

The TomoTherapy system is capable of producing megavoltage computed tomography (MVCT) images using the same beam line components that are used for treatment procedures. Daily MVCT image guidance has become the standard for most TomoTherapy users. Establishing a QA program for image guided procedures is crucial to ensure the proper delivery of complex IMRT treatments. Geometric and image quality tests for MVCT imaging should be included in the QA program to guarantee accurate image guidance of patient positioning. MVCT images are mainly used for alignment of the patient. However, MVCT images can also be used for planning or adaptive planning calculations. MVCT images have been shown to be very useful for adaptive radiation therapy approaches. When used for dosimetric calculations, the imaging QA program should also include proper monitoring of the CT numbers since they can affect dosimetric results.

This lecture will provide an overview of MVCT imaging principles and recommended QA tests. QA procedures for geometric accuracy and image quality of MVCT images will be discussed.

Educational Objectives:

1. Understand the principles of MVCT imaging.
2. Understand the rationale for MVCT imaging QA procedures.
3. Understand the recommended components of a MVCT QA program.