

AbstractID: 3769 Title: Volumetric Breast IMRT Planning using ICRU-50 concepts

Purpose: In this study we present a method of performing volumetric breast IMRT using ICRU 50 concepts of CTV and PTV while respecting the irradiated volumes of conventional breast tangents.

Method and Materials: The technique uses standard tangential beam directions. Conventional tangents are placed on the patient's planning data and are used as a guide. Breast tissue, defined by clinical palpation and CT, is contoured as the CTV. The PTV is created by expanding the CTV 0.7 cm in the medial and posterior direction to account for setup error and breathing motion. The PTV and CTV are kept to within 0.5 cm of the skin surface, and 0.6 cm of the conventional beam edges to allow for penumbra and buildup. In the superior and inferior directions the PTV may be extended to cover traditional margins. Anteriorly, the IMRT field pattern is extended 1.5 cm from the PTV into air for setup error and breathing motion.

Results: Twenty patient plans were reviewed comparing conventional and IMRT CTV doses. The plans used both 6 and 10 MV. Analysis showed comparable coverage (V95) to the CTV with a reduction in the volume receiving higher dose using IMRT. The average percent difference to V95 was 0.6%. With IMRT the average reduction to V105 was 19.5%, and there was an average reduction of 1.72 Gy to the hottest 1% of breast tissue.

Conclusion: The margins used in conventional breast treatment have been the standard of care for many years. Volumetric IMRT breast planning offers superior dosimetric results but defining the volumes can be a challenge. This technique allows the creation of the IMRT targets while preserving coverage of similar margins used in conventional treatment. This technique is currently used clinically at our institution.