

AbstractID: 10394 Title: Dose Summation Technology for Radiation Therapy Facilities Equipped with Heterogeneous Planning and Delivery Systems

Purpose: Multi-modality dose summation is often needed for patients who have been previously treated or are being treated with different systems, but unfortunately, it is rarely available in commercial treatment planning systems. This study presents a technology that sums up 3D dose distributions planned/delivered by different treatment systems to help the radiation therapy team in making optimal plans. **Methods and Materials:** Ideally, dose summation would be carried out through DICOM RTDOSE import/export, but this option is presently non functional because the import capability is difficult to implement. To remedy the lack of RTDOSE import in our clinic, a software system, DICOMan, was developed to address DICOM issues such as object visualization, system incompatibility, file transfer and format conversion, etc. DICOMan first acts as a DICOM storage server receiving DICOM RTDOSE file that is exported from a planning workstation. It then reads the dose matrix, converts it to another format that is recognizable by the other treatment planning system where dose summation or plan comparison is performed. **Results:** RTDOSE was exported from the HiArt Tomotherapy Planning System to DICOMan, where it was displayed and converted to the Philips Pinnacle RTP dose format along with specific scripting files that automate the file transfer and the dose summation process. **Conclusion:** A dose summation function is very useful and sometimes critical in radiation therapy clinics equipped with heterogeneous planning and delivery systems. It reduces uncertainties in the case of multiple treatment systems or patients transferred to other systems. It provides quantitative rather than qualitative dose estimations. Before DICOM RTDOSE import/export becomes widely implemented, the technology described here is helpful in assisting radiation therapy clinics to deliver quality care in the multisystem setting which is so prevalent.