

AbstractID: 1280 Title: A Study of Interfraction Organ Motion During Radiation Therapy for Prostate Cancer

The prostate lies in close proximity to the rectum and bladder and careful choice of treatment margins can limit complications to these organs. To that end, a combination CT / linac was used to measure organ motion relative to the treatment plan isocenter during consecutive sessions of radiation therapy. Anterior / posterior (AP) motion has been previously identified as the most dramatic component of prostate motion, and our initial measurements are limited to changes in this direction.

The CT / linac combination allows patients to be imaged and treated on the same couch by simply rotating the table. Wire markers were taped to the patient's skin daily such that the treatment plan isocenter could be identified in CT scans. Pretreatment scans were made for three patients over ten consecutive fractions each for a total of 30 scans. Daily measurements were made of the distance along the central AP axis between the posterior skin boundary and several anatomical landmarks: posterior rectal border, rectal / prostate interface, anterior prostate border, anterior and posterior bladder borders, and the anterior skin border. Graphs of these measurements illustrate the daily variation in organ position, and implications for radiation therapy dosimetry and patient comfort are discussed.