

AbstractID: 6619 Title: Diode Dosimetry for the Routine Quality Assurance in IMRT

Purpose: Due to the complexity of IMRT dosimetry, dose evaluation is usually done using a QA phantom for MU and isodose line measurement. However, the actual treatment fields to be delivered to the patients are not usually evaluated. This is because with Varis one has to implement a work-around to perform IMRT QA, i.e., separately sending the entire data set to a separate "QA course" in which case one never really QAs what the patient is being treated but instead a copy of the patient data. In this case, errors could occur in the original data transfer that would not be picked up in the QA exercise.

Method and Materials: IMRT planning was done using Eclipse and exported to VARIS. A Varian 21EX Linac was used for IMRT treatment. VeriDose diode detector was used for in vivo measurement. A MapCheck, Ion chamber and a solid water were used for MU and isodose line check. Our diode reference readings were obtained at the time of IMRT QA and measured on the phantom on the CAX at the corresponding patient's SSD with the same fields as for "QA course".

Results: For prostate IMRT treatments, the ratios of the measured diode dose on phantom to dose on patient are all within $\pm 5\%$, but individual field measurements exhibit excursions of up to $\pm 8\%$. The difference is greater for Breast and H&N IMRT with the maximum discrepancy of about $\pm 8\%$ and $\pm 10\%$, respectively.

Conclusions: We have evaluated the use of diodes for application to IMRT in vivo dosimetry. Phantom and patient measurements are compared to be in agreement to generally better than 10%. We believe that in vivo diode dosimetry adds a necessary component to IMRT QA by allowing us to make the link between the detailed phantom measurements with the actual treatment situation.