

## **Generic inverse treatment planning of few-field intensity-modulated boost treatments of prostate cancer**

In our clinic, conformal prostate boost treatments are delivered by a three-field technique, which employs custom-made shields and physical modifiers. In order to decrease the departmental workload involved in the planning, preparation and delivery of such treatments, we have been exploring the possibility of replacing the current technique by a similar one based on the use of intensity-modulated beams delivered by multiple MLC fields. Such an approach requires routine use of inverse treatment planning (ITP), a process which involves the tuning of several parameters. However, we have demonstrated that a single optimal set of these parameters produces consistent and clinically acceptable plans for prostate boosts. Using the forward planning (FP) beam geometries we replanned fifteen patients with ITP. A single set of dose/weight parameters was used. Compared to FP, the ITP provided better target coverage and consistently reduced the average doses to the rectum and the bladder by, on average, 2 Gy for a prescription target dose of 25.2 Gy. The ITP resulted in "Hot Spots" in the PTV but the dose values of these "Hot Spots" were generally within the ICRU 50 limit (+7% of the prescription dose). Our study shows that generic ITP planning of three-field boost in the course of the radiation therapy of prostate cancer is feasible. Generic ITP can provide the basis for routine IMRT, which, once commissioned, can significantly reduce the departmental workload involved in the treatment of prostate cancer.