Purpose:
To evaluate prospectively the acute and late morbidities (toxicity) of hypofractionated stereotactic radiosurgery with cyberknife with stage I/II lung cancer: predictors for radiation pneumonitis and fibrosis.
End Point is to determine the radiation induced lung toxicity (pneumonitis and fibrosis) and tumor response using biological-effective dose histogram.

Methods and Materials:
The model evaluates the biological consequences of inhomogenities in the physical dose to the surface of the lung for a given fractionation scheme. A method of normalizing the surface area of the lung is employed so that the predicted NTCP is independent of the differing cross-sectional size of the lung. The surface area of the lung is normalized to ensure that all sections of the lung contribute equally to the NTCP.

Results
The model has been used to assess late lung complications and the milder RTOG grade 2 and 3 reactions. This model was found to predict late lung toxicity levels of $1.5 \pm 0.6 \%$ for an accelerated treatment of 60 Gy in 3 fractions commonly employed at our center. The model predicts that the average NTCP for late effects for four lung patients becomes greater than 5 % with a fractionation scheme of 60 Gy in 3 fractions.

Conclusion:
The relative seriality model will be extended to incorporate dose-surface histograms and BED. The model assesses the biological effects of inhomogeneities in the dose delivered to the lung. Dose-surface histograms provide a convenient means of studying the differences in the biologically effective dose to the lung.