RPC WEBPAGE NEWSLETTER

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Brachytherapy Seed QA Requirements: Must measurements be made in-house?

Clinical trials involving prostate brachytherapy, such as the RTOG 0232 protocol, require that institutions comply with published recommendations for brachytherapy seed quality assurance. In addition, the seeds must appear on the RPC/AAPM Brachytherapy Seed Registry (http://rpc.mdanderson.org), indicating that they comply with the AAPM's dosimetric prerequisites.

One of the AAPM recommendations for QA procedures that causes frequent questions among AAPM members is the requirement for an independent measurement of source strength. For example, TG-40 states that "Each institution planning to provide brachytherapy should have the ability to independently verify the source strength provided by the manufacturer." TG-40 further recommends that "….brachytherapy sources used in radiation therapy have calibrations with direct or secondary traceability to national standards". TG-40 states that "Direct traceability is established when a source or calibrator has been calibrated either at NIST or at an ….ADCL…Secondary traceability is established when the source is calibrated in comparison with a comparable source with direct traceability, or with an instrument with direct traceability. "Statistical inference is permitted when large numbers of sources are to be used, and verification of a single seed is considered acceptable for sources purchased in sterile configuration.

Institutions can establish secondary traceability to NIST either by sending their chamber and electrometer to an ADCL or by purchasing an ADCL-calibrated seed for comparison with the seeds to be implanted. The disadvantage of the second route is that a new ADCL calibrated seed would have to be purchased frequently. If the chamber and electrometer are submitted to an ADCL, they should be recalibrated every two years, for consistency with the recommendations of TG-56. The details of these procedures are discussed on page 658 of the new TG-43 update, published in *Medical Physics*, March 2004.

The RPC is frequently asked if an outside entity such as a radiopharmacy can be used to provide the independent check of seed calibration. It is the opinion of the RPC that an outside pharmacy can satisfy the requirement for an independent verification of source strength, provided the pharmacy complies with the before-mentioned recommendations. Specifically, the pharmacy must have an appropriate well chamber and electrometer that have been calibrated within the past two years by an ADCL for the specific seed model used by the hospital. As an alternative, the pharmacy may purchase an ADCL calibrated seed of the same model and approximately the same source strength for comparison with the seeds to be implanted. The pharmacy should also document that they conduct regular quality assurance procedures to assure the stability of the chamber and electrometer.

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