

Maximum and minimum skin exposure using dose-area product measurements: Application to a cardiac catheterization laboratory.

Abstract:

A new method to determine the maximum and minimum skin exposure from dose-area product measurements is presented. These upper and lower limits of skin exposure are very useful for managing health risk from radiation since it is only when the maximum exceeds a certain value that a more rigorous estimation of the skin exposure becomes necessary. First, a calibration of the dose-area product meter was done to yield the variation of the skin exposure per unit dose-area (SE/DAP) as a function of the dose-area per unit mAs (DAP/mAs). Measurements were done in the 50 – 120 kVp range. It was found that the SE/DAP vs- DAP/mAs variation is best described by a sum of two exponential decays. Such a functional form allows one to extract the maximum and minimum SE/DAP for a given kVp independently of the mAs.

The application of this method to monitor skin exposure in a cardiac catheterization laboratory is presented. Very good agreement is found between the maximum and calculated skin exposures (using mAs data) when the average kVp calibration curve is considered.