AbstractID: 9916 Title: Fluoroscopic Dose Measurement and Management

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 may not be sufficient for patient safety. Many of these rules date back to an era in which fluoroscopy was used for simple diagnostic procedures. The X-ray tubes of this earlier era often overloaded and shut down before dangerous doses were delivered. Neither of these suppositions are currently valid. For example, modern systems meeting all 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 FDA now requires such instrumentation in all new fluoroscopes. The Society of Interventional Radiology has published a standard of practice recommending dosimetry for all interventional procedures. The DICOM-DOSE project, a joint initiative of DICOM and the IEC will shortly provide tools for automated dose reporting. 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 needed in a program of patient fluoroscopic radiation safety. Key concepts include:

ICRU diagnostic dosimetric quantities and their fluoroscopic extensions

FDA and IEC compliance measurements

Construction dosimetric features, and performance of modern fluoroscopes

Extended QA protocols for compliance measurements, system characterization and clinical dosimetry.

Dose recording and reporting, including DICOM-DOSE

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.