RayStation

ONE SYSTEM ENDLESS POSSIBILITIES

RayStation* optimizes for all treatment techniques, with robust algorithms that account for density and patient setup uncertainties. RayStation's ultrafast multi-purpose optimization engine can solve virtually any optimization problem within radiation therapy, using many degrees of freedom of the treatment unit.

System Highlights

>> First TPS with true Machine Learning automated planning and Deep Learning organ segmentation.

>> Automation built throughout the entire platform with templates, scripting, protocols and more.

>> Unprecedented speed in both dose calculation and optimization due to utilization of the GPU.

>> Plan for all linacs including Tomotherapy machines and most proton delivery systems.

>> Extensive tools and views for Robust optimization and Robust evaluation

>> Monte Carlo dose calculation for electrons, photons and protons.

>> Co-Optimization of beam sets

>> Unique modules such as Fallback Planning, Plan Explorer, Automatic Breast, Deformable Registration and Adaptive Replanning, all in one platform.

>> Fast development pace combined with world class service and support!

*Subject to regulatory clearance in some markets.
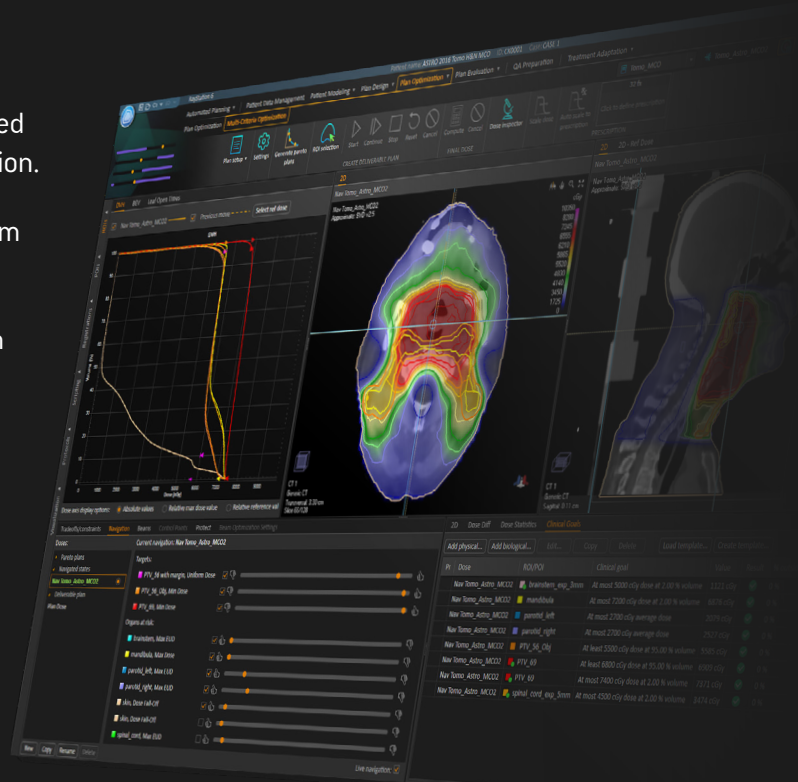
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ADVANCED PLANNING FEATURES

» Muli-Criteria Optimization (MCO)

- First released in 2011 with improvements in every release since
- Generation of Pareto plans upfront with an optimal solution space to incorporate user-specified priorities, objectives and constraints
- Automatic navigation based on clinical goal prioritization- New to V10A
- MCO can be used to generate deliverable plans for SMLC, DMLC, VMAT, TomoTherapy & Proton PBS

» Robust Optimization

- Provides enhanced optimization to account for setup uncertainties, density changes, intrafraction motion with 4D-CT images and junction fields
- Applicable in both Photon Proton treatment planning

» Robust Evaluation

- Shows various plan scenarios through DVH bands and clinical goals

» Fallback Planning

» Co-Optimization

- Optimize multiple techniques or plans with different prescriptions simultaneously

» Plan Evaluation

- Comprehensive plan evaluation tools — dose differential histograms, line profiles, perturb dose evaluation, clinical goal scorecards etc.
- Biological evaluation to quantify tumor control probability and toxicity risk
- Evaluate, compute and compare multiple plan in a single workspace

» Monte Carlo dose algorithm for all modalities; photon, protons and electron planning

» Plan Explorer

- Automatically generates any number of plans for defined clinical goals and combinations of treatment techniques and machines.
- Easy filtering of plans via radar charts, which show fulfillment of clinical goals.
- Explore automatically generated Machine Learning plans.

PROTONS

» RayStation supports proton therapy systems from IBA, Hitachi, Varian, Mevion, ProNova, Mitsubishi Electric and Sumitomo, as well as several standalone synchrotron systems.

» GPU Monte Carlo dose computation for final dose and optimization

» Robust optimization and evaluation

» 4D Optimization

» MCO with Robustness

» Simulated organ motion

» Fully integrated adaptive planning

» Apertures for Pencil Beam Scanning

» Machine Learning for Protons

» Ocular planning

AUTOMATION

» Machine Learning

- Personalized dose from 3D voxel prediction, not DVH mimicking
- Automatically generate multiple deliverable plans with varying target/OAR tradeoffs from one model
- Benefit from trained models from leading cancer clinics
- Train your own models
- Share models with other clinics

» Scripting

- IronPython and CPython
- Automate any clinic specific tasks to include ability to write files, start processes, communicate with other computers and control scriptable applications such as Microsoft Office or .NET

» Protocols and Templates

» Automated Breast Planning

» Structure Definition

- Multi-Atlas based auto segmentation
- Model Based Segmentation

» Deep Learning Segmentation

- Benefit from trained models from leading cancer clinics
- Train your own models
- Share models with other clinics

ADAPTIVE RE-PLANNING

» Integrated and efficient workflows for treatment adaptation all within one system

» Dose tracking module makes it possible to recalculate, deform and accumulate doses from different fractions to demonstrate the actual dose delivered to the patient

» Plans can be re-optimized and adjusted to compensate anatomy or dose changes

» Powerful scripting tools make automation and customization for adaptive possible

» Deformable Registration
- Two deformation algorithms; both run on GPU for an increase in efficiency and speed
  - ANACONDA - Anatomically Constraining Deformation
  - Algorithm also called Hybrid in GUI
  - Morfeus - Biomechanical DIR
- Supported image modalities are CT, CBCT and MR.

STEREOTACTIC RADIOSURGERY

» Treat multiple targets with a single iso center

» Select which target(s) to treat with a beam

» Coplanar and non-coplanar beams for any linac based technique

» Automated collimator angle selection to minimize exposure of healthy tissue

» Segment weight optimization for dynamic conformal arc

» Supports cones, DCA, IMRT, VMAT, Tomo and 3D for SRS planning

SPEED

» By utilizing the GPU for dose calculations, deformations and more, RayStation delivers plans in a fraction of the time it takes most treatment planning system.

IMRT
7 BEAM PROSTATE
1 MILLION VOXELS
28/40 ITERATIONS
5s CC OPTIMIZATION
2.5s CC FINAL DOSE

VMAT
PROSTATE
1 MILLION VOXELS
40/40 ITERATIONS
21s MC OPTIMIZATION 1% UNCERTAINTY
10s MC DOSE COMPUTATION 1% UNCERTAINTY

DUAL ARC
LUNG
3.7 MILLION VOXELS
72/80 ITERATIONS
83s MC OPTIMIZATION 1% UNCERTAINTY
16s MC DOSE COMPUTATION 1% UNCERTAINTY
70s CC OPTIMIZATION
15s CC FINAL DOSE
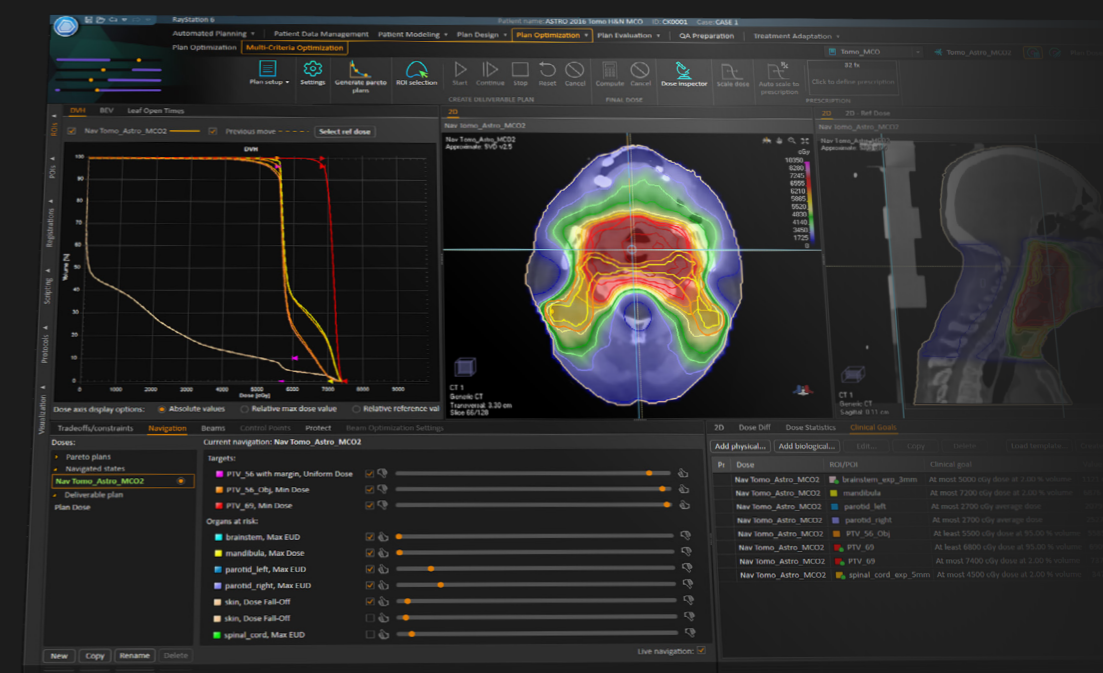
ADVANCING CANCER TREATMENT

RaySearch is a committed pioneer of oncology software. Since 2000, we have worked in close cooperation with leading centers to improve life and outcomes for patients. We develop all our products from the ground up and continuously revise every aspect, from algorithms to user interface designs. Medical science never stands still, and neither does RaySearch — our relentless drive to do things better leads us to ever-higher performance, accuracy, safety and usability. And this is just the beginning.

We believe software is the driving force for innovation in oncology today. Our systems use groundbreaking automation and machine learning to create new possibilities. RayCare*, the next-generation oncology information system, will enable one workflow for all the oncology disciplines, ensuring fluid coordination of tasks and optimal use of resources. RayStation harmonizes treatment planning, providing one point of control for all planning needs — any equipment, any scale.

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