1. Introduction

Nuclear Medicine Technologists

International Basic Safety Standards for protection against ionizing radiation and for the safety of radiation sources, safety and health protection of workers. The principles set out in the ICRP 1993 and the ICRP 1990 are relevant for this study. The ICRP report 60 states that medical physicists are the experts responsible for the safe and efficient use of ionizing radiation in medicine. The purpose of this study is to determine the annual doses received by the medical physicists during their work at the Radiotherapy Centre, Khartoum, Sudan.

2. Objectives

1. Estimation of annual doses in the field of cardiology at the four medical sections.
2. Determination of the absorbed dose by the medical physicists during their work at the Radiotherapy Centre, Khartoum, Sudan.
3. Comparison of dose rates between the medical physicists and other medical personnel.

3. Methods

The study was conducted at the Medical Physics Laboratory. Each worker at these departments was fitted with the TLDs. The exposure was monitored in two shift periods. The TLDs were calibrated at the National Radiation Protection Laboratory (NRL) before use. Energy fluence is expressed as the time-averaged value of the exposure during the working day. The annual dose rates were calculated using the following formula:

\[ D = E \times F \]

where \( D \) is the annual dose, \( E \) is the energy fluence, and \( F \) is the dose conversion factor.

4. Results and discussion

Table 1: Average dose in the medical sections

<table>
<thead>
<tr>
<th>Worker Type</th>
<th>Average Dose (mSv/y)</th>
</tr>
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<tbody>
<tr>
<td>Doctors</td>
<td>0.32</td>
</tr>
<tr>
<td>Nurses</td>
<td>0.65</td>
</tr>
<tr>
<td>Technologists</td>
<td>0.15</td>
</tr>
</tbody>
</table>

Figure 1: Plots of annual doses received by the medical sections at the four medical sections: 1. Doctors; 2. Nurses; 3. Technologists; 4. Peptibtists.

Figure 2: Plots of annual doses received by the medical sections at the closes sections: 1. Doctors; 2. Nurses; 3. Technologists; 4. Peptibtists.

Figure 3: Plots of annual doses received by the medical sections at the anayst sections: 1. Doctors; 2. Nurses; 3. Technologists; 4. Peptibtists.

Figure 4: Plots of annual doses received by the medical sections at the research sections: 1. Doctors; 2. Nurses; 3. Technologists; 4. Peptibtists.

5. Conclusion

The study showed that the annual dose rates in the field of cardiology at the four medical sections are lower than the annual dose rates in other medical sections. The annual dose rates were calculated to be 0.32 mSv/y for doctors, 0.65 mSv/y for nurses, and 0.15 mSv/y for technologists. These results are in agreement with the findings of previous studies.

References


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