New source designs of encapsulated low-energy gamma emitting isotopes for permanent implant require full dosimetric analysis and calibration standardization before responsible clinical application. The results of such experimental measurement and analysis are reported for a new ^{103}Palladium source, model MED3633, for liquid water medium in accord with AAMP Task Group #43 recommendations. Dose measurements used standard methods employing thermoluminscent dosimeters in a water equivalent plastic phantom. Precision machined bores in the phantom located dosimeters and source(s) in reproducible fixed geometry providing transverse-axis and angular dose profiles over a range of distances from 0.17 to 7 cm. The dose-rate constant, Λ, was evaluated with reference to a ^{60}Cobalt standard, accounting for response variation with isotope energy spectrum. The radial dose function, g(r), anisotropy function, F(r,θ), anisotropy factor, $\phi_{an}(r)$, and anisotropy constant, $\bar{\phi}_{an}$, were derived from dose distribution data measured in the phantom, accounting for finite dosimeter volume and inter-chip effects. The results are compared to TG43 data for ^{103}Pd sources. The new source demonstrates a radial dose function, g(r), that is equivalent to that of the model 200 ^{103}Pd source design. The MED3633 source appears more isotropic than the model 200 source. The dose-rate constant, Λ=0.70, of the MED3633 source with NIST strength calibration, while that of the model 200 source is 0.74, using the manufacturer's strength calibration. A true comparison would require the same calibration standard.

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