AbstractID: 7736 Title: IMRT dose calculation comparison between BrainSCAN and Eclipse

Purpose: To evaluate the dose calculation difference between BrainSCAN (5.31) and Eclipse (6.5) for the same IMRT plan.

Method and Materials: 9 IMRT plans (3 Head/Neck, 3 Brain, and 3 prostate) were developed using BrainSCAN and exported to Varis RV system. The same patient CT scan was imported into Eclipse and the same isocenter position was selected with the help of AP and lateral radio-opaque markers. The field parameters were brought back into Eclipse from the treatment field in Varis, using the "convert to planning field" function. The MLC leaf motion information was brought back using the "convert to actual fluence" function for each field, with the same MU as the BrainSCAN plan. Dose distribution was calculated using Eclipse PBC algorithm. Isocenter dose was compared to that from BrainSCAN. The 2D isodoses of the 3 orthogonal planes across the isocenter were exported from both TPS and compared using RIT. The plan was mapped to the same phantom from each TPS separately, and a Kodak EDR2 film was exposed so that it can be used as a judge to the isodose comparison. A Varain 21EX with MLC80 was used for IMRT delivery. Both dynamic and step-and-shoot were included.

Results: The isocenter dose shows a -0.1±1.1% difference. The isodose comparison also shows good general agreement. However, we do notice that the Eclipse calculated isodose tends to smooth out the step-shapes created by the MLC leaves, while the BrainSCAN preserves those shapes, which are closer to the actual situation shown on the film.

Conclusion: This comparison study showed that the IMRT dose calculations of BrainSCAN and Eclipse are generally in good agreement. Eclipse tends to smooth out the step-shapes, which is very clear in our study because 1-cm leaf width MLC was used. A comparison with Eclipse AAA algorithm is on progress.