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Determination of Scattered Radiation on General X-Ray Tabletop Using Dose Mapping Technique

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Introduction: Scatter radiation is an essential parameter to be measured in diagnostic imaging, as it can degrade image quality and increase radiation exposure to both patients and healthcare personnel. Due to the invisible nature of X-rays, scatter radiation cannot be directly visualized and must be quantified using indirect measurement techniques such as dosimetry during patient exposure. This study investigates the distribution of scatter radiation on a general X-ray tabletop using a dose mapping technique, with a specific focus on the examination couch area where the patient is positioned during the imaging procedure. **Methods**: Scatter doses were recorded at 15 locations on the general X-ray tabletop using nanoDot™ optically stimulated luminescence dosimeters, arranged in a grid with 50 cm horizontal and 25 cm vertical spacing. An anthropomorphic upper body phantom was positioned centrally to simulate patient attenuation. Standard chest X-ray exposures with proper collimation were performed at three exposure settings: 60 kVp/2.0 mAs, 70 kVp/2.5 mAs, and 80 kVp/3.2 mAs. Dosimeters were analyzed using MicroStar reader and the data were processed in Microsoft Excel to generate 3D graphs illustrating the scatter dose distribution. **Results**: Results showed that scatter radiation was most intense along the central axis of the X-ray beam. As a result, scatter radiation is concentrated near the beam's central axis. **Conclusions:** The method effectively maps scatter radiation across the general X-ray tabletop and identifies intensity variations associated with the heel effect. Furthermore, awareness of scatter radiation distribution is essential for the effective implementation of radiation safety procedures**.**

Keywords: scattered radiation, mapping technique