

Purpose: To compare the IMRT QA pass/fail rates of a 2D diode array system MapCHECK™ and a cylindrical 3D diode array system Delta⁴®, and to investigate the benefit of DVH-based IMRT QA. **Methods and Materials:** Eight treatment plans totaling 62 IMRT fields were measured using both MapCHECK and Delta⁴. The data were compared to the treatment planning data using Gamma analysis. Passing criteria was defined as 95% of measured points had to have a gamma value ≤ 1.0 using a distance to agreement of 4mm, a 5% dose window, and a 10% dose threshold. Structures, including GTV and organs at risk (OAR), and dose volume histograms (DVHs) were exported from the treatment planning system to Delta⁴ for comparison to measured DVHs. **Results:** QA with Delta⁴ used an average of 466 detector points per field. Using gamma analysis, 60/62 (96.8%) IMRT fields passed with an average of 98.9% of detector points within a gamma value ≤ 1.0 when measured on the Delta⁴. QA with MapCHECK used an average of 88 detector points per field. Application of the same gamma analysis resulted in 14/62 (22.6%) IMRT fields passing with an average of 91.3% of detector points with a gamma value ≤ 1.0 as measured by MapCHECK. Further analysis of IMRT fields that failed using MapCHECK QA, indicated that the measured data was within 1-2% of the treatment plan. Planned GTV DVHs corresponded with the Delta⁴ measured GTV DVHs, however measured OAR DVHs differed from their planned DVHs. **Conclusions:** This study suggests that QA results acquired with Delta⁴ correspond more accurately to the actual treatment plan as compared to MapCHECK. Incorporating Delta⁴ into routine QA will decrease the overall QA analysis time. The increased pass rate with Delta⁴ may result from the increased amount of detectors per treatment field.