



Fluoroscopy Safety Awareness: High Dose Operator Management

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Physicians, nurses, technologists and others involved in medicine constitute the largest single group of workers occupationally exposed to manmade sources of radiation and medical staff exposures have increased substantially over time [1,2], especially in the last decade or so. Medical staff doses generally track upward as the number of patient cases increases.

According to worldwide estimates, staff involved in fluoroscopy procedures (e.g., interventional radiology or interventional cardiology) receive about two times higher whole body doses than the mean measurable doses in all medical uses [1]. In high volume hospital settings, whole body and lens of eye doses for staff involved in fluoroscopy procedures are significantly higher than the hospital average doses [3].

Staff doses vary by procedure, training, methodology, complexity, patient factors and equipment. Medical practitioners performing fluoroscopically-guided interventional procedures are often required to wear protective aprons and thyroid collars to reduce whole body effective doses. However, they are typically exposed to a relatively high ocular dose, especially when protection tools are not used because in some cases lens doses could be as high as about 1 mSv per procedure [4,5,6,7,8,9]. Increased lens doses may result in increased risk of lens opacification and ultimately cataracts over a working lifetime [9,10].

The use of adequate eye protection is clearly a necessity, especially for high-volume practices [8,10]. Leaded glasses have been shown to reduce lens doses by a factor of about three (or higher), shielded sterile drapes by a factor of ~25 and suspended ceiling shields by a factor of roughly over 100 [11]. Protection controls for staff are outlined well in NCRP Report No. 168 [10] and include engineering, safe work practices, administrative controls, and personal protective equipment and monitoring.

Several guidelines for training in radiation protection and management have been developed by professional societies and should be fully implemented [12,13,14,15]. Managing patient doses ALARA can help to reduce staff doses overall. Several strategies have been developed for both patient and staff

safety in fluoroscopy and should be considered when setting up a new program or auditing and existing practice [16,9,17,18,19,20].

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