

AbstractID: 9581 Title: Planning target volumes for radiotherapy: Dosimetric evaluation of CTV margin for IMRT prostate fields

A study has been undertaken to determine the dosimetric consequences of using different amounts of clinical target volume (CTV) expansion to create planning target volumes (PTV) that accounts for target motion during the course of IMRT therapy. Weekly CT sets from patients undergoing IMRT boost for prostate cancer were used for planning and "mapping" dose distributions. Each CT set was contoured for CTV and risk objects. The initial CT set obtained from each patient was used to create plans that differed in the amount of margin given to the CTV. Uniform margins of 0, 3, 5 and 10 mm were used to define the PTV. Beam data from plans on the initial planning CT was used to calculate dose distribution in subsequent CT sets. This calculation was done using external patient setup markers to define the treatment isocenter. Dose volume histograms (DVH) for the CTV and risk objects were obtained from each CT set. DVHs were used to compare dosimetric coverage of the CTV and risk objects in the initial plan to that in subsequent plans. In all cases 10 mm uniform margin around the CTV gave CTV dose distributions similar to that of the original plan. 5 and 3 mm margins did not always provide adequate coverage and 0 mm margin did not give adequate coverage in any CT set. Smaller margins gave better sparing of risk objects. This data supports using a 10 mm uniform margin around the CTV to provide adequate dose distribution to the CTV.