

AbstractID: 6987 Title: The Effects of Inter- and Intrapphysician Variations in Prostate Delineation on Prostatic Volume, Isocenter Location, and Critical Organ DVHs

Prostate treatments involving escalated doses and reduced margins require precise definition of the target. A study comparing interphysician and intraphysician variations in the delineation of prostate volumes was performed. Six physicians independently determined the prostate from CT data of twenty-eight patients, half of whom were given bladder and urethral contrast. Then, a single physician outlined the prostate of all the patients three additional times. The bladder and rectal volumes, generated by a diagnostic radiologist, were invisible while contouring the prostate. Inter- and intraphysician variations were assessed by comparing the delineated prostatic volumes, the location of the isocenters, and the DVHs for the bladder and rectum. For the interphysician study, the coefficient of variation (CV=standard deviation as a percentage of the mean) of the prostate volumes for the non-contrast patients averaged 11.4%; surprisingly, when contrast was given the average CV rose to 22.3%. These CVs averaged 6.7% for both intraphysician studies. Regarding isocenter displacements, the non-contrast, interphysician study again resulted in smaller average variations than the contrast study (9.0 mm vs. 14.5 mm). The intraphysician variations averaged 3.0 mm regardless of the contrast status. The most important effect of the contouring variations was seen in the DVHs of the rectum, the dose limiting structure. When comparing the percentage of rectum receiving at least 95% of the prescribed prostate dose, CVs averaged 12.6% for the non-contrast study and 21.7% for the contrast study. Thus it is imperative to develop improved methods for accurate target volume definition as contrast alone clearly isn't sufficient.