

Assessing Trainee Radiation Exposure in Fluoroscopy-Guided Procedures: An Analysis of Hp(3)

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Abstract : During fluoroscopically guided procedures, healthcare workers, especially radiology trainees, are at risk of exposure to elevated radiation exposure. It is vital to prioritize their safety in such settings. However, there is limited data on their monthly or annual doses. This study aimed to evaluate the equivalent dose to the eyes of the student trainee, utilizing LiF: Mg, Ti (TLD-100) chips at the radiology department of a hospital in Shiraz, Iran. Initially, the dosimeters underwent calibration procedures with the assistance of ISO-PTW calibrated phantoms. Following this, a set of dosimeters was prepared To determine HP(3) value for a trainee involved in the main operation room and controlled area utilized for two months. Three TLD chips were placed in a holder and attached to her eyeglasses. Upon completion of the duration, the TLDs were read out using a Harshaw TLD reader. Results revealed that Hp(3) value was 0.31 ± 0.04 mSv. Based on international recommendations, students in radiology training above 18 have an annual dose limit of 0.6 rem (6 mSv). Assuming a 12-month workload, staff radiation exposure stayed below the annual limit. However, the Trainee workload may vary due to different deeds. This study's findings indicate the need for consistent, precise dose monitoring in IR facilities. Students can undertake supervised internships for up to 500 hours, depending on their institution. These internships take place in health-focused environments offering radiology services, such as clinics, diagnostic imaging centers, and hospitals. Failure to do so might result in exceeding occupational radiation dose limits. A 0.5 mm lead apron effectively absorbs 99% of radiation. To ensure safety, technologists and staff need to wear this protective gear whenever they are in the room during procedures. Furthermore, maintaining a safe distance from the primary beam is crucial. In cases where patients need assistance and must be held for imaging, additional protective equipment, including lead goggles, gloves, and thyroid shields, should be utilized for optimal safety.

Keywords : annual dose limits, Hp(3), individual monitoring, radiation protection, TLD-100

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