

THE ROLE OF A NEEDLE MANIPULATOR/RULER IN I¹²⁵/PD¹⁰³

PRELOADED NEEDLE IMPLANTS OF THE PROSTATE

Kristin Janson BS, Brian J. Moran, MD, Michael Raslowsky BS & Michael Stutz, MD

Chicago Prostate Cancer Center, Westmont IL

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Purpose: We have customized a 15cm stainless steel (S.S.) ruler with 3 separate directional notches at the 0cm end (Figure 1). These directional notches allow for manipulation of the prostate brachytherapy needles between the ultrasound template and the perineum (Figure 2). This study shows that this method of manipulation greatly reduces radiation exposure to the brachytherapist's finger compared to manual manipulation.

Materials/Methods: I¹²⁵ and Pd¹⁰³ seeds were preloaded into 18Gx20cm brachytherapy needles. Exposure rates of the 3-6 seed needles were measured at the middle of the active length using a Victoreen 450B Dosimeter Survey Meter. Readings were taken at the needle surface and then at a distance 12cm perpendicular to the same location of the needle. A right angle was employed to ensure a perpendicular orientation of the needle to the survey meter. All rate measurements were obtained at a minimum duration of one minute.

Results:

Table 1. Exposure rates for Pd¹⁰³.

Palladium-103 (1.4mCi/seed)		
Number of Seeds/ Needle	Needle Surface (mR/h)	12cm from Needle Surface (mR/h)
3	22	2.3
4	29	2.6
5	36	3.4
6	40	4.0

Table 2. Exposure rates for I¹²⁵.

Iodine-125 (0.333mCi/seed)		
Number of Seeds/ Needle	Needle Surface (mR/h)	12cm from Needle Surface (mR/h)
3	14.1	0.71
4	21	1.3
5	23	2.0
6	27	2.2

Conclusion: Use of a 15cm S.S. ruler with 3 separate directional notches at the 0cm end allows for the accurate manipulation of prostate brachytherapy needles while reducing exposure rates by approximately 10-fold to the brachytherapist's index finger.

Figure 1. Stainless steel ruler with 3 directional notches.



Figure 2. Using the directional notches to steer a needle.

