

ABSTRACT

Non-contrast adult head CT examination is one of the most frequently performed procedures in radiology installations. The high frequency of this examination leads to cumulative radiation exposure in patients, which must be managed through the application of radiation protection optimization principles. The Diagnostic Reference Level (DRL) is a dose evaluation tool used to ensure that the radiation dose delivered remains at an optimal level without compromising diagnostic image quality. This study aimed to identify the distribution of Computed Tomography Dose Index volume (CTDIvol) and Dose Length Product (DLP) values, establish the 75th percentile (P75) as the local DRL, and compare it with Indonesia's National DRL published by Badan Pengawas Tenaga Nuklir. The study was conducted using a quantitative descriptive approach at the Radiology Installation of Samaritan Hospital, Palu, during the period of February to March 2026. Data were collected from 129 adult patients (age >18 years) who underwent non-contrast head CT examination using a GE 64-Slice CT scanner. CTDIvol and DLP values were recorded directly from the CT console and analyzed using descriptive statistics, including minimum, maximum, mean, median, standard deviation, and 75th percentile values. The results showed a mean CTDIvol of 30.77 mGy (minimum 5.65 mGy; maximum 31.67 mGy) and a mean DLP of 813.36 mGy·cm (minimum 318.99 mGy·cm; maximum 983.53 mGy·cm). The local DRL (P75) was established at 31.67 mGy for CTDIvol and 856.83 mGy·cm for DLP. Comparison with Indonesia's National DRL (CTDIvol 60 mGy; DLP 1,275 mGy·cm) indicated that the local DRL values were below the national reference, demonstrating that the examination protocols applied at Samaritan Hospital Palu comply with patient radiation protection optimization principles in accordance with the As Low As Reasonably Achievable principle.

Keywords: *CT-Scan Head, CTDIvol, Diagnostic Reference Level, DLP, dose optimization, radiation protection*