

Prowess is the first planning system that has implemented an IMRT planning approach that simultaneously optimizes aperture shapes and aperture weights for step-and-shoot IMRT. This inverse planning technique, called Direct Aperture Optimization (DAO) directly incorporates all of the multileaf collimator constraints into the optimization. The need for leaf-sequencing is thus eliminated. In addition, the system provides real-time tuning whereby the optimization parameters can be adjusted during the optimization. This inverse planning system has been implemented clinically at the University of Maryland School of Medicine. The key advantage of this approach is the efficiency of the optimized plans. Results demonstrate that for most IMRT patients, only five apertures per beam direction are necessary to produce a high quality IMRT plan. Consequently, all patients can be treated in a traditional fifteen minute time slot. Clinical results will be presented.

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