Automated seed loaders for permanent prostate implants are now commercially available. Besides improved radiation safety, these systems offer seed assay capability and ease of needle loading, making pre-planned as well as intra-operative implant procedures more time-efficient. The Isoloader (Mentor Corporation, CA) uses individual $^{125}$I seeds (SL-125 ProstaSeed) loaded in up to 199 chambers inside a shielded cartridge. The unit performs seed counting and calibration using a built-in solid-state detector.

In order to evaluate the reproducibility and accuracy of the calibration process, two test cartridges were measured with Isoloader itself and compared with a well-type ionization chamber (HDR-1000Plus, Standard Imaging). The first cartridge had 90 seeds with 0.23U/seed (test#1); the second, 69 seeds with 0.59U/seed (test#2). All the seeds from both cartridges were measured 7-10 times using the Isoloader. Four seeds from each cartridge were assayed intensively using both the Isoloader and the well chamber (100-200 times/seed).

The measured air kerma strength for all seeds from the Isoloader had a standard deviation 2.8% for test#1 and 2.6% for test#2, including 2.4% due to seed activity fluctuation associated with manufacturing and 1.5%(test#1) and 1.1%(test#2) due to measuring reproducibility. For the intensively measured seeds, the measuring reproducibility of Isoloader and the well chamber were 0.8-2.8% and 0.6-1.1%, respectively. The variation in the Isoloader calibration is attributed to small detector solid angle, bead instability within seed-capsule (verified by radiographs) and non-uniform radioactivity coating of beads. The standard deviation of the Isoloader was comparable to that of the well chamber and clinically acceptable.