AbstractID: 7975 Title: Inter-Fraction Tumor/target Positioning

Precise and accurate placement of radiation dose within the human body is a significant technical challenge. The use of fractionated treatment regimens exacerbates this problem by requiring that any efforts employed to achieve precision and accuracy must be repeated over the prolonged course of radiation therapy. While it has long been presumed that mobility of internal anatomy could be a confounding factor in delivering the desired dose to the target, recent developments in volumetric imaging have allowed these issues to be quantified. This has resulted in increased awareness of the need for caution in assumptions regarding target and normal tissue stability and has driven a formalization of the accommodation of these uncertainties through the use of appropriate 'safety margins'. The reduction of the inter-fraction motion is a major focus of the radiation therapy community and these efforts intend to bring about a reduction in the volume of normal tissue that needs to be irradiated to assure target coverage. Ultimately, this reduction in normal tissue irradiated will open opportunities for dose escalation.

Educational objectives:
1. Understand the magnitude of inter-fraction motion present in radiation therapy.
2. Understand the methods by which these can be measured/quantified.
3. Understand the approaches that can be taken to address inter-fraction mobility (image-based, intervention-based, margins).

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