

**Time:** 2:24:00 PM - 2:30:00 PM

**Presenter:** Yasir Andrabi, MD, MPH

**Title of Abstract:** Integration of automated CT dose tracking software with clinical practice; our experiences so far.

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**Modality:** CT

**Organ System:** Multi

**Intro:** Tracking radiation dose is a challenge in a busy, academic practice. A commercially available automated CT dose tracking software (eXposure) was introduced in our practice after initial evaluation phase. Integrating this software with our clinical practice enabled us to track radiation doses along various protocols and exam types. This is particularly significant in large centers with multi-vendore, multi-site CT practice.

**Purpose:** To evaluate the feasibility and effectiveness of integrating automated CT dose tracking software with our clinical practice for monitoring radiation doses along various exam types performed on various scanners from different vendors and models.

**Methods Used:** A commercial software (eXposure<sup>TM</sup>) that estimates CT dose based on CT parameters on DICOM images was introduced in our practice after initial evaluation phase. All CT exams performed between Dec 12 and Jun13 on 17 scanners (GE=12, Siemens=3, Philips=2) were retrieved using the software. Out of 57,280 CT exams performed during this period, we retrieved all GI exams (n=16,820) performed (>215 protocols). Using the software we further tracked the dose profiles of routine abdominal exams (6680) along various scanners and reconstruction algorithms and compared data using t-test and ANOVA. We correlated the software based dose estimates with scanner generated dose reports for a phantom. We also tracked any outliers by plotting box plot for SSDE.

**Results of Abstract:** It was feasible to automate dose reports of 8146 patients scanned using the above mentioned protocols on all 17 scanners. The noted SSDE variability within various scanner type were; GE (n=4342),  $9.9 \pm 1.8$ , Philips (n=1470),  $7.9 \pm 2.1$  and Siemens (n=868), SSDE:  $10.9 \pm 2.9$  (p value > .05). Dose variability along various reconstruction algorithms; FBP (n=3126) SSDE=  $11.2 \pm 1.8$ , ASiR (n=1823): SSDE=  $8.8 \pm 2.2$ , iDOSE (n=1470) SSDE=  $7.9 \pm 2.1$ , SAFIRE (n=261) SSDE=  $9.8 \pm 1.8$  (p < .0001). No significant differences in dose values were found between the dose estimates based on software and scanner generated dose report (p > 0.05). We found 12 outliers on box plot due to higher body weight (>300 lbs).

**Discussion:** It is feasible to introduce a commercial software in a busy and diverse CT practice to reliably estimate and monitor patients radiation exposure. It also provides an opportunity to track any unexpected dose variations.

**Scientific and/or Clinical Significance?** Close monitoring of radiation dose exposure is an essential part of compliance with ALARA principle and can be effectively accomplished with the use of dose tracking software.

**Relationship to existing work** To the best of our knowledge there are no previous studies evaluating the feasibility of automated CT dose tracking software. in work