Purpose: Recently introduced I-125 Model 9011 ThinSeed has a smaller diameter but similar brachytherapy dosimetry parameters to the Model 6711 seed (both seeds, Oncura-GE Healthcare, Arlington Heights, IL). Thorough testing is essential prior to introducing the 9011 seed into routine clinical practice. This treatment planning study evaluates the dosimetry differences between the Model 9011 and the Model 6711 I-125 seeds.

Methods: Twenty-five patients recently treated were selected for this treatment planning study. Four treatment plans were generated using an identical seed configuration to the 6711 clinical treatment plan. The plans generated were: (a) Model 6711 seeds (0.391 mCi/seed); (b) Model 9011 seeds (0.391 mCi/seed); (c) Model 9011 seed +5% enhanced activity (0.411 mCi/seed) and (d) Model 9011 seed +10% enhanced activity (0.430 mCi/seed). The prescribed dose was 145 Gy for all patients. The typical dose parameters such as prostate V100, V150, V200, D90, rectal V100, etc. were evaluated.

Results: The mean prostate volume was 36.9 ± 9.1 cc and the mean number of planned sources was 86 ± 13seeds. The following mean dose parameters were obtained for the various plans:
Prostate V100 (a) 99.9% (b) 99.8% (c) 99.9% (d) 100%; Prostate V150 (a) 64.2% (b) 53.6% (c) 63.1% (d) 71.8%; Prostate V200 (a) 21.7% (b) 18.3% (c) 21.7% (d) 25.5%; Prostate D90 (a) 130.5% (b) 123.6% (c) 129.9% (d) 135.8%; Urethra D30 (a) 142.2% (b) 135.3% (c) 142.1% (d) 148.7% and Rectum V100 (a) 0.5 cc (b) 0.3 cc (c) 0.5 cc (d) 0.74 cc.

Conclusions: Using an identical seed configuration and activity to the existing 6711 I-125 seeds, the 9011 I-125 seeds achieves a similar prostate coverage with lower prostate V150%, V200%, urethra and rectal dose parameters. By increasing the 9011 activity per seed by 5%, results in a similar dose distribution and dose parameters as the 6711 treatment plan.