

AbstractID: 13890 Title: Dose to Contralateral Breast: A Comparison of Traditional Linac and Tomotherapy Techniques

Purpose: To characterize the dose and its distribution to the contralateral breast in patients undergoing whole-breast radiotherapy using helical tomotherapy, and traditional linac with enhanced dynamic wedges or field-in-field techniques. **Method and Materials:** At the start of this IRB approved study, patients were selected and offered consent and enrollment. Dosimetry was performed using thermoluminescent dosimeters (TLDs) which were individually calibrated and tracked to generate a linear dose response curve for each. Positions for measurement were marked on the patient for reproducibility. The measurement positions were 5 cm superior, inferior, medial, and lateral to the breast center of the contralateral breast and 2 cm from center of sternum toward the contralateral breast. TLDs were placed in buildup caps to ensure buildup to electronic equilibrium. TLDs were placed daily for five consecutive treatments and then read 10 days after the last treatment. Calibration curves were applied to the TLD readings. **Results:** To date, three patients have been treated on Tomotherapy and five patients with traditional tangents. The contralateral breast doses, presented as a percentage of the prescription dose ± 1 standard deviation, are as follows: Tomotherapy; two cm from sternum $36 \pm 8\%$, five cm medial $17 \pm 6\%$, five cm superior $6 \pm 1\%$, five cm lateral $6 \pm 1\%$, five cm inferior $6 \pm 1\%$. Traditional tangents; two cm from sternum $12 \pm 5\%$, five cm medial $5 \pm 2\%$, five cm superior $2 \pm 1\%$, five cm lateral $2 \pm 1\%$, five cm inferior $2 \pm 1\%$. The average breast dose, calculated as the arithmetic mean of the doses five cm from the breast center, were $9 \pm 6\%$ for Tomotherapy and $3 \pm 2\%$ for traditional tangents. **Conclusion:** At our institution, helical tomotherapy produces doses in the contralateral breast that are approximately three times that of traditional tangents.