

AbstractID: 4886 Title: The dose area product in radiation therapy- a new concept for the parameterisation of small fields

Purpose:

To establish a new parameterisation of small fields.

Material and Methods:

The traditional parameterisation of a narrow photon field via the central axis dose and the relative transversal dose profile has met considerable methodical complications. These difficulties are to find a sufficiently small detector, to adjust the detector accurately on the axis of the narrow beam and to find a detector material not responding to lateral changes of the electron spectrum within the small field. These obstacles can be avoided by reconsidering the parameterisation of the narrow-field dose distribution. The new parameter recommended for characterising the absolute dose values in a plane perpendicular to the beam axis is the *dose-area product* DAP (the area integral of the dose in this plane). It can be measured with a flat ionisation chamber of large cross section of the sensitive volume.

Results and Conclusions:

The radial adjustment of the large area chamber is by no means critical. The dose-area product provides a simple normalisation of the relative transversal dose distribution which can be measured with radiochromic film. We have investigated the abilities of a large-area flat ionisation chamber of PTW Freiburg (PTW TM 34070-2,5) of 8,1 cm diameter and 2 mm thickness of the sensitive volume to measure the DAP of narrow photon beams with side lengths up to 5 cm. A modified output factor has been defined as the quotient of the DAP, measured at 5 cm phantom depth for SSD 100 cm distance of the phantom, and the monitor reading. Besides the useful feature of the DAP is its direct measurability during patient treatment by means of the DAVID chamber, an on-line monitor arranged in the accessory holder, so that non-negligible deviations of the actual from the chosen field size of narrow photon fields can be immediately detected.