

In the treatment of localized prostate carcinoma, optimal dose delivery to the clinical target volume (CTV) is achieved through conformal 3-D using 4-field and cross-fire techniques. For most of these cases a dose of 70 Gy is delivered to the CTV in 35 fractions either by 4-field or cross-fire or both using a 10 MV X-ray. In the present retrospective study, we analyzed the influence of prostate motion and patient positioning errors during the course of radiotherapy, on dose coverage to target volume and normal structures and on the sensitivity of the treatment technique to these factors. The target movement and setup errors were sampled from a Gaussian distribution for all 35 treatments in the four cases studied. Prostate movement and setup error data were taken from published data<sup>1</sup>. The standard deviations for the target movement were 1.4 mm, 2.1 mm, and 2.3 mm and for the setup errors were 2.1 mm, 2.5 mm, and 2.5 mm in X, Y and Z directions respectively. Composite Dose Volume Histograms (DVH) were generated and analyzed for both techniques. The prescription isodose for the plans without motion and setup errors was 97% for the 4 field and 94% for the cross-fire plans. The inclusion of target motion and setup errors resulted in a target coverage of 90% isodose for 4 field and 48% isodose for cross-fire plans. The implications of the results of this study on the target and normal structures on a few patients will be presented.