

AbstractID: 2903 Title: Software tools for transferring treatment plans between two planning systems

Purpose: There is often a need to transfer treatment plan data from one system to another. However, even when both systems are claimed to be compliant with a standard (e.g., DICOM-RT), the system-specific implementations may be incompatible. The purpose of this work is to develop and evaluate tools to seamlessly transfer plans designed on one commercial treatment planning system (TPS) to another TPS and vice versa.

Method and materials: Pinnacle and Eclipse are the two TPS used in this study. From Pinnacle to Eclipse, a filter to make the Pinnacle DICOM-RT plans conform to Eclipse implementation was developed. From Eclipse to Pinnacle, a tool to convert a DICOM-RT plan file to Pinnacle Script file was developed. To evaluate these tools, ten prostate patients planned and treated using IMRT at our institution were used. The 10 IMRT plans were first transferred from Pinnacle to Eclipse, and the doses of the 10 plans were recalculated on Eclipse. New IMRT plans were designed on Eclipse also. The latter were transferred back to Pinnacle and doses were re-calculated there. Also, optimal fluence distributions generated on Eclipse were transferred to Pinnacle, and the Pinnacle's leaf sequencer was used to generate new leaf sequences. To evaluate the differences between Pinnacle and Eclipse plans, dose and dose-volume indices were used.

Results: The dosimetric data for the plans transferred to Eclipse from Pinnacle do not differ significantly from the original plans, and vice versa. For plans of similar quality, the ones designed on Eclipse had 56% fewer segments than the plans designed on Pinnacle. The Pinnacle generated 23% more segments than the Eclipse using the same optimized fluence distributions imported from Eclipse.

Conclusions: DICOM-RT implementations are often not complete and, therefore, compatible among different commercial planning systems. Special tools are needed to make the plans interchangeable.