AbstractID: 8368 Title: Fluoroscopic Skin Dose Measurements

Fluoroscopically guided *invasive* procedures are an essential part of medicine. Until the late 1980's, most of these were relatively low dose diagnostic procedures. Patient radiation safety issues focused on the risks of stochastic injury. Deterministic effects were rare and usually attributable to malfunctioning equipment. By 1990, radiation induced skin injury became a concern. Initially, attention was focused on malfunctioning equipment and high dose-rate techniques. By the mid 90's the most likely cause was seen to be long procedures conducted at 'normal' dose rates. Evidence for chronic skin injury began to emerge by the end of the second millennium. The irradiation of any particular portion of skin depends on dose rate, irradiation time, and beam geometry. It is not surprising that more inclusive measuring means, in the sense of providing information about the spatial and temporal distribution of absorbed dose, give better dosimetric estimates than do simpler means. A wide selection of skin dose measurement techniques is available. These include TLDs, dosimeters placed on the patient's skin, dose-area-product instrumentation, dose at a reference point instrumentation, as well as film and radiochromic media. The panel will review the physics and technical pros and cons of each of these techniques. Skin dose measurements can provide useful information for patient management. The importance of detailed measurements increases for long and complex procedure. An interventional radiologist will present the viewpoint of the 'consumer' of dosimetry information including a clinical comparison of different techniques. Radiation management is of interest to the public health authorities in all parts of the world. This session will also include presentations of the United States and European regulatory viewpoints on managing fluoroscopic skin dose. Most non-interventional procedures and many interventional procedures do not approach deterministic dose levels. There is little need to monitor individual patients undergoing such procedures. Determining 'typical' doses and assuring appropriate equipment performance achieves adequate radiation monitoring. Radiation risks are accepted when the procedure is ordered and agreed to. Complex interventional procedures may be at the other end of the radiation dose spectrum for reasons including increased imaging time and, perhaps, the need for higher dose-rate imaging. One can anticipate exceeding deterministic injury levels in some of these procedures. In this arena, dosemetry instrumentation facilitates better patient dose management. Clinical dosemetry in the fluoroscopic laboratory is a component of good patient management. One can anticipate continued improvements in technologies available for patient dose estimation. Were appropriate, direct and measurements document the radiological footprint of a procedure. As such, they provide useful information regarding the possible occurrence of an acute injury. Given, that many patients require multiple procedures, this documentation also aids in the planning of return visits. The nature of the measuring tool, and its required accuracy are procedure dependent. There is little need to install elaborate instrumentation on fluoroscopes used only for known low-dose procedures. Advanced techniques using more extensive evaluation tools are indicated for higher dose procedures and susceptible patients. As in most things, a reasonable balance is appropriate.