

AbstractID: 14143 Title: Changes in radiation dose of abdominal and pelvic computed tomography examinations over a seven year period

PURPOSE: Computed tomography (CT) technology has rapidly evolved. Phantom studies show higher radiation doses with increasing detector rows. However, scanner-based dose-reduction techniques have also evolved. Given these opposing trends that impact patient dose, it is unclear whether doses increased have or decreased over time. Using an automated dose information extraction tool, we analyzed trends in radiation doses over time for abdominal and pelvic examinations at our institution.

METHOD AND MATERIALS: Radiation dose (total DLP) from 1716 abdominal and pelvic CT examinations performed between 2003 and 2010 were analyzed. Examinations were performed on 6 MDCT scanners ranging from 4 to 64 detectors. Dose data from protocol sheets was extracted using a novel extraction system.

RESULTS: Average DLP for CT examinations of the abdomen and pelvis performed in 2003 was 728.9 +/- 278 mGy-cm. Average DLP for examinations performed in 2010 was 1034 +/- 458 mGy-cm, a 41.8% increase. For a 16 slice scanner in constant use since 2003, average DLP increased from 728.9 +/- 278 mGy-cm in 2003 to 1004 +/- 421 mGy-cm in 2010, a 37.7% increase. For abdominal and pelvic examinations from the year 2010, average DLP for exams performed on 16-slice scanners (2 total) was 1094 +/- 478 mGy-cm. The average DLP for examinations performed on 64-slice scanners (3 total) was 1245 +/- 598 mGy-cm, which is an average 13.8% higher dose.

CONCLUSIONS: Average CT radiation dose has increased over time. Scanners with greater numbers of detector rows delivered a higher radiation dose. Patient radiation doses for abdominal and pelvic examinations performed on a given scanner also increased over time. The upward trend in dose is likely due to a combination of hardware factors, protocol changes, and potentially changes in the patient population. Knowledge of these trends is important for effective implementation of dose reduction protocols and quality assurance.