

## BrachyVision Treatment Planning



# Expect more with BrachyVision



## The new paradigm for image-based planning

BrachyVision™ is a complete 3D treatment planning system that introduces a new paradigm of patient-centric, image-based planning. Optimized for use with Varian's VariSource™ iX and GammaMedplus™ iX HDR afterloader products, BrachyVision meets all of your brachytherapy planning needs.

As part of the ARIA™ oncology information system family, BrachyVision offers a common interface for users of Varian systems. BrachyVision offers:

- Integration with the Eclipse™ treatment planning system supporting a combined database, patient registration, and common interface
- Image acquisition via film scanner, DICOM 3, ultrasound, or directly from an Acuity™ treatment planning, simulation & verification system
- Applicator data entry via radiographs, coordinates, transverse images or reconstructed planes in addition to the use of standard plans and applicator libraries
- Contouring and segmentation
- Interactive planning and optimization
- Plan evaluation and analysis



### Poised for the future

At Varian BrachyTherapy, we know that new techniques and challenges arise in brachytherapy treatment planning. We dedicate a team to continuously anticipate and respond to evolving needs of the brachytherapy practitioner. We have delivered major updates every year since BrachyVision's launch in 2000.

As the market leader in brachytherapy treatment planning, BrachyVision continues to offer a complete solution suitable for all of your brachytherapy planning needs.

# Complete brachytherapy planning system

BrachyVision is a complete treatment planning system that allows plans to be generated for LDR, PDR, and HDR treatments using coordinates, films, or 3D images.

## Image acquisition

The flexibility of BrachyVision allows the user to acquire images

- Using DICOM 3.0
- Directly from an ARIA server

Usable images include:

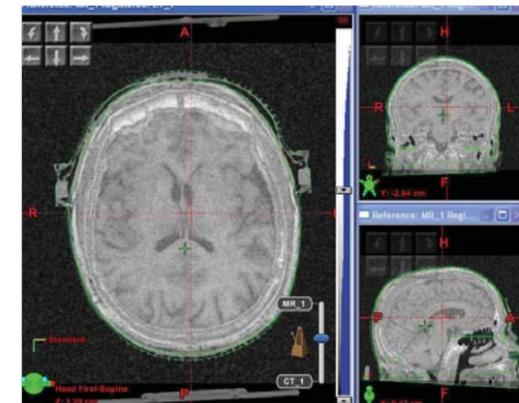
- Film
- Cone-beam CT
- SPECT
- CT
- PET
- Ultrasound
- MR

## Image registration

The registration workspace matches pairs of image sets including films and 3D. BrachyVision uses the same extensive range of registration tools as Eclipse to fuse images either manually using markers or automatically using DICOM coordinates or mutual information. A volume of interest or existing structure can define the pixels to be used during the automatic matching.

Once registered, the user can easily switch between the images or choose to combine the images using the blending tool in any workspace. This flexibility allows:

- Structures to be outlined on one set of images and viewed on another.
- Plans based on different image sets to be summed to view the total dose including external beam plans.
- Dose distributions and catheter identification to be made from either data set and displayed on the other.
- Brachytherapy doses can be taken into account when optimizing your external beam plan in Eclipse.



## Fine tuning the match

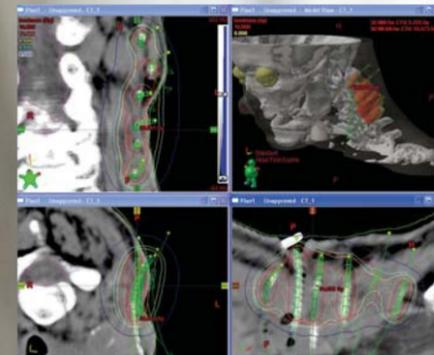
Fine tuning allows for manual adjustments pixel by pixel to the match. Image blending and a spy glass tool assist in this process.

## Ideally suited for accelerated prostate brachytherapy

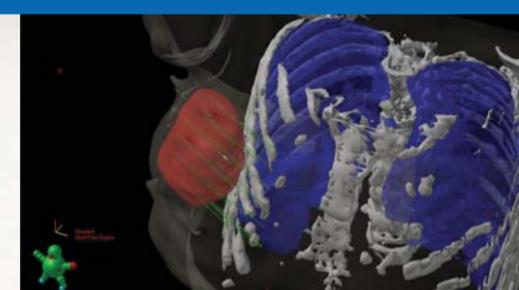
Combined with the advanced capabilities of BrachyVision, Vitesse™ real-time HDR brachytherapy allows 3D HDR prostate brachytherapy to be performed accurately and quickly without the need for CT.



The creation of digitally reconstructed radiographs (DRRs) allows you to display the dose on films when extracting applicators from CT.



Fully interactive 3D volume images enable the user to view the images at any angle on any plane. This makes applicator entry, dose review and adjustment easy.



## Rich suite of tools

Moving beyond rules-based brachytherapy and applying tools and techniques from external beam planning, BrachyVision delivers revolutionary 3D image-based planning. Tools that help you obtain optimal dose distribution also take full advantage of the exquisite conformal dose capabilities of the Varian afterloader technology.

# Extensive set of tools to meet every need



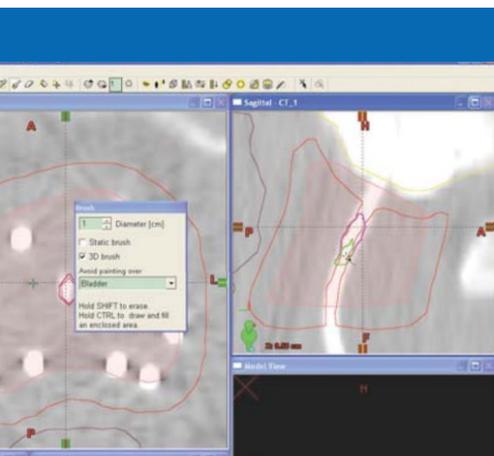
## Powerful contour editing

### Delineate target volumes

For image-guided brachytherapy (IGBT), segmenting organs at risk and precisely delineating target volumes are critical and time-consuming tasks. BrachyVision uses the same extensive set of tools found in Eclipse to reduce this time from hours to minutes. Clinicians can accurately define target and critical structures on fused multi-modality images with advanced drawing and editing capabilities. Enhanced templates and powerful post-processing of structures accelerate the contouring process.

### Contour definition

Manual contouring could not be simpler with our freehand tool. This tool enables a structure to be created, modified, stretched, copied, moved and optimized without switching tools. In addition to manual contouring tools, BrachyVision increases speed and efficiency by using both image-based and logic-based automatic segmentation.



The Smart Brush allows fast outlining of structures on any plane.

## Building the perfect plan

### Plan data from localization radiographs

Add plan layers, such as applicators, reference lines and points, using either coordinate, scanned, or imported images. Films can be orthogonal, variable angle isocentric, or semi-orthogonal with a reconstruction box.

### Entry of applicators from 3D data

BrachyVision speeds the process of applicator detection using an intuitive auto detection routine. Adjust the search parameters during the detection process or manually reconstruct the applicator using any planes within the 3D image set if required.

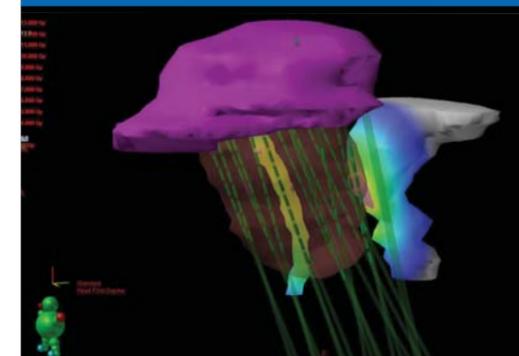
### Standardizing plans

Store library applicators, implant templates, or an entire plan template containing everything required to instantly create new plans.

Generate clinical protocols that allow the user to pre-define:

- Clinical plan objectives
- Structures to be generated for the plan including color and style, and CT values used for automatic contouring
- Plan template
- Optimization objectives for volumetric optimization
- Review options

Once generated, add a clinical protocol reference to a course to then automatically generate the structure properties and plan for the patient. The same protocol reference can then be used to create multiple plans for the patient. Clinical protocols standardize the generation and review of any plan. Export and import clinical protocols to share with other centers.

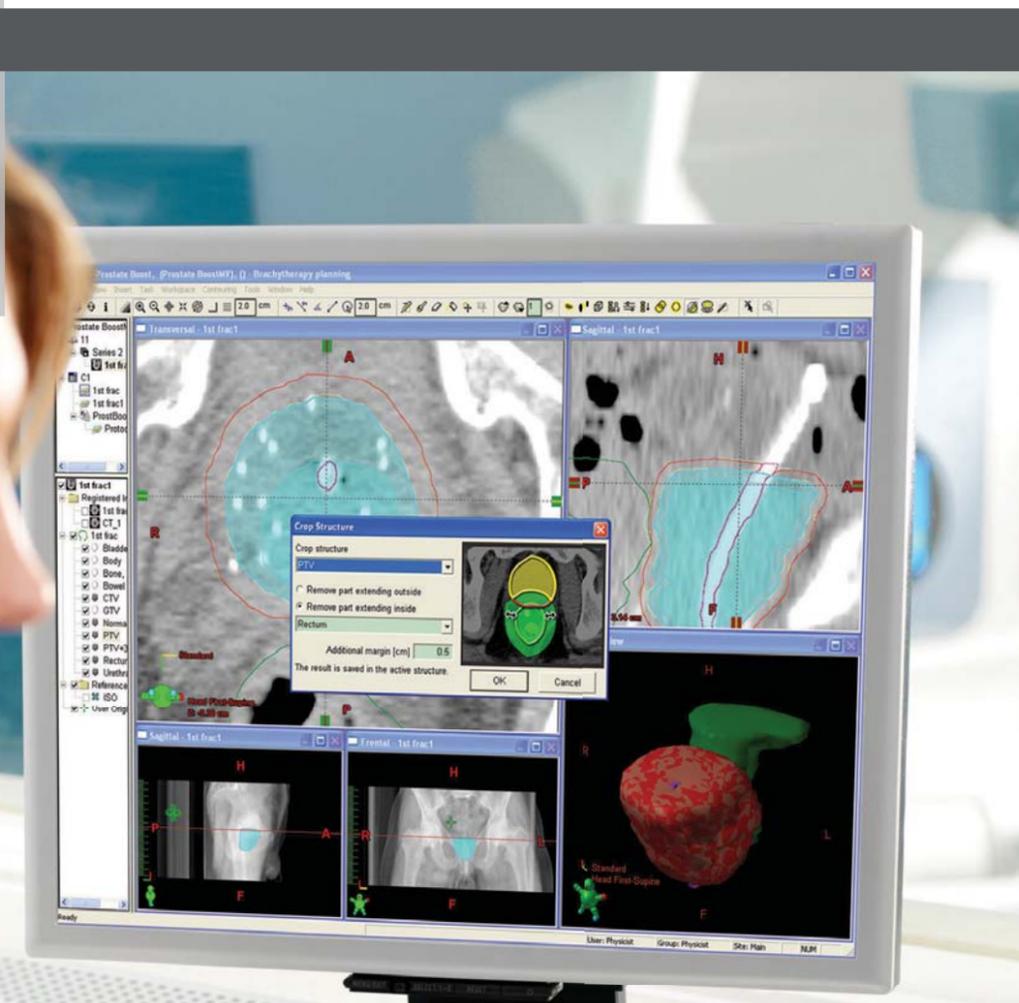


### Dose visualization

Visualize the dose as lines, shades, surface dose and 3D clouds. Surface dose helps identify hot spots on critical structures.

## Easily generate the structure you require

Many Boolean tools exist for generating the required structures. The crop tool allows the simple removal of intersections between structures including a margin.



# Planning with the latest technology



## Multiple dose optimization methods

BrachyVision provides a variety of dose optimization methods which may be used alone or in combination to obtain the optimal dose plan.

### Adaptive volume optimization (AVOL)

Adaptive volumetric optimization introduces options to the existing inverse planning tool to get the plan you want — the first time, every time. The optimization routine attempts to match the specified DVH limits to structures (or lines) while creating smoother dwell times and less hot spots. This results in a more clinically acceptable plan with less need for manual intervention.

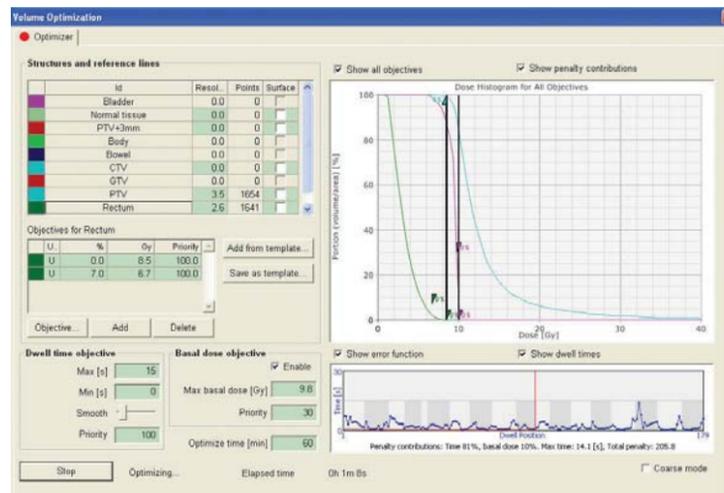
### Geometric optimization

Geometric optimization produces a treatment plan for a volume implant with a reduced dose gradient. Once you have defined the catheters and potential dwell locations, the geometric optimization function quickly provides a good dose distribution.

### Manual dose optimization

Dose Shaper™ graphical interactive optimization provides inverse visual planning for unparalleled dose control. Alter dose values by pushing an isodose line towards or away from a structure boundary using the cursor in any plane. The dose is instantly updated. Dose reduction to critical structures, or coverage to the target with a particular dose line becomes an extremely simple process.

View which source contributes most to the dose at a point, and instantly adjust the time from the same control to update the dose if required.



Adaptive volumetric optimization uses an interactive DVH display. Eclipse users will find it familiar and easy to use.

## Usability, flexibility and freedom

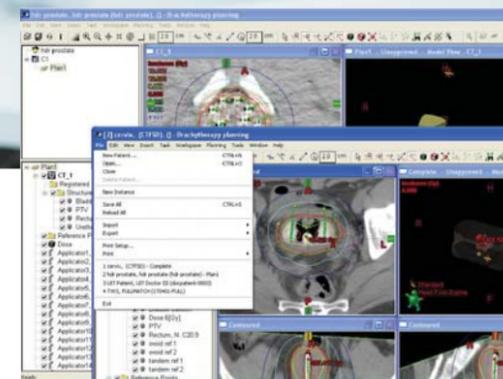
BrachyVision continues to give easy access to the tools you need and the freedom to make changes to any aspect of the plan at any time.

### The data you require in the format you want it

BrachyVision allows you to define how you want to view your data with customizable reports. Reports include treatment data, check lists, electronic approvals, or dose quality parameters, such as

- V100: Volume of structure getting 100% of the prescription.
- D90: Dose to 90% of the structure volume.
- V12.5Gy: Volume of the structure receiving 12.5 Gy of the prescription.
- D0.1cc: Maximum dose to 0.1cc of the structure

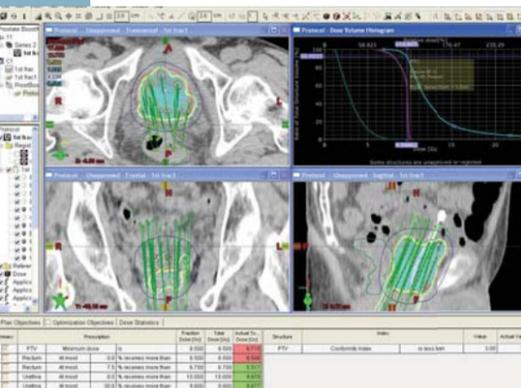
In addition, collective printing saves time by allowing you to specify multiple reports. Then, print all of them at the press of a button.



### View multiple windows simultaneously on one workstation

Have multiple patient windows open at the same time for plan comparison during planning to set up several patients for review. View alternative patient images during contouring.

# Intuitive plan evaluation



## Analyze and compare alternative plans

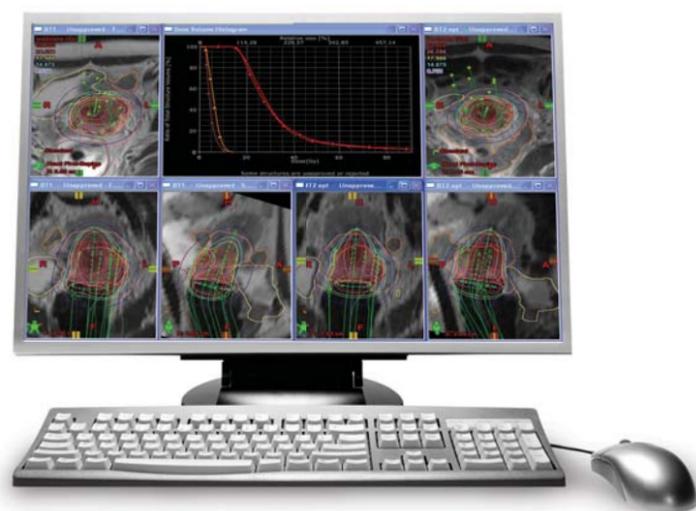
Use the plan evaluation workspace for analyzing and comparing alternative plans to determine the most appropriate plan for treatment. Compare plans side by side, or sum and evaluate matched image sets. View DVHs on the same graph for both multiple and summed plans.

## Plan export

BrachyVision creates an export file of the selected plan. Transfer the export file to the VariSource iX or GammaMed*plus* iX treatment machine.

## Administrative functions

Included you will find a comprehensive package for identifying source models, afterloader characteristics, and pre-defined applicators and templates for interstitial implants.



### Dose volume histogram

A dose volume histogram shows cumulative, differential, or natural histograms for any identified structure. The cross hair cursor allows simple, precise, and fast access to the volume of any dose value. At the same time, an isodose curve for that value will be visible in the 2D view.

## Technical specifications

### Stand alone workstations

Hardware (configuration to be as follows or better)

#### Tower system

- Intel 2.33 GHz core duo processor
- 2 GB DDR
- 80 GB SATA hard drive (7200 RPM)
- 16X DVD+RW/+R internal drive
- Windows® XP® PRO
- 256 MB graphics card
- Ethernet interface
- 21-inch flat panel monitor

#### Laptop system

- 2.2 GHz Intel core duo processor
- 15.4" screen
- 2.0 GB DDRII
- 120 GB 7200 RPM hard drive
- 8X Max DVD+/- RW combo
- Windows® XP® Pro
- Ethernet interface
- 512 MB graphics card

Note: Unless 100% DICOM data interface is envisioned, or a network film scanner is available, a film digitizer option should also be purchased.

## Software

- HDR brachytherapy planning
- DICOM-3 network image data interface
- LDR brachytherapy planning
- Template-based pre-plans
- Installation and training
- Telephone support
- Three days classroom applications and treatment planning training (includes travel and accommodations)

## Software only workstations

Additional BrachyVision software licenses are available for purchasers who wish to add a BrachyVision license to an existing Eclipse™ workstation. The BrachyVision software version will be reliant on the Eclipse version.

## Options

### Vidar® VXR Dosimetry Pro® image digitizer

The Vidar VXR family of film scanner has become the standard for medical imaging projects.

- SCSI-2 or USB interface
- Optical density range to 3.85
- Grayshade to 16 bit
- Resolution to 4K x 5K



### Flatbed film scanner

The flatbed scanner is a consumer-grade product suitable for those who will scan film occasionally, or who have budgetary constraints which make this more affordable option attractive.

- SCSI-2 interface
- Optical density range: 0.00 - 3.40
- Bed size: 17 x 11 inches; scan area 11 x 15 inches
- Grayshade: 12 bit
- Resolution: 600 x 1200 (interpolated to 9600 dpi)

## Environmental specifications

- Voltage: 98 to 240 Vac, 50-60 HZ
- Heat dissipation: 200 BTU/hour, minimum

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For more information on BrachyVision, visit <http://www.varian.com/brachytherapy>.

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