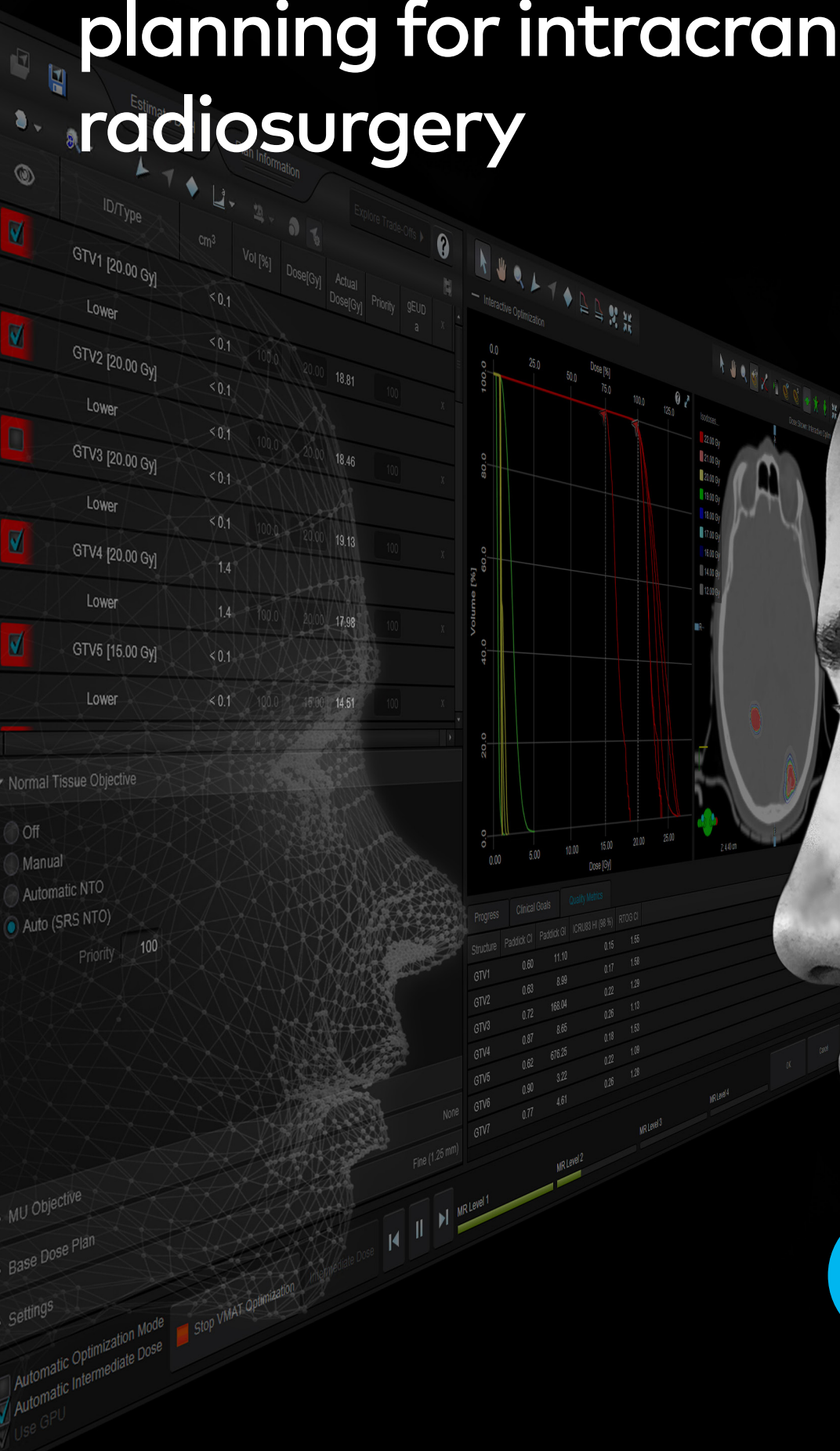


Elevate your treatment planning for intracranial radiosurgery



Develop your clinical practice in intracranial radiosurgery using a single isocenter

Compact dose distributions avoiding dose to normal brain and critical structures has long been the aim of focused radiosurgery treatments.

The inherent complexity in treatment planning with non-coplanar couch angles and dose optimization when multiple targets are involved often meant radiosurgery planning was restricted to the most experienced radiation oncology centers with dedicated resources.

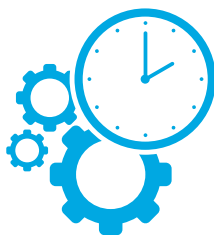
Varian's goal is to provide you with the capability to plan and deliver state-of-the art radiosurgery treatments within the Eclipse™ treatment planning system.

THE FOUNDATION OF YOUR SUCCESS



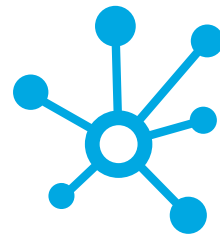
QUALITY

Plan with greater consistency and higher quality



EFFICIENCY

Advanced algorithms for automation in plan creation



INTEGRATION

Automated treatment delivery with integration to TrueBeam®/Edge® radiotherapy systems



QUALITY

Radiosurgery plans with greater efficiency, consistency, and quality

New algorithms allow you to create collision free non-coplanar radiosurgery plans. The "Virtual Dry Run" enhances patient safety and allows full simulation of the radiosurgery delivery without leaving the treatment planning console.

Steep dose gradients with minimization, and in most cases elimination, of dose bridging between individual metastases when treating multiple targets enables optimal sparing of sensitive normal brain tissue.

Leveraging the Eclipse treatment planning infrastructure within the department, the HyperArc® high-definition radiotherapy module allows planning of single and multiple metastases as well as primary brain tumors using only a single isocenter for the fast and efficient treatment delivery using TrueBeam® radiotherapy system and Edge® radiosurgery system.

Radiosurgery-specific algorithms simplify the most challenging planning scenarios

HyperArc improves planning efficiency with multiple algorithms:

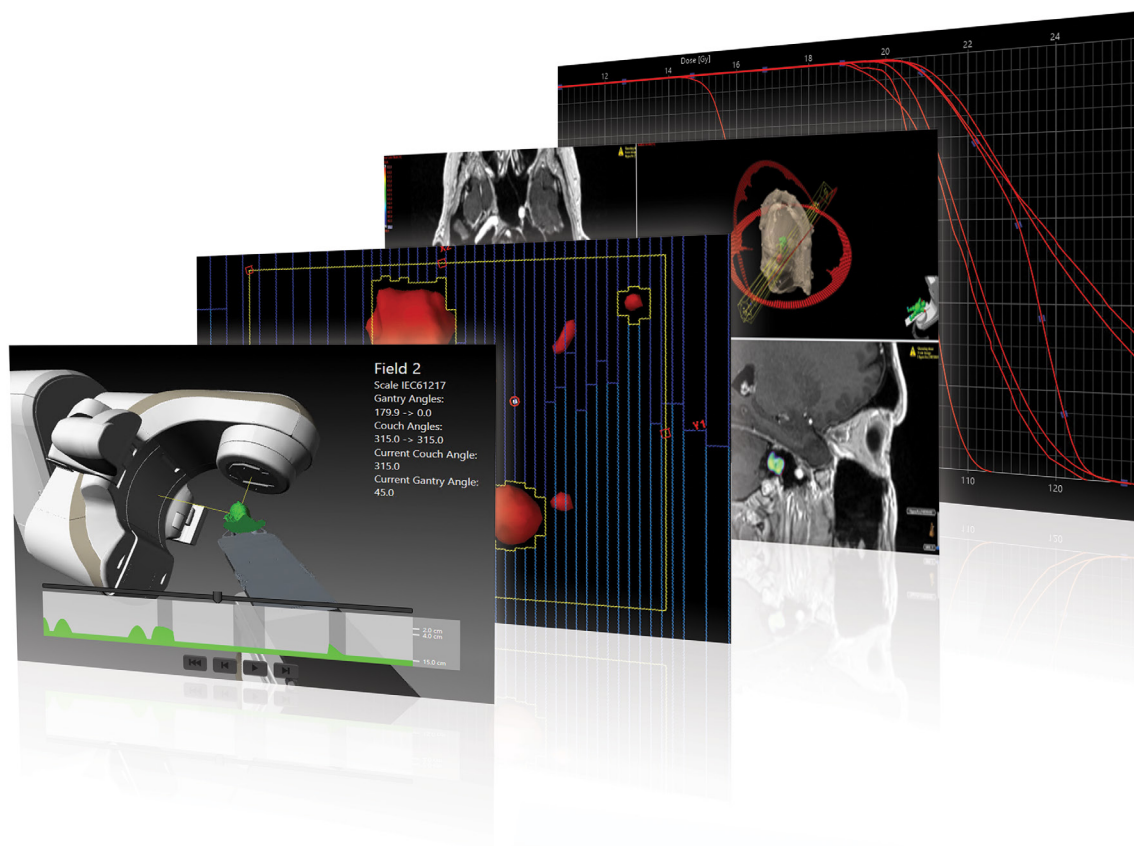
Collimator Angle Optimizer defines the most appropriate collimator angle for each field ensuring the MLC leaves fit to the target and minimize dose bridging between targets.

In conjunction with the VMAT optimization, target masking limits leaf positions to block some targets during gantry rotation which contributes to an optimal dose distribution. Collimator Angle Optimizer works in synchronization with dynamic jaw tracking to keep the jaws as close to the MLC aperture as possible.

SRS Normal Tissue Objective specifies higher levels of the prescription isodose in the target volume. The resulting target dose heterogeneity leads to a steeper dose gradient and dose fall-off for improved low dose brain spillage.

Automatic Lower Dose Objective provides a more consistent coverage to all target volumes without needing to manually adjust dose levels and objective priorities. It also accommodates different dose prescriptions for multiple targets by balancing the dose received by each target during the plan optimization.

EFFICIENCY



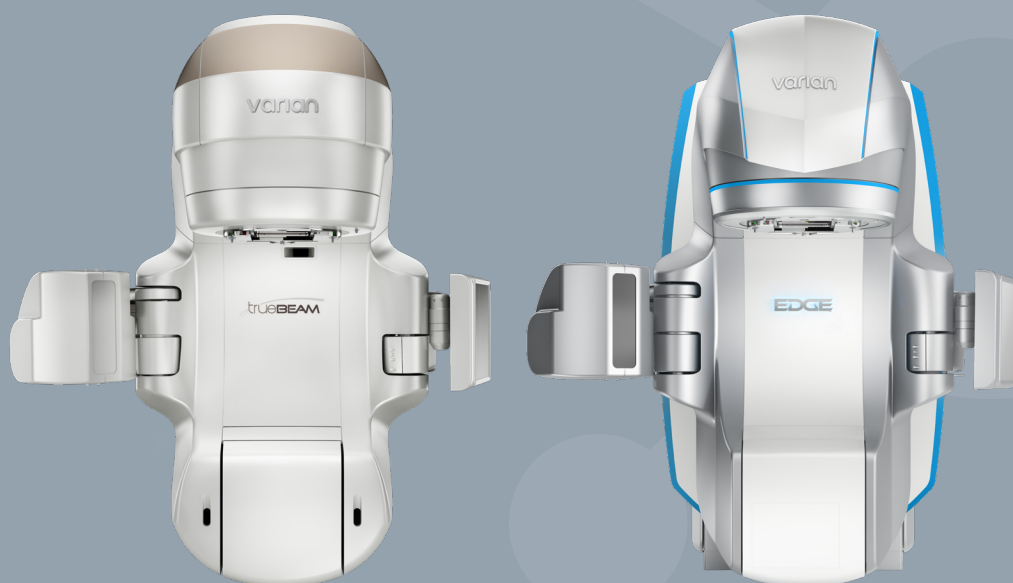
Fast calculations. GPU reduces dose computation time for plan optimization. Faster calculations mean faster plan development: a full HyperArc optimization for a radiosurgery plan of 6 metastases treated using the HD MLC is completed in less than 18 minutes¹.

Choice of MLC. HyperArc plans utilize either Varian's proven 5mm MLC or the 2½ mm HD MLC. The finer MLC leaf width provides higher tumor conformity, a steeper dose gradient and better normal tissue sparing², which is particularly valuable for small and irregularly shaped targets, typically seen in radiosurgery of benign indications.

TrueBeam and Edge integration enables HyperArc plans to be delivered in a fully automatic mode. Radiosurgery treatments are completed within a standard treatment slot which impacts not only patient scheduling and patient comfort, but also helps ensure that radiosurgery treatments may be scheduled without disruption of the daily workflow on the treatment machine.

INTEGRATION

Advanced and automated radiosurgery delivery



The seamless integration with TrueBeam and Edge systems means radiation therapists no longer need to re-enter the treatment room for imaging, patient correction shift, or couch motion between non-coplanar couch positions. These operations are all carried out remotely from the console. As HyperArc utilizes a single isocenter for all treatments, radiosurgery treatment times are consistently within a 15 minute time slot³, independent of the dose prescription, fractionation scheme or number of targets being treated.

Patient	No. of lesions	Dose	Treatment Time
48 yrs., male	3	3x 9Gy	12 minutes
55 yrs., female	3	3x 9Gy	11 minutes
53 yrs., male	3	1x 25Gy	15 minutes
56 yrs., female	5	1x 25Gy	14 minutes
61 yrs., female	8	3x 8Gy	12 minutes
55 yrs., male	10	3x 9Gy	13 minutes

HyperArc treatment times reported by IRCCS Ospedale Sacro Cuore Don Calabria, Negrar, Italy

Cornerstones of your radiosurgery program

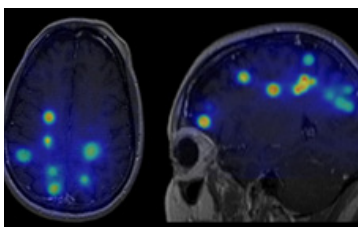
HyperArc requires the **Qfix Encompass™ SRS Immobilization System** for frameless immobilization with increased patient comfort and the **PerfectPitch™ 6D couch** for precise alignment in radiosurgery treatments.

Encompass provides advanced, non-invasive and sub-millimeter⁴ immobilization for frameless stereotactic radiosurgery treatments and is integrated into the HyperArc Virtual Dry Run.



Correct rotational alignment is essential in the treatment of multiple metastases due to the reliance on a single isocenter. The PerfectPitch 6D couch enables rotational couch alignment with sub-millimeter/degree positioning accuracy⁵.

Additional options to streamline radiosurgery treatments are provided with **Velocity™** and the **SRS End-to-End Phantom**.



Velocity is a vendor neutral software that manages oncology images and aggregates data from a wide variety of imaging modalities, planning systems and devices. Clinicians can build a longitudinal patient history that is image driven, allowing visualisation of tumor response to help support better decision making.

The anthropomorphic SRS End-to-End Phantom enables quality assurance of multi-modality image acquisition, isocenter position (Winston Lutz Test), treatment plan and dosimetric verification. Inserts may be exchanged without moving the phantom for enhanced stability in QA procedures.





References:

- 1) Data on File. Varian Medical Systems, Inc. March, 2022. Optimization at 2.5mm, final calculation at 1.5mm using Eclipse 16.1 & GPU processor
- 2) E. Bossart et al., Assessment of single isocenter linear accelerator radiosurgery for metastases and base of skull lesions. *Physica Medica* 81 (2021) 1-8
- 3) R. Ruggieri et al., Linac-based VMAT radiosurgery for multiple brain lesions: comparison between a conventional multi-isocenter approach and a new dedicated mono-isocenter technique. *Radiation Oncology* (2018) 13:38. (Your results may vary)
- 4) A. Shah et al., Intrafraction motion during frameless radiosurgery using Varian HyperArc® and Brainlab Elements™ immobilization systems. *Journal of Radiosurgery and SBRT*, Vol 7 (2020).
- 5) TrueBeam/Edge Product Specifications

Important Safety Information

Radiation treatments may cause side effects that can vary depending on the part of the body being treated. The most frequent ones are typically temporary and may include, but are not limited to, irritation to the respiratory, digestive, urinary or reproductive systems, fatigue, nausea, skin irritation, and hair loss. In some patients, they can be severe. Treatment sessions may vary in complexity and time. Radiation treatment is not appropriate for all cancers. www.varian.com/safety

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varian.com

USA, Corporate Headquarters and Manufacturer

Varian Medical Systems, Inc.
Palo Alto, CA, USA
Phone +1-650-493 4000
800 544 4636
Fax +1-650-493 5637

EMEA and CIS Headquarters

Siemens Healthineers
International AG
Steinhausen, Switzerland
Phone +41-41-749 88 44
Fax +41-41-749 88 99

Asia Pacific Headquarters

Varian Medical Systems
Pacific, Inc.
Kowloon, Hong Kong,
SAR China
Phone +852-2724-2836
Fax +852-2369-4280

Australasian Headquarters

Varian Medical Systems
Australasia Pty Ltd.
Sydney, Australia
Phone +61-2-9485 0100
Fax +61-2-9485 0119

Latin American Headquarters

Varian Medical Systems
Brasil Ltda.
São Paulo, Brazil
Phone +55-11-3457 2655
Fax +55-11-3286 0034

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