Medical Physics Seminar

Monday, March 28, 2016

1345 HSLC ~ 4:00 P.M.

Abby Besemer

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Development, Validation, and Implementation of RAPID: A Patient-specific Monte Carlo 3D Internal Dosimetry Platform

Patient-specific absorbed dose calculations for targeted radionuclide therapies are important for reducing the risk of normal tissue complications and optimizing tumor response. However, the only FDA approved software for internal dosimetry calculates doses based on the MIRD methodology which estimates mean organ doses using activity-to-dose scaling factors tabulated from standard phantom geometries. This work describes the development of a Monte Carlo internal dosimetry platform that utilizes serial PET/CT or SPECT/CT images to calculate patient-specific voxelized dose distributions and the investigation of the dosimetric impact of various parameters and methodologies used in the 3D internal dosimetry workflow.

Alfonso Rodriguez

Research Assistant, Student of Sean Fain

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The Effect of High Resolution Kernels, Iterative Reconstruction, and Acquisition Parameters on Quantitative Computed Tomography Measures of the Lung

With the latest advancements in multislice detector computed tomography (MDCT), quantitative lung CT measurements has demonstrated potential for accurate characterization of regional lung disease, which may lead to better interventional procedures to treat obstructive lung disease (OLD) before lung function is severely compromised. The purpose of this talk, then, is to explore the accuracy of quantitative lung CT measurements, including densitometry and airway measures, using typical clinical acquisition/ reconstruction parameters, and from these results, determine acquisition/reconstruction parameters which improve qCT measures with the goal of reducing overall dose to the patient. Additionally, automatic exposure control techniques, will be investigated for use in protocol design of lung imaging studies across vendor platforms.

1345 Health Sciences Learning Center (HSLC) 4:00 - 5:00 P.M.