
- Window level = 100
- All four cylinders of the 6-mm rods must be clearly visible

## Module 3 – Uniformity

- Edge-to-center mean CT number difference must be < 5 HU for all four edge positions
- Correct size and location of ROIs
- The center CT number must be between -7 and +7 HU ( $\pm 5$  HU preferred)
- Adult abdomen protocol from Table 1 must be used
- Window width = 100
- Window level = 0
- No image artifacts

## Module 4 – High Contrast Resolution

### Using the Adult Abdomen Protocol

- The adult abdomen protocol from Table 1 must be used (especially correct reconstruction algorithm)
- Window width = 100
- Window level  $\approx 1100$
- The 5 lp/cm bar pattern must be clearly resolved

### Using the Adult HRC Protocol

- The adult HRC protocol from Table 1 must be used (especially correct reconstruction algorithm)
- Window width = 100
- Window level  $\approx 1100$
- The 6 lp/cm bar pattern must be clearly resolved

## CTDI Images

### Adult Head

- Adult head protocol from Table 1 must be used
- An axial scan must be used
- Phantom should be in the head holder
- Phantom must be 16 cm in diameter
- The non-chamber holes must be filled
- Complete the Dose Calculator Excel spreadsheet correctly (Scan parameters entered into spreadsheet must match Table 1 and actual scan parameters)
- Print and submit the Dose Calculator Excel spreadsheet
- The CTDI<sub>vol</sub> must not exceed 80 mGy

### Pediatric Abdomen

- Pediatric abdomen protocol from Table 1 must be used
- An axial scan must be used
- Phantom must be on the table top
- Phantom must be 16 cm in diameter
- The non-chamber holes must be filled
- Complete the Dose Calculator Excel spreadsheet correctly (Scan parameters entered into spreadsheet must match Table 1 and actual scan parameters)
- Print and submit the Dose Calculator Excel spreadsheet
- The CTDI<sub>vol</sub> must not exceed 25 mGy

### Adult Abdomen

- Adult abdomen protocol from Table 1 must be used
- An axial scan must be used
- Phantom must be on the table top
- Phantom must be 32 cm in diameter
- The non-chamber holes must be filled
- Complete the Dose Calculator Excel spreadsheet correctly (Scan parameters entered into spreadsheet must match Table 1 and actual scan parameters)
- Print and submit the Dose Calculator Excel spreadsheet
- The CTDI<sub>vol</sub> must not exceed 30 mGy

### **Important note regarding making dose measurements with axial scans when the protocol in Table 1 uses helical scanning.**

The CTDI measurement must be performed using an axial scan with all other technical parameters (kVp, mA, exposure time, N, T) the same as the original protocol. For some scanners, this will require paying careful attention to the technical parameters when switching from helical to axial mode. It is absolutely essential that the detector configuration used for the helical scan prescribed in Table 1 be used for the axial scan for measuring CTDI. In some scanners this may require going into “service mode” to achieve these settings. The Frequently Asked Questions (FAQ) section of the ACR Accreditation Web site provides additional guidance for this issue. Please go to [www.acr.org](http://www.acr.org), click on the accreditation section, and then scroll down until you see the CT Accreditation information.

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