

AbstractID: 8385 Title: Investigational Low Dose MV CBCT for Daily Pediatric Localization

Purpose: Extraneous irradiation is a major concern in pediatric radiation oncology. A modified version of the Siemens MV CBCT has been developed that allows for low dose and high contrast imaging. We will determine the required setup margin stratified by age, tumor site, sedation, and treatment position in an IRB approved pediatric localization protocol of where low-dose megavoltage cone-beam CT (LD-MV CBCT) is a central component.

Methods and Materials: Research participants are assigned a non-ionizing localization technique based on disease site, treatment position, age, and use of anesthesia. Along with the protocol localization technique, each research participant will receive a LD-MV CBCT at the start of each fraction and the end of every other fraction. Per protocol, the LD-MV CBCT delivers only 1.0cGy per scan at isocenter for each research participant. The proper CBCT settings are determined with aid of a treatment planning system. The pre-treatment LD-MV CBCT will be used to assess the accuracy of the localization technique and the post-treatment LD-MV CBCT will quantify the rigidity of the immobilization schema. The resultant data will provide quantitative information about the inter- and intra-fractional motion of the target, which comprises the SM portion of the PTV.

Results: In one week, the dose to the research participant due to the daily pre and post-treatment LD-MV CBCT will be approximately 7.5cGy. The CBCT will supplant routine verification ports films, which, if obtained twice a week, would deliver approximately 5.0cGy at isocenter. The research participant will receive only 2.5cGy a week in additional dose when daily LD-MV CBCT is used compared to twice a week port films.

Conclusion: We will have motion and imaging data on 40 research participants by August 2008, with a planned 200 research participants for the protocol. **Conflict of Interest:** Supported in part by Siemens Medical USA.