

AbstractID: 4685 Title: Independent monitor unit verification with the RadCalc® program of serial tomotherapy IMRT treatment delivery

Purpose: To present our initial experience with the implementation of commercially available independent monitor unit (MU) verification calculation software (RadCalc®) for dose verification for patients undergoing IMRT (serial tomotherapy) treatments planned using a commercially available IMRT planning system (CORVUS® 6.0) and delivered using the multileaf intensity modulating collimator (MIMiC) delivery device.

Method and Materials: As a first step we defined a separate machine within the RadCalc® software to facilitate the dose verification process. At our facility, serial tomotherapy is used to deliver IMRT treatments. This is accomplished using the MIMiC delivery device attached to a Varian 600C linear accelerator producing a 6 MV photon beam. Dosimetric data for this treatment machine which included collimator and phantom scatter factors (S_c and S_p) and leaf transmission for the MIMiC were also incorporated in the RadCalc® Software. After the treatment plans are approved for treatment by the radiation oncologist a hybrid QA (quality assurance) plan is generated and delivered to an ion chamber and film placed in a rectangular solid water phantom of dimensions 30 cm x 30 cm x 22 cm. The phantom geometry was also defined in the RadCalc® software to facilitate dose calculation and comparison with the dose determined from ion-chamber measurements. In this preliminary study a total of 13 patients undergoing IMRT treatment with the MIMiC were analyzed.

Results: Initial results indicate a good agreement (within $\pm 5\%$) between dose calculated from the hybrid plan, ion chamber measurements, and the dose calculated by the RadCalc® program.

Conclusion: Based on initial results presented here we have set an action level of $\pm 5\%$ which will be reviewed and revised as necessary as we continue to acquire and analyze additional patient data.