

ABSTRACT

COMPARISON OF ESD VALUE ESTIMATION USING TLD MEASUREMENT AND TUBE OUTPUT IN DETERMINING DIAGNOSTIC REFERENCE LEVEL. The United Nations Scientific Committee on the Effects of Atomic Radiation (UNSCEAR) noted that approximately 3.6 billion patient examinations utilize X-rays for diagnostic and interventional radiology purposes worldwide. To ensure patient safety, the International Commission on Radiological Protection (ICRP) recommends the application of Diagnostic Reference Level (DRL) as a guide for optimizing radiation protection. The study was conducted at Karawang Regional Hospital by comparing the estimated Entrance Surface Dose (ESD) value on chest radiography with a grid using two different methods, namely measurements using a TLD-100 chip attached to the patient's skin surface and calculations based on the output of the X-ray tube combined with exposure factors (kV, mAs, FFD) and a Backscatter Factor of 1.35. Data were analyzed using the Mann-Whitney test. The median ESD value using the TLD-100 chip was 0.395 mGy, while the tube output method was 0.256 mGy. There was a significant difference in the dose received by patients between the two methods (p value = 0.001) with a median difference of 0.139 mGy. This difference is possible because the TLD detector captures scattered radiation according to the varying thickness of the patient's body, while the tube output method uses a static Backscatter Factor. Despite the difference, the dose received by both methods is still below the BAPETEN standard DRL value of 0.4 mGy.

Keywords : Entrance Surface Dose (ESD), TLD-100, Tube Output , Diagnostic Reference Level (DRL)