Name of Policy:	**CT scanner dose index monitoring**	
Policy Number:	3364-135-159	
Department:	Radiology	
Approving Officer:	Director, Radiology - UTMC	
Responsible Agent:	Assistant Professor & Deputy Clinical Service Chief	**Effective Date: 12/1/2024**
Scope:	University of Toledo Medical Center Radiology	Initial Effective Date: 06/01/2020

_____	New policy proposal	_____	Minor/technical revision of existing policy
_____	Major revision of existing policy	X	Reaffirmation of existing policy

(A) Policy statement

It is the policy of the University of Toledo Medical Center and the Department of Radiology that particular CT scanner dose metrics be monitored for all patients undergoing diagnostic CT scans.

(B) Purpose of policy

To monitor radiation dose for CT scan protocols before and after each scan to ensure patient doses are within acceptable ranges.

(C) Procedure

The selected dose metrics that are required to be monitored by the CT techs:

1) The volume computed tomography dose index ($CTDI_{vol}$),
2) The Notification Value (NV) for certain scanning protocols, and
3) The Alert Value (AV)

Definitions:

Notification Value (NV)

A value of $CTDI_{vol}$ (in units of mGy) used to trigger a notification action when the value would likely be exceeded by the prescribed scanning protocols.

Alert Value (AV)

A value of $CTDI_{vol}$ (in units of mGy) used to trigger an alert when the CT scanner projects that the prescribed scanning protocols **within an ongoing examination** would result in a cumulative dose index (i.e. the summation of all $CTDI_{vol}$ for that patient for that scan and for that day) that would exceed the specified AV trigger value.

CT Dose Metric Values:

This CT monitoring policy will use the following CT dose metric values:
Table (1) Notification Values (NV) for selected set of CT scanning protocols:

Examination	Notification Value (NV) $CTDI_{vol}$ (mGy)
Adult Head	80
Adult Abdomen	30
Adult Chest	25
Brain Perfusion	600
Pediatric Head (1-year-old)	40
Pediatric Abdomen (40-50 lb.)	20

Table (2) Alert Value (AV) for accumulative CT scans:

Examination	Alert Value (AV) (mGy)
The summation of all $CTDI_{vol}$ for that patient, for that scan and for that day	1000

I. Before scanning is started:

When the CT scanner projects that the displayed $CTDI_{vol}$ value of a prescribed scanning protocol within an ongoing examination would result in a cumulative dose index that will exceed the listed Notification Value (NV) take the following actions:

a. Recheck the scanning protocol and be sure it is the correct one.

b. Contact the radiologist in charge and inform him/her of the situation.

c. Do not proceed and scan the patient until you obtain a verbal approval from the radiologist in charge and document the radiologist approval as a comment in the CT images.

d. Contact the certified medical physicist and inform him of the situation you are encountering.

II. After scanning is completed:

a. When the CT scanner displayed $CTDI_{vol}$ value, after the scanning has been completed, exceeded the Notification Value (NV) take the following action:

- Contact the certified medical physicist and inform him of the situation you are encountering.

b. When the CT scanner displayed cumulative $CTDI_{vol}$ value for that patient, for that scan and for that day, has reached the Alert Value (AV) take the following action:

- Contact the certified medical physicist immediately and inform him of the situation you are encountering.

III. Corrective Actions:

a. The "excessive" CT doses will be reviewed by the certified medical physicist as soon as possible but not more than 48 hours from the time the event occurred.

b. If necessary, corrective actions will be taken to alter the scanning protocol such that the projected $CTDI_{vol}$ value will not exceed the listed Notification Value (NV) for that scanning protocol.

c. The newly suggested scanning protocol must be approved by the chairman of the department before adding it to the scanning protocols list.

d. The medical physicist will present his report about such an event during the next Radiation Dose Review Committee meeting.

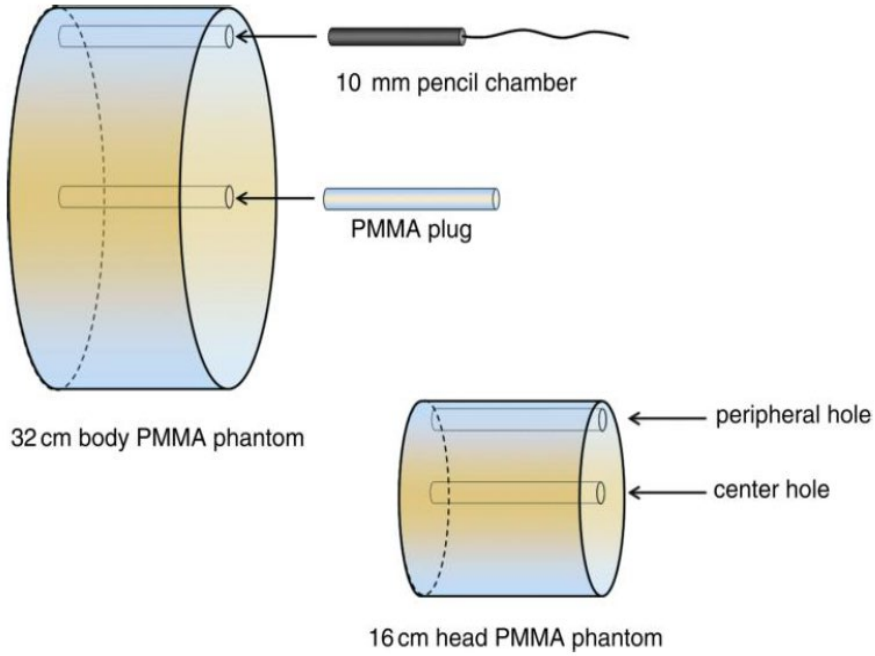
(D) Reference

The volume CT Dose Index $CTDI_{vol}$ metric is a reasonable estimate of patient absorbed dose in CT scanning. The $CTDI_{vol}$ is a quantity that can be measured on either a large (32 cm. diameter) or small (16 cm. diameter) plastic cylinder (the type of plastic is called PMMA). Dose measurements are made at the center and at the periphery, and those values are combined using a weighted average to produce a single estimate of radiation dose to that plastic cylinder.

The $CTDI_{vol}$ measured in the large phantom is used as a reference for the adult CT in the torso (chest, abdomen, and pelvis). The $CTDI_{vol}$ measured in the small phantom is used as a reference for the head CT, and also as a reference for the pediatric body.

The $CTDI_{vol}$ value is reported in mGy.

Once the $CTDI_{vol}$ values are measured on a particular CT scanner by the manufacturer, they are stored in a table and can be computed from the technique factors used to scan the patient.


10 mm pencil chamber
PMMA plug
32 cm body PMMA phantom
peripheral hole
center hole
16 cm head PMMA phantom

Approved by:		**Review/Revision Date:**
/s/ Nathan Egbert, MD Assistant Professor & Deputy Clinical Service Chief	Date	6/1/2020 11/1/2020 12/1/2021 12/1/2023 12/1/2024
/s/ Sulaiman Aldoohan, Ph.D. Assistant Professor, Medical Physicist	Date	
/s/ Ryan Landis, BSRT (R) (CT) Director, Radiology	Date	Next Review Date: 12/1/2027