

## AbstractID: 5558 Title: Treatment planning study of prostate cancer IMRT with a flattening filter free accelerator

**Purpose:** IMRT is a common treatment modality for prostate radiotherapy. With IMRT, the optimization of the fluence map renders the flattening filter unnecessary. Flattening-filter free therapy for IMRT has been investigated recently, but clinical evaluations have not been conducted. In this study we compare IMRT treatment plans for prostate therapy generated with and without a flattening filter.

**Methods and Materials:** IMRT plans were generated at 6MV for 4 early stage prostate patients using clinical dose prescriptions. Plans were generated with Eclipse 8.0 (Varian Medical Systems), which we commissioned with beam data measured on a Clinac 21EX operated with and without the flattening filter. For each patient two plans were generated, one with and one without the flattening filter. The plan DVHs were normalized so 98% of the PTV received 75.6 Gy.

**Results:** Plans using the unflattened beam required 2 times fewer monitor units (on average) than plans using the flattened beam. Treatment plans using the unflattened beam had more homogeneous PTV coverage. The average maximum dose was 81.0 (0.6) Gy for the unflattened beam and 84.2 (0.6) Gy for the flattened beam. The average minimum dose was 70.5 (0.8) Gy for the unflattened beam and 71.2 (0.8) Gy for the flattened beam. DVHs showed nearly identical doses to critical structures between flattened and unflattened treatments.

**Conclusion:** Clinically acceptable IMRT plans for prostate cancer can be developed with unflattened beams. They require substantially fewer monitor units than comparable treatments with conventional flattened beams while generating more homogenous PTV coverage.

**Conflict of Interest:** Research sponsored by Varian Medical Systems.