

AbstractID: 12996 Title: Our experience reducing CT radiation dose to pediatric populations

Purpose: To share our experience implementing new strategies (as technology became available) to reduce Computed Tomography (CT) radiation dose to pediatric patients at a high-volume cancer center housing 13 General Electric (GE) multidetector row CT (MDCT) scanners representing various models.

Method and Materials: In October of 2008, tube current modulation (TCM) was implemented and protocols were created based on the display field of view parameter. Approximately 10 months later, the noise index for all protocols was increased by 2. Three months after increasing the noise index, the minimum and maximum tube current (mA) values were both dropped by 20% across all protocols. A chart review was used to identify eight pediatric patients (from 1 – 15 years old) that received chest CT scans before and after implementation of each of the three dose-reduction strategies; within each patient, all technical parameters other than effective mAs were constant between scans.

Results: The average effective mAs (across all eight patients) dropped from 103 mAs (49 – 171 mAs) prior to October 2008 to 75 mAs (42 – 109 mAs) after implementing all of three strategies. TCM alone reduced dose by an average of 19 %, increasing the noise index combined with TCM by 20% on average, and dropping the minimum and maximum mA values combined with the other two strategies by an average of 23%. All of the exams included in this study were of diagnostic quality with respect to the imaging task.

Conclusion: To date, the combination of these efforts has led to an average reduction in dose of 23%. Additional approaches (adaptive statistical iterative reconstruction and organ shielding) are currently being evaluated and are expected to provide even greater dose-savings to our pediatric patients.