

# Monaco<sup>®</sup> HD

High precision  
radiotherapy  
treatment planning

Unlocks unique HD  
treatment capabilities



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# Monaco<sup>®</sup> HD Treatment Planning is the key to Elekta's Precision Radiation Medicine

**With gold standard Monte Carlo accuracy and simplified daily planning, featuring a new user-friendly interface, Monaco HD lets you achieve true precision radiation medicine, personalized for your patients.**

Monaco treatment planning is designed to support all conventional linacs. However, when used with Elekta linear accelerators Monaco offers exclusive features that further enhance plan quality and faster delivery time.

With Elekta's SureStart (Accelerated Go Live), the time to start treatments after installation is reduced up to 70% and Monaco beam models can be quickly compared with measured data for validation before clinical use.



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# Deliver personalized radiation therapy for every patient

## Your single source for planning

With Monaco HD, you have a complete system to support all major treatment modalities, including 3D conformal radiation therapy, IMRT, VMAT, SRS, SBRT and MR Planning.

## Deliver what you plan

Monaco uses the Monte Carlo algorithm—the most accurate dose calculation available on the market. Elekta's 40 years of experience in treatment planning and over 3,600 systems installed have enabled ongoing refinements to ensure the highest possible standard for planning accuracy and true precision radiation medicine.

Multicriterial optimization (MCO) takes the patient's biology into account and ensures organs at risk (OAR) are spared while maintaining target coverage. The system's Predictive Insights tools



enable real-time interaction during and after optimization, facilitating efficient trade-off decisions without the need to optimize multiple plans.

The Monaco treatment planning system unlocks:

- 1,024 dynamic control points for superior and efficient treatment
- Performance of highly modulated deliveries with faster arc treatments
- Increased patient comfort with less on-table time

## Speed without compromise

Monaco now features a sleek and easy-to-follow user interface, to guide you to advanced features intended to create accurate plans for you and your patients.

At Elekta, we're committed to providing a superior, seamless user experience with MOSAIQ and Monaco together, saving you time by automating

export and removing manual steps during plan promotion.

Streamline clinical startup and the treatment planning process with world class RTOG protocols. Automated with robust templates and MCO, Monaco creates a HD plan with only five clicks, eliminating trial and error.

## Automatically respond to change

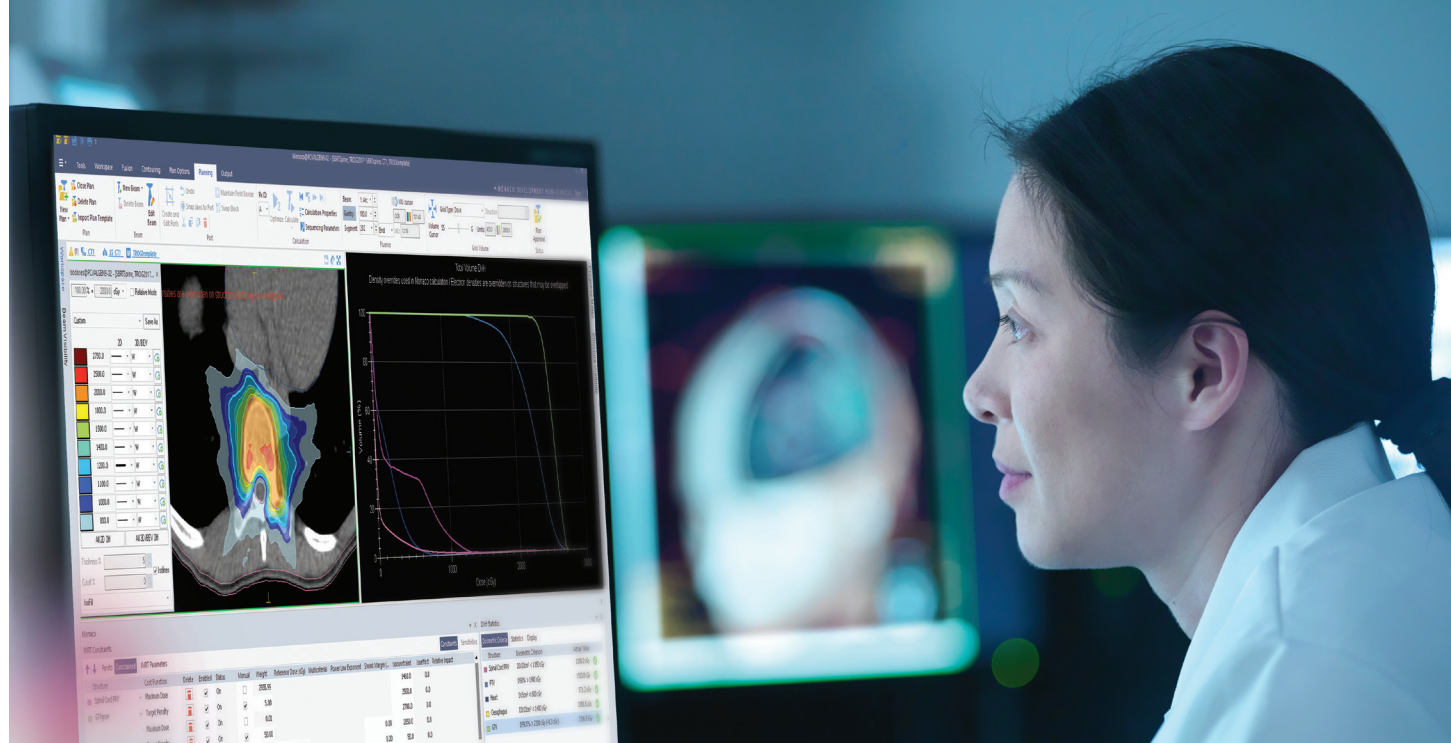
Automate the contouring process with deformable image registration for accelerated inpatient adaptive therapy and retreatments. Predictive insight tools such as the variation tool, relax response and point sensitivity provide Intelligent guidance to improve plan quality. Rapidly improve overall planning efficiency by up to 70% without the need of help structures.

# Integrated planning capabilities for a streamlined user experience

Choose from a broad suite of planning tools and a range of robust dose calculation algorithms to optimize personalized radiation therapy delivery for each patient.

## 3D conformal

Monaco's 3D conformal treatment capabilities includes customizable templates that support automated plan generation. Monaco supports a range of modalities to cater to your clinic's needs for expanding treatment planning capabilities—including support of wedges, bolus and VMC++ Electron Monte Carlo.



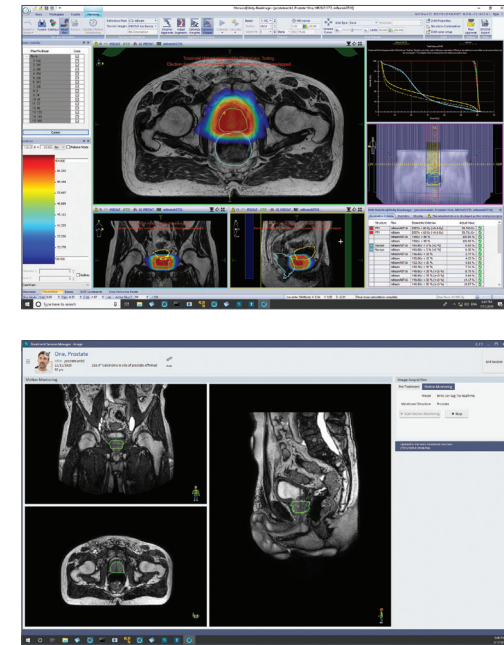
## IMRT

Monaco integrates innovative biological cost functions with multicriterial constrained optimization, a powerful leaf-sequence optimizer and a robust Monte Carlo dose calculation algorithm to create the most advanced IMRT planning solution available today. Monaco is a vendor-neutral planning platform that supports all major linear accelerators and connects to any record-and-verify information system.

## VMAT

Monaco Volumetric Modulated Arc Therapy (VMAT) functionality can optimize single or multiple noncoplanar arcs simultaneously, providing the

flexibility and control needed for more complex treatment plans. Arc plans can be delivered with a single button push at the linear accelerator console, ensuring maximum efficiency in treatment delivery. Dynamic gantry speed and dose rate variations are automatically optimized and all control points are seamlessly integrated into a single deliverable arc sequence. Monaco offers the Monte Carlo dose engine for electron and photon—for a continuous arc calculation as a single beam, rather than just dose approximations that occur with many discrete (control point) gantry angle positions. Monaco also offers inversely optimized Dynamic Conformal Arc Therapy (DCAT).



## Segment shape optimization

- Our proprietary approach to smoothing and clustering segments and then optimizing beam weights and shapes, enables clinicians to improve dose conformity, plan quality and delivery efficiency
- Reduces the number of segments, shortening treatment times
- Powered by Monte Carlo, develop plans that improve sparing of OAR and dose conformity

## Stereotactic planning

- DCAT therapy lets you deliver highly conformal stereotactic plans with a variable MLC target margin to dynamically conform to the target as

the beam rotates around the patient

- Creates multiple arcs in a noncoplanar fashion to render more conformal plans
- Supports stereotactic cone treatments for static and arc fields
- Can reduce the collimator leaf down to a virtual 1 mm width across the full treatment field of view to support dynamic Y jaws, for enhanced conformity and superior sparing of OAR

## MR Planning

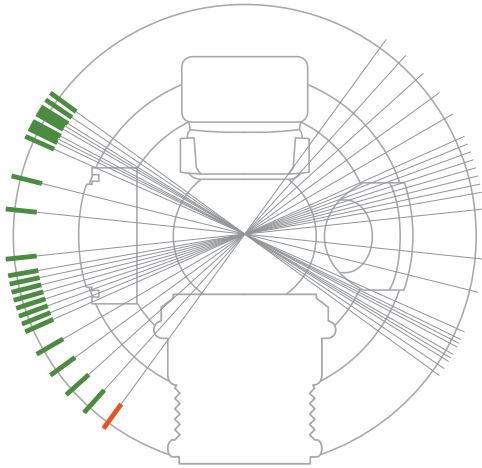
- Creates radiotherapy treatment plans on transverse MR images using bulk density overrides for the dose calculation

## Why Monaco?

- Uses the gold-standard Monte Carlo algorithm so you can deliver precisely what you plan
- Utilizes MCO planning to minimize OAR dose while maintaining target dose objectives
- Simplifies adaptive, personalized re-planning
- High Definition Dynamic Radiosurgery (HDRS) sustains high modulation while delivering a high dose rate with IntelliBeam, maximizing Elekta's linac capability for VMAT
- Incorporates jaw tracking, leaf and gantry speed optimization, to shorten linac delivery times



## Deliver highly conformal SRS/SBRT in standard treatment slots

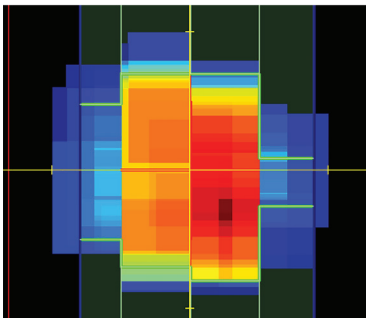


### Elekta IntelliBeam

Flexible gantry rotation with up to 1,024 dynamic control points.

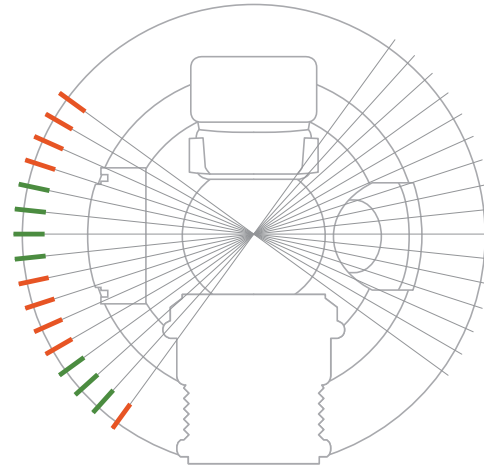
1. Higher modulation
2. Shorter delivery time
3. Superior plan quality

Comparison between Elekta linacs using Pinnacle, Raystation, and Elipse to a Versa HD system with Monaco



### Treat smaller stereotactic targets

HDRS full-field 1 mm virtual leaf hypermodulation



### Other Systems

Equidistant control point size up to 180 control points per arc.

1. More arcs
2. Inefficient delivery
3. Suboptimal sparing for OAR



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# Elekta Care™

## Get the most from your Elekta solution

Elekta Care is designed to help you maximize the use of your Elekta technology, so you can focus on your patients and your practice.

Elekta Care supports you from startup through your product's lifecycle with comprehensive options from education, training and upgrades to solutions allowing you the highest uptime and improved operational efficiency.

Elekta employs the largest full-time staff of dedicated radiation treatment planning professionals in the industry in the fields of research and development and customer support. Our physics services for beam data modeling will enhance the Monaco user experience and create efficiencies in moving to clinical use status. When you select our solutions, you gain access to our entire team:

- PhD and MS physicists
- PhD mathematicians
- CMDs and RTTs
- Professional software and hardware engineers

**Learn more at [elekta.com/elektacare](https://elekta.com/elektacare)**



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- ⊕ **165 remote service specialists**
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**For almost five decades, Elekta has been a leader in precision radiation medicine.**

**Our nearly 4,000 employees worldwide are committed to ensuring everyone in the world with cancer has access to—and benefits from—more precise, personalized radiotherapy treatments.**



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