

AbstractID: 8878 Title: Effect of body weight on patient setup for prostate helical tomotherapy treatments

Purpose: To determine the effect of body weight and anatomical fat on initial setup for prostate patients receiving daily image guidance on helical tomotherapy.

Method and Materials: Initial setup corrections from MVCT imaging were retrospectively analyzed for 25 prostate patients. All patients were set up in the head-first supine position to skin tattoos, and immobilization consisted solely of foam knee pillows and foot rings. Patients were stratified into two groups based on body weight being above and below the median weight of all analyzed patients. Distributions of setup corrections in the lateral, longitudinal, and vertical directions were assessed. Additional preliminary analysis of anatomical fat comparing measurements of transverse areas of the body at the L4-L5 vertebral inter-space and setup tattoo levels was performed on planning CT images of 13 out of the 25 patients.

Results: The mean setup corrections in the positive vertical direction were significantly greater for Group A (patients weighing > 213 lbs) than for Group B (\leq 213 lbs), which were 11.5 mm and 4.3 mm, respectively. This may be attributable to increased couch sag occurring with increased weight and with placing the patient head-first instead of feet-first. Variances for Group A were larger than for Group B, which show an increased variation in initial setup for the heavier patient group. The anatomical fat measures corresponded well with each other, indicating that the location of the body used for initial patient setup seems to correlate with methods used to characterize abdominal fat.

Conclusions: Our measurements of setup corrections suggest that daily imaging is of greater benefit for heavier patients. Analysis of anatomical fat measures suggests that characteristics of the location of the setup tattoos are affected by abdominal fat.

Conflict of Interest: Some authors have a financial interest in TomoTherapy, Inc.