

AbstractID: 2611 Title: The Radiological Physics Center's QA Activities

Purpose:

To describe the mission and activities of the Radiological Physics Center (RPC).

Method and Materials:

The RPC was founded in 1968 under an agreement between the AAPM and the Committee for Radiation Therapy Studies (CRTS). The agreement called for the AAPM to solicit applications to form a QA center that would be a resource in radiation dosimetry and physics for cooperative clinical trial groups and all radiotherapy facilities that deliver radiation treatments to patients entered onto cooperative group protocols. The RPC has functioned continuously for 36 years to support medical physicists and radiation therapy departments.

Results:

The RPC's mission has changed only slightly over the years. The primary responsibility is to assure NCI and the cooperative groups that the participating institutions have adequate quality assurance procedures and no major systematic dosimetry discrepancies, so that they can be expected to deliver radiation treatments that are clinically comparable to those delivered by other institutions in the cooperative groups. To accomplish this, the RPC monitors the basic machine output and brachytherapy source strengths, the dosimetry data utilized by the institutions, the calculation algorithms used for treatment planning, and the institutions' quality control procedures. The methods of monitoring include on-site dosimetry review by an RPC physicist, and a variety of remote audit tools. During the on-site evaluation, the institution's physicists and radiation oncologists are interviewed, physical measurements are made on the therapy machines, dosimetry and quality assurance data are reviewed, and patient dose calculations are evaluated. The remote audit tools include 1) mailed dosimeters (TLD) evaluated on a periodic basis to verify output calibration and simple questionnaires to document changes in personnel, equipment, and dosimetry practices, 2) comparison of dosimetry data with RPC "standard" data to verify the compatibility of dosimetry data, 3) evaluation of reference and actual patient calculations to verify the validity of treatment planning algorithms, and 4) review of the institution's written quality assurance procedures and records. Mailable anthropomorphic phantoms are also used to verify tumor dose delivery for special treatment techniques. Any discrepancies identified by the RPC are pursued to help the institution find the origin of the discrepancies and identify and implement methods to resolve them.

Conclusion:

While conducting these reviews, the RPC has amassed a large amount of data describing the dosimetry at participating institutions. Representative data from the monitoring programs will be discussed and examples will be presented of specific instances in which the RPC contributed to the discovery and resolution of dosimetry errors.

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Educational objectives:

1. Become familiar with the activities of the Radiological Physics Center.
2. Know how to contact the RPC for assistance or collaboration.
3. Understand the role of the RPC in monitoring institutions that participate in clinical trials.
4. Review common errors and misconceptions regarding dosimetry, credentialing requirements, and other issues.