

AbstractID: 2694 Title: Dosimetry Accuracy Of Delivery Of Gold Beam Data IMRT Plans On Similar Linear Accelerators With Same Vendor

Purpose: Under certain circumstances, IMRT patients need to be transferred from one Linac to another. Since a same set of commercial Gold Beam Data (GBD) have been used to model the treatment planning systems for multiple similar types of Linacs at our centers, the dosimetric accuracy needs to be investigated to determine the necessity of replanning when the treatment of an IMRT patient is moved from one machine to another. In this study, we investigated the dosimetric accuracies of IMRT plans delivered on different similar Varian accelerators.

Method and Materials: In our institution, GBD has been used to model the Eclipse™ treatment planning systems for certain types of Varian machines (23 EX). IMRT treatments were planned using the Eclipse™ systems with 6 and 10 MV photon beams for different anatomical sites. Corresponding QA plans were also generated. The QA plans were used in the validation measurements, and the same measurements (same plans, same MU & dMLC files and phantom) were repeated on five of those Linacs. The measurements were performed using both ion chambers and films.

Results: For plans using 6 MV photon beams, the mean ratios of planned to measured dose on the five machines for breast, prostate, tonsil, pelvis and brain plans were 0.984(SD0.0078), 0.998(SD0.0029), 0.979(SD0.0121), 1.006(SD0.0132) and 1.012(SD0.0054), respectively. For plans using 10 MV photon beams, the mean ratios of planned to measured dose on two of the machines for breast and pelvis were 0.979(SD0.00) and 0.949(SD0.0042), respectively. In the film analysis, a good agreement was found between films and plan isodoses on a coronal plane (for high dose gradients ± 2 mm and low dose gradients ± 4 mm).

Conclusion: This study demonstrated that the IMRT patients could be transferred from one machine to another similar Varian machine with same energy without replanning.