

## AbstractID: 14530 Title: The Latest in Radiation Dose Reduction Techniques in CT

The dose per exam for a CT of the abdomen and pelvis has decreased by a factor of 2-3 since the 1980s due to a number of technical innovations. This was accomplished in parallel to scan times being reduced from several minutes to several seconds and routine image thicknesses being decreased from 10 mm to 3 – 5 mm. Some of the advances responsible for these improvements included: use of solid-state scintillating detectors and electronic circuits with lower levels of “background” noise, wider multiple-detector-row arrays having thin individual detector elements, more powerful x-ray tubes and generators which allow greater pre-patient “beam-hardening,” and beam shaping filters that vary decrease intensity to the patient periphery or restrict the majority of the dose to the center of the patient for cardiac imaging. A number of additional dose reduction techniques now exist and are gaining wide-spread use, including automated adjustment of scanner output according to patient size, tube current modulation based on patient attenuation or ECG, automated selection of the most dose-efficient tube potential, iterative reconstruction methods, increased spiral pitch or non-spiral cardiac CT acquisition modes, dynamic z-axis collimation, and novel noise reduction techniques, some of which require raw data and some of which operate on reconstructed images.

This presentation will provide an overview of CT dose reduction techniques, emphasizing those with the greatest clinical impact, and new and emerging techniques. The participant will learn about the general classes of CT dose reduction techniques, and examples of specific implementations will be given.

### Learning Objectives:

1. Recognize the general classes of dose reduction techniques in CT
2. Understand the basic principles of each general class
3. Learn how specific implementations of each class function
4. Appreciate the magnitude of dose reduction that can be achieved using the described techniques