

Effective dose of for medical workers operating in a PET/CT department

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Aim/Introduction:

The PET/CT applications have been continuously increasing for diagnostic procedures. Although such an increase is a positive trend for the benefit of patients, the associated risk of radiation exposure of staff needs to be properly evaluated. The aim of this study was to measure the radiation exposure of the staff and evaluate the doses in the first PET/CT department in Greece at Hygeia S.A.

Materials and Methods:

To estimate the effective dose from external exposure all 6 members of the staff (2 nurses, 2 medical physicists, 2 technologists, had TLD badges worn at the upper pocket of their overall, TLD rings on the second finger of each hand consisting of disk measuring diameter by 0,9 mm thickness. The basic stages for the PET/CT procedures involve 4 steps: segmentation of the dose, injection of the radiopharmaceutical, nursing care during uptake and positioning of the patient.

Results:

The results of our study for the average cumulative whole-body dose for 100 patients ($\mu\text{Sv}\pm\text{SD}$) at different stages were: segmentation of the dose $189\pm 7,23$, injection of the radiopharmaceutical $245\pm 6,67$, nursing care during uptake $70\pm 5,63$, positioning of the patient $146\pm 12,3$. The statistical analysis showed small differences between stages 1, 2 and 4 ($p>0,05$) but a great statistical difference was observed between stages 2,3 $p=0,023$. The results for the finger doses ($\mu\text{Sv}\pm\text{SD}$) regarding the same stages were: segmentation of the dose 284 ± 77.4 , injection of the radiopharmaceutical 225 ± 62.3 , positioning of the patient $26,79\pm 5.87$.

Conclusion:

The personnel dose results are significantly lower than the recommended annual dose by International Commission for Radiological Protection. However, a greater effort should be made to reduce the doses further in line with the ALARA principal