

AbstractID: 10539 Title: Evaluation of Inverse Planning Dose Optimization for HDR brachytherapy in Treatment of Cervical Cancer

**Purpose:** We investigated the differences between geometrical optimization and inverse planning simulated annealing (IPSA) for the treatment of cervical cancer.

**Methods and Materials:** Patients were selected and two optimization plans for each patient were generated with geometrical optimization and IPSA. The clinic target volume and critical organs were contoured using Oncentra MasterPlan Version 3.1 (Nucletron Corp., Veenendaal, The Netherlands). For each patient, the dose constraints and optimization parameters were set to meet clinic goal for all plans. The dose volume histograms (DVH) of target and critical organs were generated for comparison.

**Results:** We found that IPSA significantly improved the target dose homogeneity compared with geometrical optimization. For the tumors adjacent to critical structures, IPSA dramatically spared the volume of the critical structures to be irradiated.

**Conclusions:** IPSA is superior over geometrical optimization in terms of target coverage and minimizing normal structures irradiated.