Purpose: The limitations of pre-planned prostate brachytherapy seed implantation can be overcome by intraoperative re-planning in the OR. Main purpose of this report is to compare geometric parameters between pre-planned and OR-planned procedures regarding changes in prostate volume/shape, number of seeds/needles and total activity, to address prostate volume/shape changes observed in the OR when the patient is under anesthesia and to present post-implant dosimetric results.

Methods and materials: In 33 clinical 125I cases, ultra-sound (US) volume studies and plans were performed for both preplanning and in the OR just before seed implantation. Changes in volume/shape and number of seeds/needles used were compared between the two data-sets and patient received brachytherapy treatment using the OR plan. For each patient, D90 and V100 were obtained from day one post-implant CT dosimetry.

Results: The mean US volume change observed between pre-plans and OR-plans was (5.3 Å± 4.4)cc, with a maximum of 20cc. Change in the number of seeds between the plans were (8.9 Å± 5.7) on an average and showed excellent correlation with prostate volume change. The number of needles remains relatively unchanged. The average total-activity changed was (2.7 Å± 1.6)mCi, with a maximum of 7mCi. Prostate shape changes (in terms of no. of seeds changed) in the OR was seen mainly in the anterior aspect of prostate. The average D90 and V100 were (90.3 Å± 4.6)Gy and (148.7 Å± 16.6)% of the prescription dose, respectively.

Summary and Discussion: Significant variations of prostate volume changes between pre-planned and the OR-planned implants were observed in many cases. Largest change in the no. of seeds was due to change in shape of the prostate in its anterior aspect clearly shows the effect of pelvic muscle relaxation and patient re-positioning in the OR. This supports the argument in favor of performing intraoperative re-planning and implant-dosimetry.