

AbstractID: 3749 Title: Development of a Software Tool for Generating Predicted Dose Images from Pinnacle Dose Maps for the Purpose of IMRT Quality Assurance Using PortalVision

Purpose: To develop and evaluate a method of importing the predicted dose maps of patient treatment fields generated by the Pinnacle treatment planning system (TPS) into the dosimetry module of Varian's PortalVision electronic portal imaging system (EPID), for the purpose of verifying planned IMRT fields.

Methods and Materials: PortalVision, when equipped with the dosimetry module, is equipped with tools to perform relative dose comparisons of dose images acquired by the EPID vs. predicted dose images generated by a TPS. Treatment plans were created using the Pinnacle TPS. Dose maps of individual fields were saved as files using Pinnacle's Planar Dose Map function. The dose maps were calculated in a geometry equivalent to that of the detector panel. Using in-house developed software, the dose map files were converted to the correct predicted dose format and imported into the PortalVision software. Predicted dose maps were generated for open square fields of several standard sizes, wedged fields, and IMRT fields. The IMRT fields were taken from typical prostate, and head and neck patients. Fields from ten IMRT patients were evaluated. The treatment fields were delivered using a CI2100EX accelerator. Point dose measurements were obtained from the acquired dose image and compared with film measurements. The predicted vs. delivered dose distributions were evaluated using the available PortalVision tools. The results were compared against those of films analyzed using RIT.

Results: Point dose measurements made with PortalVision in areas of high dose, low dose gradient agreed with film to an average of +/- 3%. Dose Difference and Gamma results agreed with film results to within +/- 3%.

Conclusion: This work shows that a predicted dose map from a TPS can be modified and imported into Varian's PortalVision software in order to perform IMRT patient QA with accuracy comparable to traditional film methods.