AbstractID: 7486 Title: Measuring Kerma-Area Products (KAP) in CT

**Purpose.** To determine Kerma-Area Product (KAP) for head and body CT examinations, and compare these with KAP of common radiographic and fluoroscopy examinations.

**Method.** A single projection in CT is analogous to a conventional radiograph; for both exposures, the average incident air kerma may be multiplied by the corresponding cross-sectional area that intercepts the patient to obtain the projection KAP. Summing all projections in a CT examination enables CT examination KAP to be determined. Measurements of the absolute intensity of the CT beam was obtained at the scanner isocenter (CTDI<sub>air</sub>), together with relative intensities on a line perpendicular to the long patient axis (z-direction). The beam cross-sectional area was determined using the known geometry of the CT scanner combined with elliptical shaped head and body dimensions of adult patients.

**Results.** CT KAP values for head and body examinations were ~10 Gy·cm<sup>2</sup> and ~25 Gy·cm<sup>2</sup>, respectively. For comparison, average values in the 2000 UNSCEAR report were: (a) ~1 Gy·cm<sup>2</sup> for head/chest radiographic examinations; (b) ~5 Gy·cm<sup>2</sup> for abdominal radiographic examinations; (c) ~20 Gy·cm<sup>2</sup> for barium studies; (d) ~100 Gy·cm<sup>2</sup> for interventional procedures.

**Conclusion.** Measurement of the CT output, and the corresponding x-ray beam profile transmitted through the beam shaping filter, permits the determination of KAP values for CT examinations. Specifying KAP as a measure of the radiation incident on patients undergoing CT examinations would unify CT dosimetry with current practice in radiography and fluoroscopy.