

AbstractID: 1283 Title: Comparison of ¹⁰³Pd and ¹²⁵I Dose to Eye Structures during Treatment of Ocular Tumors or Age Related Macular Degeneration

The Monte Carlo code MCNP4C was used to construct a geometric model of select eye structures for dose calculations. Dose to these structures in the eye are calculated based on dose treatment points at distances of 0.2 to 0.5 cm from the inner sclera with the source location remaining in a fixed location in the posterior portion of the eye adjacent to the optic nerve. Based on the calculated dose rates, the dose calculations performed for structures in the eye can be applied to ocular melanoma cases where a prescription dose is given to a tumor apex between 0.2 and 0.5 cm or to age related macular degeneration cases assuming a prescription dose point between 0.2 and 0.3 cm. The source geometry configuration for both cases is identical except for the isotope specified. For eye structures beyond the prescription point, dose sparing is seen for Pd-103 over I-125 due to the steeper dose fall-off associated with the lower energy photons. For a dose point 2-mm from the inner sclera, the dose sparing from Pd-103 versus I-125 for the optic nerve was 28% and for the lens was 90%. In addition, a detailed dose profile from the source was calculated onto which a representation of the eye structure can be superimposed. The isodose lines for each dose point were calculated based on the calculated dose rates. Comparison to similar calculations performed using Plaque Simulator software by Bebig showed expected results.

Theragenics Corporation® has funded this research.