

Institutional Diagnostic Reference Levels for Non-Contrast Computed Tomography Examinations of Adults at Sri Jayewardenepura General Hospital, Sri Lanka.

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The computed tomography (CT) scanner is considered a major imaging modality which utilizes ionizing radiation in medical imaging. Diagnostic reference levels (DRLs) have been employed to prevent patients from receiving unnecessary radiation doses. This study was aimed to determine institutional diagnostic reference levels (IDRLs) for four non-contrast CT (NCCT) examinations at Sri Jayewardenepura General Hospital, Sri Lanka based on DRL quantities such as volume computed tomography dose index ($CTDI_{vol}$), dose length product (DLP), and size-specific dose estimate (SSDE). 310 adult patients between the age of 18-80 years who underwent CT scans of NCCT brain, chest, abdominopelvic, and Kidney-Ureter-Bladder (KUB) examinations were included. Dosimetric data such as $CTDI_{vol}$, and DLP were retrospectively collected. Anteroposterior (AP) and lateral diameters were obtained from the mid-slice of the axial CT images for each patient for SSDE calculation. The AAPM reports 204 and 220 were followed in obtaining effective diameter (D_{eff}) and the conversion factors required for SSDE calculation. IDRLs were determined as the median of distribution of $CTDI_{vol}$, DLP, and SSDE for NCCT brain (n=110, 91.30 mGy, 1852.70 mGy.cm, 90.42 mGy), chest (n=50, 8.60 mGy, 288 mGy.cm, 12.46 mGy), abdominopelvic (n=100, 32, 11.40 mGy, 555.50 mGy.cm, 15.32mGy), and KUB examinations (n=50, 12.70 mGy, 597.10 mGy.cm, 16.60 mGy). The preliminary data provided by this study can be used for optimization of these CT examinations in the hospital. Adding SSDE to the CT systems is important in determining the radiation dose received by the patients according to their dimensions. Further studies can be recommended with increased sample size.

Keywords: *computed tomography, institutional diagnostic reference levels, volume computed tomography dose index, dose length product, size-specific dose estimate*