

AbstractID: 1462 Title: Analysis of Dosimetry and Efficiency with ImFAST IMRT Planning

The goal of this study was to determine the impact of ImFAST resegmentation on the doses delivered to both targets and organs at risk (OAR) against improvement in treatment efficiency. The “step and shoot” IMRT plans were generated in CORVUS system with 10% or 20% beam modulation steps. Stand alone ImFAST was used on eleven approved plans with large numbers of segments, varying from 74 to 148, for resegmentation of beams. Dose intensity maps were exported from CORVUS and renormalized to 5 levels in ImFAST to produce new IMRT plans using standard optimization algorithm. Both CORVUS and ImFAST plans were reformatted and imported into ADAC planning system as two separate trials. To ensure the integrity of the plan setup, CT and contour data were transferred from CORVUS to ADAC system directly utilizing DICOM-RT feature. The comparison was performed by dose volume histogram (DVH), which were exported from ADAC system and further analyzed in Microsoft Excel. The results demonstrate that, after resegmentation, a) dose delivery time is reduced from 14% up to 35% by decreasing the numbers of segments; b) variation in target doses at 95% and 5% volume coverage ranges from -2.7% to +3.4% and -3.1% to +2.3%, respectively; c) net change in doses to OAR at 5% and 50% volume coverage ranges from -12.8% to +3.2% and -6.10% to +5.3%, respectively. In conclusion, stand-alone ImFAST is a useful tool in selected clinical situations to improve the efficiency of IMRT, however the dosimetry should be independently verified.