

## AbstractID: 8854 Title: Comparison of measured and calculated dose to the contralateral breast during breast irradiation with tangential fields

**Purpose:** To compare calculated and measured dose to the contralateral breast for breast irradiation with tangential fields.

**Method and Materials:** Doses to 14 points distributed throughout the contralateral breast were calculated and measured in a female anthropomorphic RANDO phantom for tangential-field breast treatment. Traditional and forward tangential treatment plans with 6 MV and 15 MV beams were generated for the target breast using the Varian Eclipse (version 7.7.51, algorithm PBC) and Nucletron Oncentra MasterPlan (OTP) (version 1.4.3.1) treatment planning systems. Doses were measured in the contralateral breast by placing thermoluminescent dosimeters (TLDs) at the 14 points during radiation delivery of the plans. The target breast was treated to a dose of 180 cGy per fraction for each plan.

**Results:** For 6 MV beams, the mean measured dose was 4.1 cGy, and the Eclipse- and OTP-calculated mean doses were 2.5 and 5.3 cGy, respectively. For 15 MV beams, the mean measured dose was 5.2 cGy, and the Eclipse- and OTP-calculated doses were 1.8 and 5.6 cGy, respectively. However, the OTP-calculated doses were in better agreement with the measured doses: the mean percent differences between the Eclipse-calculated and measured doses were -67%, and -40% for the 6 MV beams and 15 MV beams, respectively, while the mean percent differences for OTP were 29% and 6%. In addition, the percent difference between the Eclipse-calculated and measured doses increased with increasing distance from midline, while for OTP this difference diminished.

**Conclusion:** Calculation of the dose outside the primary radiation field is difficult for most model-based treatment planning systems unless a Monte-Carlo-based algorithm is used. The Eclipse-calculated dose to the contralateral breast was less than the measured dose, while for 83% of the points the OTP-calculated dose was greater than the measured dose. However, the OTP-calculated dose was in better agreement with the measured dose.