

Evaluation Of The Dosimetric Characteristics Of A Superficial X-Ray Therapy Machine Having Beveled Applicator

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Beveled applicators are used in superficial therapy for treatment of curved areas of the skin such as the forehead. The preliminary evaluation of the dosimetric characteristics of beveled applicator using a 100 kVP superficial therapy unit is presented. The circular beveled applicator used to do the measurements was a 3.6 cm diameter glass end applicator with an SSD of 25 cm and a cross sectional area of 10.2 cm². The output was measured using a R-250 condenser chamber and a Victoreen R-meter for the beveled applicator with straight and tilted setup, i.e., the beam was along the central axis and in an angle with respect to the horizontal, respectively. Measurements were done for surface and for depths 0.5, 1, 2 and 3 cm in water across the cross-section of the applicator for both setups. Film dosimetry was also performed using a Welhoffer film densitometer and isodose distributions were generated for the skin surface. Results of these measurements indicate that using a beveled applicator will change the isodose distribution at the surface and at depth. The dose non-uniformity resulted from inverse square distance for a 30 degree beveled applicator increased from 2% at the surface to 8% at 0.5 cm depth, to 23% at the depth of 1 cm, and to 45% at 1.5 cm depth from the surface. Methods to reduce this dose non-uniformity will be discussed.