AbstractID: 11896 Title: Breast CT as a Platform for Image Guided Therapies of Breast Cancer

Dedicated breast computed tomography (CT) systems were designed and fabricated in our laboratory using off-the-shelf components (x-ray system, detector, and bearing) integrated into a custom designed system. For imaging, a 360 degree acquisition using cone beam geometry is used to acquire 500 projection images which are reconstructed to produce a high resolution ~512 x 512 x 512 CT volume data set. In addition to the diagnostic imaging capabilities of the bCT scanner, the system appears to be an excellent platform for image guidance of interventional procedures such as robotic biopsy, radiofrequency ablation, and cryoablation. In addition to percutaneous procedures, the bCT system may also be an excellent platform for rotational beam radiation therapy. Computer simulations and physical phantom-based experiments were used to define the dose distributions possible using the bCT system for radiation therapy. A number of beam energies from 120 kVp to 480 kVp were simulated. Initial results suggest that in addition to homogeneous dose distributions for treating the whole breast, that focused therapeutic approaches using collimators may be possible. The pendent position of the breast with the women prone is also thought to be a more reproducible approach to fractionated radiotherapy of the breast.

Educational goals are to inform the attendee of the possible benefits of breast cancer therapies delivered from a breast CT platform

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