

**AbstractID: 1821 Title: Characterization of mean lung dose in Stereotactic Body Radiation Therapy (SBRT) by direct measurement in anthropomorphic phantom and by Monte Carlo calculation**

Stereotactic Body Radiation Therapy (SBRT) represents an exciting new delivery paradigm in which hypofractionated, extremely conformal dose distributions may be delivered to lung and liver lesions. At our institution over 230 such fractions have been delivered to roughly 75 patients to date, yielding exciting short term follow up data. A standard delivery scheme for lung metastases at our facility entails the delivery of 3 fractions of 12 Gy, delivered Mon., Wed., and Fri. Of significant interest to the SBRT community at this time is the accurate determination of the mean lung dose delivered for SBRT of lung lesions. Dose delivered to healthy lung, subsequent to SBRT for lung, is of significant interest with regard to potential for induction of pneumonitic reaction in the lung. For an accurate determination of mean lung dose to be obtained it is imperative that a sufficient understanding of the dosimetry in the very low-density environment of the lung be acquired. In this study we perform direct measurements of dose delivered to lung equivalent media in a highly customized anthropomorphic phantom (CIRS Thoracic Phantom with custom modifications). Thermoluminescent dosimeters (TLD's) sorted for high precision are utilized to directly measure the delivered lung dose for the serial tomotherapeutic delivery method utilized at our facility. Nomos Peregrine Monte Carlo (MC) dose calculations are also performed and dose volume histogram (DVH) data is generated. Measured and MC calculated dose is compared with Corvus mean-path-length (MPL), heterogeneity-corrected predicted dose.

Dr. Salter holds patents and receives royalties related to Nomos' *AutoCrane*<sup>TM</sup>