AbstractID: 1781 Title: IMRT: The Devil is in the Details

Intensity Modulated Radiation Therapy (IMRT) has the reputation of being a 'super-treatment', able to generate treatment plans which escalate dose to target volumes and decrease dose to critical structures with mimimal effort. While robust optimization algorithms are often able to overcome restrictive dose objectives, poor attention to planning details can compromise final dose distributions. Consequently, structure contouring and beam placement are as important as appropriate prescriptions and planning objectives. Physically impossible dose objectives, such as those that require dose infinite gradients between targets and overlapping critical organs, decrease target dose homogeneity. Target contours drawn in dose buildup areas may cause skin and other normal anatomy dose tolerances to be exceeded as the buildup region dose is increased to meet minimum dose goals for the target. This can lead to solutions such that small setup errors can lead to unintended hot spots; bolus can be beneficial in such situations. The number of independent beamlets available to the optimizer can be maximized by avoiding the use of parallel opposed beams. Couch and gantry rotations may help minimize the amount of healthy tissue traversed by radiation. IMRT grants clinicians a high degree of control over dose distributions. With this enhanced control comes a responsibility to understand how these and other parameters (such as inhomogeneity correction, an iterative approach to optimizing, and using appropriate discretization parameters when segmenting intensity maps), affect the final treatment plan. We will show how accounting for these parameters will improve IMRT treatment plans.

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