

Currently, prostate brachytherapy is enjoying a revival following a careful review of the outcomes of this approach compared with surgery. All prostate brachytherapy procedures inevitably deliver significant absorbed doses to adjacent tissues such as the urinary bladder wall, rectum and testes. The objective of this study was to provide a comparison of absorbed dose estimates to organs other than the prostate from brachytherapy with Pd-103, I-125 and Ir-192. The activity of the respective sources were assumed to be 150 mCi, 45 mCi and 5 Ci, and the prescribed prostate therapy dose for each procedure was 115 Gy, 160 Gy and 18 Gy respectively. No optimization routines were assumed for treatment planning and changes in the photon spectrum in each source from containment were not considered for this study. The residence time for Pd-103 and I-125 were calculated for total decay of these permanent implants. Ir-192, was assumed to remain in the prostate for 15 minutes (5 minutes per fraction). Individual organ S values for each procedure were calculated assuming the prostate to be a 16 g hemi-ellipsoid source organ in the pelvis of the standard man phantom model. The average absorbed dose to the whole body, and 23 organs were calculated for each procedure and also normalized to the respective prescribed prostate dose. The absorbed dose estimate for the testes and urinary bladder wall were found to be highest for I-125 and lowest for Pd-103. This information could be used in retrospective analysis of toxicity/outcomes for these brachytherapy options.