





RayPlan

RayStation

EXCELLENCE IN THE ESSENTIAL TREATMENT PLANNING TECHNIQUES

The RayPlan®* treatment planning system makes proven, innovative RayStation® technology accessible to clinics that need a cost-effective and streamlined solution. Fast, efficient and straightforward to use, RayPlan supports the full range of treatment planning activities for 3D-CRT, IMRT, VMAT, TomoTherapy and electron beam radiation therapy.

*Regulatory clearance needed in some markets



WHY SOFTWARE MATTERS



SPEED AND ACCURACY

GPU-powered computation
Monte Carlo dose calculation
Collapsed Cone dose calculation



PHOTON AND ELECTRON

3D-CRT
IMRT
VMAT
Electrons
TomoTherapy
Stereotactic planning
MR-based planning

ADVANCING CANCER TREATMENT



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THE PHYSICIAN TOOLBOX

Manual and semi-automatic contouring
Plan evaluation
Virtual simulation

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COMMISSION, CHECK, GO

Modeling
Quality Assurance
Seamless connectivity
Hardware independence

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SERVICE OFFERING

Smooth go-clinical process
A comprehensive service contract
RayPlan online community
Trainings
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FEATURES OVERVIEW

SOFTWARE HAS UNLIMITED POTENTIAL

No one wants to wait for better cancer treatment, and software is a way to accelerate change. Software refinements make it possible to keep pace with new techniques and discoveries in an efficient manner.

Radiation therapy equipment is a significant investment. However all too often, software is an afterthought rather than an integral aspect. Thoughtfully designed software is the key to realizing the full potential of equipment and getting the best return on investment.

But RayPlan is more than just software. It incorporates the knowledge and experience of a team of experts dedicated to bringing scientific advancements in cancer treatment faster to the clinical world. RaySearch continuously enhances the system, paying as much attention to small improvements as to major additions. Every development is designed to support you in securing better outcomes and improved access to care.

UNIQUE AND CONTINUOUS MACHINE COMPATIBILITY - with most linacs, OIS and third-party QA

FAST DEVELOPMENT PACE - you will always be at the cutting edge of treatment planning

PROVEN TRACK-RECORD - a large community of enthusiastic users

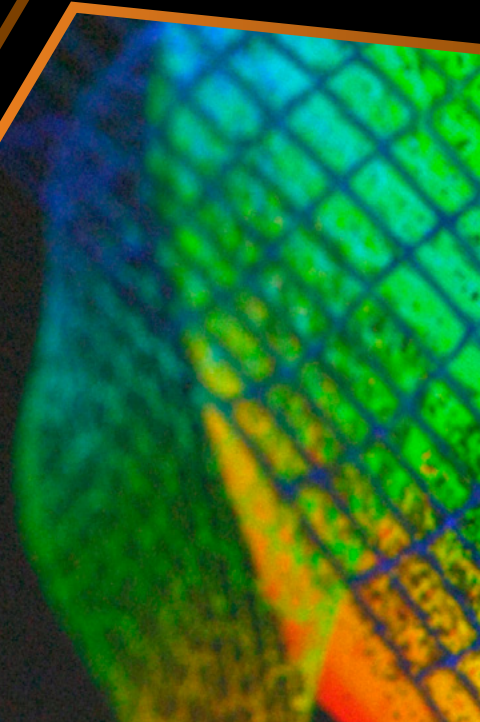
WORLD-CLASS SERVICE - support where and when you need it

UNRIVALED SPEED - outstanding plan quality within seconds

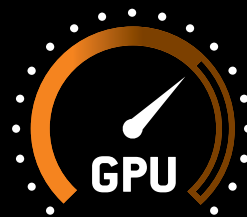
ACCURACY FIRST - ensuring you deliver what you planned for

COST EFFECTIVE HARDWARE OPTIONS - for more flexibility

OPTION TO UPGRADE TO RAYSTATION - to access additional advanced features



SPEED AND ACCURACY YIELDS PLAN QUALITY



RayPlan's unrivaled computation speed can radically transform your treatment planning process.

As the computation time is measured in seconds rather than minutes, you can efficiently produce several competing treatment plans to assess different trade-off situations and avoid interruptions.

This has been shown to contribute to overall plan quality. For example, decreasing calculation times for VMAT planning, from around 10-17 minutes for optimization and final dose calculation to around 2-4 minutes, significantly increased the fulfillment of clinical goals*.

RayPlan also offers the possibility to use Monte Carlo dose algorithms**, providing the highest level of accuracy. All the calculations are run on GPU, enabling the outstanding results displayed to the right***.

KEY FEATURES

- Monte Carlo (MC) algorithms for photons and electrons
- Collapsed Cone (CC) photon dose calculation engine
- Singular value decomposition photon dose calculation engine for real-time purposes

* Case Study "The effect of planning speed on VMAT plan quality."

** MC dose for photons will be available to all RayPlan users, but is limited to selected sites in RayPlan 8B.

***Results may vary as dose computation time depends on several variables.

IMRT
7 BEAM PROSTATE
1 MILLION VOXELS
26/40 ITERATIONS

5s
CC OPTIMIZATION
2.5s
CC FINAL DOSE

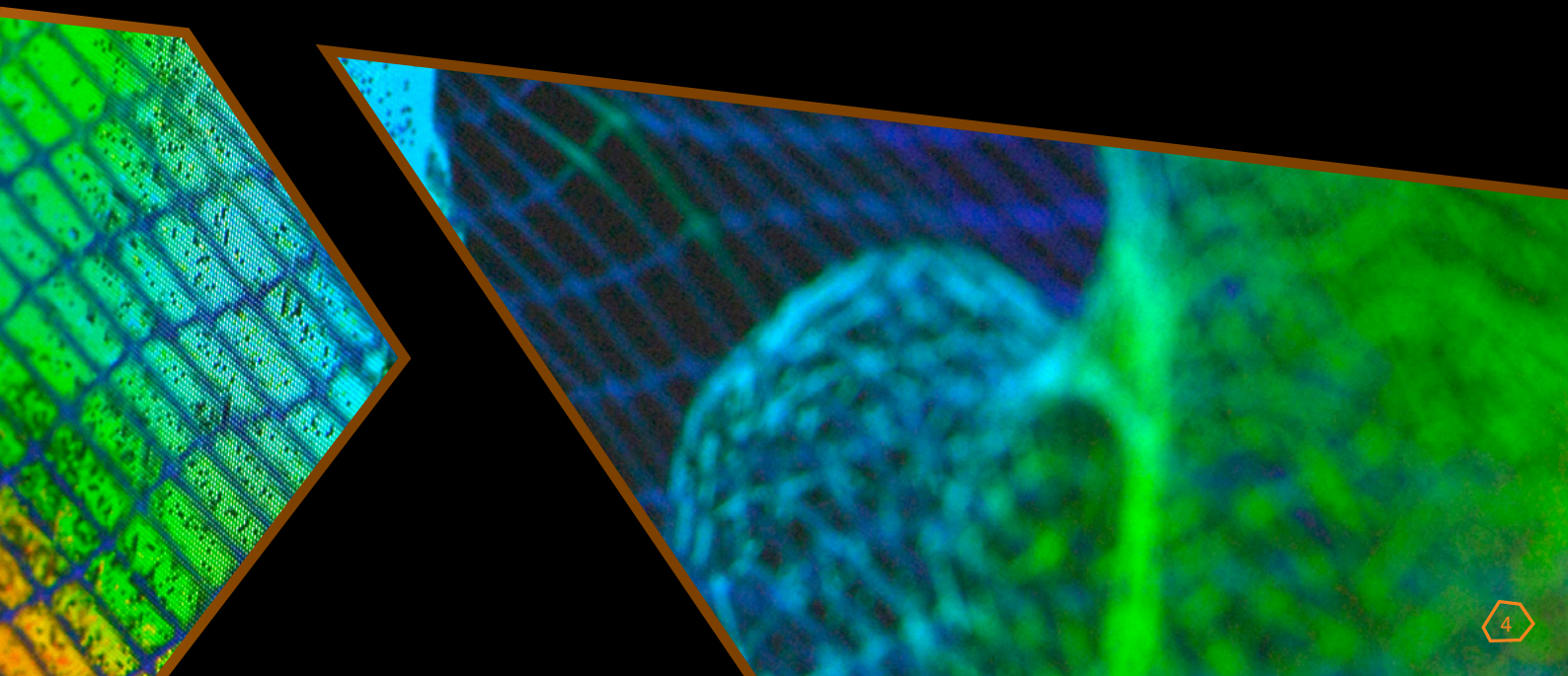
DUAL ARC
LUNG
3.7 MILLION VOXELS
72/80 ITERATIONS

83s
MC OPTIMIZATION
1% UNCERTAINTY
16s
MC DOSE
COMPUTATION
1% UNCERTAINTY

70s
CC OPTIMIZATION
15s
CC FINAL DOSE

VMAT
PROSTATE
1 MILLION VOXELS
40/40 ITERATIONS

21s
MC OPTIMIZATION
1% UNCERTAINTY
10s
MC DOSE
COMPUTATION
1% UNCERTAINTY



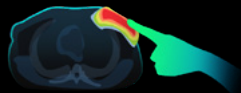
ONE SYSTEM. ENDLESS POSSIBILITIES.

RayPlan's ultrafast multi-purpose optimization engine can solve virtually any optimization problem within radiation therapy, using many degrees of freedom of the treatment unit.



3D-CRT

Fast and consistent conventional 3D-CRT treatment planning with manual and automatic tools for conformal treatment using treat- and-protect, beam weighting, wedges, etc. Modern inverse planning techniques are provided for creating conventional 3D-CRT plans, which can be automatically optimized in regard to any combination of segment shapes, segment monitor units, collimator, gantry and couch angles.



ELECTRONS

Creation of mixed electron and photon plans is enabled, with multiple coupled or independent beam sets applied in a single treatment plan. 3D visualization of the treatment setup makes it possible to inspect the physical perimeter of the selected applicator in relation to the patient geometry, which assists in collision avoidance. The electron module supports automatic generation of the cutout shape, using the same treat-and-protect tools as the 3D-CRT module. The cutout can also be created and edited using manual tools.



IMRT

State-of-the-art tools make it simple to design and optimize IMRT treatment plans. Direct machine parameter optimization ensures high quality step-and-shoot and sliding window plans and speeds up the planning and delivery processes.



STEREOTACTIC PLANNING

Use the same software for stereotactic as for the rest of your treatments. RayPlan offers many proven tools to support the creation of high-quality stereotactic workflows. Thanks to the GPU technology, it takes seconds to calculate complex IMRT and VMAT plans, typical for stereotactic treatments, even for dose grids with resolution as fine as 1 mm.



VMAT

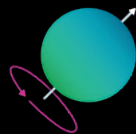
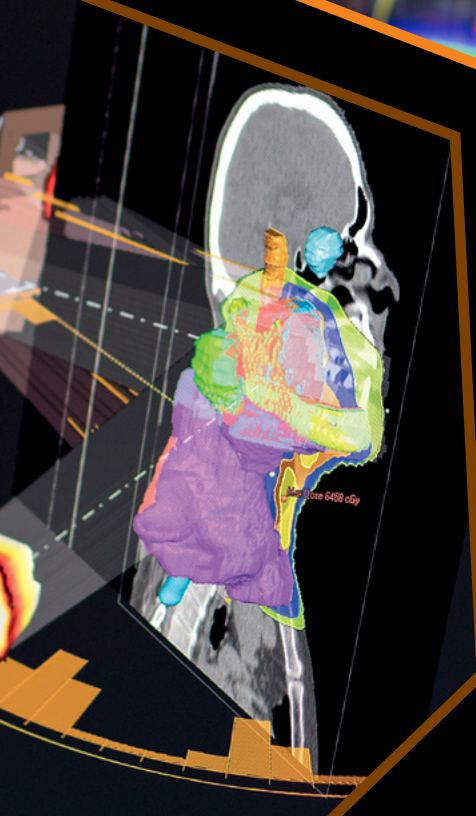
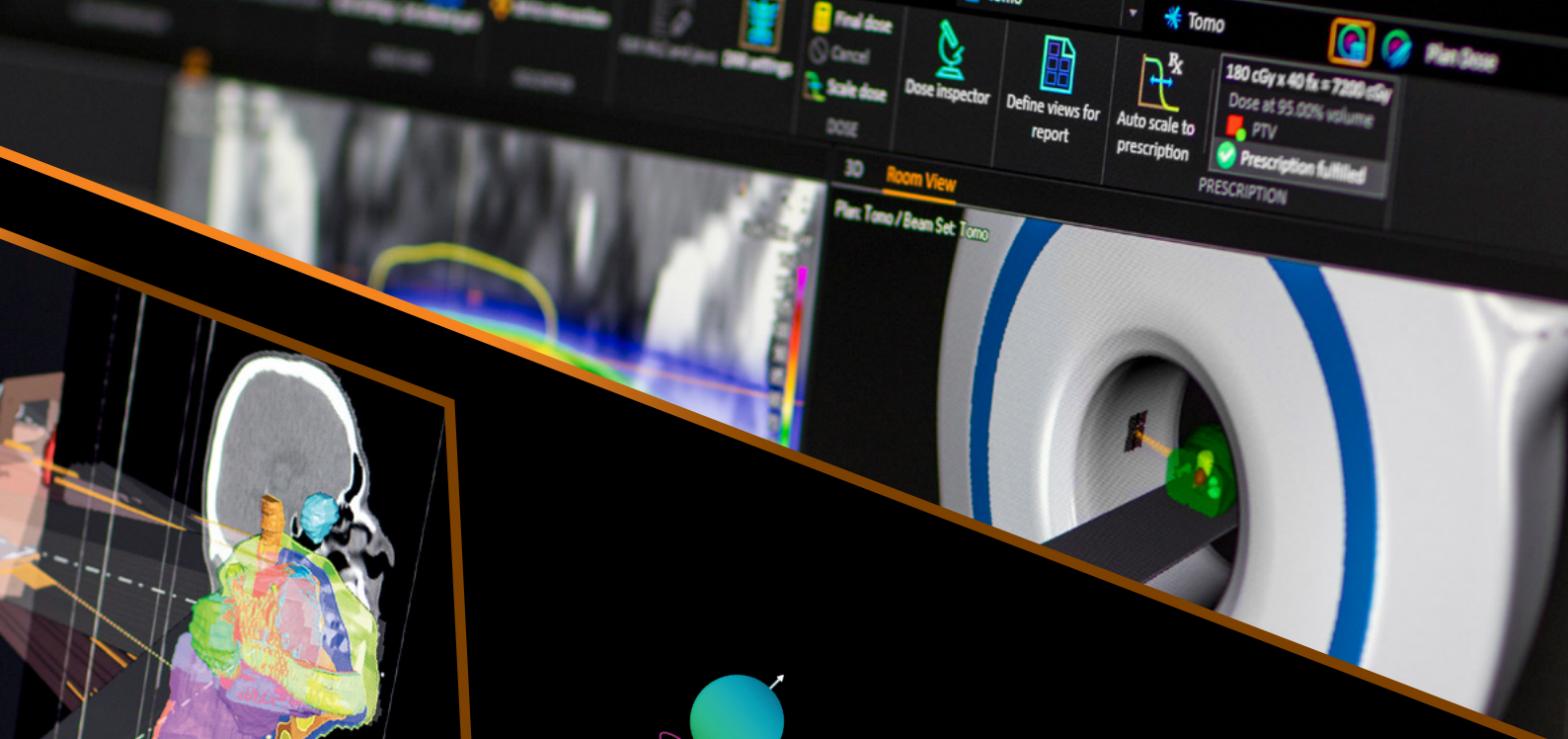
Design and optimization of single- or multiple-arc VMAT plans through an optimization procedure (inverse planning). Objectives and constraints are defined for the desired dose, and the system creates a plan that matches these criteria as closely as possible within the limitations of the treatment machine. The optimized plan is directly deliverable, without the need for post-processing that might degrade quality.



TOMOTHERAPY PLANNING

RayPlan supports planning of TomoTherapy treatments. Optimization capabilities for the TomoTherapy machine include dynamic jaw support, delivery time constraints and the possibility to specify "protect" regions where irradiation is avoided. TomoTherapy planning can be smoothly integrated into the clinical workflow and treatment plans are sent to Accuray's integrated data management system for delivery (IDMS 1.1 or later is required).





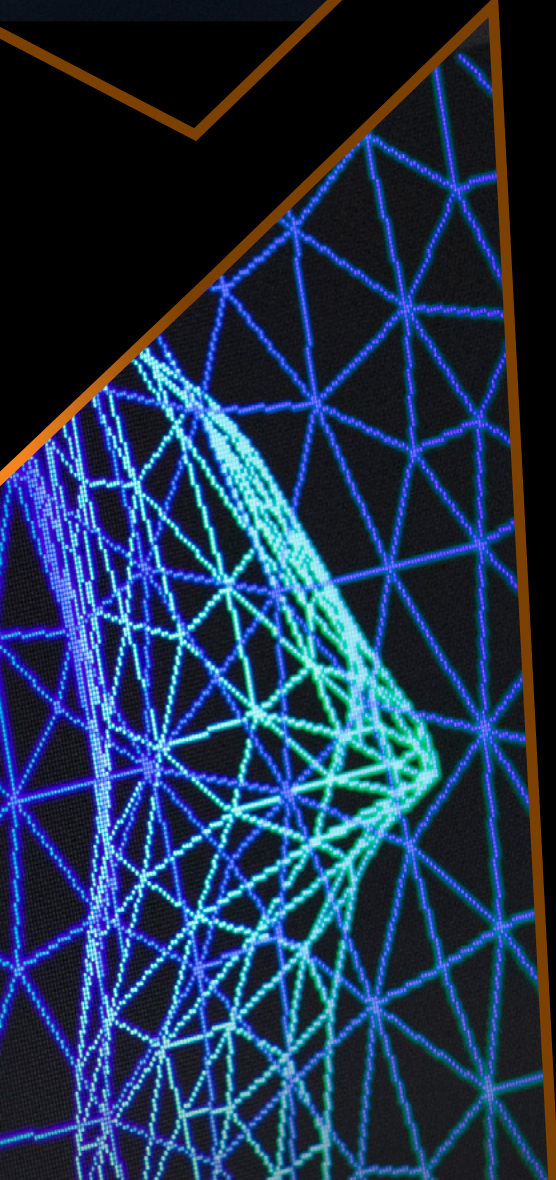
MR-BASED PLANNING

An MR image can be used as the planning image for photon therapy. MR images provide superior soft-tissue contrast compared to CT images, which enables better characterization of soft tissue and improved delineation of tumors and organs at risk. Planning is based on a user-defined bulk density assignment approach.



CO-OPTIMIZATION OF MULTIPLE BEAM SETS

Two beam sets in a plan can be optimized simultaneously, and co-optimized beam sets share an objective function list. Objective functions can be assigned to each beam-set dose, or to their sum. This feature enables efficient planning of non-integrated boost treatments. SMLC, DMLC and VMAT are supported.



A COMPREHENSIVE TOOLBOX FOR PHYSICIANS



RayPlan provides a comprehensive toolbox for anatomical modeling and plan evaluation.

ACCURATE AND EFFICIENT CONTOURING

RayStation provides you with fast and user-friendly tools to efficiently and accurately contour the patient in the treatment planning process. It includes a comprehensive toolset, ranging from manual tools to high-end semi-automatic and fully automatic contouring tools.

Smart brush and smart interpolation

The image-guided smart brush and smart interpolation facilitate contouring by snapping to image features and can help delineate organs and targets using only a few contours.

Structure templates

Structure templates allow you to create ROI with predefined name, type and color, which allows for consistently labeled structure sets according to your clinic's protocol. Structure templates may also include geometries including density overrides for quick retrieval of support structures.

ROI algebra

With ROI algebra, you can create derived ROI using Boolean expressions and margins. A derived ROI remembers its expression and will automatically detect when it needs to be updated. Derived ROI also go into structure templates, saving you the time it takes to specify complex expressions.

Image registration/fusion

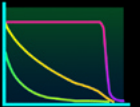
Rigid registration of multi-modality imaging CT, CBCT, PET and MR is fully supported. It can be used for showing fused images as a reference while contouring, and for mapping regions or points of interest between image sets.

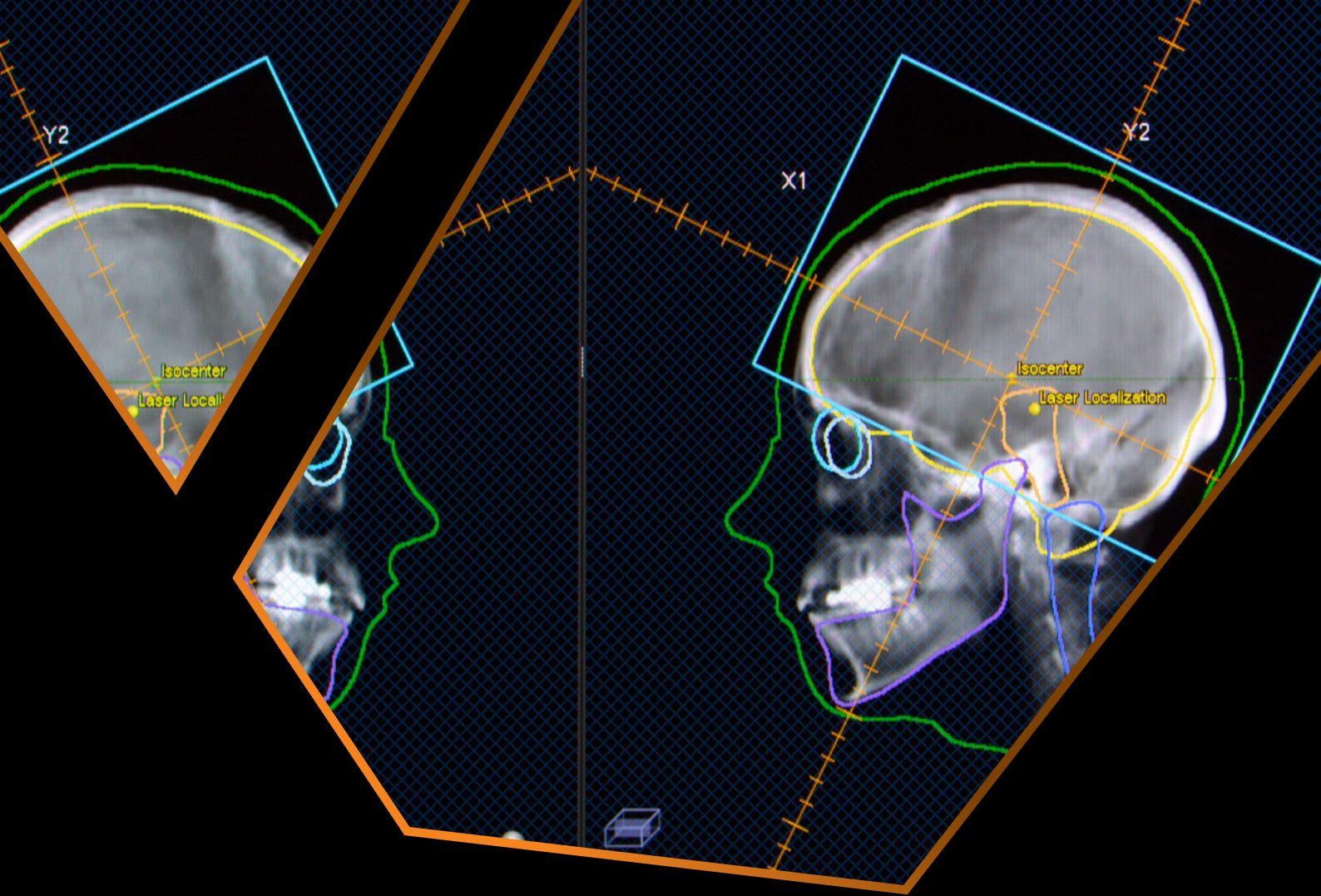
Model-based segmentation (MBS)

MBS delineates organs automatically using statistical shape models for different body sites. The adaptation to new image data utilizes a combination of greyscale gradients and shape statistics. Multiple ROI can be delineated simultaneously, which increases throughput, accuracy and reproducibility.

SIMULTANEOUS PLAN EVALUATION

Several predefined layouts are available for simultaneous comparison of dose distribution, dose statistics, clinical goals and dose-volume histograms for up to three different plans. Dose can be directly computed on additional image sets for evaluation. For evaluation of robustness, dose can also be computed for a density perturbation or patient shift.



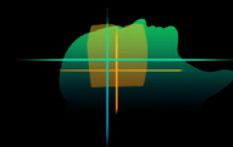


VIRTUAL SIMULATION

RayPlan offers a dedicated workspace for performing virtual simulation tasks related to isocenter placement, export to patient marking systems, beam design and plan export. This will smoothen your workflow prior to planning as the virtual simulation module is integrated into RayPlan.

KEY FEATURES

- Dedicated workspace for virtual simulation
- One-click creation of plan with orthogonal beam pair
- Isocenter placement using DRR pair
- Export to patient marking systems
- A multitude of beam-design tools for field shaping
- DICOM export



COMMISSION, CHECK, GO

RaySearch takes pride in striving for seamless connectivity with the diverse software and modalities involved in the treatment. We leave you the flexibility to choose to purchase your own hardware, or having us propose cost-effective hardware options. All to make sure we accommodate your needs and budget in the most efficient way.



MODELING

A dedicated graphical user interface is available for photon and electron. This workspace allows for evaluation of models and treatment planning tools prior to commissioning a machine.

QUALITY ASSURANCE

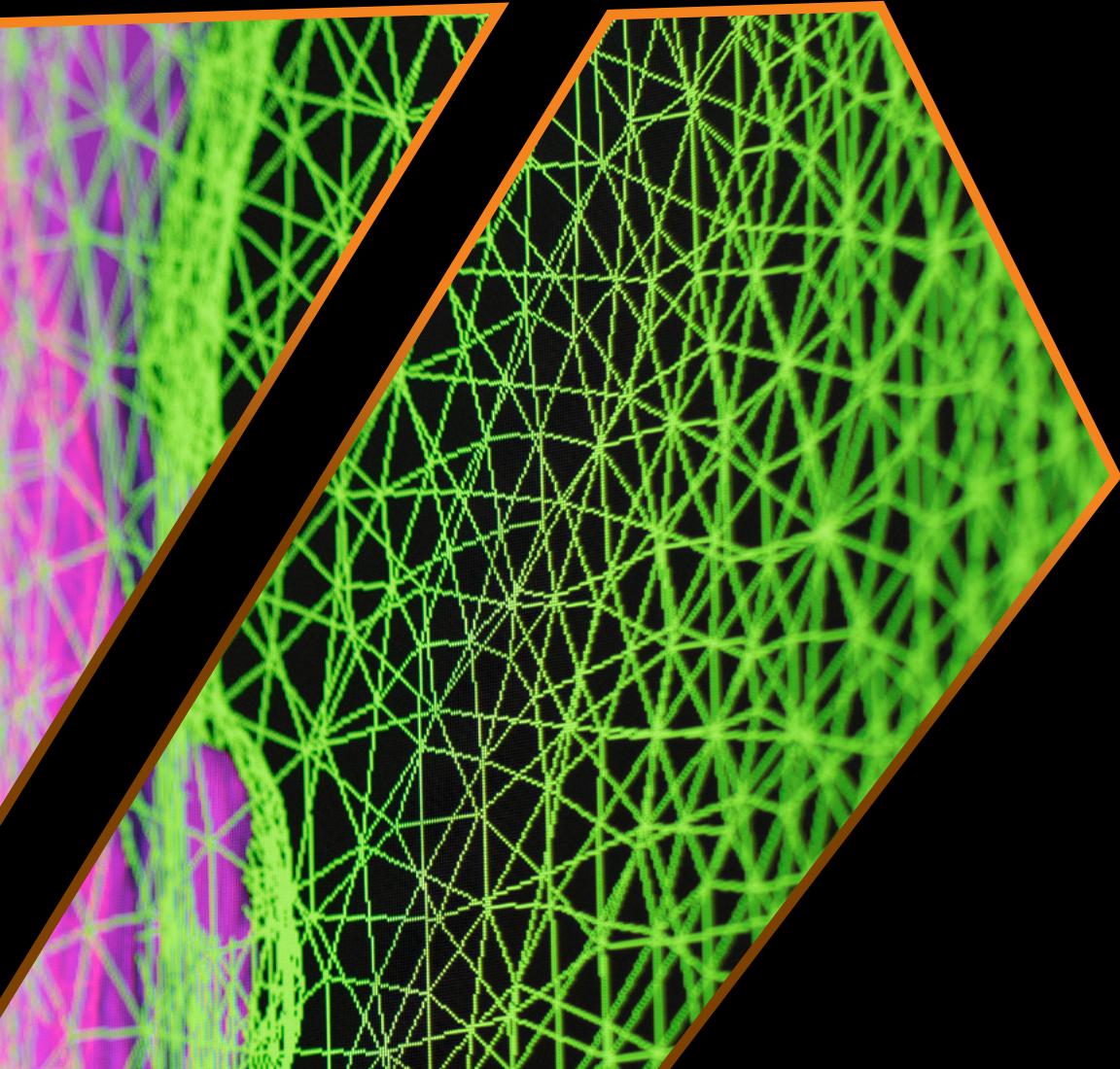
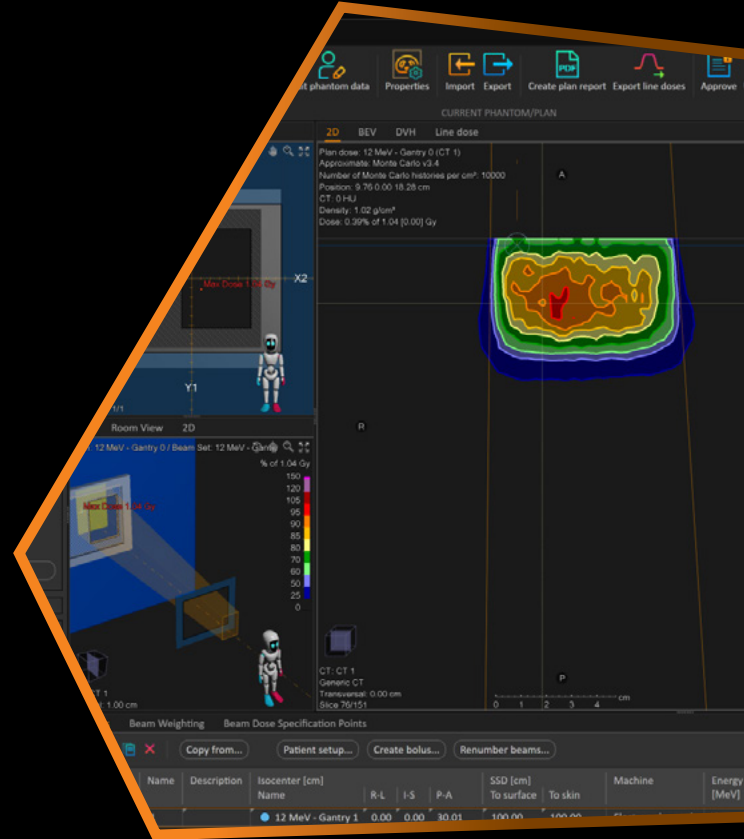
The module for Quality Assurance preparation makes it straightforward to transfer the clinical plan to a phantom and recalculate dose, either beam by beam or for the entire plan. The output from the module is the dose distribution in DICOM format or a 2D dose plane, a QA report and, optionally, a new treatment plan with collapsed gantry angles.

SEAMLESS CONNECTIVITY

RayPlan is compatible with most commercially available linear accelerators, OIS and third-party QA. Its data model is fully compatible with the DICOM standard, making it easy to import or export any DICOM RT object. This includes multiple CT, MR and PET image series, 4D-CT, structure sets, doses and RT Plan and RT Ion treatment plans. In addition, RayPlan communicates with other data sources, such as IHE RO, DICOM senders and receivers and DICOM archives, using either file transfer, DICOM storage service classes or DICOM query/retrieve. RaySearch is involved in both the technical and planning committees of the IHE RO, and we consider it a very high priority to work with these organizations and other companies in radiation oncology to assure safe and seamless connectivity where possible.

HARDWARE INDEPENDENCE AND FLEXIBLE SOLUTIONS

- Flexible setup; centers can choose to purchase their own hardware
- Floating licenses
- Unlimited patient data storage, flexible configuration of multiple parallel databases and gradual archiving
- Dose calculation based on GPU
- Flexible deployment options that can include at-desk clients or shared-server solutions





MORE THAN SERVICE — A COMMUNITY

Customer satisfaction is a top priority at RaySearch. Our service department ensures you get the best experience when using RayPlan through efficient product delivery, high quality training and fast and effective support — all at a local level. We listen to our customers and try our best to accommodate all enhancement requests in future versions of the software.

SMOOTH GO-CLINICAL PROCESS

We recognize that implementing a new treatment planning system or replacing an existing platform is not an easy task. We strive to streamline the installation to ensure it has very little impact on the daily work of the clinical staff. As a customer you will be assigned a dedicated RayPlan Delivery Team consisting of three experts: an application specialist, an IT-specialist and a physics specialist. For each installation, we also assign a project manager who leads the dedicated team of experts and will guide you through every step of the process.

A COMPREHENSIVE SERVICE CONTRACT

The standard service contract lets you access all new software releases that are already licensed, completely free of charge, ensuring you can benefit from the latest improvements as soon as they are available. We work with you to ensure an effective implementation of RayPlan's advanced technologies and workflows at your center.

RAYPLAN ONLINE COMMUNITY

Our dedicated online community gives you quick and direct access to experts from the service team, enabling you to get your questions answered and discuss the issues that matter to you.

The online community is also an easy way to connect with other RayPlan users. You can ask questions, log support cases, request enhancements and browse the knowledge database for answers to frequently asked questions. All cases logged in the portal are investigated by a RayPlan expert to provide the best solution to your problem within 24 hours.

TRAINING

Training is an important part of the go-clinical process, as well as an ongoing partnership with you and your teams to ensure you get the full potential from our products and benefit from the latest functionality updates. RaySearch regularly provides in-house and customized onsite trainings in application, physics, and IT for RayPlan users. These training courses are approved for continuous education credits in different countries. Via the online community, you also get access to webinars to refresh or deepen your knowledge.

USER MEETINGS

Customers are invited to annual user meetings in Europe, USA or APAC. Local user meetings are also organized to allow users to communicate in their respective languages and discuss issues specific to their region.

These meetings allow you to hear about the latest product news and meet with our R&D teams to ask questions and get hands on advices. The meetings are also a fantastic opportunity to network with users from other clinics and to hear presentations about how they use the software in their clinic.

WHICH SYSTEM MEETS YOUR NEEDS?

RayPlan and RayStation comparison. This list below covers the available features but does not describe the license configuration.

Features	RayPlan	RayStation
Patient modeling		
Manual and semi-automatic organ and target delineation tools	✓	✓
Rigid image registration and fusion tools	✓	✓
Model-based segmentation	✓	✓
Atlas-based segmentation		✓
Plan evaluation		
Dose statistics and clinical goal lists	✓	✓
Plan evaluation tools	✓	✓
Perturbed dose computation (isocenter shifts and density errors)	✓	✓
Robust evaluation		✓
Photon dose calculation		
Monte Carlo photon dose calculation engine	✓	✓
Collapsed cone photon dose calculation engine	✓	✓
Beam commissioning workspace with auto-modeling	✓	✓
Electron dose calculation		
Dose calculation engine using Monte Carlo	✓	✓
Electron planning		
Forward electron treatment planning tools for electron applicators and inserts	✓	✓
3D-CRT planning		
Manual and automatic tools to create conformal treatment using treat-and-protect, beam weighting, wedges, etc.	✓	✓
Direct optimization of 3D-CRT treatment parameters (leaf positions, beam weights, wedge fractions and wedge/collimator/gantry/couch angles)	✓	✓

Features	RayPlan	RayStation
IMRT planning		
Direct optimization of step-and-shoot segment shapes and segment weights	✓	✓
Support for Sliding Window IMRT (dynamic MLC)	✓	✓
VMAT planning		
Direct optimization of leaf positions and arc segment weights	✓	✓
Creation of single or multiple arcs	✓	✓
Virtual simulation	✓	✓
TomoTherapy		
General features		
QA preparation	✓	✓
Configurable plan reports	✓	✓
GPU-accelerated computing	✓	✓
Co-optimization of multiple beam sets	✓	✓
Scripting		✓
MR-based planning	✓	✓
Automated planning tools and Machine learning		✓
Adaptive radiation therapy		✓
Particle Therapy (Proton, Carbon Ion, BNCT)		✓

WORK AT THE SPEED OF THOUGHT

Take clinical efficiency to new levels through smart, personalized automation.



 RayStation

 RayCare

**ADVANCING
CANCER
TREATMENT**

RaySearch
Laboratories 

AN INVESTMENT IN THE FUTURE

When you choose RayPlan, you have the option to upgrade to the full capabilities of RayStation at any time. RayPlan gives you the functionality you need today, with the assurance that your future needs will always be covered.



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.

* Subject to regulatory clearance in some markets.

www.raysearchlabs.com

