

AbstractID: 14589 Title: SPECT/CT: Basics, Quality Assurance, and Clinical Applications

Single-photon emission computed tomography (SPECT) together with computed tomography (CT), commonly referred to as SPECT/CT, is rapidly becoming a mainstream imaging modality and creating a new paradigm for SPECT imaging. The ability to contemporaneously acquire electro-mechanically registered dual-modality SPECT and CT scans improves the SPECT image quality due to CT-based attenuation correction and enhances the diagnostic confidence of SPECT by providing a CT-based anatomical overlay. The utilization of SPECT/CT has been mainly in the field of oncology with applications including: tumor localization, differential diagnosis, staging and response to treatment, pre-surgical planning, radiation therapy treatment planning, and quantitative SPECT/CT-based internal radionuclide therapy dosimetry/treatment planning. SPECT/CT is also being utilized for cardiac and skeletal imaging and imaging of other non-malignant diseases.

This lecture will review the physics principles underlying SPECT and SPECT/CT imaging, discuss quality assurance of SPECT/CT systems, and present several examples of the clinical application of SPECT/CT.

Educational Objectives:

1. To understand the physics principles underlying SPECT/CT image acquisition, processing and reconstruction
2. To understand the quality assurance procedures specific to hybrid SPECT/CT system
3. To become familiar with clinical applications of SPECT/CT imaging