Purpose: To evaluate the clinical implementation of a deep inspiration breath hold (DIBH) treatment for left breast radiotherapy using surface imaging and visual aid.

Methods: A CT scan of the patient at DIBH is acquired and used for treatment planning. The plan and skin contour, containing isocenter and surface information are exported from the treatment planning system and imported into the surface imaging system (SIS). The skin contour constitutes the treatment reference surface or target DIBH position. A region of interest (ROI) consisting of the sternum and medial breasts is selected in the SIS. A set of video goggles allows the patient to view their breathing signal within the SIS, aiding in producing a reproducible and stable DIBH similar to simulation. Once the patient is set up at free breathing, she performs a DIBH while being monitored with the SIS. Shifts to minimize displacements from their reference DIBH surface are made. The surface image and patient setup are validated with weekly MV images. The beam is enabled when the two surfaces are within a predetermined tolerance.

Results: Data for evaluation of the implementation was acquired for 4 patients throughout treatment. Average treatment time was 16.8 minutes and 14.2 minutes for setup. The average displacement from the reference surface was 0.4 mm during DIBHs. The average reduction of heart mean dose and volume receiving 50% of the prescribed dose between DIBH and FB was 38% and 89% respectively. A total of 15 patients have completed this new treatment. 2 were excluded for inability to achieve reproducible and stable DIBH.

Conclusion: The workflow we have implemented has proven to be effective and efficient for clinical purposes. Surface imaging provides adequate real time information valuable to the treatment process. Visual aid has helped patients achieve DIBH with high reproducibility and stability.