Poster #: 30

Title of Abstract: FEASIBILTY OF APPLYING AUTOMATED CT DOSE TRACKING SOFTWARE IN A MULTI-SITE MULTI-VENDOR CT PRACTICE USING KIDNEY STONE CT EXAMS AS A MODEL.

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Modality: CT

Organ System: GU

Intro: Tracking radiation dose is a challenge in a busy, academic practice. The new dose tracking software enables us to monitor radiation doses effectively and also gives us an opportunity to track any outliers that may be due to patient factors or any protocol voilations.

Purpose: To evaluate the feasibility of applying commercial software to track radiation dose in patients undergoing kidney stone CT exams in a busy academic practice.

Methods Used: A commercial software (eXposureTM) 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, 763 kidney stone exams constituted 1.4% of total exams. Relevant radiation dose information provided by the software were evaluated to track the radiation dose patterns along various scanners, different age groups, weight groups and reconstruction algorithms and were compared 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 for each patients scanned on all 16 scanners. 1) The noted SSDE variability within various scanner type were; GE (n=630), 10.2 ± 3.7, Philips (n=75), 7.9 ± 2.1 and Siemens (n=58),SSDE:10.4 ± 2.9 (p value>.05). 2) Dose variability within age groups, <30 years: SSDE=9.7 ± 3.5, ≥30 years: SSDE=10 ± 3.8 (p=0.6). 3) Dose variability within weight groups, <200 lbs: SSDE=9.1 ± 3.3, ≥200lbs: SSDE=11.5 ± 4.1 (p<0.0001). 4) Dose variability between reconstruction algorithms, FBP: SSDE=11.5 ± 3.6, Iterative reconstruction (IR): SSDE=8.7 ± 3.8 (p<0.0001). 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 5 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

N/A