

**Purpose:** To assess the feasibility of developing patient-size specific methods of estimating organ doses in tube-current modulated MDCT exams.

**Methods:** A previously developed tissue-equivalent anthropomorphic phantom and an accompanying adipose equivalent add-on were used with a fiber optic dosimetry system to collect specific organ doses for tube-current modulated chest, abdomen, and pelvic MDCT exams on both a Siemens and Toshiba scanner. The adipose add-on allowed for measurements in both a 50th and 90th percentile by weight male, with the same image quality setting being used for imaging both phantoms. Plots of tube current response of each system to the phantoms were collected along with average doses to organs of interest. Organ doses from each phantom were then compared and plotted versus phantom circumference in order to develop scanner and organ specific equations to adjust organ dose for patient size in tube-current modulated exams.

**Results:** Organ doses were seen to increase in the larger phantom for nearly all organs and exams across both scanners, with average increases on the order of 25%. The nature of the increases differed between the scanners, which showed markedly differing tube-current responses to the two phantoms, indicating that any attempts to account for TCM and patient size in organ doses must be scanner specific. A circumference based, patient size dependent organ dose calculator was developed for both scanners using the collected dose measurements, though much more data is required for the calculator to be useful. Collected physical measurements for breast and lung dose on a Siemens chest scan matched well with the limited published simulation data.

**Conclusions:** The creation of patient size specific, organ dose estimators for TCM MDCT scans appears feasible, though a larger sample of organ dose data is required, which is something more easily achieved through simulation, rather than physical measurement.