

## AbstractID: 4634 Title: Potential Radiation Guidance Levels for Invasive Cardiology

### **Purpose:**

An International Atomic Energy Coordinated Research Program investigated the feasibility of providing guidance levels for fluoroscopically guided invasive cardiology procedures.

### **Method and Materials:**

A sample of 6,000 cases of coronary angiography (CA), coronary angioplasty (PTCA) or combined CA and PTCA from ten laboratories in four different countries were used for the analysis. Dosimetric and patient demographic data were collected. Intercalibration of kerma area product (KAP) meters and quality control tests were periodically performed. Image quality and skin dose distributions were evaluated in a small sample of procedures. Procedure complexity was evaluated in a subset of 1,000 PTCA cases.

### **Results:**

Classification into three clean categories proved difficult due to the rapid evolution of interventional cardiology and considerable variability in routine clinical practice among the centers. It may be better to categorize cases as either coronary angiography only (DX) or interventional, with a variable CA component (RX).

Median values of KAP (for similar procedures) varied by a factor of three between centers. Complexity has a factor of two influence on KAP. The data suggest that a laboratory can normalize its data by complexity scaling.

Dose inefficient laboratories were identified by noting that the median value of procedures exceeded the third-quartile value for the entire pool. One laboratory exceeded the guidance level because of the use of 25 fps imaging in place of the more common 12.5 fps. Another laboratory, not under routine QA testing, had high fluoroscopic and cinefluorographic dose rates.

### **Conclusion:**

Guidance levels for invasive cardiology appear to be feasible. Suggested KAP guidance levels for a facility performing procedures of moderate complexity are 50 Gy $\text{cm}^2$  for DX and 120 Gy $\text{cm}^2$  for RX. These values should identify dose inefficient laboratories. Guidance for fluoro time and cine frame count is being developed. Further research is needed as clinical procedures and technologies evolve.