

AbstractID: 14034 Title: Delivery Quality Assurance for Stereotactic Body Radiotherapy (SBRT) Using a Teflon Cylindrical Phantom

**Purpose:** At our institution the delivery quality assurance (DQA) of Tomotherapy plans is accomplished with a cylindrical water equivalent phantom, EDR2 film, and two ion chambers for point dose measurements. Most plans deliver at most 5Gy to the dose plane, however, recently a stereotactic body radiotherapy (SBRT) protocol has produced plans delivering upwards of 12Gy to the film plane. EDR2 film saturates at a dose of ~7Gy, requiring a modification of our DQA procedure for SBRT plans. To reduce the dose to the film plane and accommodate a possible move to SBRT using Varian RapidArc a new phantom of teflon has been constructed and tested.

**Method and Materials:** Our teflon phantom is cylindrical in shape and of a similar design to the water equivalent phantom currently used for DQA. The cylinder is 4 inches in height, 12 inches in diameter, and bisected across the diameter. The phantom has two chamber positions located centrally, 5mm and 10mm above and below the film plane. The phantom was scanned into the Tomotherapy and Varian Eclipse planning systems using an MVCT scan on the Tomotherapy system. SBRT plans were delivered and film distributions and point dose measurements compared.

**Results:** The phantom sufficiently reduced dose to the film plane for the DQA of SBRT plans. Both treatment planning systems appear capable of calculating an accurate absolute point dose in the phantom. The measured dose distribution in the phantom correlated very well with both planning system calculations ( $\gamma < 1$  for  $> 95\%$ ).

**Conclusion:** The teflon phantom appears to be a potential option for SBRT DQA. Preliminary data show that the planning systems are capable of calculating point doses in the teflon, and the dose to the film plane is reduced sufficiently to allow for a direct measured DQA without the need for dose rescaling.