

AbstractID: 8672 Title: Simple plan evaluation methods for three dimensional conformal radiotherapy

Aim: Dose volume histograms (DVHs) play a vital role in determining the optimal plan for radiotherapy treatment delivery. The current concepts of conformality index (CI), equivalent uniform dose (EUD) derived from dose volume histogram (DVH) does not provide any spatial information. In this study, slice-based evaluation methods have been proposed for spatially analyzing the radiotherapy treatment plans.

Methods and Materials: A case of prostate cancer has been selected for demonstrating the proposed tools for evaluating the dose distribution. Three dimensional conformal radiotherapy treatment planning (3D-CRT) was performed with three fields employing multileaf collimator and the treatment plan was evaluated with DVH. The dose maximum point, conformality index, PTV coverage index (PCI) and equivalent uniform dose were evaluated for every single slice along the cranio-caudal direction for all the planning target volume (PTV) contours and plotted against slice location.

Results: The dose maximum point plotted against the slice position allows in identifying those slices where dose maximum point is outside the target volume. The plot of conformality index gives the information about location of those slices where excess of surrounding normal tissues is encompassed inside the prescription dose. Similarly, the plot of PCI and EUD with slice position gives the information about those where the tumor is not covered adequately.

Conclusion: The methods proposed in this study will reduce the time consumed for analyzing the treatment plans and forms as a simpler way to assess the spatial distribution of the dose inside the target volume.