

The relative dosimetry profile of a high dose-rate ^{103}Pd applicator was calculated using Monte Carlo analysis. The applicator is being developed by Theragenics Corporation[®] for investigational use in the brachytherapy treatment of Age-Related Macular Degeneration (ARMD) and ocular tumors. The reference dosimetry point was defined along the axial centerline of the device at a depth of 10 mm in water and is based on Thermoluminescent Dosimeter (TLD) measurements conducted by NIST. The reference dosimetry evaluation is presented elsewhere. The relative dosimetry was evaluated by performing Monte Carlo calculations using MCNP4C. The source was modeled in its as-built condition and surrounded by a 30-cm water sphere. The source design includes a cylindrical stainless steel holder which contains the ^{103}Pd . The active portion of the device has an outer diameter of 8.0-mm. The holder is designed to minimize the photon transport to locations peripheral and posterior to the device. The dose to water was calculated using surface fluence detectors at axial distances ranging from $z=0$ to 20-mm and radial distances from $r=0$ to 20-mm. Therefore, the tally points represent an idealized, infinitesimally thin detector. The results from this modeling are used to calculate a 2-dimensional representation of the isodose contours and an "Along-and-Away" table.

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