

E1-21: Experimental determination of an important radiological protection quantity for personal dosimetry

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Experimental determination of individual dose equivalent, $H_p(10)$, for broad parallel beam of photon radiation with energy range of 50 keV to 1,250 keV in Anterior-Posterior geometry was carried out with Rando male phantom made of human tissue equivalent materials, to ascertain precise conversion coefficient for $H_p(10)$.

$H_p(10)$ has been recommended by the International Commission on Radiation Units and Measurements, for practical purpose of radiation protection against external photon radiation. $H_p(10)$ has been defined as dose equivalent in soft human tissues below a specified point on a body at a depth of 10 mm for strongly penetrating radiation.

An alternative method was chosen to measure $H_p(10)$ using the Rando male phantom which closely represent the human body. The Rando phantom, with tissue equivalent BeO (beryllium oxide) TLDs inserted at a depth of 10 mm from the front surface of the phantom, was exposed to a broad unidirectional beam of photon radiation.

Conversion coefficients were calculated and compared with the values reported in ICRP-51. The values were in good agreement in high energy range. A maximum discrepancy of $\approx 14\%$ at energy of $\approx 60\text{keV}$ was observed.