

AbstractID: 3018 Title: Evaluation of doses delivered by SBRT to the lung of an anthropomorphic thorax phantom

Purpose: Evaluation of SBRT through the use of a thorax phantom.

Methods and Materials: A new protocol evaluates stereotactic body radiation therapy for patients with lung cancer. Institutions must be credentialed before enrolling patients. Successful irradiation of a thorax phantom is one of the steps. The thorax phantom is a plastic shell incorporating structures that represent the spinal cord, the heart and the lungs. A structure representing a tumor is positioned in the left lung. TLDs and radiochromic films measure the delivered dose distribution. Institutions were instructed to image the phantom, plan a treatment following specific constraints and deliver the treatment as if to a patient. The measured dose distributions were compared to the institutions' calculated isodose distributions.

Results: Institutions were instructed to deliver a treatment calculated without heterogeneity corrections and submit both corrected and uncorrected isodose distributions. Results from seven institutions established a baseline for this test. The average of the ratio between measured and calculated target dose was $0.97 \pm 3\%$ with corrections on and $1.14 \pm 3\%$ with corrections off. The displacement between measured and calculated dose distributions in the vicinity of the target did not exceed 5 mm.

Conclusions: Criteria for the evaluation of this test were defined for heterogeneity-corrected dose calculations. A range of $0.97 \pm 7\%$ was established for the ratio of measured and calculated target doses. A maximum of 5 mm displacement between the calculated dose distribution and the film profile was considered acceptable. Additional criteria are under consideration

Conflict of Interest: Not applicable

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