AbstractID: 4423 Title: Daily Localization II: EPID, MVCT

The Mega-Voltage Cone-Beam CT (MVCBCT) system provides a 3D image of the patient anatomy in the actual treatment position that can be tightly aligned to the planning CT, allowing daily verification and correction of the patient position moments before the dose delivery. Integrated onto a linear accelerator, the system consists of a new a-Si flat panel adapted for MV imaging and a workflow application allowing the automatic acquisition of projection images at low dose rate, CBCT image reconstruction, CT to CBCT image registration and couch position adjustment. Moreover, MVCBCT provides accurate electron density and allows studies of dosimetrical impact of setup error, anatomical changes or presence of implanted metallic objects.

This lecture will provide an overview of the physics characteristics of MV and MV CBCT imaging, acceptance testing and commissioning, acquisition and reconstruction, image registration, alignment precision and quality assurance procedures. An overview of the clinical applications will be provided. Finally, current challenges and future developments will be addressed.

Educational objectives

1. Understand the basics concepts of MV Cone-Beam CT imaging
2. Understand the workflow and issues related to clinical applications of MV CBCT, including acquisition, reconstruction, registration and patient alignment.
3. Understand the possibilities of 3D Imaging for patient alignment

This work was supported by Siemens Oncology Care Systems