AbstractID: 11992 Title: Credentialing for Clinical Trials: The Role of the RPC

Purpose:
To describe the role of the Radiological Physics Center (RPC) in credentialing institutions for clinical trials involving advanced technology radiation therapy.

Method and Materials:
The RPC was founded in 1968 under an agreement between the AAPM and the Committee for Radiation Therapy Studies (CRTS). We have functioned continuously for 40 years to support medical physicists and radiation therapy departments that participate in NCI-sponsored clinical trials. The focus of this presentation is on the RPC's evaluation of advanced technology radiation therapy. The use of the RPC phantoms has revealed a number of interesting conclusions about the delivery of IMRT and SBRT that should be understood by the community. Other credentialing programs address the use of brachytherapy, IGRT, and proton beam therapy.

Results:
At all participating institutions, 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 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. The RPC has recently extended all of the monitoring and credentialing programs to include proton beam facilities.

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. The results of credentialing programs for IMRT, SBRT, brachytherapy, and proton beams will be described.

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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. Become familiar with the results of measurements using the RPC's anthropomorphic phantoms.
5. Review common errors and misconceptions regarding dosimetry, credentialing requirements, and other issues.