Free yourself from long hours spent re-planning

Philips Pinnacle³ Dynamic Planning specifications

Pinnacle³

PHILIPS

sense and simplicity

Fast. Easy. Clinically Feasible.

Pinnacle³ Dynamic Planning is designed to make re-treatment and treatment adaptation feasible for most clinics. Fast assessment and automated re-planning tools generate at-a-glance information to help monitor treatment efficacy and create new plans with limited user intervention. This enhanced capability allows your clinic to adjust for patient changes over time in the treatment planning process.

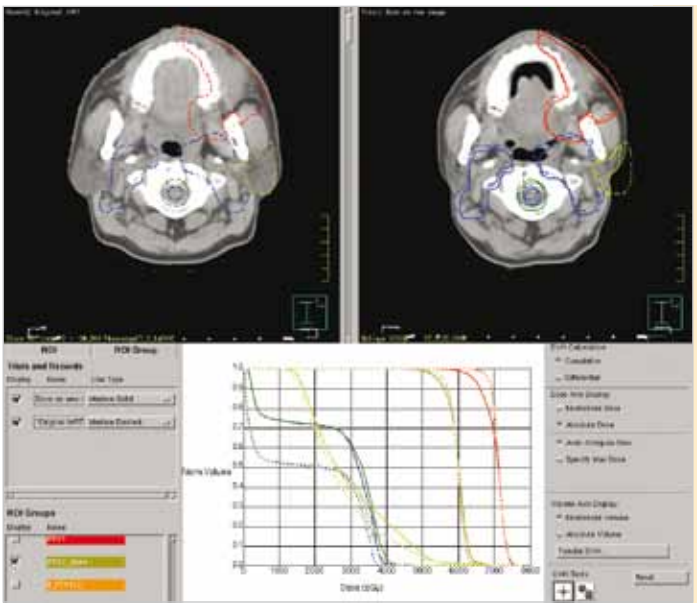

Figure 1. Head and neck case comparing original and assessment images. DVH curves show the difference in delivered dose between the original and the re-plan.

Fast assessment
Enable fast and comprehensive assessment to determine the need to re-plan.

Automated re-planning
Facilitate fast and easy plan adaptation with limited user intervention.

Manage treatment plans over time
Dynamically track the impact of patient changes to treatment plans.

Facilitate re-treatments
Enhance targeting when planning on patients requiring re-treatments.

New features

Assessment tools

- Copy the plan data to a new image set and deform contours
- Create records with read only views of data that include: Isodose line display, anatomical structures, points of interest, maximum dose point display, dose comparison panel, DVH comparison
- ROI groups to assess motion and volumes across treatments including: creating DVHs with data from ROI groups, track motion and view volume through the trend panel tool, ROI expansion and contraction tools
- Dose accumulation for multiple trials and records associated with the primary image set
- Trending for structure volumes, locations and dose

Re-planning tools

- New contours, new isocenter, and new beams are mapped along with the original data to the new image data set for comparison

Manage treatment plans over time

- Record Viewer and Treatment Navigator: view and navigate among current and previous plans that were used for treatments for the same patient

Facilitate re-treatments

- One button to recalculate dose on the new image data set
- Display isodose lines on the new record

Easy to launch

- Dynamic Planning is available directly from the Launch Pad

Implementation

Clinical decision support

Dynamic Planning provides the user with the tools needed to make decisions and act upon them based on patient changes over time – either during the course of one treatment or for re-treatments. Due to a high level of automation both the assessment and the re-planning (where required) can be done quickly.

Requirement for Cone-Beam CT (CBCT) for Dynamic Planning

Dynamic Planning is designed to work with updated images taken during the course of treatment from either CT or Cone-Beam CT scans.

Deformation in Dynamic Planning

Dynamic Planning supports one clinical application of Deformable Image Registration (DIR) algorithms. DIR is the technique that maps voxels in one image set to corresponding voxels in the other image set. There are 3 main clinical applications of DIR: contour deformation for automated re-contouring, image deformation for image fusion and dose deformation.

Dynamic Planning uses contour deformation to propagate and deform contours from an original CT image set that was used for treatment planning to a new image set (CT or CBCT). The latter image set is imported during the course of treatment to monitor changes in patient anatomy.

Dynamic Planning's contour deformation algorithms are tuned to perform most accurately in the anatomical areas most often requiring treatment adaptation – namely head and neck, and thorax.

Dose deformation is not supported in Dynamic Planning at this time. Several publications (e.g. *Inverse consistency and transitivity in dose accumulation*, Bender, Hardcastle, and Tomé, Med. Phys. 39 (1), January 2012, pp 272-280), suggest that current deformable algorithms do not provide results that are accurate enough for routine clinical use. The recommended procedure is to re-compute dose on the image set that will be used for planning. The new copy-plan feature offers an elegant, automated mechanism to perform this computation on the new image set.

Supporting DICOM-RT Dose import from other systems

Pinnacle³ 9.6 can import DICOM-RT Dose (photons, electrons, protons, brachytherapy, TomoTherapy®, CyberKnife®, etc.)* from any vendor that exports dose in the following format: DICOM-RT DOSE Summation type "PLAN". This information is available in the Pinnacle³ DICOM Conformance Statement. This imported dose can be summed with dose computed within Pinnacle³ provided that both doses are computed on the same image set.

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System requirements

Memory

- 16GB RAM for smaller networks
- 128GB RAM for larger networks on SmartEnterprise

Storage

- The addition of CBCT and CT images acquired during treatment will increase demand for storage

System compatibility

- Dynamic Planning requires Pinnacle³ 9.6 which will run only on Intel-based platforms (server and client)
- Pinnacle³ 9.6 **will not** run on a SPARC-based server or client
- It is not recommended to install Pinnacle³ 9.6 on a server that supports a mixed network of clients supporting SPARC- (i.e. SB2500 and earlier) and Intel-based (810 and later) workstations

Pinnacle³ 9.6 software enhancements

Pinnacle³ 9.6 offers enhancements in many areas of the base software platform in addition to supporting the new Dynamic Planning option.

Workflow enhancements

- **Sort Utility** allows sorting of your lists of anatomical structures, points of interest and beams
- **DVH Track tool** allows the user to click on a curve of the DVH and view the dose and volume values for any point along the curve
- **DVH Zoom tool** allows the user to click and drag to zoom in on a portion of the graph
- The dose comparison panel allows users to evaluate dose from plans created on the same or different image sets

Launch Pad enhancements

- The list of plans in the Patient Select window is now organized by the primary image set allowing the user to hide or display the plans associated with an image set
- Images imported with patient demographic data now allows the user to edit the data

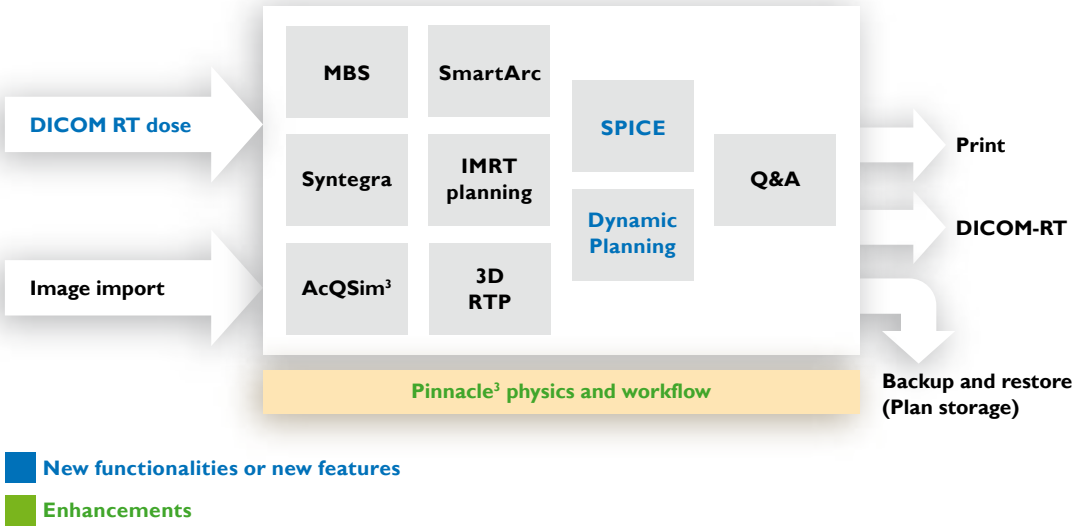
DICOM RT

- DICOM RT dose import is now permitted when the dose summation type is set to plan
- DICOM RT dose import creates a new record for the data

Changes to Pinnacle³

Enhance accuracy and streamline workflow

Changes from Pinnacle³ 9.2 to Pinnacle³ 9.6 with SPICE and Dynamic Planning



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