

## AbstractID: 2070 Title: Anatomical Shift Analysis With CT Images For The Repositioning Of Head and Neck Cancer With TomoTherapy

The study was conducted to determine the amount of interfraction motion present in head and neck patients immobilized in thermoplastic masks and treated with daily CT based image-guidance. Helical TomoTherapy is the latest development in radiation therapy that combines Intensity Modulated Radiation Therapy (IMRT) with daily CT imaging in an integrated system. The first commercial version, called the Hi-Art<sup>2</sup>, has the ability to obtain CT images of the patient on the treatment system prior to each treatment. The positional uncertainties associated with traditional radiation therapy and IMRT can be compensated with daily imaging. Thus, the position of the tumor relative to the treatment beam can be corrected by moving the patient with appropriate offsets. Observation of head and neck movement with respect to longitudinal, lateral, and vertical directions allowed accurate repositioning of the patient. The data collected from displacement in pitch, yaw and roll directions will allow for implementation of small set-up corrections for therapy. Treatment planning volumes must also deal with critical structures including the spinal cord, brainstem, parotid glands, portions of the larynx below the level of the hyoid bone, the optic nerves, optic chiasm, and globes of the eyes.

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