Dosimetric Characteristics of Temporary Prostate Implants Using Low and High Activity Iridium-192 Sources. Since November 1996 over 300 prostate cancer patients received Ir-192 temporary brachytherapy. Before January 1998 low dose rate (LDR) techniques were used and since then a high dose rate (HDR) remote afterloader was used to deliver the treatment. The transperineal implants were done under ultrasound and fluoroscopic guidance using a Syed template. For the LDR implants, seeds of two activities, 0.43 and 0.13 mgRaEq were used with only one seed activity per ribbon. Differential seed spacing (dumbbell loading) was used for selected ribbons in order to provide adequate coverage at the prostatic base and apex. For the HDR implants, optimal dose distribution was obtained by geometric optimization and by manually adjusting the dwell times. For both the LDR and HDR implants, the entire peripheral zone routinely received 120% of the prescribed dose. The dose homogeneity index was 0.77±0.02. With the flexibility of the HDR treatment planning, dose to critical structures were better controlled. Maximum doses to a rectal marker, urethra, and bladder were 47±12%, 109±1%, and 71±19%, respectively, for the HDR implants, as compared to 64±11%, 109±7%, and 78±15% for the LDR implants. By fine-tuning the treatment margins HDR technique also reduced the normal tissue volume being irradiated. With appropriate differential source loading in LDR brachytherapy, Ir-192 temporary implant can be done safely and effectively with both HDR and LDR techniques.