

Abstract:

Clinically relevant dosimetric measurements to characterize a new ^{125}I source were performed. Measurements were made in phantom using TLD rods. The NIST traceable air kerma strength, S_k , of the source was used in determining the dose-rate constant, Λ . Reference TLD calibration for the absolute dosimetry was made using a calibrated ^{60}Co teletherapy beam. Analysis was made with the results represented in terms of the AAPM Task Group #43 parameters. Based on this study, the new source compares favorably with other commercially available ^{125}I source(s). A comparison of the radial dose distribution is made between liquid water and a tissue equivalent material for the ^{125}I energy range. Tabular data evaluated in liquid water suitable for incorporation into treatment planning system(s) are provided for the dose-rate constant, Λ , the radial dose function, $g(r)$, the anisotropy function, $F(r,\theta)$, the anisotropy factor, $\phi_{\text{an}}(r)$, the point-source approximation anisotropy constant, $\bar{\phi}_{\text{an}}$, and the point-source average dose-rate times the square of distance for unit air kerma strength, $r^2 \cdot D(r)$.

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