

Abstract ID: 9498 Title: Dosimetric Comparison of ^{131}Cs -131 to ^{125}I -125 for Treatment of Ocular Melanoma

Purpose: To determine the conditions where it is advantageous to use ^{131}Cs as an alternative to ^{125}I in the brachytherapy treatment of ocular melanoma. **Method and Materials:** The dosimetry of nine previously treated patient plans was evaluated comparing ^{125}I seeds and ^{131}Cs seeds in identical configurations of standard eye plaques. Calculations were performed following the TG43 protocol in ADAC Pinnacle Treatment Planning Software. The resulting doses to prescription point and other structures were compared for the same plan using the two different isotopes. In addition, comparisons using ^{131}Cs were performed so that a prescribed dose of 85 Gy was achieved, first by adjusting the source strength and second by adjusting the treatment time. ^{131}Cs plans were also created for a dose range of 60–95 Gy to determine optimal conditions where ^{131}Cs may provide a dosimetric advantage compared to ^{125}I . **Results:** 12% reduction in prescribed dose to the tumor observed for the same ^{125}I seed is replaced by ^{131}Cs seed with identical air kerma strengths. Other points of interest show a reduction in dose from 6 to 13%. An average increase of 14% for the ^{131}Cs source strength results in a dose increase of 10% for the prescription point of interest. An average increase of 15% in treatment time results in a dose increase of 10% for the prescription point of interest. Equivalent doses were found for risks to structures when 70–75 Gy for ^{131}Cs was used. Doses below 75 Gy demonstrate reduced dose to critical structures. **Conclusion:** For given prescription dose at the tumor apex, ^{131}Cs delivers greater dose to critical structures. Use of ^{131}Cs as a source for ocular melanoma may provide a dosimetric advantage for at-risk structures if the biological equivalent dose is found to be 75 Gy or less.