

AbstractID: 5049 Title: Reliable Radiation Dosimetry for Acquiring Beam Data for a 6 MV Linac Based Stereotactic Radiosurgery

Purpose: To evaluate the reliability of the dosimetry systems available at our institution in the measurement of beam data for 6 MV linac based stereotactic radiosurgery.

Method and Materials: The measurements of total scatter factor (S_t), tissue maximum ratio (TMR) were made by using X-Omat V films, IC03, IC10, and a PTW Markus chambers. Only the films, IC03 and IC10 were employed in off axis ratio (OAR) measurements. Eight collimators with 10 to 50 mm diameters were involved in all measurements.

Results: The TMR values measured by IC10 and Markus were agreeable within 2% for the collimators of 20 to 50 mm. The TMR values determined by all detectors for the collimators smaller than 20 mm may not be accurate enough for clinical use. The S_t values determined by all detectors with field sizes equal to or greater than 30 mm agreed within 2%. Markus and IC10 showed very closed values of S_t within 0.2%. For all collimators, the values of IC03 and film were about 1% less than the ones of Markus, and IC10. With the collimators of less than 25 mm, film presented the highest S_t values but Markus gave the highest values for the larger collimators. Film showed higher values of off axis ratios inside the beam area than IC10 and IC03 for all collimators. Comparisons of S_t

Conclusions: From our study, it is concluded that the TMR values for 10 mm collimator should be measured by IC03 but for larger collimators, IC10 is preferred. Among our detectors, film is the best one for the measurements of OAR for all collimators and S_t for the two small collimators (10 to 20 mm), with the larger collimators, Markus chamber should be used.