

AbstractID: 4724 Title: Estimation of cardiologists radiation doses received during interventional examinations

Purpose:

The aim of this work is to suggest a simple method for the estimation of cardiologist extremity doses.

Method and Materials:

The extremity and effective doses of nine cardiologists working at five different angiographic units were measured for 157 interventional examinations. Simultaneous measurement of patient doses were also carried out using a DAP meter separately for each projection. Fluoroscopy time (T_{fl}), number of radiographic frames (N_{rf}) were recorded on-line during these measurements.. A Rando phantom was exposed at similar projections with patient studies and one minute of fluoroscopic exposure ($DFL_{x,n}$) and one frame of radiographic exposure ($DRN_{x,n}$) were determined for each projection. Scatter radiations from these exposures were also measured at 50, 100 and 150 cm above the floor level at the cardiologist positions for the estimation of legs, wrists and thyroid (or eye) doses. Weighting of projections were determined for the patient group of each cardiologist using the recorded values of T_{fl} and N_{rf}

Extremity doses, D_x were calculated from the following formula:

$$D_x = \sum_n DFL_{x,n} \cdot T_{fl} + \sum_n DRN_{x,n} \cdot N_{rf}$$

n gives the projection number and x is the distance from the floor level.

Results:

Measured and calculated extremity doses for each cardiologist were in good agreement (R= 0.75 for thyroid). The calculated doses for 50cm and 100cm were found within the measured values of left and right legs and wrists. The use of dominant projection data alone still provided comparable results.

Conclusion:

If there is a lack of personal dosimetry for cardiologists, it could be possible to make an estimation of extremity doses from the of total fluoroscopy time and frame numbers used in the examinations together with the knowledge of scatter radiations at cardiologist positions.

Conflict of Interest (only if applicable):