

AbstractID: 2034 Title: Treatment planning considerations and techniques for the new RadioMed[®] 103Pd coiled wire linear brachytherapy source

The novel design of the ¹⁰³Pd linear source from RadioMed[®] is provided as an alternative to seed-type sources for prostate implants. This source was designed to eliminate the shortcomings of loose seed implants, such as seed migration and seed clumping that creates under- and over-treated regions within the prostate gland. In this project, applications of the new RadioMed[®] source in available treatment planning systems have been investigated. Dosimetric data were input into both the Prowess and VariSeed 7.1 planning systems. During calculations, the continuous length of the source was approximated with trains of either point sources or linear sources. This project examined the use of 0.5 cm and 1.0 cm ¹⁰³Pd line source dosimetry to approximate the dose distribution of longer sources. Dose distributions calculated by the planning software using these approximations are compared to the dosimetric data obtained by Monte Carlo calculation. The results indicated an excellent agreement between the Monte Carlo and treatment planning system calculations with the linear source approximation, but the point source approximation was found to have overestimated the dose distribution at shorter distances. In addition to inputting the basic source information into the software for proper use of this source, attention must also be paid to the planning technique. The required source activities per centimeter are related to the loading scheme and prescribed dose. Detailed information regarding the available planning systems as well as possible modifications for improvement will be discussed. This work was supported by the U.S Army Medical Research under DAMD 17-02-1-0242.