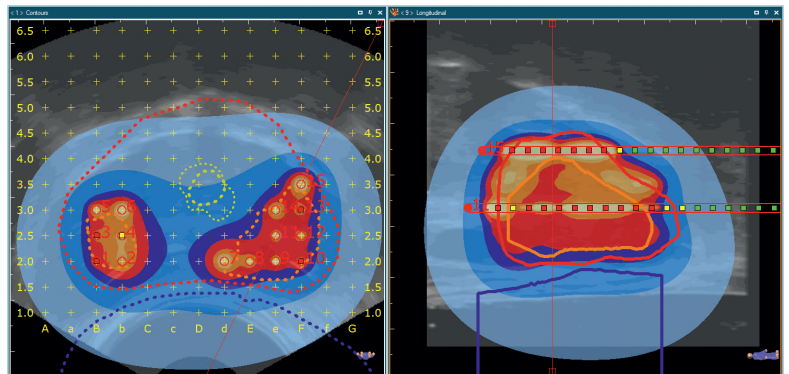




SagiPlan®

The comprehensive treatment planning software (TPS) for all HDR applications including real-time prostate treatment.



One TPS for all HDR brachytherapy treatments with modern user interface and advanced planning features for an efficient and fast workflow.

Ease of Use

SagiPlan® provides an intuitive multilingual user interface. The customized layout and configuration of parameters for user preferences and treatment settings make planning fast and easy.

Multimodality Imaging and Image Registration

SagiPlan® supports various image formats and modalities including CT, MR and radiographic films. With advanced image registration methods (manual, automatic, landmarks), data can be fused and displayed simultaneously for a reliable target definition and plan evaluation.

Applicator Reconstruction

All applicators delivered by Eckert & Ziegler BEBIG and Mick Radio-Nuclear Instruments are implemented in the SagiPlan® Applicator List with full 3D geometric data allowing for an easy, fast and accurate reconstruction. Flexible applicators are easily reconstructed with automatic image processing based on CT image data.

Full and Flexible Connectivity

SagiPlan® provides full DICOM connectivity features with DICOM RT images, structures, plan and dose data. The DICOM Query and Retrieve features together with the DICOM RT plan export to SagiNova® enable a seamless workflow.

Plan Template List

SagiPlan® speeds up planning significantly with integrated Plan Templates. The Plan Template List helps the user to store their own set of applicators including their 3D spatial arrangement, control points for plan optimization and dose monitoring as well as the entire source dwell position information.

Extensive Dose Calculation and Optimization Features

SagiPlan® is compliant with AAPM TG-43 and the HEBD-WG recommendations. It enables dose calculations for both, cobalt-60 and iridium-192 sources, and provides approximations for the effect of applicator and shielding attenuations. Manual and automatic optimization of the dose can be done with a variety of tools, such as manual isodose shaping, geometric optimization and inverse planning for a reliable control of the target coverage. The fast simulated annealing algorithm optimizes dwell times with respect to user-defined dose objectives.

Integrated Prostate Module

The additional software package – Prostate Module – is fully integrated into SagiPlan®. The Prostate Module uses transversal or longitudinal TRUS for real-time planning. Due to automatic fusion of live TRUS data and real-time isodose and dose-volume histogram calculation on live TRUS image streams, SagiPlan® supports focal therapy very well. Needle placement guidance enables easy finding of needles with automatic angle recognition and position feedback.

Unique BED and EQD2 Feature

SagiPlan® is the only TPS which can calculate the biologically effective dose, total BED, equivalent dose for 2 Gy fractions, and total EQD2 for any structure volumes or points selected by the user. Individually defined α/β ratios allow for an easy evaluation of the HDR treatment course together with external beam radiation (EBRT) plans. The calculation is based on individually defined α/β ratios for different control points for both EBRT and for fractionated HDR brachytherapy.

Exclusive



User Interface & Access Control

- Multi-lingual user interface
- User account administration to set privileges
- Plan approval with e-signature

Connectivity

- DICOM Query and Retrieve Store SCU and Store SCP functions
- DICOM 3.0 RT import of CT, MR, US, CBCT and PET images, structures and DICOM RT export of images, plan, dose, and structures
- Support of BMP, JPEG, TIFF, PNG and other image formats
- Support of analog and digital frame grabbers, including a simulator frame grabber and stepper for training purposes
- Ability to perform centralized and distributed planning with server-based patient database and floating licenses
- ATC/RTOG compliant anonymized data export

Contouring and Image Registration

- Continuous, by points, circular or spherical mode
- Contour interpolation and projected structure outline
- Structure editing in arbitrary planes
- Automatic contouring
- 3D VOI modifications in arbitrary planes
- Transfer of structures to other coordinate systems and registered image sets
- Logical Boolean operators for structure generation
- 3D margining tool for isotropic and non-isotropic margins
- Image fusion for CT, MR, US and PET images
- Manual, landmark-based and automatic image registration

Reconstruction Techniques

- 2D reconstruction without images, non-isocentric (reconstruction box), isocentric and isocentric with deviation, multiple image sets, manual and automatic pixel determination, corresponding projection lines
- 3D reconstruction on image sequences with and without template, and reconstruction on fused images
- Creation of up to 4 DRRs from CT images at user-defined angles

Applicators

- All applicators from Eckert & Ziegler BEBIG and Mick Radio-Nuclear Instruments available within Applicator List Library
- Reconstruction of applicators in arbitrary planes, including DRR images
- Automatic reconstruction of flexible applicators
- Easy positioning with mouse click, three-point method or coordinate entry

Planning

- Flexible control points positioning by mouse click, coordinates, along the line, within structure volumes and on structure surfaces

- Basal dose points (Paris System) and Manchester-based (A and B points)
- Editing of dwell positions and properties on images, automatic activation based on contours, control points or distance from applicator tip
- Dwell position separation between 1.0–15.0 mm with activation of all positions, every 2nd, every n-th with up to 100 dwell positions depending on applicator type
- All applicators, control points and dwell position information are saved as Plan Templates

Dose Calculation and Optimization

- Compliant with AAPM TG-43 and the HEBD-WG recommendations
- Approximations for the effect of applicator and shielding attenuations
- Display of source strength and apparent activity for planning vs. calibration date
- Manual editing of dwell times via bars or value entries
- Geometrical and control point based optimization
- Isodose shaper
- Inverse planning with fast simulated annealing algorithm

Dose Evaluation

- Evaluation of isodose lines in any arbitrary plane
- Live dose cursor and hot-cold dose display
- 3D isodose cloud display and 3D surface depiction with dose
- Real-time update of dose-volume histograms and user-defined parameters ($V100$, $D90$, D_{2cm^3})
- COIN, dose volume, DNR, overdose volume and dose homogeneity indices are calculated and updated automatically
- Graphical and acoustical dose alerts
- Multiple plan comparison with synchronized dose display
- Customizable report printout
- BED and EQD2 calculation for selected points, organs and Total BED and EQD2 for external beam and brachytherapy treatments

Prostate Module

- Add-on, fully integrated software module
- Includes image registration with live US images with any other image modality
- Includes prostate simulator for demonstration and training purposes
- Automatic needle sorting and labelling according to template position

User Defaults and Treatment Defaults

- Configurable settings for contouring, isodose line display, applicators etc. are saved as User Default
- User-defined treatment defaults for respective anatomical sides with fractionation, contouring presets, structure names and DVH parameters for plan analysis

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