

AbstractID: 1550 Title: Analysis of the Radiation Dose at or Near Surface in Radiation Oncology Using Monte Carlo Calculations Compared with Other Commonly Utilized Measurement Devices

Using Monte Carlo calculations, the absorbed radiation dose at or near the phantom surface has been studied. Results were compared with measured data using a typical 0.125 cc and an extrapolation ionization chamber. Typically, clinics in the United States accept their surface dose from measured data using a water scanning system, which generally employs a 0.125cc ion chamber. This erroneously results in an over-estimation of the dose at or near the surface by more than 30% for a 6 MV, and 15% - 20% for a 10 MV photon beam when a 10x10 cm² field is used. Our Monte Carlo results calculated using BEAMnrc agree favorably with the measured data obtained from extrapolation chamber. The considerable decrease in skin doses measured and predicted by this work have significant implications in terms of tolerance as well as the need for bolusing the skin when tumor involvement is near the skin surface. Accomplishing surgical salvage through previously irradiated skin may in fact be better tolerated than previously predicted when skin dose estimates were erroneously considered higher.

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