Eclipse™ Treatment Planning System

Eclipse Interactive IMRT Planning

Powerful 3D conformal planning tools in Eclipse are combined with interactive dose-volume optimization for fast, flexible, and accurate intensity-modulated radiation therapy (IMRT) planning. Clinicians can make real-time decisions using the interactive IMRT features in Eclipse. With thousands of patients at hundreds of institutions worldwide successfully treated with IMRT plans generated by Eclipse, it is an established solution for IMRT planning.

Rapid IMRT Plan Setup

Eclipse has comprehensive clinical protocol templates that speed the planning process. These templates pre-populate all of the planning parameters based upon the physician's intent, including structures, field arrangements, optimization criteria, and even output formatting. With clinical protocol templates, clinicians can create class solutions for IMRT that can be easily individualized for the needs of each patient through interactive optimization. Easy transfer between institutions simplifies the sharing of clinical experience and the adoption of IMRT.

The complexity of IMRT demands the segmentation of many organs at risk and accurate delineation of target volumes. Powerful tools in Eclipse such as enhanced structure templates, advanced contouring tools, automatic segmentation, structure post-processing, and flexible screen layouts, reduce segmentation time from hours to minutes.

Clinical Flexibility

With the flexibility of Eclipse, clinicians can rapidly customize treatment plans for individual patients. Eclipse can incorporate the base dose from an existing treatment plan to optimize IMRT boosts or to adapt the plan based upon the treatment already delivered. By accounting for these base dose distributions, the clinician can combine IMRT with conventional photon, electron, proton, or brachytherapy plans. Eclipse automatically splits the fields for large field IMRT. For lateral fields in head and neck treatments, the jaws can be locked to decrease the dose given to shoulders. Planning for non-coplanar beams and multiple targets simplifies even the most complex cases.
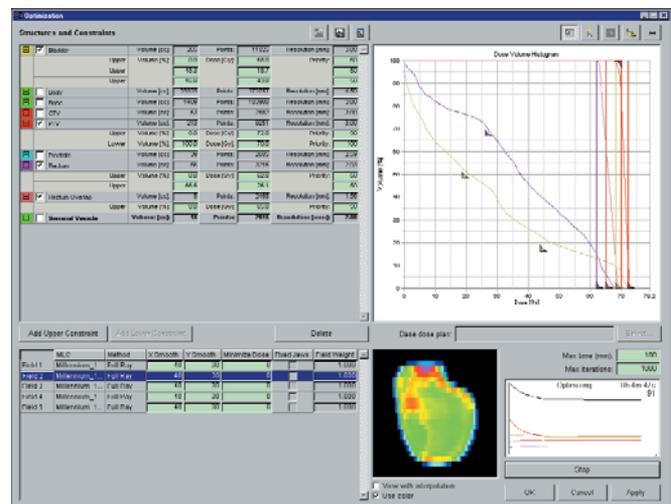
The user interface updates optimization information with each iteration so the clinician can interactively modify parameters based on real-time feedback.
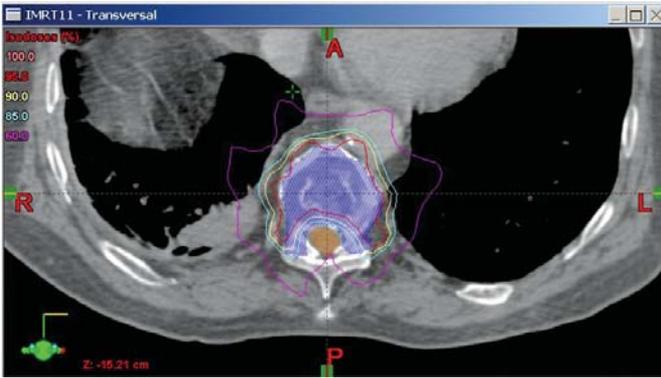
Interactive Optimization

Eclipse uses a very fast optimization algorithm to converge rapidly to a good plan. While the plan evolves, the clinician can see real-time updates to the dose-volume histogram (DVH), objective function, and fluence matrices. The best plan can be created quickly by interactively modifying the dose constraints during optimization. The first plan is the right one every time with the Normal Tissue Constraint, which removes the need for "tuning" structures. The clinician can restart any previous optimization from where it ended, even using different image sets, to efficiently adapt treatment plans during the course of treatment.

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Accurate Dose Calculation

During each iteration of the optimization, Eclipse's fast algorithm accurately calculates dose to the entire volume, including bolus, while accounting fully for scatter and heterogeneities. DVH curves displayed during optimization match the results for the final dose calculation.
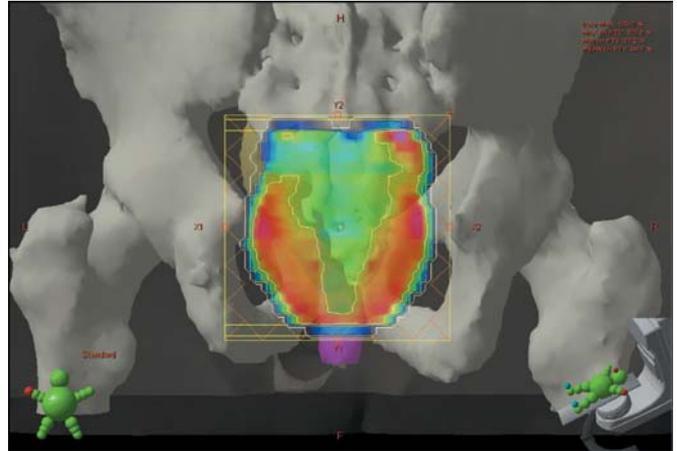
The leaf motion calculator (LMC) converts optimal fluence to a deliverable leaf motion sequence and fluence while reducing treatment time and monitor units. The LMC incorporates the physical limitations, leakage, and dosimetric effects of the multileaf collimator into the leaf sequence calculation.

Fluence matrix displayed in the beam's eye view (BEV) highlights the correlation with the underlying patient anatomy.

Eclipse IMRT plan shows good sparing around the spinal cord.

Delivery Efficiency

Sliding window IMRT deliveries for Varian C-Series Clinac® linear accelerators and multiple static segment treatments for Varian, Siemens, Elekta, Mitsubishi, and General Electric accelerators can be calculated in Eclipse. High-resolution IMRT treatments planned on Eclipse can be delivered in a normal 15-minute time slot on a Varian Clinac.
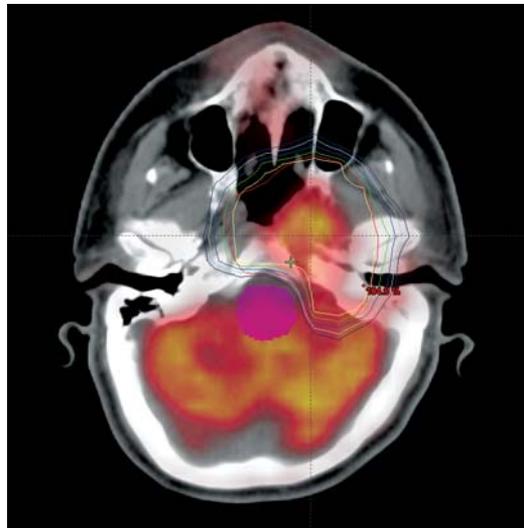
Efficient Plan Verification and QA

Eclipse can calculate QA dose distributions for pre-treatment plan verification on either QA phantoms or the PortalVision™ MV imaging system. Comparing the resulting dose distributions with point dose measurements, film dosimetry, and PortalVision dosimetric images, greatly reduces the QA time required for IMRT pre-treatment verification. With extensive support of the DICOM RT standard, the clinician can export all pertinent plan information from Eclipse to independent monitor unit calculation programs or verification devices, and for clinical protocol studies.

IMRT dose distribution on a fused CT/PET image shows brain stem sparing.