

AbstractID: 3892 Title: Evaluation of a new 3D polyurethane dosimeter for IMRT verification

**Purpose:** To demonstrate the dosimetric accuracy of PRESAGE™, a new type of three-dimensional dosimeter, when used in the Radiological Physics Center's (RPC) Head and Neck Phantom.

**Methods and Materials:** An IMRT treatment plan was developed for the RPC Head and Neck Phantom, which contained simulated planning target volumes and an organ at risk. A conventional dosimetry insert, containing radiochromic film and TLD, was in place while the IMRT plan was delivered. The insert was removed and replaced with a PRESAGE™ dosimeter and delivery of the IMRT plan was repeated. An additional PRESAGE™ dosimeter was irradiated to doses between 0.5 and 7.5 Gy with stereotactic beams to develop a calibration curve. The PRESAGE™ dosimeter was imaged using an OCT-OPUS™ laser CT scanner 24 hours after irradiation. Two-dimensional comparisons were performed between the treatment plan, the distribution measured with film/TLD and the distribution measured with PRESAGE™.

**Results:** The PRESAGE™ dosimeter showed a monotonic and easily characterized response with dose. Optical density maps obtained following IMRT delivery were converted to dose and compared with the treatment plan and with film/TLD data. Film and PRESAGE™ data showed good agreement, and both indicated higher doses in the steep gradient region between the PTV and the organ at risk.

**Conclusions:** This work demonstrated the use of PRESAGE™ as a dosimetric tool for the verification of IMRT treatments. The dosimeter provided a three-dimensional distribution that was used for comparisons with treatment plan distributions.

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