

Radiology Compliance Branch
RADIATION PROTECTION SECTION



Division of Health Service Regulation • N.C. Department of Health and Human Services

COMPUTED TOMOGRAPHY INSPECTION CHECKLIST

Required for Inspection

- All applicable items on the general [Medical Inspection Checklist](#)
- Records of operator training
(Training on facility specific scanner(s) and imaging protocols inclusive of dose-index, expected dose range for protocols and dose saving features.)
ARRT, ARRT (CT) certification, or other training documentation
- Protocol manual that includes the technical factors and the maximum dose
(Projected CTDI_{vol} values or equivalent for each type of study performed)
- Calibration and maintenance records [21CFR1020.30 (h) (1) (ii)]
(Copy of most recent PM available and service provider registration number)
- QA/QC procedures and records [21CFR1020.33]
(Daily, weekly or other frequency required by manufacturer. Performed and documented by a trained onsite CT radiologic technologist under the supervision of a medical physicist)

Recommended Written Procedures

- Initiating any changes in CT protocols
- Permanently recording patient doses
- Radiologist review of CTDI_{vol} in potentially high dose CT procedures
- Facility identification of CTDI_{vol} in excess of recommended levels
(E.g. facility alert level in place and/or dose tracking in place)
- Reporting adverse events associated with CT overexposure
(E.g. reporting requirements to the FDA) [MedWatch How To Report Serious Problems to FDA](#)

Additional Recommended Items

FDA, CRCPD, The Joint Commission, AAPM, and ACR recommended practices.

- Annual Physics Reports [Performance Monitoring of Diagnostic CT Equipment](#)
[2012 ACR Technical Standard of Diagnostic Medical Physics Performance Monitoring of CT Equipment](#)
- Facility accreditation documentation, if applicable
[CMS Advanced Diagnostic Imaging Accreditation](#)
- CT Dose Management Committee established [CRCPD CT Dose Management Trifold](#)
- Patient Safety Program established (TJC Facilities)
Education and radiation dose in imaging departments [The Joint Commission Sentinel Event Alert](#)
- Protocols password protected or software modifications in place
- "Notification" and/or "alert" values in place on scanners
NEMA XR 25 CT Dose-Check Standard [AAPM Recommendation Notification and Alert Levels Statement](#)
- Facility participates in the ACR Dose Index Registry [ACR Dose Index Registry](#)
- Additional guidance:
[FDA Initiative to Reduce Unnecessary Radiation Exposure from Medical Imaging](#)
[Image Gently](#)
[Image Wisely](#)



Recommended Performance Monitoring Characteristics for Diagnostic CT Equipment

Performance Evaluation (Equipment performance and patient dosimetry)

- Alignment light accuracy (laser)
- Image localization from scanned projection radiograph (localization image)
- Table incrementation accuracy (table index)
- Radiation beam width (beam collimation)
- Reconstructed image thickness
- Image quality
 - High Contrast (spatial) resolution
 - Low-contrast sensitivity and resolution
 - Image uniformity
 - Noise
 - Artifact evaluation
- CT number accuracy
- Acquisition workstation display
- Dosimetry
 - Radiation output of CT scanner (CT dose index [CTDI_{vol}] or equivalent)
 - Patient radiation dose estimate for representative examinations
- Limited protocol review by QMP
 - Head and abdomen for adult and pediatric patients as applicable. Additionally, very high dose protocols (e.g. brain perfusion)
 - Elements reviewed should include documentation of kVp, mA, rotation time, detector configuration, pitch, reconstructed thickness, and use of AEC (including ensuring documentation of reference settings used), and (CTDI_{vol}) resulting from each examination
- Safety evaluation
 - Visual inspection
 - Work load assessment
 - Scatter and stray radiation measurements (if work load and other related parameters have changed since acceptance testing)
 - Audible/visual signals
 - Other tests as required by state of local regulations
- Monitoring required after replacement of a major component**

QMP should, in a timely manner evaluate the need for performance testing of the CT scanner.
- Radiation output and patient radiation dose estimates**
 - Medical physicist should annually compare measured CTDI_{vol} values to values reported by the scanner, to ensure that the scanner is correctly reporting the values. These comparisons should include both 16cm and 32 cm dosimetry phantoms, as appropriate for the unit.
 - Patient radiation dose estimates should be evaluated at least annually by a medical physicist for selected procedures, comparing them to established reference levels when available.
 - Tables of patient radiation absorbed dose for representative examinations (e.g., head, thorax, abdomen, and pelvis) should be prepared and supplied to the facility. These should include dose estimates to pediatric patients, as applicable to the facility. These should be compared with appropriate guidelines or recommendations when they are available.

Quality Control Program

(Performed and documented by a trained onsite CT radiologic technologist under the supervision of a medical physicist)

- CT number accuracy
- Noise (CT number standard deviation)
- Artifact evaluation
- Display devices
 - Acquisition work-station and
 - Hard-copy display unit(s), if used for patient images
- Visual checklist

Acceptance Testing/ Written Survey Reports and Follow-up Procedures