

AbstractID: 6990 Title: IGRT and Treatment Planning: Geometric Uncertainties and Individualized Patient Treatment

Widespread use of precision conformal and intensity modulated treatment techniques puts extreme emphasis on targeting. While the cloud of uncertainty associated with defining and localizing targeted tissue has been realized for quite some time, standards for working with this uncertainty are hardly widespread. When looking at the range of variations in target position across a population, it becomes clear that there is quite a range for any given body site, with some patients exhibiting very small variations, and others at extremes far beyond the population mean. The ability to characterize individual patients early on in treatment permits modification of the population assumptions used in planning, providing potential benefit to a subset of patients. Making plans robust to expected variations, especially at the start of treatment, may further aid in this individualization process. One critical tool in these endeavors is the ability to estimate potential dosimetric consequences of various levels of uncertainty, as opposed to the use of geometric margins as approximations. The educational objectives of this talk are:

- Gain an understanding of the range of geometric uncertainties in a population
- Look at various methods of assessing individual variations and their impact
- Compare geometric and dosimetric means of assessing the impact of variations
- Introduce the topic of robust planning