

**Purpose:**

CT manufacturers are required to report dose using standardized CTDI phantoms. However, CTDI can be confusing when applied to pediatric patients due to variations in patient size. We propose a simple method to scale standard CTDI to better represent a pediatric patient's dose by providing universal conversion tables that are indexed by patient size ranges.

**Method and Materials:**

The Medical Imaging and Technology Alliance (MITA) and Image Gently Pediatric CT Physics Work Group have obtained CTDI ratios between the 32 cm, 16 cm and 10 cm phantoms for current 16 and 64 slice scanners. X-ray attenuation was measured for the CTDI phantoms and retrospectively determined from pediatric and adult pre-scan projection images. Regression relationships between patient dimensions, attenuation and dose ratios were used to create tables of CTDI scale factors as a function of patient dimensions.

**Results:**

The range of attenuation ratios of the 2<sup>nd</sup> and 3<sup>rd</sup> quartiles for pediatric heads compared to the standard CTDI phantoms was 0.85 to 0.95 (16 cm) and 0.46 to 0.51 (32 cm). The range for pediatric bodies was 1.03 to 1.35 (16 cm) and 0.85 to 0.95 (32 cm). Individual measurement errors relative to the mean CTDI ratio due to manufacturer, scanner generation and kVp or bowtie filter selections were minimal. Preliminary results show errors increased from 0 % to 14 % with increasing difference between the attenuation of the pediatric patient and CTDI phantom.

**Conclusion:**

Universal dose conversion tables can be provided based on dimensions or can be automatically calculated from a patient's attenuation determined from a pre-scan projection image with reasonable accuracy to scale CTDI or its future replacement to better represent dose for pediatric patients.