Cardiac Dedicated Ultrafast SPECT Cameras: New Designs and Medical Physics Implications

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Abstract Myocardial perfusion imaging using nuclear cardiology techniques has been widely used in clinical practice because of its well documented value in the diagnosis and prognosis of coronary artery disease. Recently, industry has developed innovative designs of dedicated solid-state cardiac SPECT cameras that constrain all detector area to imaging just the heart. New software that recovers image resolution and limits image noise has also been implemented. These SPECT innovations are resulting in shorter study time and/or reduced radiation dose to patients, promoting easier scheduling, higher patient satisfaction and, importantly, higher image quality. Implications to the medical physicist working in laboratories using these new hardware and software technologies deal with novel approaches for: acceptance testing, measuring imaging performance, performing quality control, implementing new protocols, and optimizing efficiency while reducing radiation dose. This presentation discusses these new implications to medical physicists and describes the software and hardware innovations for cardiac-centric SPECT imaging which provide a strong foundation for the continued success of myocardial perfusion SPECT imaging.

Objectives:

1. Teach the principles of solid state SPECT imaging
2. Make audience aware of benefits of new imaging hardware and software
3. Make audience aware of medical physics implications of new technology