The patient’s skin and the lens of the eye are the critical tissues for most fluoroscopically guided interventional procedures. Risks include hair loss, skin toxicity, and radiogenic cataracts. Appropriate dosimetric feedback to the operator contributes to optimizing benefit-risk. Ideally, interventional fluoroscopes should provide real-time feedback via a continuously updated dose maps and accurate estimates of peak skin dose. Such technology is not generally available in 2011. However, a variety of real-time and post-procedure tools are currently available for managing fluoroscopic skin irradiation. Equipment conforming to IEC 60601-2-43 (2000, 2010) displays fluoroscopic time, \( P_{KA} \) and \( K_{a,r} \) at the operator’s working position. All fluoroscopes sold in the USA after mid 2006 displays fluoro-time and \( K_{a,r} \). Various film and detector arrays have been used to obtain post-procedure dose maps for more than a decade.

Newer fluoroscopes and third-party dose monitoring systems are beginning to offer useful proprietary dose mapping in angular space (defined by gantry angles) in both real-time and post-procedure flavors. Initial commercial deliveries of the DICOM Radiation Dose Structured Report (RDSR) provide detailed post-procedure procedural information in enough detail to facilitate detailed dose reconstruction. Data in the RDSR is in defined public fields to facilitate accessibility. The relevant DICOM and IEC standards include specifications for real-time streaming of the data. This will facilitate the development of independent real-time dose modeling.

This lecture will review the technologies available in 2011 and will provide an estimate of future time-lines in this area. It will also include a discussion of the use of complete sets of dosimetric data as part of the quality process.

Learning Objectives:

1. Understand the advantages and disadvantages of currently available dose monitoring technologies.

2. Understand the evolution toward real-time skin dose mapping.

3. Understand how standardized dosimetry can be incorporated into a QA program.