

## **Establishment of Institutional Diagnostic Reference Levels for Whole-body Positron Emission Tomography/Computed Tomography Imaging Procedures**

AMLN Adikari<sup>1</sup>, V Ramanathan<sup>1#</sup> and R Tudugala<sup>1</sup>

<sup>1</sup>Faculty of Allied Health Science, General Sir John Kotelawala Defence University, Ratmalana, Sri Lanka

<sup>#</sup>vijitha.r@kdu.ac.lk

### **Abstract**

The use of Positron Emission Tomography/Computed Tomography (PET/CT) imaging has become more popular in oncology. A concern with PET/CT is the combined radiation doses from both CT and radiopharmaceuticals. A Diagnostic Reference Level (DRL) is an effective tool for optimizing patient and staff radiation exposure while maintaining adequate diagnostic image quality. The aim of this study is to optimize the patient radiation dose by establishing institutional DRLs for whole-body PET/CT imaging procedures performed at Apeksha hospital in Maharagama, Colombo, Sri Lanka. A total of 86 imaging procedures was selected for this study. All data were collected from September 2022 to November 2022. The median (50<sup>th</sup> percentile) of the administered activity, Dose Length Product (DLP) and CTDI<sub>vol</sub> values were considered as the DRL values as recommended by the International Commission of Radiological Protection (ICRP). The median values of the administered activity, effective dose, total DLP and CTDI<sub>vol</sub> were reported as 184.26 MBq, 3.50 mSv, 1407.5 mGy.cm and 7.51 mGy respectively. According to the ICRP recommendation, the established DRL values for administered activity, total DLP and CTDI<sub>vol</sub> for PET/CT whole-body scan procedures performed in the PET/CT Unit of Apeksha Hospital are 184.26 MBq, 1407.5 mGy.cm and 7.51 mGy respectively. This study is an initiative process of developing national DRLs for PET/CT imaging procedures in Sri Lanka. Furthermore, a significant statistical correlation was found in between the effective dose and patients' body mass index. In addition, a significant relationship was found in between effective dose and patients' clinical indication.

**Keywords:** *PET/CT, DRL, Effective dose, Whole-body scan*