

AbstractID: 8741 Title: Comparisons of measured doses using ion chamber and Matrixx for IMRT-QA

Purpose: To investigate the accuracy of measured dose with the MatriXX for IMRT-QA. **Method and Materials:** An ionization chamber (PTW N31002) and a MatriXX (IBA Dosimetry) were used for measurements. The MatriXX was calibrated at the reference point (CAX, d_{max} , 100-cm SSD, 10×10 cm² field) and was frequently checked for stability. IMRT-QA plans were prepared with a Pinnacle TPS. The calculation points in IMRT-QA plans were located in a low dose gradient region, and planned dose was 200 cGy. Dose to the calculation point was measured by the ionization chamber in solid water and then separately by the MatriXX. In order to rule out output fluctuations of the linac, we measured the machine output under calibration conditions after each IMRT-QA measurement and normalized the reading at the calculation point to that at the calibration reference point to obtain measured dose at the calculation point. Raw data obtained with MatriXX were interpolated linearly to find the dose at the calculation point. **Results:** The difference between outputs measured by the chamber and by the calibrated MatriXX for a static 10×10 cm² field at the reference point was less than 1%. For the 13 patient plans studied, comparisons show that the dose obtained by MatriXX was always greater than that by the chamber in solid water. The chamber readings agreed with the MatriXX readings on average within 2.1%. The range of agreement was 0.4% to 4.6%. Gamma analysis for all cases had >98% of the points within 3% or 3 mm agreement for relative dose distributions. **Conclusion:** Differences between doses measured by MatriXX and ionization chamber for the same QA-plan were observed. For 13 QA-plans, dose from MatriXX was 2.1% greater on average than that from an ionization chamber. Identification of the origin of this discrepancy requires further investigation.