

AbstractID: 3984 Title: Patient Specific QA for Prostate and H&N IMRT using MapCheck

Purpose: To evaluate the MapCheck system as a device for routine IMRT QA.

Method and Materials: 20 prostate and 2 nasopharyngeal cases are used for this study. IMRT treatment planning was performed with Varian Eclipse/Helios planning system using sliding window technique. The measured dose distributions (both absolute and relative) are compared with the generated ones from the planning system.

Results: For prostate IMRT QA, the measured dose distribution agrees well with the calculated ones by using a 3% difference and 3 mm distance to agreement (DTA), 10% threshold criteria. The pass rate is over 90% (20 cases) for both relative and absolute dose comparison. For nasopharyngeal head & neck IMRT, the relative pass rate is over 90%, while the absolute pass rate is around 40-60% by using a 5% difference and 3 mm DTA. Most of measured points are 5-10% higher than planned in the absolute comparison. In addition, we made ion chamber point dose verification measurements at carefully selected points in the relatively low dose gradient area at the same gantry angle of each beam as delivery of the treatment. Chamber measurement results have shown an agreement of within 3% in total dose compared to the calculated ones.

Conclusion: Our clinical experience shows that MapCheck device works well for prostate IMRT QA, for both absolute and relative dose verification, which dramatically increases our IMRT QA efficiency. However, from the preliminary work from our 2 nasopharyngeal head & neck IMRT cases, the measured dose by MapCheck appears to be 5-10% higher than the planned dose for most points, while the relative dose map matches well with the planned data (with criteria 10% threshold, 5% difference, 3mm DTA) which is inconsistent with ion chamber measurements. The discrepancy is under investigation.