

## AbstractID: 5701 Title: Investigation of near surface doses in mesothelioma intensity modulated radiation therapy

**Purpose:** To investigate the measured and computed near surface doses for intensity modulated radiation therapy (IMRT) of mesothelioma. The near surface dose value is important since in most cases the intent is to deliver about 90% of the prescribed dose to the surgical scar region.

**Material and Methods:** Two planning CT scans (3mm slice thickness) of a humanoid Alderson phantom with 5 mm and 10 mm bolus placed on the thoracic region were acquired with our Philips CT scanner. At the time of CT, opaque markers are placed under bolus to designate 10 different locations throughout thoracic region for calculations and measurements. IMRT plans are generated using the Nucletron OTP treatment planning system. IMRT calculations are performed for a 3 mm × 3 mm calculation grid and inhomogeneity correction with pencil beam algorithm. Plans are delivered to the phantom with a Siemens Oncor linac. Doses are measured at each marked location under each bolus, mimicking depths of 5 mm and 10 mm, using a pair of LiF thermoluminescence dosimeters (TLD).

**Results:** The average dose difference between the measured and calculated data at depth of 5 mm is 8.6% with percent differences ranging from 3.6% to 18.3%. For the points at 10 mm depth this average is about 2.7 % and the percent difference range is 0.1% to 4.7%.

**Conclusion:** Our results indicate that dose calculated for mesothelioma IMRT cases at depth of 5mm show a larger uncertainty relative to the measurements than dose calculated at deeper depth of 10 mm for OTP. The measurements show good agreement at 10 mm depth; on average, results are within accuracy of the TLD measurements (within 3%). It is therefore important for patient treatment to carefully evaluate the near surface dose (i.e.5 mm depth) via measurements.