

Proper management of patient dose during fluoroscopic procedures should begin when the imaging equipment is selected for purchase and continue on a daily basis until the equipment is removed from service. Equipment features designed to reduce exposure per image, e.g. variable rate pulsed fluoroscopy, spectral beam filtration, automatic brightness control schemes, etc. can significantly reduce patient exposure while maintaining image quality. The physicist must interface with the installer and application specialist to ensure these features are properly installed. Performance measurements by the physicist of entrance exposure to the image receptor and to the patient for all modes of operation across the range of patient sizes to be imaged when the equipment is new and periodically thereafter verify proper calibration. Periodic training sessions required for operators that stress exposure reduction techniques that are both generic and specific to the imaging equipment have a significant impact on patient exposures. A technique, whether direct or indirect, that allows estimates of skin dose for individual cases, e.g. thermoluminescent dosimetry, film dosimetry, MOSFET sensors, Dose-Area-Product meter, CareGraph®, PEMNET®, etc. should be available. This allows the documentation of calculated patient dose and can be used to alter patient doses during a procedure if the feedback to the operator is real time. These topics are discussed for basic to complex applications of fluoroscopy, for patients that range in size from 2 - 100 kilograms, and for conventional vs flat plate image receptors.

Educational Objectives:

1. Review recent advances in equipment technology designed to reduce patient exposures.
2. Discuss the role of the imaging physicist in establishing and maintaining optimized patient exposures per image.
3. Describe appropriate training programs for operators provided by the imaging physicist
4. Review techniques available that lead to estimates of radiation skin dose on individual cases.
5. Apply the above topics to patient exams that vary in both complexity and patient size.