

Over a short period of less than a decade, the use of in-room kilovoltage (kV) x-ray imaging for target localization and treatment intervention is becoming common practice in the community. Several distinct systems are commercially available which include rail-track-mounted systems, ceiling/floor-mounted systems and gantry-mounted systems. These systems are developed with different focuses of applications, ranging from the provision of tomographic images for soft tissue guidance to radiographic projection images for intra-fraction verification. These systems have different limitations pertaining to image quality, imaging dose and the validity of the information. The systems also have different levels of operational complexity. The presentation will provide an overview of the challenges of treatment verification, the application principles and performance of the various in-room systems. Requirements for effective utilization of these systems in terms of implementation, quality assurance and clinical applications will be presented.

Educational objectives:

- Understand the challenges for treatment verification
- Understand the configurations and operation principles of different in room kV x-ray imaging systems
- Understand the requirements for effective implementation and quality assurance for IGRT
- Understand the clinical applications and the associated limitations