

Parallel introduction of Intensity Modulated Radiation Therapy (IMRT) in the early to mid 1990s, Image Guided Radiation Therapy (IGRT) is an important but problematic new tool for the Radiation Oncology community. The challenges are similar to IMRT in that IGRT is a general classification that covers many different approaches with numerous variations. Where IMRT ranges from tomotherapy to conventional MLC-based dose delivery with many different treatment planning approaches, IGRT covers a broad spectrum of techniques ranging from stereoscopic x-ray imaging with rigid-body registration to cone-beam volume imaging with deformable fusion. Thus, like IMRT, guaranteeing the safe and effective use of this new modality in a clinical trial setting will require procedures that are comprehensive as the ones currently in place for IMRT. As quality assurance techniques are redeveloped for routine clinical use of advanced technologies like IGRT, they must also be appropriately standardized for use in clinical trials.

Image Guidance is defined for RTOG protocols as the steps of obtaining a daily in-room images of the patient in the treatment position, matching or fusing these images to the ones obtained during the treatment planning process, and the procedure of manually or automatically changing the patient's position based on the fusion information. Notice that this description does not consider the patient as a deformable object. Using this simple definition, a number of Radiation Therapy Oncology Group (RTOG) protocols have employed or are including IGRT for targeting the lesion. These protocols require institutions to verify the IGRT methodology through a credentialing process. This process is aimed at guaranteeing that each institution understands the protocol requirements related to the use of their fusion software or manual shift capabilities.

This presentation will discuss the process used by the RTOG to credential institutions for the use of IGRT in their protocols, and it will present the problems and considerations that will have to be addressed as the above definition of IGRT expands to include moving targets and deformable fusion.