

## **Patient radiation dose evaluation in dual energy x-ray absorptiometry at a selected private hospital**

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Dual Energy X-Ray radiation with specialized digital detection system used in Dual Energy X-Ray Absorptiometry (DEXA) scanning is a highly specialized radiological procedure used to detect pathological and structural changes of the skeletal system in patients with advanced age. DEXA scan is, by far the most widely used technique for bone mineral measurements, since it is considered to be cheap, accessible, easy to use and able to provide an accurate estimation of bone mineral density in adults. It is crucial to define and optimize the radiation dose received by patients during DEXA examination, taking into account that females have a higher risk for stochastic effects than their counterparts due to higher radio sensitivity of uterus and ovaries. According to the International Commission on Radiological Protection, the effective dose is the most appropriate quantity, correlating to the risk from exposures during radiological procedures.

The objective of this study was to indirectly estimate the effective dose and entrance surface dose (ESD) to female and male patients subjected to DEXA scanning at the Lanka Hospitals by using dose area product meter (DAP) value. Results were compared with available international reference levels to identify factors associated with higher effective doses where necessary.

DAP values recorded for 60 patients included both hips and spine AP. The mean DAP values for both hips and spine were 1.6 and 2.4 Gy $\cdot$ cm<sup>2</sup> respectively. The calculated mean ESD for left hip, right hip and spine AP were 133.66, 133.80 and 147.79  $\mu$ Gy respectively. The calculated mean effective doses for the same regions were 2.16, 2.16 and 2.88 mSv. The ESD and effective doses for both hips and spine were significantly lower than the international reference levels.

In this study the lower radiation dose was found to contribute a substantial portion to the patients and depends on many interrelated parameters which include the equipment, bone mineral density, difference due to Caucasian race, scan mode and variables in the clinical situation.