AbstractID: 3145 Title: A Dosimetric Comparison of Three Commercially Available Carbon Fiber Table Extension Boards

Purpose: To measure and compare the changes in dose distributions produced by the presence of a carbon fiber extension board (used to provide necessary patient extension beyond the gun end of the treatment couch). The tested carbon fiber extension boards are designed to be "radiotranslucent" so that the transmitted radiation beam is not significantly altered. We measured the attenuation due to the boards being placed in the beam's path, compared the relative dose distributions obtained using different boards, and also examined the effect of "build-up".

Methods and Materials: The three boards evaluated were the Med-Tec Type-S system, the Brainscan H&N Tx system, and the Orfit HP long baseplate for IMRT. Dosimetric data were obtained for 6 MV photons with an Exradin A12, 0.65 cm^3 Farmer ionization chamber, with Kodak EDR film, and with an Exradin P11, 0.62 cm^3 plane parallel chamber (for measuring dose buildup in a Gammex RMI solid water phantom).

Results: The Orfit board's maximum attenuation was 1.2%. The Med-Tec Type-S board's maximum attenuation was 2.3%. The Brainscan board's maximum attenuation was 13.7%. The isodose distribution and profiles for each board will be presented.

Conclusion: We determined that the Orfit board did not significantly alter the radiation beam and resulting dose distribution. Its adaptability to various tables was favorable compared to the Med-Tec system, which is well suited for the Varian Exact couch. The Med-Tec board is also well suited for therapeutic radiation, but had a higher change in attenuation than the Orfit system. The Brainscan board was sub-optimal due to non-air equivalent material used as structural support in the board's interior, which caused significant beam attenuation.

Conflict of Interest: Research was supported by equipment loan from Orfit Industries and Med-Tec, Inc.