

Purpose: There is a significant difference in complexity between the planning and delivery of 3D conformal therapy as compared to IMRT. This study compares alternative radiation therapy plans for prostate cancer using both 3D conformal plans and IMRT plans, to ascertain if there are dosimetric advantages to IMRT given the current constraints. **Method and Materials:** A single physician outlined the prostate (GTV), rectum, bladder, femoral heads and penile bulb of 10 consecutive prostate patients. IMRT plans, using the current RTOG constraints from RTOG study 0415, and 3D conformal treatment plans (3DCRT) were created for each patient. The 3DCRT plans consisted of 6 beams, with opposed lateral and paired oblique beams, using 6 MV and 18 MV photons, created with the Pinnacle treatment planning system (TPS). The IMRT plans were generated using the Pinnacle system, the HiArt Tomotherapy system, and the Corvus TPS. In total, 6 plans were created for each patient. **Results:** By comparing the plans in terms of dose statistics and dose volume histograms we observed that the 3DCRT was able to meet the RTOG dose constraints. The dose to critical structures was comparable between 3DCRT and IMRT plans, independent of the TPS. Dose homogeneity of the PTV was better achieved with the IMRT plans. The 3DCRT plan could be further improved if a better choice of beam angles was made. **Conclusion:** The plans were evaluated for: (i) ability to deliver 95% of the dose to the PTV with insignificant variation, and (ii) for dose to the rectum and bladder. The 3D conformal plans were able to meet the RTOG criteria, suggesting that the added time and expense of IMRT planning for these cases was unjustified and that the true power of IMRT is not being realized.