AbstractID: 1727 Title: Dosimetric evaluation of target dose in Stereotactic Body Radiation Therapy (SBRT) of lung using a dynamic motion anthropomorphic phantom

Stereotactic Body Radiation Therapy (SBRT) represents an exciting new development in the field of radiation therapy wherein large hypofractionated doses of radiation may be delivered conformally to targets of liver and lung. The delivery of large conformal doses to such targets poses numerous challenges, which can include the presence of significant degrees of target motion. A Dynamic thorax phantom has been designed and constructed to allow for motion studies of targets in lung. The phantom is constructed from a CIRS IMRT Thorax phantom with custom modifications, and allows for complex, unit-density target motion in lung equivalent material. Through a combination of translational and rotational motion, the motion actuator can facilitate three-dimensional motion. Linear motion in the superior/inferior (S/I) direction can be isolated from lateral and anterior/posterior (A/P) motion in both frequency and amplitude, and the two sets of motions may be synchronized to each other. Sinusoidal and other complex motions are achievable. The phantom has been designed specifically to study the ramifications of dynamic target motion in lung, in the presence of temporally modulated radiation therapy delivery beams (i.e. IMRT). A dosimetric evaluation of target coverage will be presented for the specific cases of delivery via serial tomotherapeutic IMRT, static gantry IMRT and static field treatment.