

## AbstractID: 10428 Title: NCTP Of Bladder And Rectum : Does Simultaneous Integrated Boost IMRT Score Over Other Techniques

**Purpose:** The main objective of this study was to analyze the radiobiological effect of different treatment strategies in high risk adenocarcinoma prostate. **Method and Materials:** Ten cases of high risk adenocarcinoma prostate were selected for this dosimetric study. Four different treatment strategies used for treating prostate cancer were compared. Conventional four-field box technique covering prostate and nodal volumes followed by three-field conformal boost (3D+3DCRT), four-field box technique followed by intensity modulated radiotherapy (IMRT) boost (3D+IMRT), IMRT followed by IMRT boost (IMRT+IMRT) and simultaneous integrated boost IMRT (SIBIMRT) were compared in terms of tumor control probability (TCP) and normal tissue complication probability (NTCP). The dose prescription except for SIBIMRT was 45Gy in 25 fractions for the prostate and nodal volumes in the initial phase and 27Gy in 15 fractions to the prostate in the boost phase. For SIBIMRT, equivalent doses were calculated using biologically equivalent dose (BED) assuming  $\alpha/\beta$  of 1.5Gy with dose prescription of 60.75Gy to GTV and 45Gy to CTV in 25 fractions. IMRT plans were made with 15MV equi-spaced seven coplanar fields. NTCP was calculated using Lyman-Kutcher-Burman (LKB) model.

**Results:** A NTCP of  $10.7 \pm 0.99\%$ ,  $8.36 \pm 0.66\%$ ,  $6.72 \pm 0.85\%$ ,  $1.45 \pm 0.11\%$  for bladder and  $14.9 \pm 0.99\%$ ,  $14.04 \pm 0.66\%$ ,  $11.38 \pm 0.85\%$ ,  $5.12 \pm 0.11\%$  for rectum was seen with 3D+3DCRT, 3D+IMRT, IMRT+IMRT and SIB-IMRT respectively.

**Conclusions:** SIBIMRT had the least NTCP over all other strategies with reduced treatment time (3 weeks less). It should be the technique of choice for dose escalation in prostate carcinoma.