

## AbstractID: 11406 Title: Evaluation of a PAGAT gel for use in an anthropomorphic phantom

**Purpose:** To evaluate the use of PAGAT, a normoxic polymer gel formulation, in the Radiological Physics Center's (RPC) Head and Neck Phantom.

**Methods and Materials:** Conventional and IMRT treatment plans were developed for the RPC's head and neck phantom, which contained simulated planning target volumes and an organ at risk. A PAGAT dosimeter was placed in the phantom and the conventional treatment plan was delivered. A different PAGAT dosimeter was used to measure the IMRT treatment. An additional group of PAGAT dosimeters were irradiated to doses between 1 and 5 Gy through parallel-opposed beams to develop a calibration curve. The dosimeters were imaged using an OCT-OPUS™ laser CT scanner 24 hours after irradiation. Profile, isodose, and gamma index comparisons were performed between the treatment plan and the distribution measured with PAGAT.

**Results:** Good agreement was observed between the conventional treatment plan and the gel distribution with the exception of one target region where the dose was most fractionated. The gel overestimated the dose in this region. The gel used to measure the IMRT treatment overestimated the dose by 35%. Relative comparisons of the IMRT treatment showed agreement consistent with that seen in the conventional treatment plan.

**Conclusions:** The over-response of the gel is attributed to the fractionation dependence of the gel, which was investigated. Calibration gels should be irradiated with a fractionation scheme similar to the experimental gels, particularly for IMRT treatments, so that absolute dose comparisons can be performed.

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