

Quality Driven
Innovative
Customer-focused
Exceeding
expectations

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|--|--|--|--|--|--|
| A D U L T | B o d y C T | CTDI <25 *Indication, priors? *Centered correctly? *Avoided oversean? *Breast shields? | A H D U L T | H e a d C T | CTDI <75 *Indication, priors? *Centered correctly? *Avoided oversean? |
| | | CTDI 25-30 *Followed green steps? * Correct protocol? *AutoMa, CareDose on/off? *Pitch, kV, slice thickness OK? | | | CTDI 75-80 *Followed green steps? * Correct protocol? *AutoMa, CareDose on/off? *kV, slice thickness OK? |
| | | CTDI >30 *Followed green/yellow steps? *Asked for help from CT lead? *RADIOLOGIST approval prior to scan? | | | CTDI >80 *Followed green/yellow steps? *Asked for help from CT lead? *RADIOLOGIST approval prior to scan? |

CT Dose Reduction Initiatives Pre-Scan CTDI Limits

By Douglas H. Sheafor, MD

Welcome to LOWDOSE, a new publication from Charlotte Radiology's Radiation and Contrast Committee.

The focus of the inaugural issue is new Charlotte Radiology guidelines for pre-scan CTDI limits. These guidelines are designed to guard against inadvertent use of excessive technique during CT scans by reviewing the projected CTDI prior scanning the patient.

These guidelines are just one part of a comprehensive set of safeguards that are in place (or in development) to insure our patients are imaged with ALARA technique.

WHAT IS CTDI?

The CT Dose Index specifies the amount of radiation intensity in a CT exam based on phantom measurements using an ionization chamber. For a given scanner and technique, the CTDI is "fixed" and independent of scan length and patient size. When the same intensity of radiation (same CTDI) is directed at a child and an adult, the dose is higher in the child because the organ doses are higher in a smaller patient.

WHAT IS AN ACR DRL?

The ACR has established Dose Reference Levels as part of

its accreditation program. The DRL is the CTDI below which 75% of patients should fall. The CTDI at which the ACR will fail a facility is currently the DRL+5.

WHY SHOULD WE CARE ABOUT PRE-SCAN CTDI?

CTDI's are a good way to compare radiation intensity between scanner manufacturers and platforms. A projected CTDI is displayed on all CHS CT platforms during the planning phase of the scan. Until automatic warning software is available, pre-scan assessment can identify scan techniques that will result in patient doses above the ACR targets.

WHAT TO DO IF THE PRE-SCAN CTDI IS TOO HIGH?

The approach to various CTDI's are included on each chart (which will be posted at each CT scanner). Prior to scanning any patient, assess the projected CTDI and match to the appropriate color coded chart (other than monitoring phase scans). Once following all appropriate steps, if the pre-scan CTDI remains in the red zone, contact the supervising radiologist for scan protocol modification or approval to scan in the red zone. The radiologist will then determine what further dose reduction steps can be taken or approve the scan in the red zone. Make sure to document the approval on the requisition prior to scanning it in to the PACS system. Please keep a record of all red zone scans and provide to the RSO.

QA/QC POST-SCAN

CHS and Charlotte Radiology are currently investigating methods to automatically "scrape" CTDI's and DLP's from dose reports like the one on the right. Once this data is available, ongoing QA/QC of scan dosing will be readily available throughout the system. Until that time, radiologists will be asked to check each scan's dose report and QA any ACR dose outliers (red zone scans) that are missing appropriate documentation.



Questions?
 Contact your lead technologist, RSO, or Douglas Sheafor, MD - Radiation and Contrast Committee, Charlotte Radiology

**P B
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CTDI <20

- *Indication, priors?
- *Centered correctly?
- *Avoided overscan?
- *Breast shields?

CTDI 20-25

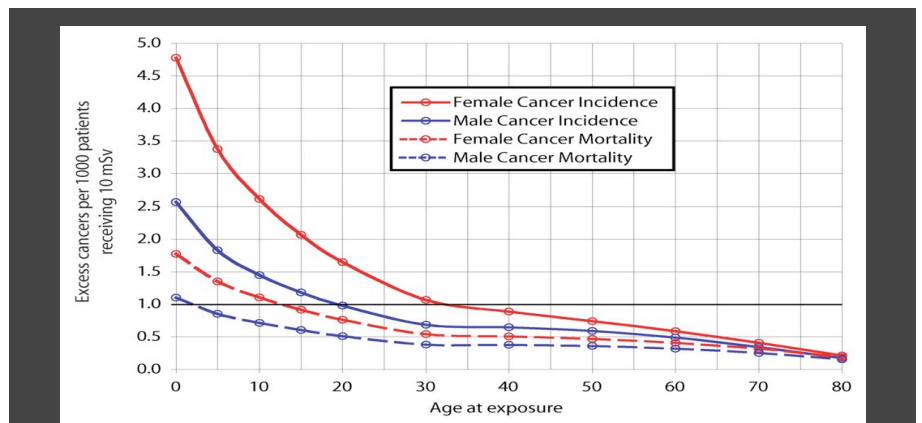
- *Followed green steps?
- * Correct protocol?
- *AutoMa, CareDose on/off?
- *Pitch, kV, slice thickness OK?

CTDI >25

- *Followed green/yellow steps?
- *Asked for help from CT lead?
- *RADIOLOGIST approval prior to scan?

Exam Description: CT ABDOMEN W

| Dose Report | | | | |
|------------------------|---------|------------------|---------------|---------------|
| Series | Type | Scan Range (mm) | CTDIvol (mGy) | DLP (mGy-cm) |
| 1 | Scout | -- | -- | -- |
| 200 | Axial | 192.750-192.750 | 13.13 | 6.57 |
| 2 | Helical | 146.000-1433.500 | 5.61 | 253.63 |
| Total Exam DLP: | | | | 260.20 |



Age versus Cancer Risk (based on age at first exposure)

A 10 mSv scan dose is the average radiation received by a patient undergoing a single one phase CT scan of the abdomen and pelvis. Younger female patients are at the highest risk from radiation exposure.