Purpose: To credential institutions treating clinical trial patients with intensity modulated radiation therapy

Methods: The credentialing body's anthropomorphic head and neck phantom was sent to institutions wishing to participate in multi-institutional clinical trials. The phantom contained two PTV structures and an organ at risk (OAR). TLD and film dosimeters were imbedded in the PTV. Institutions were asked to image, plan and treat the phantom as they would a patient. The treatment plan should cover at least 95% of the primary PTV with 6.6 Gy and at least 95% of the secondary PTV with 5.4 Gy. The plan should limit the dose to the OAR to less than 4.5 Gy. The passing criteria were +/-7% for the TLD in the PTVs and a distance to agreement of 4 mm in the high dose gradient area between the PTV and the OAR.

Results: The phantom was irradiated 1005 times by 689 institutions from 2001 through February 2011. 804 of the irradiations passed the criteria. 145 irradiations failed only the TLD criteria, 24 failed only the film criteria and 32 failed both sets of criteria. Only 61% of the irradiations passed a narrowed TLD criterion of +/- 5%. When possible, gamma calculations were made for an area around the primary PTV in the axial plane. The average percent of pixels meeting the gamma criteria was 89%.

Conclusions: The head and neck phantom is a useful credentialing tool for multi-institutional IMRT clinical trials. Tightening the criteria would significantly reduce the number of passing irradiations. Altering the criteria to use the gamma calculation instead of the DTA would slightly reduce the number of institutions passing, but would give a more comprehensive view of the fitness of the irradiation.

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