Radiation usage during fluoroscopically guided interventions can be high enough to warrant careful dosimetry and patient management. Basic compliance with the usual set of local regulatory requirements is sufficient for patient safety in the interventional environments. For example, modern systems meeting all current regulatory dose restrictions are capable of delivering table-top air kerma rates exceeding 200 mGy/min for normal mode fluoroscopy and 1,500 mGy/min for cinefluorography.

Clinical dosimetry during each complex intervention is facilitated by dosimetric instrumentation built into the fluoroscopic system. The Society of Interventional Radiology has published a standard of practice recommending dosimetry for all interventional procedures. In 2008, the ACR published a technical standard for the use of radiation in fluoroscopic procedures. A DICOM Structured Report for detailed reporting of radiation usage in interventional fluoroscopy has been defined, tested and is currently being deployed in clinical systems. The Joint Commission has included fluoroscopic procedures with skin doses exceeding 15 Gy in its list of sentinel events; with the implicit challenge to facilities that they can prove the absence of such occurrences.

This course reviews technical elements for a program of patient fluoroscopic radiation safety.

1. ICRU diagnostic dosimetric quantities and their fluoroscopic extensions
2. Construction, dosimetric features, and performance characteristics of modern fluoroscopes
3. Extended QA protocols for compliance measurements, system characterization and clinical dosimetry.
4. Dose recording and reporting, including DICOM-DOSE
5. The Joint Commission fluoroscopy sentinel event.

Educational objectives

1) Understand dosimetric concepts relating to interventional fluoroscopy
2) Characterize the dosimetric features and performance of a modern fluoroscope
3) Be able to set up a clinical dose recording and reporting policy that will meet clinical and JC requirements.