

Purpose: ICRP report 103 updated tissue weighting factors for effective dose (ED) calculation. To determine the effective dose from CT scans, DLP-to-ED conversion factors are needed. The purpose of this study was to determine such conversion factors for 7 models of scanners available in our practice.

Methods: We used the IMPACT CT Patient dosimetry calculator to determine the DLP-to-ED conversion factors for brain, chest, abdomen-pelvis (abd/p) and chest-abdomen-pelvis (CAP) CT scans. A radiologist identified the beginning and end locations of each scan. The study included two 64-slice scanners (GE LightSpeed VCT, Siemens Somatom Definition), two 16-slice scanners (GE LightSpeed 16 and Toshiba Aquilion), two 4-slice scanners (GE HiSpeed QX/I, Toshiba Asteion) and one two-slice scanner (GE Nx/I 2). 120 kVp was used for all calculations with maximum collimation for each scanner, ranging from 20-40 mm. We calculated the DLP-to-ED factors for each scanner in addition to their average and standard deviation. For the sake comparison, we determined conversion factors based on ICRP 103 and ICRP 60.

Results: In units of $\mu\text{Sv}/\text{mGy cm}$, the average conversion factors for brain, chest, abd/p and CAP were 2.60, 19.9, 16.3 and 17.8, respectively. Their standard deviations were 0.15, 0.93, 1.14 and 0.90, respectively. The maximum deviations from the mean ranged from 10% to 12 % and were exhibited mostly by 2- and 4-slice scanners. The ratio of conversion factors based on ICRP 103 to those based on ICRP 60 ranged from 0.91 to 1.22.

Conclusions: DLP-to-E conversion factors for brain, chest, abd/p and CAP scans were determined for several CT scanners based on ICRP 103. The conversion factors for each scanner or their overall average can be used to determine the effective dose.