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Training for Radiation Protection in Interventional Radiology

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Progress in radiological equipment has incorporated more powerful x-ray sources into the standard Fluoroscopy and CT systems. Expanding use of interventional procedures carries extensive use of fluoroscopy and CT which are both associated with excessive radiation exposure to the patient and personnel. During cases of Intravenous CT Angiography (IVCTA) and direct IntraArterial CT Angiography (IACTA), one may substitute a substantial number of diagnostic angiographies.

Basic training in interventional radiology hardly includes some of the fundamentals of radiation protection. Radiation Protection in Interventional Radiology (RPIR) must be implemented in daily practice and become an integral part of procedure planning strategy in each and every case. Interventional radiologists must master all modern imaging modalities in order to choose the most effective, but least hazardous one. In addition, one must be able to use various imaging techniques (Fluoroscopy, CTA, MRA and US) as a stand-alone method, as well as combine two techniques or more.

Training programs for fellows: PC-based simulation of procedures and radiation protection. Special attention should be taken in the training institutions and a basic training in radiation protection is advised before the trainee is involved in the practical work.

Amendment of techniques for balloon and stent deployment with minimal use of fluoroscopy.

Attention to the differences between radiation protection in cardiovascular and nonvascular radiology with special measures that must be taken for each one of them (i.e., peripheral angiography vs. stenting, Endoluminal Aortic Stent Graft, or nonvascular procedures such as biliary or endourological stenting or biliary intervention).

A special emphasis should be put on the training techniques of Interventional Radiologists, both beginners and experienced.

Patient dose monitoring by maintaining records of fluoroscopic time is better with non-resettable timer, but is optional. Use of automated systems that record Dose-Area Product (DAP) or total skin dose are more reliable. Any new fluoroscopy equipment should integrate a DAP-meter with PC-based automatic recording of procedural dose per radiologist and cumulative dose per patient. A person in charge of radiation protection will review on the monthly basis readings of DAP-meter for each radiologist and take measures if excessive exposures have been used.

Basic principles of radiation protection in Interventional CT will be presented.