



IAEA

Atoms for Peace and Development

الوكالة الدولية للطاقة الذرية

国际原子能机构

International Atomic Energy Agency

Agence internationale de l'énergie atomique

Международное агентство по атомной энергии

Organismo Internacional de Energía Atómica

Vienna International Centre, PO Box 100, 1400 Vienna, Austria

Phone: (+43 1) 2600 • Fax: (+43 1) 2600781662

Email: Official.Mail@iaea.org • Internet: <http://www.iaea.org>

In reply please refer to: **326-E.2.20**

Dial directly to extension: (+431) 2600-28207

Principles of operation of the IAEA/WHO postal dose audit service for radiotherapy centres

- This service is offered by the IAEA Dosimetry Laboratory (DOL) to Member States that are eligible to receive Technical Cooperation support from the IAEA. It is also offered to WHO Member States upon WHO's request. The service is not routinely offered to Member States that have a national dosimetry audit network for radiotherapy.
- The service is cost free to participants. It provides an independent check of the beam calibrations for the high energy photon (^{60}Co and high energy X rays) and electron beams where the reference conditions can be set-up¹.
- Please note, that we do not check: brachytherapy, orthovoltage X-ray beams, or small beams used in stereotactic radiosurgery, be it a Gamma-knife, X-ray knife, Cyber-knife, Stereotactic Gamma System, or similar.
- A hospital can request the number of dosimeter sets corresponding to the number of clinical photon beams used for teletherapy; however, not more than 3 beams will be checked in an irradiation run (irradiation window).
- A hospital can also request up to three dosimeter sets corresponding to the lowest, middle, and highest energies of clinically commissioned electron beams for new linac installations.
- The IAEA/WHO postal dose audit service is organized in 10 irradiation runs per year. Over a period of two years, each participant can be included in one of these irradiation runs.
- Individual requests (outside the irradiation windows) are accepted for new installations, following major repair of the treatment units, Co-60 source replacements, unusual patient skin reactions, and for other important reasons. Such requests can be made at any time and will be given the highest priority.
- During each irradiation window, the DOL irradiates reference dosimeters (2 Gy, Co-60 beam). It's therefore important that the participants keep to the fixed irradiation window.
- In each irradiation run, two reference institutions, a Primary Standards Dosimetry Laboratory and a leading radiotherapy centre irradiate dosimeters with well-defined doses as part of the quality control of the process.
- Dosimeters irradiated by participants should arrive at the DOL not later than 6 weeks after irradiation, otherwise the hospitals will have to wait for their results due to queues to the dosimeter readings arising from irregular return of dosimeters.
- If any participant cannot irradiate the dosimeters in the scheduled time window, they can still do this later. The DOL should be informed when the "late" participant intends to make the irradiation in order to prepare the reference dosimeters.
- The audit results are sent to the participants within 8 weeks of receiving their irradiated dosimeters at the DOL, depending on the queue to the readers. Participants receive individual result certificates for each beam checked. Results within 5% limit are considered acceptable.
- If the results are within the acceptance limit of 5%, the next participation is recommended after two years.
- Institutions with results outside the 5% acceptance limit are provided with a second, follow-up dosimetry set for immediate repeat irradiation and a discussion is initiated with the institution's medical physicist to identify the reasons for the discrepancy, and the next participation is recommended after one year.
- The results of IAEA/WHO postal audits are kept confidential by the IAEA/WHO staff and the national audit coordinators, where existing, and will not otherwise be disseminated without the written permission of the participating radiotherapy centre.
- The audit material sent to your institution represents a significant investment in cost, time and effort to the IAEA/WHO. Failure to return dosimeters may be reported to your local authorities or to the Ministry of Health.
- Only those institutions that agree to the terms and conditions of the IAEA/WHO postal dose audit service, as outlined in this note, will be provided with the dosimeters.

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Dosimetry Audit Team

International Atomic Energy Agency (IAEA)

Dosimetry Laboratory, DMRP Section, Division of Human Health

Vienna International Centre, PO Box 100, 1400 Vienna

Tel: +43 1 2600-28207 or 28331, Fax: +43 1 2600781662, E-mail: Dosimetry@iaea.org

¹INTERNATIONAL ATOMIC ENERGY AGENCY, Absorbed Dose Determination in External Beam Radiotherapy: An International Code of Practice for Dosimetry Based on Standards of Absorbed Dose to Water, TRS 398. IAEA, Vienna (2006)