AbstractID: 10921 Title: Skin dose determination for various IMRT delivery methods

Purpose: To examine the effect of various methods of IMRT delivery on skin dose. **Method and Materials:** MLC based optimized IMRT plans were created using Pinnacle® TPS: two controlled cases – a 6-step step-wedge and a 4-field forward planned IMRT plans – and one clinical case for abdomen treatment. For the same cases, optimized fluence maps were used to define the corresponding thickness distribution of brass compensators using the p.d software (.decimal) The planned compensator apertures were imported in Pinnacle® TPS for dose calculation using the same geometry with the MLC plans (isocentric method on a 30cm diameter cylindrical phantom). Equivalence between the MLC and compensator calculated plans were verified through isodose lines and Dose Volume Histogram comparisons. All measurements were performed using a 23Ex Varian accelerator with 120MLC and the compensators were fitted at the wedge tray location. Absolute dose measurements using ionization chambers were also performed at the center of the phantom geometry for plan verification purposes. Entrance, exit and total skin dose measurements were done using ultra thin TLDs and gafchromic EBT film. **Results:** Measurements of the entrance skin dose was shown to be reduced for the compensator based plan for the controlled cases up to 45% (step-wedge plan) and the effect was even more prominent for thicker compensator material. However, the exit and total skin dose measurements were higher for the compensator IMRT plans than the respective MLC ones for the most part of the surface area. **Conclusion:** Preliminary results showed that the hardening of the beam when using compensator based IMRT delivery affects the patient's skin dose reducing the entrance skin dose but leading to higher skin doses when accounting for the total plan delivery. Current and future work includes Monte Carlo simulations for verification purposes.

Conflict of Interest: Research sponsored by .decimal.