# AbstractID: 1403 Title: Dosimetric characteristics of a new RadioMed® 103Pd wire line source for use in permanent brachytherapy implants

Recently, a novel linear brachytherapy source in the form of a coiled wire has become available for use in interstitial implants of various treatment sites, such as prostate cancer. This source type employs a design which is completely different from that of most "seed" sources currently on the market, and can improve upon or eliminate several common problems with "seed" implants, such as seed migration and low ultrasonic visibility. Dosimetric characteristics of these sources with active lengths of 0.5 cm to 5.0 cm were determined for clinical applications. For 0.5 cm and 1.0 cm active length sources, dose rate constant, radial dose function, anisotropy function, and anisotropy constant were experimentally and theoretically determined following AAPM Task Group 43 (TG-43) recommendations. Measurements were performed with LiF thermoluminescent dosimeters in Solid Water™ phantoms, and calculations were performed in Solid Water™ and water using the MCNP4c2 Monte Carlo code. Dose rate constants and relative dose rate distributions in matrix forms were also obtained for active lengths 2.0 cm to 5.0 cm. The results of these investigations indicated that the measured and calculated dose rate constants, $\Lambda$, of the new 0.5 cm length $^{103}$Pd source in Solid Water™ were 0.641 $cGyhr^{-1}U^{-1}$ and 0.636 $cGyhr^{-1}U^{-1}$, respectively. The calculated $\Lambda$ for liquid water was found to be 0.650 cGy/hr/U, which is comparable to other commercially available $^{103}$Pd seeds. Complete dosimetric data and simulation results are described in this paper.
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