AbstractID: 4836 Title: The State of Radiotherapy Physics Through The Eyes of a Quality Auditor

Purpose: To assess the radiotherapy programs of institutions participating in NCI sponsored clinical trials and assist them to implement remedial actions.

Materials and Methods: The Radiological Physics Center (RPC) has developed an extensive Quality Assurance (QA) program over the past 38 years. This program includes on-site dosimetry reviews where measurements on therapy machines are made, records are reviewed and personnel are interviewed. The program's remote audit tools include mailed dosimeters (TLD) to verify output calibration, comparison of dosimetry data with RPC "standard" data, evaluation of benchmark and patient calculations to verify the treatment planning algorithms, review of institution's QA procedures and records, and use of anthropomorphic phantoms to verify tumor dose delivery. The RPC assists institutions in finding the origins of discrepancies, and in resolving them.

Results: The percent of institutions receiving dosimetry recommendations has been level at 70% for the past 5 years. The most frequent recommendations were for maintenance of an appropriate QA program, beam calibration, depth dose and wedge factors. Since TG-51 was published, the number of reference calibrations meeting the RPC's ±3% criterion has decreased. The TLD program shows that only ~3% of the beams are outside our ±5%/±5mm criteria, but these discrepancies are distributed over nearly 15% of the institutions. There continues to be a 33% percent first time failure rate for the IMRT H&N anthropomorphic phantom. The other anthropomorphic phantoms, i.e. pelvic IMRT, lung stereotactic and liver stereotactic, have higher pass rates.

Conclusion: Numerous dosimetry errors continue to exist and the RPC's QA program plays an important role in identifying and helping institutions resolve these errors to improve not only the quality of clinical trial patients' treatments, but also all patients treated at the participating institution.

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