AbstractID: 2004 Title: Automation of conformal avoidance planning using the DICOM standard

Purpose: Conformal avoidance is a treatment technique in which the goal is to shape the high dose volume to avoid critical structures while treating a volume derived from a conventional technique. It is useful for situations in which the target is difficult to define, such as cervical cancer and head and neck cancer treated postoperatively. Manual definition of the conformal avoidance planning target volume (caPTV) is time consuming. We report on using the DICOM standard to automate caPTV creation. **Methods and Materials:** We created caPTVs for ten cases of whole pelvis irradiation. First, we contoured all critical structures on the treatment planning CT. Second, a conventional treatment plan was generated and the resulting dose distribution exported to a DICOM file, which was imported into software that we developed. A structure was created by automatically extracting a specified isodose level. The structure was saved to a DICOM RT structure file which was imported into the treatment planning system. The caPTV was completed by excluding volumes in common with the critical structures. For comparison, in two cases the caPTV was also created using a manual method in which the dose distribution was printed and the desired isodose line was digitized. **Results and Conclusion:** The present method is more accurate and is significantly faster than manual creation, requiring less than 5 minutes as compared with 30 to 60 minutes. The method is straightforward and, because it uses the DICOM standard, can be readily implemented on any TPS supporting DICOM RT structure set storage.