AbstractID: 11657 Title: Simultaneous Boost and Skin Dose Toxicity Reduction for Breast Cancer Treatments using IMRT and RapidArc

Purpose: To reduce the overall treatment fractions by about a week and minimize the skin dose toxicity by treating stage I-II breast cancer patients with IMRT and eventually RapidArc both, incorporating a simultaneous boost to the tumor bed.

Background: Radiation therapy is prescribed to breast cancer patients after receiving a lumpectomy or mastectomy to remove cancerous tissue. In the past, treatments using two 6MV tangential fields with wedges followed by an electron boost to the tumor bed have often resulted in unnecessary dose to unaffected tissue. As a consequence, patients experienced edema, pain, desquamation, discoloration, and other negative side-effects. IMRT and RapidArc are treatment techniques where the dose can be tailored to the shape of the target, reducing the exposure of adjacent tissues to unnecessary radiation and potential damage.

Methods and Materials: Skin dose measurements using TLDs from 35 patients receiving conventional radiotherapy were collected over a period of 9 months. Seven 3x3x1 mm^3 TLD chips were placed on the 4 quadrants of a patient's breast and 3 on the inframmary fold. Same TLD arrangement was used for patients receiving IMRT or RapidArc which, in addition, incorporated a simultaneous boost of an additional ~10Gy delivered to the tumor bed, within the regular 28 treatment sessions.

Results: Preliminary data indicates percent differences of 4-20% less skin dose on the IMRT/RapidArc cases, primarily in the inframammary fold region. Furthermore, our skin dose data on the IMRT/RapidArc treatments indicates a strong correlation to the size and shape of the breast under treatment suggesting that patients with large breast may experience little skin sparing - confirming observations reported elsewhere. Dose to heart, lungs and contralateral breast were kept to a minimum.

Conclusion: This work continues with more breast patients receiving IMRT or RapidArc, and thus far the data continues to support our preliminary observations.