New source designs of encapsulated low-energy gamma emitting isotopes for permanent implant require full dosimetric analysis and calibration standardization before responsible clinical application. Part of such an effort is direct dosimetry measurement in phantoms and part is functional analysis of the measured data. Fitting procedures smooth noisy raw data and provide credible values near to and far from the source, outside the scope of measured data. A strength of fitting functions is in their use as interpolation and extrapolation functions in treatment planning systems either directly or through the pre-computation of look-up tables.

In this report, we present an analysis of measured dosimetry data for three brachytherapy sources recently available from North American Scientific, Inc.: ^{125}I (IoGold) source models MED3631-A/S and MED3631-A/M and ^{103}Pd (PdGold) source model MED3633. For each source design, the radial dose function, g(r), the anisotropy function, $F(r,\theta)$, and the anisotropy factor, $\phi_{an}(r)$, were evaluated. Fitting functions used in this analysis are identical to those used in similar analysis[1] of TG43 Iodine and Palladium compendium data[2] and derive from the formalism of the Interstitial Collaborative Working Group (ICWG). The forms of the fitting functions were chosen to approach reasonable values at data limits[1]. Fitting parameter results for each function are provided for each brachytherapy source model. Fit error was significantly less than measurement uncertainty, meaning that incorporation into treatment planning systems should not introduce significant errors in clinical use.

(1) Medical Physics **26**, 153-160 (1999). (2) Medical Physics **22**, 209-234 (1995).