# AbstractID: 2685 Title: Skin Entrance Radiation Dose in An Interventional Radiology Procedure

**Purpose:** Monitoring of skin entrance radiation exposure in lengthy interventional procedures with X-ray is recommended because of the potential for skin injury. X-ray on-time and dose-area product (DAP) are readily available real-time measurements. It would be of interest to study the correlation of these parameters and skin entrance radiation.

**Method and Materials:** Twenty interventional procedures performed through the aortic arch to one or more of its three associated major blood vessels were monitored. Two pieces of GafChromic XR Type R film were placed between the patient and the examination table. An observer recorded the X-ray on-time and DAP for each phase of the procedure. Each film was scanned post-procedure in RBG mode, and then the red component of the image was analyzed for peak skin entrance radiation dose (in air kerma) after proper calibration. All DAP values were corrected according to a calibration with an ion chamber. With the corrected DAP values for the respective phases of a procedure, and the Monte Carlo model used by the National Radiological Protection Board (United Kingdom), the effective dose in a standard man was calculated.

**Results:** For these twenty cases, the mean and standard deviation of were 17.2 $\pm$ 6.4 minutes for X-ray on-time, 256 $\pm$ 65 Gy.cm$^2$ for DAP, 94 $\pm$ 34 cGy for peak skin entrance dose in air kerma, and 13.2 $\pm$ 3.1 mSv for effective dose. The peak skin entrance dose was correlated to X-ray on-time, DAP and effective dose with the coefficients of 0.69, 0.68, and 0.49 respectively. The corresponding r-values in linear regression analysis were 0.48, 0.46, and 0.24.

**Conclusion:** The poor correlation with DAP and X-ray on-time suggests that skin dose should be measured independently. However, peak skin entrance dose would be a poor indicator for effective dose. Determination of the latter requires more detail information.