

AbstractID: 13766 Title: The Comparison of Matrixx IMRT QA and MapCheck IMRT QA

Purpose: Compare Matrixx and MapCheck IMRT QA techniques and understand their similarity and difference on expressing IMRT QA results. This will help ones set up consistent criteria to evaluate IMRT QA results when both techniques are used (especially at the same clinic).

Methods and Materials: Matrixx (IBA Dosimetry) and MapCheck (Sun Nuclear Corporation) IMRT QA techniques were used to perform IMRT QA for the same IMRT treatment plan. Ten IMRT treatment plans on different disease sites including head and neck, prostate, brain, esophagus, and pelvis were used in this study. In order to make a consistent comparison for these two QA methods, for each treatment plan we created the same IMRT QA verification plan with all beam's gantry angles set at zero degree and then exported the 2-dimension dose plane at a certain water-equivalent depth. Before doing QA dose measurements, both Matrixx and MapCheck devices were calibrated by using manufactures' manuals and verified by delivering open-field beams at different sizes and depths. For the same IMRT QA plan, in respectively Matrixx and MapCheck measured the dose at the depth that the calculated dose plane was located. We compared the measured doses and the passing rates for the same DTA and Gamma criteria.

Results: The doses measured by Matrixx were consistent with the ones measured by MapCheck, but the passing rate might be quite different depending on how the dose threshold was set for MapCheck and the dose region of interest was set for Matrixx although the same DTA and Gamma criteria for the comparison were used.

Conclusion: A higher passing rate for Matrixx IMRT QA compared with the lower one by MapCheck doesn't mean that the treatment plan QA by Matrixx is better than the one QA by MapCheck, and vice versa. Consistent evaluation criteria need to be consent.