AbstractID: 2803 Title: Effect of Scan Parameters in Cardiac Imaging with MDCT

Cardiac imaging has become a reality with the introduction of multiple-row detector computed tomography (MDCT) technology. Rapid evolutions in multiple row detectors ranging from 4 to 64 rows have led to the progression towards isotropic resolution imaging. This has become possible with improved technical factors such as sub-millimeter spatial resolution in z-direction (< 1mm), shorter scan time (< 400 ms), high temporal resolution (< 250 ms) and fast reconstruction of multiple data sets at various intervals in the cardiac cycle yielding larger 3D image data sets.

Recently CT imaging, especially cardiac imaging is not confined only to conventional imaging areas such as Radiology but is also performed outside the conventional imaging areas such as Cardiology. In such cases, medical physicists often become the conduit between imaging and non-imaging areas in assisting the clinicians to understand key features of MDCT. Therefore, it is critical for the medical physicists to become familiar with the various scan parameters and how they influence the overall image quality, so that he or she can provide valuable contributions towards developing appropriate scan protocols, developing strategies for radiation dose reductions and many other aspects.

CT image quality in general is influenced by a variety of scan parameters such as kVp, mAs, pitch, image noise, slice thickness, reconstruction algorithms etc. With cardiac CT imaging in mind, the presentation will discuss the effect of various scan parameters and how it affects the radiation dose and image quality.

Educational Objectives:

1. To become familiar with the advantages and disadvantages of various MDCT data acquisition modes.
2. To describe the effects of scan parameters on image quality and patient radiation dose.
3. To become familiar with spatial, temporal resolution and other key requirements in cardiac imaging.
4. To illustrate the image quality requirements in select clinical imaging sequences.