

AbstractID: 11195 Title: Evaluation of RadCalc V5.2 as an independent Monitor Unit checking program for dynamic IMRT plans

Purpose: To evaluate the accuracy of an independent monitor unit check program for checking Head and Neck IMRT plans generated by Eclipse v8.6 Treatment Planning System (Varian, Palo Alto, USA). **Method and Materials:** The independent monitor unit check program, RadCalc v5.2 (Lifeline Software, Texas, USA), was first commissioned to check conventional 3D conformal radiotherapy treatment plans. The IMRT module in RadCalc was then optimized to test the controlled dynamic fluences used for IMRT delivery by Varian linear accelerators. The optimization involved adjustment of four RadCalc parameters: phantom scatter factor represented by S_p to the value of 1.5% from published values of C. McKerracher and D. I. Thwaites (1), Collimator scatter factor correction S_c to 0.650, Radiation Light offset to 0.95 and MLC transmission to 0.022. Preliminary data obtained from RadCalc has been compared to predicted doses by Eclipse TPS and to the ionization chamber measurements for a "chair" optimal fluence proposed by Van Esch et al (2). Preliminary analysis of three IMRT plans for Tonsil and Parotid treatments was also carried out using clinical verification data. **Results:** Initial investigation has shown that RadCalc is capable of predicting doses to within 2% for "chair" optimal fluence. For clinical IMRT cases RadCalc predicted dose agreed within 5% of ionization chamber measurements in a homogenous medium. **Conclusion:** RadCalc has the potential to be a useful independent monitor check QA tool for checking IMRT treatment plans. Further analysis is required to evaluate the accuracy and adequacy in a clinical IMRT program. **References:** 1. C. McKerracher and D. I. Thwaites, Radiotherapy and Oncology 86 (2008) 272–275. 2. Ann Van Esch et al, Radiotherapy and Oncology 65 (2002) 53–70.