

AbstractID: 7640 Title: A Comparative Analysis between Conventional MLC Based and Solid Compensator Based IMRT Treatment Techniques. A Clinical Review After 5 Years.

Purpose: The goals of this study were to evaluate the clinical differences of solid and MLC based IMRT treatments. Dosimetric comparison of the dose outside the target volume at various depths was carried out. The investigation was extended to compare delivery time and monitor unit requirements for IMRT techniques.

Methods and Material: The ADAC Pinnacle inverse planning system was used to generate MLC based IMRT plans. Using .decimal software, ADAC was also used to generate compensator based IMRT plans. Plans were generated for the following target volumes, prostate, adrenal gland, brain, and head and neck. The delivery time, number of monitor units and the fluence intensity maps were compared. Dose points outside the target volume were compared to determine out of target doses. Delivery of treatment plans was performed on a Rando phantom and mosfet dosimeters, gaf chromic film and TLDs were used to compare measured doses of MLC and solid IMRT treatments.

Results: For the more complex plans the solid compensators resulted in 26.7% fewer monitor units and delivery time was reduce in half when compared with MLC plans. However for relatively simple IMRT plans such as prostate boosts or adrenal gland plans where the target has a relatively simple cylindrical shape the MLC plans resulted in an average of 41.6% fewer MUs and required about 16% less time to deliver than the solid compensator plans. Mosfet skin dose analysis showed that the solid compensators resulted in an average of 17.5% less dose.

Conclusions: Based on the measured results it is evident that solid compensators are a viable IMRT treatment option when considering complex target arrangements that require many beams segments. For relatively simple plans which result in fewer and larger beam segments compensator based plans showed no advantage over MLC plans in regards to MUs and treatment time.