

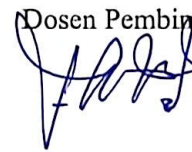
ABSTRACT

Tibial fracture is a case of musculoskeletal trauma that does not escape the role of ionizing radiation in supporting clinical diagnosis through radiological examination and C-Arm fluoroscopy surgery. The frequency of these examinations has the potential to cause biological effects on patients due to the accumulation of increasing radiation doses. Through this research, the accumulated effective dose from conventional radiography and intraoperative C-Arm fluoroscopy will be determined, analyzed biological risks based on age and gender, and evaluated the application of the principle of clinical justification. The research was carried out at the Radiology Sub-Department of RSAL dr. Mintohardjo Jakarta on 30 patients following surgery for tibia fractures for the period November 2025 to March 2026. The effective radiographic dose was calculated using the KAP conversion factor, while the fluoroscopy dose was calculated from the DAP value with a conversion factor of 0,05 mSv/(Gy·cm²) for orthopedic procedures. The results show an average accumulated total effective dose of 0,754 mSv with a range of 0,112–1,754 mSv. Conventional radiography made the largest contribution to the cumulative dose (81,5%), while C-Arm fluoroscopy was 18,5%. As many as 33,3% of patients had doses exceeding the public dose limit of 1 mSv/year, especially at the highest frequency of radiological examinations. Most of the examinations met the principles of clinical justification, but some were identified as unjustified due to discrepancies in clinical indications and frequency of examinations.

Keywords: *tibial fracture, effective dose, clinical justification, C-Arm fluoroscopy, conventional radiography.*

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