AbstractID: 4953 Title: Analysis of dose-related data logged for fluoroscopic cardiac interventional procedures

Purpose: In response to FDA advisories of the potential for skin injuries from fluoroscopically-guided interventions, logs have been recorded of procedure-related information for all fluoroscopic cardiac studies performed at our hospital. The data includes dose-area product (DAP), estimated entrance-skin dose (ESD), fluoroscopy time, number of digital runs, image-intensifier magnification mode, and patient weight and height as well as procedure type and physician.
Method and Materials: Dose-related data was recorded for over 2000 cardiac catheterization and over 800 electrophysiology procedures. This information was transferred to a database spreadsheet and analyzed to determine distribution shape, range and median values and correlations between factors. ESD values were calculated from DAP readings using the estimated field size at the patient entrance and included backscatter. Fluoroscopy times and dose values are compared by procedure and physician. Those procedures evaluated included percutaneous-coronary interventions (PCI) performed in the catheterization laboratory and radiofrequency ablation (RFA) and biventricular-implantable-cardioverter defibrillator (BIV ICD) placement performed in the electrophysiology lab.
Results: All procedures had a wide range of DAP values, ESD values and fluoroscopy times with distributions skewed toward the lower end. PCI procedures generally had the greatest ranges (216 to 88,971 cGy-cm^2 DAP, 2 to 726 cGy ESD, 1 to 96 minutes fluoroscopy) and the highest median values (16,000 cGy-cm^2, 130 cGy, 20 minutes). There was some correlation demonstrated between DAP values and fluoroscopy time and patient body mass index. ESD values calculated from DAP values had a large uncertainty primarily due to uncertainty in the exposure geometry.
Conclusion: Although an inexact measure of skin exposure during interventional procedures, DAP values provide some guidance in identifying those patients with ESD values potentially above thresholds for deterministic effects. Tracking of this parameter can provide an indicator of when cautionary notes should be placed in the patient's chart for medical observation and followup.