



CT Dose Monitoring Protocol

Purpose

To assure that a quality assurance (QA) process is established to monitor and maintain appropriate radiation dose levels during CT examinations.

Policy

Establish and maintain a robust CT QA program that yields optimal image quality at the lowest radiation dose. The method should include an auditing process for image quality and review of total dose length product (DLP).

Population Covered

For all pediatric receiving a CT examination.

Responsible Persons

A board certified radiologist, physicist, and/or lead CT technologist should establish and maintain low dose CT protocols and a QA program for monitoring CT dose.

Definitions

ACR – American College of Radiology. Accrediting body for advanced imaging modalities.

CT – Computed Tomography. A medical imaging procedure that uses ionizing radiation to produce cross-sectional images of internal organs and body structures.

CTDI_{vol} – Computed Tomography dose index. CTDI is a radiation exposure index that is reported at the end of a CT examination on individual CT scanners.

DLP – Dose length product. A unit of measure established by multiplying the CTDI_{vol} by the length of the CT scan and reported in mGy-cm.

mGy – is a measurement of radiation absorbed dose.

GENERAL QUALITY ASSURANCE PROCESS

1. CT exam protocols should be reviewed at least once a year by a designated radiologist(s).
2. CT protocols should be updated and kept in an accessible location for the technologist.
3. Daily machine calibration should be performed with appropriate documentation following the
4. ACR recommended guidelines for quality control.
5. ACR pediatric accreditation for each CT scanner performing pediatric examinations.
6. Annual education on CT dose reduction.
7. Annual physics testing as outlined by the ACR.

CT Exam Audit Process

1. A specified number of pediatric CT audits should be performed at least monthly.
 - Perform the appropriate number of pediatric CT audits based on the recommended percentage below.
 - Less than 30 pediatric patients per month, review 100% of the exams
 - 30-100 pediatric CT patients per month, review 30 patient exams
 - 101-500 pediatric CT patients per month, review 50 patient exams
 - More than 500 pediatric patients per month, review 70 patient exams
2. An audit tool should be utilized to capture pertinent information about the examination. See suggested audit tool below.
 - [QA Audit Tool.xlsx](#)
3. Follow the instructions outlined on the audit tool for monthly audits.
4. Review the DLP for each examination to determine if the dose is appropriate for the age/size of the patient.
5. Review image to determine if protocol adjustments are necessary or technologist education is needed.
 - a. Establish process for identifying outliers
 - b. Establish multidisciplinary team to review outliers
6. Give timely feedback to the technologists.
7. Post QA data for monthly review.

References

1. ACR Website - <http://acr.org/>
2. ACR Accreditation for CT - <http://acr.org/Quality-Safety/Accreditation/CT>
3. ACR Quality Control Guideline - <http://www.acr.org/Education/Education-Catalog/Products/8336734>