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Performance Specification for New Equipment Purchases:
CT-Simulators and PET/CT: Sasa Mutic

Imaging equipment for radiation therapy (RT) has undergone significant changes during the past decade. Historically, imaging equipment has been designed almost exclusively for diagnostic radiology. Computed tomography (CT) and positron emission tomography (PET) scanners did not have any features which were specifically indented for imaging of RT patients. These scanners were used for radiation imaging often with modifications and largely were not suited well for the task.

Today, the situation is different and all major scanner manufacturers offer devices which are designed specifically for RT imaging or which have features designed for RT. This paradigm change in how scanner manufacturers view RT imaging needs has resulted in significant increase in imaging equipment choices available to RT departments. The change in scanner manufacturer approach towards RT is mainly driven by the increased need for CT and multimodality imaging (PET, MR, SPECT) in RT. The vast majority of radiation oncology departments have a CT scanner, some have more than one, and many have PET CT scanners. The scanners found in radiation oncology are also no longer predominantly low end models but more commonly state of the art scanners capable of diagnostic quality imaging.

For CT scanners, there are several gantry aperture sizes available with varying number of detector configurations. All manufacturers offer solutions for respiratory correlated imaging. Similarly, PET/CT scanners are indented to be used for RT treatment planning imaging and there are multiple options available on the market for this equipment as well.

Understanding features of CT and PET/CT scanners that are available for RT imaging and selecting the scanner which best suits the needs and workflow of an individual department can significantly affect treatment planning and radiation delivery process. This presentation is designed to address features of CT and PET/CT scanners which are important for RT imaging and which are commercially available. The

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presentation will also address typical needs of individual radiation oncology facilities and how modern CT and PET/CT scanners are meeting these needs.

Educational Objectives:

- 1.) Describe features available on commercial CT scanner (simulators)
- 2.) Describe features available on commercial PET/CT scanners (simulators)
- 3.) Describe how available CT and PET/CT scanner features can meet the needs of modern radiation oncology practice