

AbstractID: 10698 Title: Getting the most from prostate IMRT: Do stricter constraints produce better results?

Purpose: Intensity Modulated Radiation Therapy (IMRT) is considered by many to be the standard of care in the delivery of prostate external beam radiotherapy treatments. The purpose of this study is to determine if using criteria stricter than RTOG 0415 will provide dosimetric improvement. **Materials and Methods:** Treatment plans were produced for ten random patients utilizing the dose constraints recommended by the RTOG 0415 protocol, and for stricter criteria based on published data. For the published criteria (PC) the DVH goals were: rectum less than 15% receiving 65Gy, <25% 52Gy, and <35% 40Gy. For the bladder: less than 25% receiving 65Gy and <35% 52Gy. Less than 10% of the femoral heads could receive 50Gy, and <10% of the penile bulb could receive 15Gy. The prescription to the target, 76Gy, was the same for all plans. **Results:** For patient plans using the PC, the rectum received an average of 21Gy less than with the comparable RTOG plan. The PC plans show consistently lower doses to both the rectum and bladder. The PC plans also show a significant reduction in dose to the penile bulb. PTV coverage was more homogeneous for the RTOG plans. Femoral head doses were higher for PC plans than RTOG plans. **Conclusions:** Reducing the dose to healthy tissue is not a trivial issue, as hot spots in critical structures could result in increased toxicity. It is clear that in using the basic RTOG 0415 criteria for prostate IMRT optimization, we are not taking advantage of the real power of IMRT. Stricter dose constraints for the rectum and bladder can be met by IMRT and would likely result in a further decrease in toxicity; with the possibility of higher doses to the PTV.