AbstractID: 10193 Title: A method to achieve protocol dosimetry for thoracic stereotactic body radiation therapy with a traditional linear accelerator and widely available treatment planning system

Purpose: We present a systematic way to achieve protocol dosimetry objectives (RTOG 0236, 0618, and 0813) for lung stereotactic body radiation therapy using a traditional linear accelerator and a widely available treatment planning system.

Method and Materials: Thirteen patients with non-operable, non-small cell lung cancer were planned using Pinnacle 8.0 (Philips Medical Systems, Fitchberg, WI). Treatments were delivered on an Elekta Synergy with 1 cm leaves and planned with a 3D non-coplanar technique utilizing beam weight optimization.

Results: Our work shows that objectives in the RTOG protocols can be met using a standard linac with 3D planning. In all 13 cases, 95% of the PTV received the prescribed dose and 99% of the PTV received 90% of the prescribed dose. The average ratio of the 100% isodose volume to the PTV volume was 1.10 (objective of <1.2) and the average of the 50% isodose volume to the PTV volume was 3.51 (average of 0.82 lower than objective). The average dose more then 2 cm away from the PTV was 23.2Gy (average of 3.8Gy less then objective). The percentage of lung receiving 20Gy was 3.2% (objective of <10%).

Conclusion: Protocol specified dosimetry can be achieved using widely available treatment planning software and treatment delivery systems.