AbstractID: 6961 Title: Simulation and Training Tools for Image-Guided Radiation Therapy

Purpose: The goal of this study was to develop tools for the training of radiation therapists, radiation oncologists, medical physicists, and medical dosimetrists in the clinical usage of CT-based Image-Guided Radiation Therapy**.** The training application was developed in MATLAB, and will be compiled for free distribution when completed. The first version of the application will include CT-based IGRT imaging data.

Method and Materials: When the IGRT Training and Simulation application is launched, the user will be prompted to 1.) Select one of the case studies for image review, or 2.) Review Random Images. The simulator will then load the reference CT images and the IGRT CT images into the simulator from an IGRT database of example images. When loaded, the images will not be co-registered with each other. The user will have the option to 1.) Perform an automatic image registration, or 2.) Manually register the images. Approximately one third of the stored image registrations will contain known positional errors that were purposely inserted by the investigators. In addition to developing skills with image-registration, the IGRT simulator also contains tutorials and training datasets that address other clinical scenarios.

Results: Images have been acquired from IGRT treatments that contain common errors and/or anatomical changes that occur during the course of therapy. These images will be used in the IGRT Training and Simulation application to aid in the identification of errors, such as a new tumor being developed in a lung patient, substantial tumor regression, or rectal and bladder filling in prostate patients.

Conclusion: An IGRT simulator is currently being developed for the training of radiation therapists, radiation oncologists, medical physicists and medical dosimetrists. Results from the initial release of the application will be presented at the meeting.