Establishing Local Diagnostic Reference Levels for Brain and PNS CT Scans at Zayed Military Hospital, Abu Dhabi

Maryam ALBastaki

University Tunn Hussien Malaysia, Parit Raja, Malaysia

Abstract:

Computed Tomography (CT) is a vital diagnostic tool in modern medicine, offering detailed imaging but also contributing significantly to patient radiation exposure, necessitating careful dose management. Diagnostic Reference Levels (DRLs) are benchmarks designed to optimize radiation doses while maintaining diagnostic quality. This study establishes Local Diagnostic Reference Levels (LDRLs) for adult brain and paranasal sinus (PNS) CT scans at Zayed Military Hospital (ZMH) in Abu Dhabi. Retrospective data collected from March to December 2023, including 29 brain CT scans and 30 PNS CT scans, were analyzed to determine LDRLs based on the 75th percentile of dose distributions. The study identified a CTDIvol of 41.6 mGy and DLP of 751 mGy.cm for brain CT and a CTDIvol of 16.1 mGy and DLP of 25.3 mGy.cm for PNS CT. These values align with the standards of the UAE Federal Authority for Nuclear Regulation (FANR) and international guidelines, reflecting adherence to best practices in radiation safety. By establishing these LDRLs, the study contributes to dose optimization, enhancing diagnostic efficacy while minimizing unnecessary radiation exposure, and supports the integration of evidence-based practices in clinical imaging to improve patient safety and care quality.