AbstractID: 12869 Title: Carbon fiber couch effects on skin doses for volumetric arcs

Purpose: To evaluate carbon fiber couch (CFC) dosimetric effects on delivered skin dose as well as the dose and photon energy interplay for volumetric modulated arc (VMAT) treatments. **Method and Materials:** A CFC (BrainLab) was incorporated into a commercial TPS (Pinnacle) by auto-contouring. A retrospective investigation on five lung and five prostate patient plans was performed. Targets and OARs, together with a skin contour of 0.3 cm thickness in contact with the CFC, were delineated in each plan. For each patient two VMAT plans were generated: a single arc with 6MV photons, and two or three arcs with 18MV photons for the posterior arc(s) and 6 MV photons for the anterior arc. Both plans were normalized such that 95% of the PTV was covered by the same dose, escalated to the maximum allowed by the OAR constraints. CFC effects were tallied by the highest dose to 1% of the skin volume. **Results:** If 18MV rather than 6MV photons are used in the arcs traversing the CFC the skin dose reduction ranges from 12% to more than 80%. In addition, the estimated skin doses range from ~30% to more then ~83% of the prescription doses for the mixed energy 6MV/18MV plans, implying even higher fraction of the prescription dose for the 6MV plans. **Conclusions:** The results indicate that mixed energy VMAT plans would result in a substantial skin sparing of more than ~80% compared to VMAT plans with only 6MV arc(s). The increase in the treatment time due to the use of additional arcs is insignificant. The high skin doses in some cases (83% of the prescription) suggest that in hypofractionated SRS/SRT the CFC skin effect needs to be considered and promptly evaluated when arc delivery is used. **Conflict of Interest**: Research sponsored in part by Philips Radiation Oncology Systems.