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ECR 2022 / C-14496

## Residual activity in a Nuclear Medicine Department: A Dosimetric Study

**Congress:**

ECR 2022

**Poster Number:**

C-14496

**Type:**

Scientific Exhibit

**Keywords:**

Professional issues, Radiographers, Radioprotection / Radiation dose, Nuclear medicine conventional, Dosimetry, Radiation safety, Dosimetric comparison, Occupational / Environmental hazards

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**DOI:**

10.26044/ecr2022/C-14496

**DOI-Link:**<https://dx.doi.org/10.26044/ecr2022/C-14496>

## Purpose

The exposure to ionizing radiation by radiographer in Nuclear Medicine (NM) Departments is inevitable, as this area has the highest rates of residual activity. Since 1957, and later updated (2005), several guidelines have been established by the IAEA (International Atomic Energy Agency), for the management of residues from radioactive use for medical purposes, with the intention of increasing the radiological protection of the people and the environment. Optimized management is very important not only for the functioning of the NM department, but also for the...

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## Methods and materials

This is a descriptive-correlational study that aimed to assess and describe the relationships between the different variables, using a Geiger-Müller (GM) radiation detector equipment, which performs a dose rate reading for a period defined in  $\mu\text{Sv/h}$ , placed at different points in the NM department (Figure 1), similar to the procedure adopted by Kaur and Sharma in 2013, in India (2). [Fig 1] Activity measurements were taken for 63 days, with a total of 1590 measurements made at different times of the day (morning,...

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## Results

The Figure 3 describes the averages, minimum and maximum, of the activities measured over the given distances according to the location of the service where data were collected. In Radiopharmacy area, the mean dose rate values obtained were  $77.16 \mu\text{Sv/h}$ ,  $1.14 \mu\text{Sv/h}$ ,  $0.57 \mu\text{Sv/h}$  and  $0.52 \mu\text{Sv/h}$  at distances of 0m, 0.5m, 1m and 1.5m, respectively. In the Injection Room, mean dose rate values of  $1.75 \mu\text{Sv/h}$ ,  $0.31 \mu\text{Sv/h}$  and  $0.19 \mu\text{Sv/h}$  were observed at distances of 0m, 0.5m and 1m. At 1.5m, being a...

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## Conclusion

In a NM Department, the Radiographers are in contact with radionuclides, which, through decay, are a source of ionizing radiation, especially in the service area where they are handled and prepared, the Radiopharmacy. This location is one of the areas where there is a greater exposure, and the Radiographers are part of the group of exposed workers who, according to the limits established by the IAEA, must not exceed the effective dose of 20mSv per year(4). Even through surveillance with individual TLD's, which can sometimes...

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## Personal information and conflict of interest

A. D. S. Queirós: Nothing to disclose S. I. Rodrigues: Nothing to disclose L. P. V. Ribeiro: Nothing to disclose A. F. C. L. Abrantes: Nothing to disclose J. Rosas: Nothing to disclose R. P. P. Almeida: Nothing to disclose J. Pinheiro: Nothing to disclose

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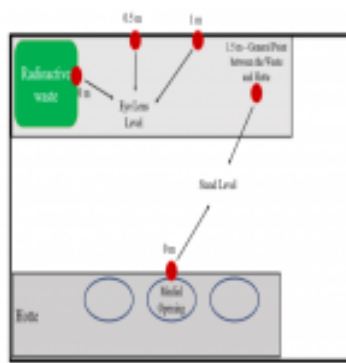
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**Fig 1:** Radiation detector equipment placed at various points in the NM Department. C...



**Fig 2:** Methodological scheme of the measurements carried out.

		0m	0.5m	1m	1.5m
Radiopharmacy	Mean	71,15	1,14	0,57	0,52
	Minimum	0,12	0,10	0,07	0,08
	Maximum	635,00	15,00	3,40	22,00
Halls	Mean	1,34			0,40
	Minimum	0,10			0,08
	Maximum	15,50			1,64
Injector Room	Mean	1,75	0,11	0,19	
	Minimum	0,00	0,00	0,00	
	Maximum	43,80	5,70	1,70	

**Fig 3:** Averages, minimum and maximum of the radiation activities measured over the...

		0m	0.5m	1m	1.5m
Morning	Mean	7,27	0,30	0,29	0,44
	Minimum	0,00	0,00	0,00	0,08
	Maximum	190,00	1,10	1,60	22,00
Midday	Mean	11,53	0,01	0,17	0,40
	Minimum	0,00	0,06	0,01	0,10
	Maximum	462,00	5,71	1,74	1,10
Afternoon	Mean	49,40	1,10	0,51	0,52
	Minimum	0,06	0,04	0,01	0,10
	Maximum	610,00	18,00	1,70	1,64

**Fig 4:** Averages, minimums and maximums of the activities measured in the different...