

To improve accuracy and consistency in low dose rate interstitial brachytherapy, the AAPM introduced the TG-43 protocol. The values for dosimetry parameters given in TG-43 are based on measurements in water rather than in air, as it was in the old protocol.

Our dosimetry evaluation for I-125 prostate implants was initially based on the old protocol. Subsequently, the TG-43 dosimetry parameters were implemented. We analyzed how the new dosimetric parameters translate into the values for target coverage and dose to critical structures.

We performed dosimetry following transperineal, ultrasound guided I-125 prostate brachytherapy using both the protocols in 50 patients. The median values for the old and new protocols, respectively were: [1] 100% target coverage dose: 58 Gy (range 27-136) Vs 47 Gy (range 21-118), [2] 90% target coverage dose: 110 Gy (range 59-205) Vs 97 Gy (range 45-183), [3] 80% target coverage dose: 139 Gy (range 74-244) Vs 123 Gy (range 60 - 216), [4] Mean urethral dose: 267 Gy (range 73 - 668 Gy) Vs 250 Gy (64.4 - 663), [5] Rectal dose: 204 Gy (range 68 - 510 Gy) Vs 189 Gy (range 61 - 476).

An important observation was that while, in general, doses per the new protocol were lower, there wasn't a constant factor applicable to different target or normal tissue doses, even within the same patient. This variation appeared to be a function of the actual seed distribution, and unlike what is seen with a symmetrical seed distribution.