Radiation protection during two decades in a nuclear medicine department

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AIM

The aim of this study was to follow the yearly radiation doses during two decades to staff working in Department of Nuclear Medicine, Aalborg Hospital. We focused on the development in procedures, the number of examinations, and the physical working environment. This includes radiation protection in general nuclear medicine and PET/CT.

MATERIALS AND METHODS

Data has been taken from list of examinations sent to the ministry of health since 2000 and measuring results of personal dosimetry from the same ministry since 1990. Until 1997 the department had very old and narrow quarters. When moving to new facilities in 1997 and when establishing PET procedures in December 2005, our primary goal was to increase distance between the radiation source (the patient) and the technologists in order to reduce occupational exposure.

The following was taken into consideration:

- Large, simple but functional rooms
- Injection room
- Electronic personal dosimeters
- Introduction program for new staff
- Improved shielding in preparation settings
- Laboratory with a direct hatch to the injection room
- A special waiting area for patients confined to bed
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RESULTS

Among the examinations giving the highest radiation dose to the staff are bone scintigraphy, myocardial scintigraphy and PET scanings. The number of bone scintigraphies has been almost stable since 2000. The number of myocardial scans has increased from 124 scans in 2000 to 595 scans in 2006. The department started PET/CT scans in 2006 and made 416 scans the first year.

Evaluating technologists working since 1990 in nuclear medicine the average occupational radiation dose has not increased.

CONCLUSION

We found that it is very important to develop the physical working environment currently while having focus on its functionality. Furthermore the electronic personal dosimeter, updated guidelines for procedures and introduction of new staff is significance to keep radiation dose low. This has been introduced in our department, and despite an increase in the number of scanings, the radiation dose to the staff has not increased.