

## عنوان مقاله:

An analytical and Monte Carlo investigation of the sufficiency of the present shielding of PET/CT imaging system at Tehran's Shariati hospital

## محل انتشار:

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## خلاصه مقاله:

By the rapid development of imaging systems such as PET/CT for diagnosis of cancer, the protection of staff and public has become a main health concern. Due to serious and irreversible harms of ionization radiations, protection of all those who are exposed is the main concern of health issues. The main basis of the calculation of the shielding design in the medical imaging systems is that the absorbed dose should not exceed the allowed limit. In this study, the current shielding status of the PET/CT installations in Tehran's Shariati hospital was investigated using the MCNPX Monte Carlo code to ensure that the dose limits for both the controlled and uncontrolled area are not violated. The proposed simulation method was benchmarked with a validated analytical method. Shariati hospital provides services to four patients every day, leading to a dose rate in the range of  $2.6 \times 10^{-6}$  to  $9.35 \times 10^{-3}$  mSv/week. The minimum dose rate in this range represents the value behind the door of the waiting room (public uncontrolled area), while the maximum in this range corresponds to the value behind the glass of the scanner room (operator controlled area). The simulation results for 8 patients/day in this center showed that the dose rate behind the wall of the injection room will increase from  $4.88 \times 10^{-6}$  mSv/week to  $2.81 \times 10^{-2}$  mSv/week, which is well below the recommended levels. This indicates that the present shielding is adequate for up to four more patients per day.

## کلمات کلیدی:

Positron-emission-tomography, Computed-tomography shielding, Dose rate, Monte Carlo Method, Analytical method

## لینک ثابت مقاله در پایگاه سیویلیکا:

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