

AbstractID: 1380 Title: Dosimetric comparison between 1.0-cm leaf-width and 0.5-cm width-leaf of MLC delivery systems for linac-based IMRT

The MLC system is the delivery system that modulates beam intensity for linac-based IMRT. Two vendors designed the leaf-width such that its projection is 1.0-cm and one vendor is 0.5-cm at the isocenter of a linear accelerator. This study reported the impact of leaf-width on the dose volume histograms. The Siemens Primus with 54 leaves and the Varian Clinac with 120 leaves were used in this study. The Primus has 27 leaves on each bank and each leaf projects 1.0-cm width at the isocenter. The Clinac has 60 leaves on each bank and each leaf projects 0.5-cm width at the isocenter for 10-cm from the beam axis. Five patients were planned for IMRT to the prostate, head and neck, and abdomen using the inverse treatment planning system.

The dose volume histogram of the PTV and OAR were compared. The DVH for the PTV derived with the leaf-width constraints are comparable. On the other hand, DVH for the OARs exhibits some differences, which do not show a systematic behavior. This result suggests that the leaf-width constraint has minimal impact on clinical plans obtained from the inverse planning system for IMRT. The optimization algorithm will produce different number of segments depending on the leaf-width.