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**Assessment of Patient's Doses from Routine Diagnostic
X-ray Tests in the Security Forces Hospital, in Riyadh
(Saudi Arabia)**

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Abstract

Medical X-ray examinations play an important role in the health care of the Saudi population and may constitute the largest man-made source of exposure to ionizing radiation in Saudi Arabia and worldwide. Several studies have emphasized the tremendous variation in patient doses between different X-ray departments and the need to establish reference levels. The main outcome of these studies was the introduction of national and international reference levels for different X-ray examinations. Furthermore, the regulatory authorities have yet suggested no reference X-ray dose levels.

The aim of the current project was to provide a survey of patient X-ray doses in the radiology department at the Interior Security Forces Hospital in Riyadh (Saudi Arabia).

In this work a total of 220 patients were examined. Eleven routine X-ray tests (each test was performed for one, two or three projections with a total of 23 projections) were assessed. The entrance surface doses (ESD) received by each patient were measured using thermo-luminescent dosimeters (TLDs) attached to the patient's skin or garment. The TLD reading system was calibrated prior to clinical work to convert the TLD's readings into doses.

All exposure parameters (kVp, mAs, field size and distance between patient and X-ray source) and patient related information (organ thickness, weight, height and age) were recorded. Twenty adults (> 15 yrs) patients were used to represent patient doses for each X-ray examination (460 samples). The collected data were statistically analyzed and compared with other international reference levels.

Histograms for various X-ray examinations were presented showing wide, positively skewed distributions of the measured entrance surface doses (ESD) for most examinations. Mean, median, first and third quartile values of ESD were reported. Survey results were generally comparable with those reported in the UK, and other countries. This study provides the received doses information by patients at the Security Forces Hospital in Riyadh. The data will also be useful for the formulation of national guidance levels for diagnostic X-ray examination as recommended by the IAEA.