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Comparative Analysis of 3D-CRT vs. IMRT Techniques in the Treatment of Carcinoma of Prostate

Rajeev K. Badkul , Tyler W. Sullivan¹, Calvin P. Myers, Fen Wang, Leela Krishnan & Eashwer K. Reddy

University of Kansas Medical Center, Kansas City, KS

¹University of Missouri, Columbia, MO

ABSTRACT

Purpose: To evaluate whether some of the conventional 3D-CRT plans are comparable to IMRT techniques in the treatment of prostate cancer.

Methods and Materials: We randomly selected 5 patients who were treated with clinical IMRT plans prescribed to 78Gy in 39 fractions. We generated 4, 5, 6, and 7 beam 3D-CRT plans for each patient, and compared them to the IMRT plan after dose re-scaling to match the IMRT's dose to 95% of the PTV volume.

Results: The average dose to the prostate, bladder, rectum, and hips were relatively independent of the plan. Generally, the 3D-CRT plans were all favorable over the IMRT in regards to bladder sparing. In terms of rectal sparing, a modified 4-field (4-field B) plan was competitive to IMRT. The integral dose and low-dose volumes were lowest for the 4-field B and IMRT techniques – ultimately favoring 4-field B. The average hip doses among the various techniques were insignificantly different and all were below the value for potential bone necrosis reported by Emami *et al.*¹

Conclusion: Overall, the technique labeled 4-field B is comparable, and in certain aspects better than the IMRT technique.