AbstractID: 1103 Title: Defining the PRV relative to PTV for the NCI IMRT benchmark and for clinical trials

The extent to which the planning organ at risk volume (PRV) is contoured relative to the planning target volume (PTV) may arbitrarily affect i) the ability of treatment plans to meet dosimetric criteria of the NCI IMRT benchmark, and ii) the quality of clinical trials that use the benchmark as part of credentialing facilities to enter patients receiving IMRT. For example, the PRV and PTV in the revised NCI benchmark are somewhat ambiguously specified as "at least 5 cm caudad/cephalad" in length, without specifying PRV and PTV lengths relative to one another. Similarly, the RTOG P-0126 Phase III dose escalation study for localized prostate cancer states that the rectum PRV "should be contoured for a length of 15 cm or to the rectosigmoid flexure." The dose/volume constraints on rectal dose are that no more than 15, 25, 35, or 50% of the rectum will receive doses of 75, 70, 65, or 60 Gy, respectively. Choice of two rectal PRVs allows the planner to choose the greater volume which may better conform to rectal dose/volume guidelines. Herein, we compare DVHs from IMRT benchmark plans with different PRV lengths ≥ 5 cm while maintaining a constant PTV length of 5 cm. Prostate plans are also compared with PRV lengths of 15 cm or to the rectosigmoid flexure. Resulting DVH statistics show significant differences in the ability of the plans to meet dosimetric goals. In conclusion, we recommend more precise definitions for PRV and PTV in the NCI benchmark for clinical trials.