AbstractID: 9723 Title: CT Dose and Related Issues

Continuing advances in CT technology coincide with increasing utilization of CT as a diagnostic tool. As a result, an increasing majority of the population's exposure to diagnostic radiation results from CT examinations. Concerns about the increased associated stochastic risk from CT dose and changes in CT technology such as the advent of multi-detector CT and helical scanning has motivated the Medical Physics community to examine and refine their methods of measuring CT dose and assessing a patient's effective dose and stochastic risk.

Further, concerns over risk and the emerging potential of CT as a screening tool raise the question of how accurately an individual patient's radiation dose from CT can be estimated from current CT measurement methods using phantoms.

This lecture will review the evolution of dose calculation in CT and how Effective Dose can be estimated from standardized measurements. We will also look at how specific patient and organ doses can be estimated using Monte Carlo methodology that incorporates both the specific technology of the CT scanner and voxelized models of real patients. Finally we will make some comparison of patient specific Monte Carlo dose estimates against phantom based dose estimates.

Educational Objectives:

1) Define and review standard CT dose measurement methodology.
2) Understand current methods for estimating patient dose from CT dose measurements.
3) Learn how Monte Carlo techniques can be used to estimate dose to specific patients and patient organs with scanner and protocol specific modeling tools.