

**Purpose:**

Patient skin injury due to radiation exposure during interventional fluoroscopy procedures is a concern. The FDA has recommended dose be monitored, along with the dose distribution on the patient's skin. Modern fluoroscopy equipment provides a readout of the accumulated reference point air kerma. However, this parameter is a poor estimate of localized skin dose since it does not take into account beam movement. Acquisition information needed to calculate skin dose can be recorded as a DICOM Dose Structured Report (Dose SR), which has recently become available on new fluoroscopy equipment. We have developed a system that uses the Dose SR to produce a skin dose map, along with determination of the peak skin dose.

**Method and Materials:**

The Dose SR provides data for each irradiation event (fluoroscopy footswitch or acquisition): kerma-area-product, reference point air kerma, C-arm angulation and table position. Using the position of the patient on the table, backscatter and table attenuation, the air kerma to 1-cm<sup>2</sup> regions on the patient's surface is calculated. The patient surface is approximated as a mathematical model using SolidWorks simulation software, with model size varied based on patient parameters.

**Results:**

The method was validated using a Siemens Axiom Artis angiography system. Measurements made with an ionization chamber and lucite phantom were compared to calculated skin dose values for a range of C-arm angles, table positions and exposure levels. Errors ranged from 2-10% with higher errors corresponding to increased C-arm angulation.

**Conclusion:**

A system has been developed to estimate skin dose and generate skin dose maps from an interventional procedure Dose SR. The system allows for a more precise determination of localized skin dose and assists with planning appropriate entry ports for future procedures to minimize skin injury. Application to any vendor platform providing a Dose SR is possible.