



PHILIPS

Pinnacle³

Launch Pad

Instructions for Use

Release 16.4 (English)

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Medical Device Directive

Pinnacle³ Radiation Therapy Planning System is CE Marked to the Medical Device Directive 93/42/EEC.

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Device Description

The Pinnacle³® Radiation Therapy Planning (RTP) software is composed of several modules including the core Pinnacle³ functionality, Syntegra™, P³IMRT®, and AcQSim³™. The Pinnacle³ RTP software runs on a Solaris UNIX (or UNIX compliant) computer, which allows qualified medical personnel to enter patient data into the system, use that data to construct a plan for radiation therapy, and evaluate the plan. Optionally, the qualified medical personnel may output the plan in an electronic or printed form for use by other systems in the delivery of treatment to a patient.

Pinnacle³ includes networking capabilities to provide connectivity to other Pinnacle³, Syntegra, AcQSim³, or P³IMRT workstations, input devices and output devices, as well as access to the Pinnacle³ database from any Pinnacle³ workstation available on the network. The system can be run from a single workstation but has network capability to other Pinnacle³ workstations and to both input and output devices via local area network (LAN) or wide area network (WAN). The Pinnacle³ RTP System also has an enterprise configuration for larger sites requiring a centralized data center environment. This system consists of one or multiple rack mountable servers on which Pinnacle³ sessions run which enables display on any network accessible computer. The expected service lifetime of the software is five (5) years.

To enable use of the software, a license key must be issued by the installer after software installation has been completed. If you have any software issues, please contact your service representative: Customer Support (1-800-722-9377 for US and Canada), your local Philips Customer Service provider, or your local Distributor. Beginning with Pinnacle³ 16.4, you will need to provide your service representative with the equipment ID assigned to your software kit. Your equipment ID can be found in the **About** window and is used to direct your call to the appropriate service personnel.

Intended Use

Pinnacle³ Radiation Therapy Planning System is a software package intended to provide planning support for the treatment of disease processes, utilizing photon, proton, electron and brachytherapy techniques.

Indications for Use

Pinnacle³ Radiation Therapy Planning System is a software package intended to provide planning support for the treatment of disease processes. Pinnacle³ Radiation Therapy Planning System incorporates a number of fully integrated subsystems, including Pinnacle³ Proton, which supports proton therapy planning. The full Pinnacle³ Radiation Therapy Planning System software package provides planning support for the treatment of disease processes, utilizing photon, proton, electron and brachytherapy techniques.

Pinnacle³ Radiation Therapy Planning System assists the clinician in formulating a treatment plan that maximizes the dose to the treatment volume while minimizing the dose to the surrounding normal tissues. The system is capable of operating in both the forward planning and inverse planning modes. Plans generated using this system are used in the determination of the course of a patient's radiation treatment. They are to be evaluated, modified and implemented by qualified medical personnel.

Contraindications

There are no known contraindications regarding the use of the Pinnacle³ RTP system.

Intended Audience

This manual is written for qualified medical personnel trained as users of Pinnacle³ RTP systems. You should make sure that you have thoroughly read and completely understand the manuals and release notes that are delivered with the software. Keep this manual and all other manuals delivered with the software near your Pinnacle³ system and review them periodically. The initial installation procedure will be performed by a Field Service Engineer. If you suspect that your system has an error, discontinue its use and contact Customer Support or your local distributor.

Minimum Requirements

This section provides the minimum requirements concerning hardware and software related to running the current product release as intended.

Professional

- Solaris 11 version 11.3 or later with Oracle X6-2
(*Note for existing sites: 11.2 or later with Oracle X5-2*)
- 64GB RAM (based on number of concurrent users)
 - Additional RAM requires upgrade
 - Upgradeable to 384GB RAM
- Rack Management: 1U each server

Network

- 10,000/1,000/100 Mbps Base-T Ethernet
- 1,000/100 Mbps Base-T Ethernet for remote management (ILOM)
- 4/8/16GBs HBA ports supported for communication between Smart Enterprise Cluster servers and the SAN

Third-Party Software

- OVDC(VCC) is used to access Pinnacle³
- Third-party software installations are not supported on any Pinnacle³ system server without proper validation.

Notes

Equipment specifications are subject to alteration without notice. All changes will be in compliance with regulations governing manufacture of medical equipment.

Pinnacle³ and P³IMRT are registered trademarks, and AcQSim³ and Syntegra are trademarks of Philips. Other brand or product names are trademarks or registered trademarks of their respective holders.

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Use of Symbols in Labeling

Philips Healthcare complies with International Standards and FDA requirements for the use of symbols in labeling. An online glossary of symbols used by Philips Healthcare is available at <http://www.symbols.philips.com>.

Smart Enterprise (Cluster Server Nodes)

- Solaris 11 version 11.3 or later with Oracle X6-2
(*Note for existing sites: 11.2 or later with Oracle X5-2*)
- Solaris Cluster required on cluster nodes
- 64GB RAM (based on number of concurrent users)
 - Additional RAM requires upgrade
 - Upgradeable to 384GB RAM
- Rack Management: 1U each cluster server

Smart Enterprise (Application Servers)

- Solaris 11 version 11.3 or later with Oracle X6-2
(*Note for existing sites: 11.2 or later with Oracle X5-2*)
- 64GB RAM (based on number of concurrent users)
 - Additional RAM requires upgrade
 - Upgradeable to 384GB RAM
- Rack Management: 1U each application server



General Device Warnings

Do not load non-system software onto the computer used by this system without the direct authorization of Philips Medical Systems. Feature performance and safety may be compromised.

To assure proper treatment, it is critical that a qualified medical person review and verify all system treatment plan parameters using an independent verification method prior to treating patients using the plan.

Report the occurrence of a serious incident in relation to this device to Philips Customer Support and the competent authority of the Member State in which the user and/or patient is established.

We recommend that you review TG40, TG53, and other pertinent radiation therapy treatment standards and incorporate those methods into your clinical practice to ensure that your use of the system results in the most accurate treatment plans. TG40, TG53, and other reports are available publicly at the American Association of Physicists in Medicine (AAPM) website.

- Comprehensive QA for radiation oncology: Report of AAPM Radiation Therapy Committee Task Group 40. *Medical Physics* 21(4), 1994.
- American Association of Physicists in Medicine Radiation Therapy Committee Task Group 53: Quality assurance for clinical radiotherapy treatment planning. *Medical Physics* 25(10), 1998.

The following clinical practices are recommended to verify the accuracy of each treatment plan:

- An independent calculation of the monitor units for each beam of a plan and treatment time for each brachytherapy plan.
- Acquisition and review of portal images or review of multi-leaf collimator (MLC) leaf positions after import to the treatment system.
- A chart check prior to the plan being delivered or during the first week of treatment.
- Independent review of the treatment plan prior to the delivery.
- Cross-functional review of the plan in a weekly chart round.
- Manual verification of record and verify settings after transfer to the treatment machine.
- Verification of the SSD and field shape during patient setup.

These reviews should be performed for a new plan or when a change is made to any component of a plan.

U.S.A. law: CAUTION: Federal law restricts this device to sale by or on the order of a physician.

This software product is a Medical Device.

Only qualified medical personnel should operate the system. New personnel should receive training prior to unsupervised operation of the system. For more information, contact Customer Support or your local distributor.

Serious injury to patients can result due to the misapplication of this product. Make sure that you thoroughly understand all the user instructions prior to using this device.

Pinnacle³ treatment plans may include the statement NOT FOR CLINICAL USE. Based on the machine or isotope data and the treatment plan, the software determined that the plan cannot be delivered clinically. Do not treat patients with plans that are not for clinical use.

Pinnacle³ includes sample data. This information is for reference purposes only. Do not treat patients with plans based on sample machines or other sample data.

1	Introduction	7
	Start Pinnacle ³ and Launch Pad.....	7
	Locked data in Launch Pad.....	7
	DICOM conformance	7
	Playing scripts	8
2	Institutions	9
	Overview.....	9
	Select an institution	9
	Add an institution	9
	Set a default institution	9
	Edit an institution.....	9
	Delete an institution	10
3	Patients and Plans	11
	Select patients	12
	Acquire images.....	15
	Edit images.....	21
	Concatenate images.....	25
	Export images	27
	Create plans	28
	Create plans with Dynamic Planning	29
	Start the planning software	33
	Plan locking.....	34
4	Backup and Restore	35
	Overview.....	35
	Backup	36
	Fields and buttons.....	38
	Restore	40
	Fields and buttons.....	43
5	System Administration	45
	Overview.....	45
	Use the system administration password	46
	Set the default tool	47
	License the software	48
	Define directory mount points for institutions	49
	Set up printers	50
	Set up scanners	52
	Delete image sets.....	53
	Set up backup devices.....	55
	Set up backup and restore defaults	55
	Manage the patient database.....	57
	Specify file maintenance settings	58
	Reconfigure automatic import settings	60

6	System Security and Data Privacy	62
	Regulatory Controls.....	63
	Security Issues and Guidelines.....	63
	System Backup Media	66

1 Introduction

This guide describes how to use Launch Pad to add patients to the database, acquire and import patient images, and add plans. Launch Pad is your gateway into the simulation, planning, image fusion, and physics tools.

Start Pinnacle³ and Launch Pad

After you are logged in to your workstation, you can start the Pinnacle³ software. Click the **Pinnacle³** icon in the front panel at the bottom of the screen. The **Launch Pad** menu appears.

The **Launch Pad** menu provides access to patient database operations for the current institution.

Locked data in Launch Pad

If data in Launch Pad is locked, no other users can modify the data until the lock is released or the user exits Launch Pad. Locking is employed in several areas:

- While any institution data is being modified, that institution and all patients in that institution are locked. If one institution is locked, you can still make changes to or work in another institution.
- While any patient information is being modified, including plan or image set information, the patient is locked.
- While physics information is being modified, the physics module is locked.
- While a plan is being modified in the software, the patient is locked. The plan and patient are not available to other users on the network until the person editing the plan exits the planning session.
- Once the software has been run on a plan, the primary CT image set and plan type are locked.

DICOM conformance

DICOM (Digital Imaging and Communications in Medicine) is a standard for the electronic transfer of digital images and associated information, developed by the American College of Radiology and the National Electrical Manufacturers Association. The Pinnacle³ software operates within DICOM standards and within the standards of the manufacturer's Conformance Statement for DICOM. The DICOM conformance statement is available on the Philips Healthcare website (www.healthcare.philips.com).

Playing scripts

Script playback is not available to users in Launch Pad. This option is only available in “research” mode within Launch Pad. Script playback is available to users within the software planning tools.

2 Institutions

Overview

All patient information is associated with an institution. The patient planning software lets you set up more than one institution. If you provide treatment planning services to more than one institution, you may want to set up multiple institutions and organize the patients and treatment machines under their respective institutions.

All the functions you need to manage your institutions are located in the **Select Institution** window. Click the **Institutions** button in the **Launch Pad** menu to open the window.

Select an institution

- 1 In the **Select Institution** window, highlight the name of the institution you want to use.
If you do not make a selection, the software uses the default institution shown at the bottom of the window.
- 2 Click the **Close** button.

Add an institution

- 1 Click the **Add** button in the **Select Institution** window. The **Add Institution** window appears.
- 2 Click the **Add Institution** button. The **Edit Institution** window appears.
- 3 Enter information about the institution.
- 4 Click the **Close** button to save the information and return to the **Select Institution** window. The new institution's name and address appear in the **Select Institution** window.
- 5 Click the **Close** button to return to the **Launch Pad** menu.

Set a default institution

- 1 Click the **Default Institution** option list in the **Select Institution** window.
- 2 Select the institution that should be the default institution.
- 3 Click the **Close** button.

Edit an institution

- 1 In the **Select Institution** window, highlight the name of the institution to be edited.
- 2 Click the **Edit** button. The **Edit Institution** window appears.
- 3 Change the information as necessary, and click the **Close** button.

Delete an institution

If an institution includes patients, you cannot delete it.

- 1 Click the **Delete** button in the **Select Institution** window.
- 2 Select the institution to be deleted.
- 3 Click the **Delete Selected Institution** button.

3 Patients and Plans

The patient planning portion of the software allows you to select patients, add and delete patients, import patient images, and add plans. All of these operations begin from the **Patient Select** window.

Click the **Planning** button in the **Launch Pad** menu to open the **Patient Select** window. The window displays the name of the selected institution and elements of the treatment as you define them, including the patient, plan, primary CT image, and fusion image set.

In the **Plans** list you can hide or display the plans associated with an image set by clicking the arrow next to the image set name.

Select patients

Patients associated with the current institution are listed in the top portion of the **Patient Select** window.

Add a new patient

NOTE

If your system is set up for automatic import, the software adds image sets to existing patients automatically. If the patient is not in the database, the software automatically adds the patient.

- 1 In the **Patient Select** window, click the **Add** button under the patient list. The **Edit Patient Data** window appears.
- 2 Enter the patient information in the fields. (The patient's last name is the only required field.)

Due to compatibility issues when you export patient data to other systems and print plans from Pinnacle³, the software does not allow you to use the following characters when you enter patient information in the **Edit Patient Data** window:

. ' ~ & () | < > + * \ / ; : @ ! [] #

If you import a DICOM image set, you can choose to import the image set with patient demographics. The software reads the DICOM file and enters the following information for you: last name, date of birth, gender, medical record number, referring physician, and comments.

NOTE

If you will export plans using DICOM RT, you must enter a first name, last name, and medical record number.

- 3 If you want to import patient images immediately, click the **Images** button and continue to the *Acquire images* section.
- 4 Click the **Close** button to return to the **Patient Select** window. The patient's name and other information appear in the patient list.
- 5 To select the patient you want to use, click the appropriate name in the list. By default, any newly-added patient is selected in the patient list.

You can sort the patient information according to the column headings in the patient list. For example, to sort the patients by last name, click the **Last Name** column heading. The patient list is sorted by last name in ascending order. To sort the list in descending order, click the **Last Name** column heading again. An arrow appears in the column heading to indicate the heading by which you are sorting. The arrow also indicates if you are sorting in ascending order (up arrow) or descending order (down arrow).

By default, patients are listed in the order in which they were added to the database.

- 6 If you want to transfer patient data to a different institution, click the **Transfer** button in the **Patient Select** window.

The **Transfer Patient** window appears. Highlight the institution to which the patient should be transferred and click the **Transfer** button.



CAUTION

If you transfer a patient, that patient is no longer available in the current institution. If the other institution does not have the correct physics data for the patient's plans, you may not be able to open the plans.

Select an existing patient and plan

- 1 Select the name of the patient from the patient list in the **Patient Select** window.

NOTE

You can find a patient by typing the patient's last name in the **Patient Select** window. Select any patient in the patient list and then type the last name of the patient for whom you are searching. (You do not need to type in a particular field.) The selected patient in the **Patients** list changes to a patient whose last name matches the name that you are typing.

- 2 Select the plan you want to use from the plan list in the **Patient Select** window.

NOTE

If you have not yet imported images and created a plan for the patient, no plans will be listed in the plan list. Continue to the *Acquire images* section.

Edit patient information

- 1 Select the patient from the patient list in the **Patient Select** window.
- 2 Click the **Edit** button under the patient list. The **Edit Patient Data** window appears.
- 3 Edit the patient information as needed.
- 4 If you have revised a patient, plan, or image set, you can click the **Revision History** button and review the revisions.

When you click the **Revision History** button, the **Patient Revision History** window appears. The window contains a list of revision files for the highlighted patient. Each file is stamped with the date of the revision. Click the files to see the revisions and who made them. To view revisions made to a different patient, select the patient from the **Patient Select** window. When the revision history is open, the other windows in Launch Pad are read-only.

- 5 Click the **Close** button to return to the **Patient Select** window.

Delete patient information



WARNING

Deleting a patient permanently removes patient data from the computer's hard drive. Patient data should be deleted only if the patient will not be planned or if the patient data has been backed up. For details on backing up patient data, see the *Backup and Restore* chapter.

- 1 From the **Patient Select** window, click the **Delete** button under the patient list.
- 2 In the **Delete Patient Confirm** window, select the patient you want to delete.
- 3 Click the **Delete Selected Patient(s)** button.
- 4 Click the **Close** button.

After you have backed up patient data, you can delete information for multiple patients at once. Hold down the **Shift** key as you click to make contiguous selections in a list. Hold down the **Control** key as you click to make non-contiguous selections.

Acquire images

If your system is set up for automatic import, image sets are automatically imported after the scans are complete, and the software automatically adds the patient and the image sets. If the software finds a patient in this institution that has the same first name, last name, MRN number, and date of birth as the demographic information included in image set that you imported, then the software imports the image set into that patient's list of available image sets. If the software does not find a patient whose information matches that of the image set you imported, then the software creates a new patient using the first name, last name, MRN number and date of birth information from the image set that you imported and imports the image set into the new patient's list of available images. For information about setting up a system for automatic import, contact Customer Support or your local distributor.

You can also import patient images using the **Image Select** window after you add the patient to the patient database. Images can be acquired over an Ethernet network or from CD-ROM.

NOTE

If your system is set up for automatic import but you do not see the image set that you expect, you can still manually import the image set or use the **DICOM File Issues** window to determine if there is a problem with the image set. See *Examine DICOM issues*.

NOTE

If an image set was imported automatically but you do not see the patient's name in the **Patients** list or the image set for the patient, either select another patient or select another image set to force an update to the **Patient Select** window. The patient's name and the image set will appear in the **Patient Select** window.

NOTE

If you need to concatenate image sets, see *Concatenate images*.

Image scanning guidelines



WARNING

If you acquire MR images with the patient lying in an orientation that is not head-first supine, the images may appear with the placement of the organs inverted. If you detect any discrepancies in the images, contact Customer Support at 1-800-722-9377 (USA and Canada) or your local distributor.

Generally, there are few limitations on the image data used for planning. However, you should note the following guidelines and recommendations:

- Many NM and PET systems reorient all scan data to be HFS (head-first, supine) if it is not actually acquired as HFS. This creates the potential for errors in Pinnacle³ treatment planning. The DICOM data that is transferred to Pinnacle³ is internally consistent, but the actual scan orientation information is lost. In this case, the data matches the Pinnacle³ orientation cube, and all orientation labels are correct. Be careful when using this reoriented data for treatment planning in Pinnacle³. For all image data, verify the patient orientation carefully, using fiducial markers if necessary.

- You cannot import sagittal or coronal images. You can only import axial images.
- All images in the image set should have the same magnification (i.e., all image pixels should be uniform in their respective X and Y dimensions).
- Each image set must have at least one image in the set.
- The images must be contiguous.
- Image sets should have unique names.
- The software does **not** correct for gantry tilt, table motion, or oblique (non-transverse) images in the X or Y (Lateral or AP-PA) directions. If you acquire images when the gantry is tilted or when the table is moving in the X or Y directions, patient geometry will be distorted. You can import image sets containing gantry tilt or table motion using DICOM Image, but you cannot use them as the primary image set.
- Image sets used as the primary data set must be collected as transverse images. PET and MR data should be used only for secondary data sets.

**WARNING**

CT and MR images are susceptible to distinct types of imaging artifacts and distortions. Some potential sources of image error are density artifacts, spatial distortion, and motion artifacts.

Image artifacts may exist in the patient image data to a varying degree. It is important to examine and critically review imaging information after import and through the course of treatment planning to identify any misrepresentations. If conditions are identified that may adversely affect treatment planning, you may have to implement one or more of the following:

- **Rescan the patient with an improved or different technique.**
- **Use a different modality for the image acquisition.**
- **Change treatment parameters to minimize the possible effect of the observed artifacts.**
- You cannot save an image set with multiple slices at the same Z coordinate.
- The software considers air to have a density of zero. CT numbers below the density of air are considered negative. The software automatically sets all negative CT numbers to zero.
- The software cannot currently make use of ScoutView images. They should not be transferred into the software.
- You cannot delete slices with ROI contours or POIs transferred from a CT simulation system.
- If you have scanned CT films for use in the software and the skin surface is not completely visible, you may have to contour the patient surface in order for the dose distribution to start at the patient surface and not in the interior of the patient.
- Image sets should not be stored in a compressed format in the patient database. Compression schemes are typically proprietary and are therefore unavailable to other vendors.
- If you have problems importing image sets, it could be that the image set has been corrupted during import. To prevent changes to the image set during import, make the media you are using write-protected.

**CAUTION**

The software does not interpolate between slices in the density grid. Each slice is treated as an extruded section, with no smoothing of the outer contours.

Cone beam CT image sets



WARNING

Cone beam CT (CBCT) image sets are not reliable for dose computation. If you compute dose on a CBCT image set, dose could contain significant clinical errors.

The current DICOM 3.0 specification cannot discern between a diagnostic quality CT image set and a cone beam CT image set. Therefore, the software does allow you to import cone beam CT image sets into Pinnacle³. However, you should only use cone beam CT image sets for image registration tasks, such as patient alignment or the generation of 4D structures.

Import patient images

NOTE

If you are going to fuse images, you must add multiple image sets for the same patient.



CAUTION

To use the same image set for two different orientations (for example, head-first and feet-first), import the image set twice, once for each orientation. Change the patient orientation as necessary in the Data Set Editor window, then rename the second image set in the Image Select window. If you do not rename it, your plans will refer to the same image set name and Launch Pad always uses the first one.

For information about Pinnacle³ DICOM conformance, see *DICOM conformance* in the *Introduction* chapter.

- 1 Select the patient from the patient list in the **Patient Select** window.
- 2 Click the **Images** button in the **Patient Select** window or **Import Images** button in the **Edit Patient Data** window or **Edit Plan Data** window. The **Image Select** window appears.
- 3 In the **Scanner Type** option list, select the format of the image file. The three main file formats are listed below. Other options may be available, depending on the configuration of your system.
 - **DICOM3File**—Select this option to import DICOM image sets from a network.
 - **DICOM3CD**—Select this option to import DICOM image sets from a CD. The CD-ROM where image sets are stored must be written in DICOM3-compliant format.
 - **PinnacleFormat**—Select this option to import non-DICOM image sets.
- 4 Click the **Add** button to add an image set for the patient.
- 5 Are you importing DICOM image sets?
 - If yes, the **Select Images For Import** window appears. See *Import DICOM image sets*.
 - If no, the **Image Import** window appears. See *Import non-DICOM image sets*.

Import DICOM image sets



CAUTION

Your DICOM image set must contain a Series Instance UID tag or the image set cannot be imported. Also, if the patient name field in the image set is blank, you can still import it but the

name fields in Launch Pad will be blank. You cannot export a plan from Pinnacle³ via DICOM RT if the patient name and medical record number fields are blank.

NOTE

If your system is set up for automatic import, the software adds image sets to existing patients automatically. If the patient is not in the database, the software automatically adds the patient.

DICOM Image allows for the import of CT, MR, NM, or PET images from either CD-ROM or a network connection via TCP/IP. The use of third-party, freeware DICOM programs is not recommended for either transfer method because it adds a step during the import process where data may be modified. DICOM files processed via such third-party, freeware DICOM applications are not guaranteed to work correctly when imported into Pinnacle³.

- 1 In the **Select Images For Import** window, use the **Import** check boxes to select the image sets that you want to import. If you have image sets that are gated, you can click the **Group** radio button to select all image sets that have the same **Study ID**. To clear all selections, click the **Deselect All** button.

If you do not see the image sets that you want to import, click the **Reread Patient/Exam Directory** button to refresh the list of image sets. If you still do not see the image sets that you want to import, click the **Examine DICOM Issues** button to determine which, if any, files have issues that prevent the software from importing them. See *Examine DICOM issues*.

- 2 Use the following options to specify how you want to import the image sets.
 - To import the selected image sets with the patient demographic information, select the **With Demographics** check box. If you select this check box, the image sets are loaded along with the patient's last name, date of birth, gender, medical record number, referring physician, and comments. If patient information already exists and you choose to import patient demographics, you will lose the existing information.
 - To review the image sets after you import them, select the **Review Upon Import** check box. If you select this check box, the **Data Set Editor** window appears when you import the images. If you select more than one image set to import using the Group column, each image set is loaded into the **Data Set Editor** window individually. In the **Data Set Editor** window, click the **Save and Exit** button to move to the next image set. For more information, see *Edit images*.
 - To delete the DICOM image set from the source directory after you import it into a plan, select the **Delete DICOM Files After Import** check box.
- 3 Do you want to automatically create a plan for this patient?
 - If yes, click the **Import Images and Add Plan** button to import the selected images. The software automatically creates a new plan and the **Edit Plan Data** window appears. For more information on the **Edit Plan Data** window, see *Create plans*. After you set up the plan, you can either enter Pinnacle³ by clicking the appropriate planning tool, or you can click the **Close** button to return to the **Image Select** window.
 - If no, click the **Import Images Only** button. The software imports the images and returns you to the **Image Select** window.
- 4 If necessary, rename the image set by selecting the image set in the list and typing a new name in the **Image Name** field. Press the **Enter** key to confirm the new name. Once you open a plan

that is associated with the image set, you cannot change the name of the image set unless you delete that plan.

- 5 If necessary, use the buttons listed below to edit, delete, concatenate, or automatically segment the image sets. Once you open a plan that is associated with the image set, you cannot edit, delete, or concatenate the image set unless you delete that plan.
 - **Edit**—Opens the **Data Set Editor** window. For more information, see *Edit images*.
 - **Delete**—Opens the **Delete Image Confirm** window. In this window, you can select which image set you want to delete. Click the **Delete Selected Image** button to delete the selected image set.
 - **Concat**—Opens the **Image Concatenate** window. For more information, see *Concatenate images*.
 - **Auto-Seg**—Opens the **Auto-Segmentation** window. For more information, see *Auto-Segmentation* in the *Pinnacle³ Planning Instructions for Use*.
- 6 You can sort image sets according to the column headings in the image set list. For example, to sort the image sets by image name, click the **Image Name** column heading. The image list is sorted by image name in ascending order. To sort the list in descending order, click the **Image Name** column heading again. An arrow appears in the column heading to indicate the heading by which you are sorting. The arrow also indicates if you are sorting in ascending order (up arrow) or descending order (down arrow).
- 7 Click the **Close** button to return to the **Patient Select** window.

Import non-DICOM image sets

- 1 In the **Image Import** window, select the patient images that you want to import. By default, image sets should be in `/usr/local/adacnew/DataSets`. If they are not, call Customer Support.

If necessary, change directories to find the image set you want. Use the **Directory** list in the right half of the window to traverse the directories on your hard disk. The current directory is shown at the top of the list. To go up one directory, double-click the double dots (..) in the list. To go down one directory, double-click the directory name in the list.
- 2 If you want to edit the image set prior to import, select the **Review Upon Import** check box. If you select this check box, the **Data Set Editor** window appears when you import the images. For more information, see *Edit images*.

NOTE

If you want to delete the original image set, click the **Delete selected file** button to delete the image set from the directory shown in the **Directory** field.

- 3 Click the **Import selected file** button. The software imports the image set and returns you to the **Image Select** window.
- 4 If necessary, rename the image set by selecting the image set in the list and typing a new name in the **Image Name** field. Press the **Enter** key to confirm the new name. Once you open a plan that is associated with the image set, you cannot change the name of the image set unless you delete that plan.

- 5 If necessary, use the buttons listed below to edit, delete, concatenate, or automatically segment the image sets. Once you open a plan that is associated with the image set, you cannot edit, delete, or concatenate the image set unless you delete that plan.
 - **Edit**—Opens the **Data Set Editor** window. For more information, see *Edit images*.
 - **Delete**—Opens the **Delete Image Confirm** window. In this window, you can select which image set you want to delete. Click the **Delete Selected Image** button to delete the selected image set.
 - **Concat**—Opens the **Image Concatenate** window. For more information, see *Concatenate images*.
 - **Auto-Seg**—Opens the **Auto-Segmentation** window. For more information, see *Auto-Segmentation* in the *Pinnacle³ Planning Instructions for Use*.
- 6 You can sort image sets according to the column headings in the image set list. For example, to sort the image sets by image name, click the **Image Name** column heading. The image list is sorted by image name in ascending order. To sort the list in descending order, click the **Image Name** column heading again. An arrow appears in the column heading to indicate the heading by which you are sorting. The arrow also indicates if you are sorting in ascending (up arrow) or descending (down arrow) order.
- 7 Click the **Close** button to return to the **Patient Select** window.

Edit images

Use the **Data Set Editor** window to review and edit imported images.

The viewing windows in the **Data Set Editor** window work like other viewing windows in the software. For more details on using these windows, see the *View Patient Data* chapter of the *Pinnacle³ Planning Instructions for Use*.

If you make any of the following changes to an image set, you cannot export structure sets, dose, or spatial registration for the modified image set. You can still export a plan, but the software does not include the isocenter in the plan.

- change the patient position
- change the patient orientation
- change the treatment position
- change the X/Y pixel size
- change the Z coordinate for a slice
- delete a slice

When you finish editing the image set, click the **Save and Exit** button to save your work and return to the **Image Select** window. To exit the window and cancel the changes, click the **Exit Without Saving** button.

Specify patient position

Patient orientation information is typically reported from the original image data file. If it is unavailable, the software assumes that the CT scan was obtained with the patient positioned on their back, head first into the scanner with the table moving into the scanner.

If you know that the positioning information from the scanner is incorrect, you can change the patient position.

- 1 Click the **Set Scanning Info** button. The **Image Set Setup** window appears.
- 2 Click the **Specify Scanning Position** button in the **Image Set Setup** window. The **Patient Setup** window appears.
- 3 Compare the CT film and the scanning orientation to the image shown in the software.

The orientation cube reflects the angle from which you are viewing the image. For example, an “I” indicates that you are viewing a transverse slice from an inferior viewing angle. An “L” indicates that you are viewing the image from the left. See the *View Patient Data* chapter of the *Classic Pinnacle³ Planning Instructions for Use* for details about the orientation cube.

- 4 If necessary, change the following settings in the **Patient Setup** window to match the actual scan.



WARNING

Changing the following two patient position settings **DOES NOT** change the CT data, it only modifies the patient orientation cube and the header file information. Verify the patient position

based on anatomical references or fiducial marks visible in the image to ensure the proper patient position. Failure to verify the patient position can result in improper planning.



CAUTION

Changing the following two patient position settings disables the patient marking feature in AcQSim³.

- **Patient position during scan**—Specify how the patient was positioned on the table during the CT scan acquisition. Possible patient positions are on back (supine), on front (prone), left side down, and right side down.
- **Patient orientation on table**—Specify whether the patient was positioned with the head first into the CT scanner or the feet first into the CT scanner.



WARNING

Changing the treatment position resamples the data set and effectively changes the patient's orientation on the table.



CAUTION

Changing the treatment position disables the patient marking feature in AcQSim³ for all scanners.

- 5 If the patient scan is head first and you want to treat feet first, click the **Change Treatment Position** button. If the patient scan is feet first and you want to treat head first, click the **Change Treatment Position** button.

The patient is rotated 180 degrees around the vertical axis. Use this option when the scan is obtained in one direction (for example, head first), but the treatment is delivered in a different direction (for example, feet first).

- 6 Click the **Close** button to return to the **Image Set Setup** window.

The **Scan acquisition direction** field shows how the table was moved in relation to the scanner during CT scan acquisition. The table starting position is outside of the scanner, and the table moves into the scanner while acquiring the CT scans. You cannot change this setting.

The data handlers properly account for scans acquired with the table moving out of the scanner.

Review the image set

After you have verified that the patient position is correct, use the tools in the **Data Set Editor** window to review the image set.

- 1 Select a viewing window layout by clicking one of the three buttons above the **Window/Level** button.



- **Display one MPR layout**—Display one large MPR viewing window.



- **Display multiple MPR layout**—Display many MPR viewing windows, all showing the same patient orientation.



- **Display three MPR, one 3D layout**—Display three MPR viewing windows and one 3D viewing window.

- 2 To improve the contrast of the image display, click the **Window/Level** button. The **Window/Level** window appears. For details on using this window, see the *View Patient Data* chapter of the *Classic Pinnacle³ Planning Instructions for Use*.
- 3 Use the 2D window controls to review the slices in 2D viewing windows.
 - **2D Tools**—Use the **2D Tools** to scroll, pan, zoom, or measure the selected image slice. For more information on using the 2D tools, see the *Tools* chapter in the *Pinnacle³ Planning Instructions for Use*.



- **Slices**—Click the **Previous slice** and **Next slice** buttons to move through the volume one slice at a time. For example, if you are viewing slices 1 through 25 and you click the **Next Slice** button, the **Data Set Editor** displays slices 2 through 26.



Click the **Previous 25 slices** and **Next 25 slices** buttons to move through the volume one page of slices at a time. For example, if you are viewing slices 1 through 25 and you click the **Next 25 slices** button, the **Data Set Editor** displays slices 26 through 50.

- **Zoom**—Click the up and down arrows to change the magnification of the displayed image slices.
 - **Reset**—Click the **Reset** button to return to the original display setting.
 - **Expand**—The **Expand** button is only available if you select the **Display multiple MPR layout** viewing window layout. Click the **Expand** button to enlarge the selected slice to fit the entire viewing window.
- 4 Use the 3D window controls to review the image set in the 3D viewing window. The **3D Tools** panel is only available if you select the **Display three MPR, one 3D layout** viewing window layout.
 - **3D Tools**—Use the **3D Tools** to manipulate the 3D viewing window. For more information on using the 3D tools, see the *Tools* chapter in the *Pinnacle³ Planning Instructions for Use*.



- **Advanced Rendering Controls**—Click the **Data Sets** button to open the **Data Set Specifications** window. For more information on using the **Data Set Specifications** window, see the *3D viewing windows* chapter in the *Pinnacle³ Planning Instructions for Use*.
- **Render**—Click the **Render** button to render the 3D viewing window.

Delete and restore slices



WARNING

Deleting too many images reduces the precision of the 3D reconstruction. Delete only images that were incorrectly acquired or sent. The **Data Set Editor** will not allow you to delete all slices. Also, you cannot delete slices with ROI contours or POIs from other systems. Removing images from the data set does not reduce calculation time.



CAUTION

Deleting slices from the image set disables the absolute patient marking feature in AcQSim³. The image set may not accurately reflect the dimensions of the patient.

**CAUTION**

Deleted slices cannot be restored once you exit the Data Set Editor. You must reload the image set if you want to recover the deleted slice.

If you want to delete a slice from the volume, select the slice and then click the **Delete Current Slice** button. The **Delete Slice Confirmation** window appears. Click the **Delete Selected Slice** button.

If you delete slices and then decide to restore them in the volume, click the **Restore Deleted Slices** button. The **Restore Deleted Slices** window appears. This window has many of the same 2D view controls. Select the deleted slice you want to restore, then click the **Restore Current Slice** button.

Renumber slices

If you need to renumber slices, click the **Slice List Editor** button and make your changes in the **Slice List Editor** window. If you change the slice numbers or you are using a DICOM Image 4.2 (or later) image set, you can revert to the Pinnacle³ slice numbers by clicking the **Use Pinnacle Slice #** button.

**CAUTION**

Changing the Z coordinates disables the absolute patient marking feature in AcQSim³. The image set may not accurately reflect the dimensions of the patient.

You can edit slice numbers, for example, to make them match your film. Edit numbers in the **Slice Number** column to match those in the Index column. To increase or decrease all numbers by one, click the **+1** and **-1** buttons. You can edit the slice z-positions in the Z Coord column. However, you cannot modify these values in a way that requires the images in the data set to be reordered.

Modify the x/y scale

**CAUTION**

Changing the x/y pixel size disables the absolute patient marking feature in AcQSim³. The image set may not accurately reflect the dimensions of the patient.

If you need to modify the x/y scale of the image set, click the **Set X/Y Pixel Size** button. The **Set X/Y Scale** window appears. This window includes directions for its use. Click the **Slice** arrows to view the previous or next slice in the volume. The **Zoom** and **Reset** controls work as described in *Review the image set*. The window also contains 2D tools to help you control the image display. For details on using these tools, see the discussion of 2D tools in the *Tools* chapter of the *Pinnacle³ Planning Instructions for Use*.

Concatenate images

When the slice spacing for image data changes, some imaging vendors must create a new series of images in order to implement DICOM properly. For example, prostate image sets are often collected with variable spacing, which creates multiple series of images instead of a single study set. Also, when an imaging device's reconstruction board is filled, the device must place additional images into a separate series. For treatment planning, these multiple series must be concatenated into a single image set.

After importing multiple image sets into Launch Pad, use the image concatenation tool to combine them for use in planning. The tool can also detect overlapping among image sets to be concatenated, and allow you to remove overlaps by adjusting the Z-start position for an individual image set. After concatenation, the tool preserves the Z-spacing within individual image sets, and enforces the consecutive order of image slices in the concatenated image set.



CAUTION

Concatenating images disables the absolute patient marking feature in AcQSim³. The image set may not accurately reflect the dimensions of the patient.

NOTE

You can adjust the Z-position of slices, but these positions must be different from image set to image set. You cannot concatenate image sets that have slices in the same Z-position.

- 1 Open the **Image Concatenate** window in Launch Pad by clicking either the **Concat Images** button in the **Patient Select** window or the **Concat** button in the **Image Select** window.

You cannot concatenate images unless there are at least two image sets for the current patient.

- 2 In the **Image Concatenate** window, specify the order of images for the combined image set. For each image set you want to concatenate, select the image set and then click the **Add** button.

To remove an image set from the **Concat List**, click on the image set number in the **Concat List**.

- 3 Click the **Concat** button. After a short pause, the **Image Concatenation Check** window appears over the **Data Set Editor** window.

The software only allows you to concatenate image sets if the following items match:

- (X, Y) pixel size
- medical record number
- patient orientation
- image scan orientation

If all items do not match, click the **Back** button to return to Launch Pad and make revisions. When the items match, repeat the previous steps.

- 4 When the image sets pass all the validation checks, click the **Proceed** button to close the verification window. The image sets are rendered and displayed in the 3D view of the **Data Set Editor**.

Image sets appear in the order of your selection.

- 5 To adjust the Z-start position for an image set, click the **Slice List Editor** button. In the **Slice List Editor** window, type the new Z-start position in the **Z Start** field. The slice list updates accordingly.

You can also use the **Data Set** option list in the **Slice List Editor** to select a different image set for viewing, if necessary. Click the **Close** button when you finish.

NOTE

The 3D display behaves differently depending on whether you open the **Slice List Editor** before or after concatenating image sets. If you open the **Slice List Editor** before concatenating, all imported image sets are displayed in 3D for better visualization when adjusting Z-start values. If you open the **Slice List Editor** after concatenating, only the image set being edited is displayed in 3D.

- 6 If you need to review the order of the image sets before concatenation, use the **Image set #** option list to display different image sets.
- 7 If you are satisfied with the order of the image sets, click the **Concat Data Sets** button. After a pause, the concatenated image set is rendered and displayed. The name of the image set changes to Concatenated and appears in the Image set # option list.

NOTE

The time required to concatenate image sets depends on workstation speed and the number of images you want to concatenate.

If necessary, use the controls in the **Data Set Editor** window to delete image slices and restore deleted slices.

If you need to adjust the order of the images, click **Exit without Saving**. Return to step 2 of this procedure, adjust the order of the images, and repeat steps 3-7.

- 8 Click the **Save and Exit** button to save the concatenated image set. The software saves the image set as "Concatenated" and returns you to the **Image Concatenate** window.
- 9 Verify that the combined image set appears in the image list, then click the **Close** button to close the **Image Concatenate** window. The software returns you to the **Patient Select** window.
- 10 If you want to rename the concatenated image set, click the **Images** button. The **Image Select** window appears. Type a new name in the **Image Name** field.

Export images

You can export DICOM Image 4.2 (and higher) image sets through the **Image Select** window. You can export the original DICOM image set only. Changes made to it in the Pinnacle³ system are not exported.

- 1 In the **Patient Select** window, highlight the patient who has a DICOM image set you want to export.
- 2 Click the **Images** button. The **Image Select** window appears.
- 3 Highlight the image set to export.
- 4 Click the **Export** button. The **Export Images** window appears.
- 5 From the option list, select the destination AE Title.
- 6 Click the **Transfer Images** button. The image set is transferred via your DICOM setup. Messages appear in the window to tell you the status of the transfer.

Create plans

Once you have added the patient to the patient database and acquired any images that you want to use for planning, you can add a new plan for the patient. There are three ways in which you can add a new plan:

- create a new plan
- copy an existing plan, either with or without dose information
- copy an existing plan to a different image set

NOTE

Any patient data that is brought into the current software version from a previous version via the backup and restore tools will still be associated with the previous version of the planning tool. To run the current planning tool on older plans, click the **Edit** button in the **Plans** area of the **Patient Select** window in Launch Pad. From the **Edit Plan Data** window, select the current version from the **Planning Tool** option list.

Create a new plan

- 1 In the **Patient Select** window, select the patient from the patient list.
- 2 In the **Plans** area of the **Patient Select** window, click the **Add** button. The **Edit Plan Data** window appears.
- 3 Enter the plan information in the fields.

You can enter the name of the plan, the planner, the physicist, and any comments. You can also select the planning tool from the option list, if more than one is available.

- 4 In the **Primary Image Set** option list, select the image set to use for the plan. If your plan instead uses irregular field calculation (Irreg), brachytherapy with no images, or a water phantom, select the appropriate option.

If you need to import additional image sets for the patient, click the **Import Images** button. For more information, see *Acquire images*.

- 5 If you want to add a secondary image set to the plan, select the image set from the list of **Available Secondary Images** and click the **Add Image** button. The image set you selected appears in the **Selected Secondary Images** list.

You cannot add the primary image set as a secondary image set. To add all image sets except the primary image set, click the **Add All Images** button.

To remove an image set from the **Selected Secondary Images** list, select the image set and click the **Remove Image** button. If you change the primary image set after you add secondary image sets, the secondary image sets are removed from the plan.

NOTE

Because CT images are spatially accurate, you must use a CT image set as the primary image set. You can have multiple secondary image sets.

Copy a plan

You can copy existing plans using either the **Copy** button (to copy all plan information) or the **Copy Without Dose** button (to copy all plan information except dose information) in the **Patient Select** window. Once the plan has been copied, you can enter the planning software to make changes to the plan.

- 1 Select the patient from the patient list in the **Patient Select** window.
- 2 Select the plan to copy from the plan list in the **Patient Select** window.
- 3 Click either the **Copy** button or the **Copy Without Dose** button to copy the plan and add it to the list of plans. The **Edit Plan Data** window appears. Use the window to change the plan data.

NOTE

If you use the **Copy Without Dose** button to copy a plan that contains records, and those records contain dose data, the record dose data is retained in the copied plan.

NOTE

If you save a data set as a standard phantom in Pinnacle³, you can copy a plan to the phantom for quality assurance and plan verification. Use the **QA Tools** button in the **Patient Select** window. For details, see the *Plan Evaluation Tools* chapter in the *Classic Pinnacle³ Planning Instructions for Use* or *Pinnacle³ Planning Instructions for Use*.

Create plans with Dynamic Planning

NOTE

This feature is only available if you have the Dynamic Planning license.

If changes occur that make a new treatment plan desirable, you can copy an existing plan to a new image set using Dynamic Planning. You can also choose to apply deformation as you copy the plan. When you apply deformation, the source image set is deformed to create a new image set that is mapped to the target image set based on the computed displacement vector field (DVF) between the image sets. The ROIs from the source image set are also deformed to the target image set.

The source image set and the target image set must have the same patient orientation and treatment position. This means that you cannot copy a plan from a prone image to a supine one, for example.

In addition, you cannot copy a plan to a target image set if that target image set is already a primary or secondary image set in the source plan.



CAUTION

If there are scripts stored in a PinnacleInit file, the software runs the scripts before copying the plan to the new image set. If the scripts make changes to the source plan, the changes occur before the software creates a record of the source plan. This can result in records that do not represent the source plan. Also, warning messages may appear before copying the plan in response to the scripted actions.

- 1 Select the patient from the patient list in the **Patient Select** window.
- 2 Select the plan to copy from the plan list in the **Patient Select** window.

- 3 Click **Dynamic Planning**. The **Copy Plan to Image Set** window opens.
- 4 The **Target Plan Name** field contains a default name for the new target plan. Change the name of the plan, if necessary.
- 5 From the **Target Image Set** list, select the image set to which you want to copy the source plan.
- 6 From the **Target Planning Tool** list, select the version of Pinnacle³ software in which you want the target plan to be saved. You will be able to open the target plan in this version of the software and newer versions.

NOTE

If you select an older version of the Pinnacle³ software from the **Target Planning Tool** list, some of the features described in this procedure will not be available because they are not supported in older versions of the software.

- 7 Select whether you want to copy all of the trials or to copy only the trials selected for treatment in the source plan.
- 8 Select whether to include beams and structures in the new plan when you copy the source plan.
 - **Yes**—ROIs, POIs, and trials are copied to a new plan. ROIs, POIs, and trial dose are copied to a new record.
 - **No**—A new plan is created with no ROIs or POIs. ROIs, POIs, and trial dose are copied to a new record.
- 9 If you selected **Yes** in step 8, select whether to apply deformation when you copy the source plan.
 - **Yes**—Select the modality of the target image set. The software creates a new deformed image set that represents the mapping of the source image set to the target image set based on the computed DVF. The software propagates the ROIs to the new plan and deforms the ROIs based on the differences between the voxels of the source image set and the target image set.
 - **No**—The software propagates the ROIs to the new plan without deformation.

NOTE

Deformation is only allowed when the primary image set in the source plan is a CT image set and the target image set is a CT image set.

- 10 Click **Create New Plan**. The software performs the following tasks:
 - Copy the source plan data to the target image set.
 - Add the source image set to the new plan as a secondary image set.
 - Register the secondary image sets to the target image set.
 - If you chose to apply deformation: Create a new deformed image set that represents the mapping of the source image set to the target image set based on the computed DVF. This deformed image set is added to the new plan as a secondary image set.
 - Create a record for each trial that was copied and open the **Treatment Navigator** window. The record contains a read-only version of the ROIs, POIs, prescriptions, and dose for that

trial. See *Use the Record Viewer and the Treatment Navigator* in the *Pinnacle³ Planning Instructions for Use*.

- Open the new plan in the **Syntegra** window so that you can confirm the appropriateness of the registration and the new deformed image set. See *Image Fusion* in the *Pinnacle³ Planning Instructions for Use*.



CAUTION

Please confirm the image registration, the new deformed image set, the prescriptions, and the placement of ROIs, POIs, and beams before you continue.

About the new plan

Source Plan Item	Result in New Plan
Image set	Retained as a secondary image set in the new plan. If you chose to apply deformation, the software also adds a new deformed image set that represents the mapping of the source image set to the target image set based on the computed DVF.
Image registration of secondary images	Retained
Absolute marking coordinates	Invalidated (set to the origin of the target image set). Patient is unmarked.
Stereo localization and frame	Invalidated
Laser center coordinates	Invalidated (set to the origin of the target image set)
Couch removal	Turned off
VOI	Set to the extent of the target image set
ROIs (on primary image set)	Propagated from the source plan to the target image set (either with or without deformation), and grouped in new ROI groups with the corresponding ROIs from the record representing the source plan. ROI groups can be used in plan evaluation tools like DVHs and ROI trending. See <i>Plan Evaluation Tools</i> in the <i>Pinnacle³ Planning Instructions for Use</i> . If ROIs were created using MBS, meshes are not retained. See <i>Model-Based Segmentation</i> in the <i>Pinnacle³ Planning Instructions for Use</i> . If after propagation an ROI is located outside of the image set, the ROI is retained, but it has no contours and is not included in ROI groups.
ROIs and POIs (on secondary image sets)	Propagated to the new plan and remain assigned to the secondary image sets. POIs that were locked are unlocked.
POIs (on primary image set)	Retain their location relative to patient anatomy in the target image set. POIs that were locked are unlocked.
Beams	Assigned to the corresponding isocenters in the target image set. The 2D Display and 3D Display options are set to Off for all beams in all trials.
Blocks	Locked to retain blocking mask from source plan. To make changes to the blocks in the new plan, you must first unlock them. See <i>Blocks</i> in the <i>Pinnacle³ Planning Instructions for Use</i> .
Dose grid	Retained
Bolus	Invalidated. Bolus parameters are retained, but you must rebuild the bolus and reassign it to the appropriate beam.

Source Plan Item	Result in New Plan
Prescriptions and Monitor Units	Prescriptions are set to Set Monitor Units mode, and monitor units are retained.
IMRT parameters	Retained
Brachytherapy sources and catheters	Not retained
Plan evaluation tools (DVH, planar dose, isodose lines)	Retained

About the new records

Source Plan Item	Result in New Record
ROIs	The 2D Display and 3D Display options are set to Off for all ROIs in all records. The Display ROIs on all data sets option is set to Yes . If ROIs were created using MBS, meshes are not retained. See <i>Model-Based Segmentation</i> in the <i>Pinnacle³ Planning Instructions for Use</i> .
POIs	The 2D Display and 3D Display options are set to Off for all POIs in all records. The Display POIs on all data sets option is set to Yes . POIs that were locked are unlocked.
Bolus	Added as an ROI with “_Bolus” appended to the bolus name
Prescriptions	Retained
Dose grid and isodose lines	Retained
Brachytherapy dose	Retained

Start the planning software

Once you have added a plan to the patient database, you can begin planning.

At the bottom of the **Patient Select** window or the **Edit Plan Data** window, click the appropriate button:

- **AcQSim**—Start the AcQSim³ software.
- **Fusion**—Start the Image Fusion or Syntegra software. This button is enabled if you have two or more image sets and at least one is selected as a fusion image set.
- **Planning**—Start the Pinnacle³ planning software. The Classic Pinnacle³ interface or the single-window Planning interface appears depending on your selection in the **Preferences** window.



CAUTION

If the software cannot find patient position information for the image set you are loading, a warning appears. If you ignore the warning and start the software, the software assumes that the volume was acquired head first and supine. To correct the situation, return to the Patient Select window in Launch Pad, then click the Images button. In the next window, click the Edit button to start the Data Set Editor and set the correct patient position information.

NOTE

When you open a plan, the **Errors Encountered During Filing** window may appear. Generally, this window appears when you create a plan in an older version of the software and then open the plan in a newer version of the software. Make sure that no commissioning errors appear. You can ignore most non-commissioning errors.

Plan locking

Plans can be locked to preserve the state of the plan. A locked plan is a read-only plan and changes cannot be saved. We recommend you lock a plan after it is approved for treatment.

When a plan is locked, a padlock icon is displayed next to the patient information above the viewing windows.

When you print a treatment plan and window for a locked plan, the printout indicates the locked status. You can print and export an unlocked plan. Prior to printing or exporting, the software may warn you that the plan is unlocked, depending on how you set the **Warn about unlocked plan** preference (see the *Utilities* chapter in the *Pinnacle³ Planning Reference Guide*).



CAUTION

In a locked plan you can make changes that modify the RPD (ROI, POI, and Dose) revision levels, but you cannot print or export plan information. Any changes you make will not be saved (the revision levels will increment while you are in the plan but will return to the locked revision levels when you close the plan).

You can delete, backup, and restore locked plans. During backup and restore, the software maintains the lock status.

Lock the plan

1 In Planning: Select **File - Lock Plan**. After you click **Yes**, the **Lock Plan** window appears.

OR

- 1 In Irregular Planning: Click the **Lock Plan** button. The **Lock Plan** window appears.
- 2 Enter your name or initials in the field. (You can use only numbers, letters, and underscores.)
- 3 Click the **Lock Plan** button. The plan is locked. You can still change the plan but you cannot save the changes. If you need to make changes that must be saved, you must copy the plan and modify the copy.

In Launch Pad an asterisk (*) appears next to the plan name to show it is locked. When you select the plan in Launch Pad, the user name, text entered when the plan was locked, and the date and time it was locked appear to the right of the plan list.

Unlock the plan

If you need to unlock a plan, you must copy the plan and modify the copy. The copied plan keeps the same RPD (ROI, POI, Dose) revision levels as the original plan.

4 Backup and Restore

Overview

Use the backup tool in Pinnacle³ to back up patient and physics data, scripts, organ models, atlases, scorecards, and treatment techniques. When you back up physics data, you can include commissioned and non-commissioned machines and isotopes.

Pinnacle³ allows you to back up data to electronic media, a specific archive directory, or a UNIX file. You can manually back up the data or set up a one-time unattended backup. Pinnacle³ detects if a backup device is busy and waits until it is ready before performing the backup.

If you back up to electronic media, keep in mind that the media may degrade over time; consult the manufacturer's instructions for information on storage and expected shelf life.

When you do a backup, you can select multiple institutions and the patients and physics machines within those institutions. Pinnacle³ creates a separate backup file and report for each institution and its corresponding data.

You can back up scripts from the *PinnacleSiteData/Scripts* directory and users' **HotScript** lists. If there are scripts with the same name, Pinnacle³ appends a number to the end of script to make it unique and allow backup of each script.

Pinnacle³ also creates a master index of the backups. You can use this master list to find and restore your data. You can also add header information to the master list from backups created prior to Pinnacle³ 7.4.

Use the restore tool to put the data back on your system. You can restore patient data into the same institution or a new institution. You can restore physics data into a new institution.

Pinnacle³ prevents you from accidentally overwriting scripts, organ models, and atlases by restoring them to different locations. See the following table for the locations of restored files.

Restored Items	Restored Location
Scripts	<i>PinnacleSiteData</i> or the user script directory in a subdirectory named <i>script.date</i> where date is the restore date.
Organ models	<i>PinnacleSiteData/UserSettings/ROILibrary.date.time</i> directory where the date and time are the restore date and time.
Auto-Segmentation customized atlases	<i>PinnacleSiteData/UserSettings/AutoSegmentation.date.time</i> directory where the date and time are the restore date and time. If there are customized atlases, the file name is <i>Pinnacle.AtlasPreferences_x.x</i> , where <i>x.x</i> is the software release (for example, 9.4). Otherwise the file name is <i>FactoryAtlasList</i> .

Pinnacle³ restores scorecards and treatment techniques to the original locations, but appends “_restored” to the name.

Backup

When you back up data you can do the backup immediately (manual) or schedule a one-time unattended backup. All backup volumes include a header file and have an index file stored on the Pinnacle³ system. Backups to a CD or DVD include an HTML index file that you can view in a web browser.

The size of your backup depends on the files you choose to include. Be aware that plan file sizes vary depending on many factors, including:

- the size and resolution of your data set (for example, water phantoms require less memory than CT data sets)
- the number of data sets (for example, if you fused two data sets those data sets must be retained in the plan file)
- the number of trials, regions of interest, points of interest, beams, beam modifiers, dose volume histograms, etc. in your plan.

NOTE

If your system has numerous processes or Pinnacle³ sessions running, the CD/DVD backup may fail due to lack of system resources. Close all unnecessary processes and Pinnacle³ sessions before a CD/DVD backup.

- 1 Click **Backup** in the **Launch Pad** menu. The **Backup** window opens.
- 2 In the **Backup Description** field, type a description of the backup.

This description becomes part of the header information that helps you identify and restore the backup file later.
- 3 In the **Type Of Backup** field, select **One Time Unattended** or **Manual**.
- 4 If you selected an unattended backup, enter the future month and day, and select the time that you want the software to perform the backup.
- 5 In the **Backup To** field, select one of these options:
 - **IO Device**—Backs up data to electronic media or an archive directory. Go to step 6.
 - **UNIX File**—Backs up data to a file. The software uses the file name as the volume name for the backup. Go to step 8.
- 6 Select the device from the **Backup Device** list.
 - If you select a tape drive, the **Rewind Current Device** button appears. Please note that you can only back up a single institution to a tape drive at a time.
 - If you select a CD/DVD drive, the **Eject CD/DVD** button appears in case you need to remove a disk.
- 7 In the **Backup Media Volume Name** field, type the title you want assigned to the backup. Click **Get Default Name** to have the software assign a name.

Go to step 9.

- 8 Type the directory path and name of the backup file. Or, click **Browse** to select the location and type a name.

Backup files are stored by default in the user's home directory.

Do not type spaces, commas, or apostrophes between characters in the file name. If you type an existing file name, the software asks you to confirm that you want to overwrite the file with the new backup.

- 9 For CD, archive directory, and UNIX file backups, in the **Compression** field set whether the software should compress the file.

NOTE

Compressing data significantly increases the time it takes to back up and restore.

- 10 In the **Print Report After Backup to** field, set whether the software should print a report of the data backed up in this session.
- 11 If the desired printer does not appear, click **Select Printers**. The **Printer Selection** window opens. Select the printer to which the software should print the report.
- 12 In the pane on the left, click the arrow next to the desired institution. Separate **Patients** and **Physics** sub-directories appear.



CAUTION

Make sure you back up the machines or isotopes associated with any patients you back up. If you do not include them in the backup, when you restore the patients the plans may be corrupted or you may not be able to open the plan.

- 13 Click the arrow next to **Patients** or **Physics** to display all the patients or machines and isotopes. If you want to back up data for select items, click the appropriate names in the lists. Highlight scripts, organ models, atlases, scorecards, or treatment techniques if you want to back them up.

Drag the cursor to make contiguous selections in a list. Hold down the **Control** key as you click to make non-contiguous selections.

Use the arrow buttons between the left and right panes to move data between the current list (left) and the list of data to back up (right). Click **clear** to remove all the items from the backup list (this allows you to start the list again).

The number of megabytes you need for the backup and the device's remaining capacity appear at the bottom of the window. If necessary, reduce the amount of data you plan to back up or delete obsolete files from your media or hard drive to accommodate the backup.

- 14 If you plan to back up to electronic media, insert the media in the drive. Make sure the device is on and ready to accept data.

NOTE

If another user is working in the physics or planning tool and you attempt a backup that includes physics data or the open patients, an error message appears. You will be unable to back up the data until the other user exits the tool. Likewise, if a backup that includes physics or patient data is in progress, no one can enter the physics or planning tool for that institution until the backup is complete.

**WARNING**

The backup process overwrites any data on the tape. Make sure you are using a tape that does not contain patient data you need for planning or archiving purposes.

- 15 If you do not want to include computed files that may have been saved during planning, select the **Exclude auto-saved computed files** check box. Plan elements that will not be backed up include (but are not limited to) the following items:
 - Dose grid
 - Control point dose
 - Brachytherapy dose
 - DRRs
 - Compensators
- 16 Click **Start Backup/Schedule Backup**. Once the backup is complete, a window opens listing the locations and names of the backups.

NOTE

The button name changes depending on the backup method. **Start Backup** appears for manual backups and **Schedule Backup** appears for unattended backups.

- 17 Click **Close** to close the window. Then click **Close** to close the **Backup** window.

If you decide to cancel the unattended backup, go back to the **Backup** window and click **Cancel Unattended Backup**. If you chose to print a report it prints now (even if it is an unattended backup).

The software informs you when the backup is complete.

**CAUTION**

The software checks for as many failures as it can during archiving, but you should still check your backup after the procedure is finished. Use the *Master index maintenance* procedure to check your backup.

Fields and buttons

The following fields and buttons are available in the windows referenced in this section.

Title	Description
Backup Description	This description becomes part of the header information that helps you identify and restore the backup file later.
Backup Device	If you choose to back up the data to a tape, CD/DVD, or archive directory, this field lets you select the type of media you are using for the backup.
Backup Media Volume Name	The name of the particular electronic media (for example: CD_001). We recommend that you label each piece of media with its volume name so it can be located when restoring data from the index. If you use a CD/DVD, the volume name will have an <i>.X.tar</i> extension where <i>X</i> is the number of the institution. One <i>.tar</i> file is created for each institution.

Title	Description
Backup To	The media you want to use to back up the data: a UNIX file or a different media.
Browse	Click this button to find a directory or file that you want to use for the backup or restore.
Cancel Unattended Backup	Click this button to cancel the backup you scheduled.
Clear	Click this button to remove all the items from the backup list (this allows you to start the list again).
Compression	Select Yes if information you are archiving should be compressed to make the file size smaller. This can significantly increase the time to back up or restore the data.
Date/Time to do backup	The month, day, and time to perform the backup.
Device Capacity	The total storage capacity of the device.
Eject CD/DVD	Click this button to open the CD/DVD tray.
Exclude auto-saved computed files	Select this check box to exclude computed files from the backup.
File Name	The name of the backup file.
Get Default Name	Click this button to have the software assign a volume name.
Print Report After Backup to	Select Yes if you want a hard copy outline of the backup after the backup is complete. If you do not print a report, you can view and print the HTML index for the backup.
Rewind Current Device	Click this button to rewind the media in the device. This is used only for tape drives.
Schedule Backup	Click this button to schedule the unattended backup. The backup will be performed at the selected time.
Select Printers	Click this button to choose a printer for the backup reports.
Start Backup	Click this button to start the backup.
Test Backup Integrity	Click this button to test whether the backup file is corrupted.
Total Device Space Needed	The amount of memory the current backup needs to back up all the data.
Type of Backup	The type of backup session you desire. A Manual backup starts as soon as you click Start Backup . A One Time Unattended backup starts at the time you set after you click Start Backup .

Restore

You can restore information by reading the header file off of the backup media or file, or using the system backup index. All backup media and files include header information. All of the backups have an index file saved on the system that outlines the content of the backup volume.

Restoring from the header file is the traditional method for restoring data. It allows you to restore data regardless of whether the information is in the index file. Restoring from the index allows you to look through records of all the backups performed on the system (unless you have removed the index records, see *Set up backup and restore defaults* in the *System Administration* chapter).

If an institution was split into multiple *.tar* files because of size (see the threshold information in the *System Administration* chapter), you can select all of the files and the software automatically combines them into a single institution for restoration.

When you restore an institution, the software appends “(restored)” to the institution’s name. If you restored the institution previously, the software appends “(restored)” plus a numeric value to the institution’s name. The numeric value represents the number of times you restored the institution.

Restore using the header file

- 1 Click **Restore** on the **Launch Pad** menu. The **Restore** window opens. Make sure that the **Restore From Header** tab is selected.
- 2 In the **Destination** field, select **Create New Institution** to restore the data to a new institution. Select **Restore into Current Institution** to restore the data into the current institution.

NOTE

You cannot restore physics data into an existing institution. You can restore into a new institution and transfer the machines as required.

- 3 Was the data backed up in a Solaris or SunOS format?
 - Solaris—In the **Format** field, select **Solaris Format**.
 - SunOS—In the **Format** field, select **SunOS Format**. Choose to restore physics data or patient data. (Only physics and patient data could be backed up from the software versions that ran on SunOS.)
- 4 In the **Restore From** field, select one of these options:
 - **IO Device**—Restores data from electronic media or an archive directory. Go to step 5.
 - **UNIX File**—Restores data from a file. The **Backup/Restore File Tool** window opens. Select the file. Then go to step 7.
- 5 Select the device from the **Backup Device** list. If you select a tape drive, the **Rewind Current Device** button appears. If you select a CD/DVD drive, the **Eject CD/DVD** button appears in case you need to remove a disk.
- 6 Are you restoring from an archive directory?
 - If yes, the **Read Header Info** window opens. Select the backups to restore and click **Read Header Info**. Then go to step 7.
 - If no, go to step 7.

- 7 Set your header preferences:
 - Set **Add Header to Index** to **Yes** if the header information should be added to the master index.
 - Set **Read All Headers** to **Yes** to read the headers of *all* the backups on the media.

NOTE

The **Read All Headers** option is not available for UNIX files.

- 8 Click **Read Header Info**.
- 9 In the top pane, click the arrow next to the desired institution. **Patients**, **Physics**, and other items that can be restored appear.
- 10 Click the arrow next to **Patients** or **Physics** to display all the patients or machines and isotopes. If you want to restore data for selected patients and physics machines, click the appropriate names in the lists of patients and machines.

Drag the cursor to make contiguous selections in a list. Hold down the **Control** key as you click to make non-contiguous selections.

Use the **Add to List** button below the current list (top pane) and the **Remove Selected** button below the list of data to restore (bottom pane) to move data. Use the **Remove All** button to remove all the items from the restore list (this allows you to start the list again).
- 11 Click **Restore**. Once the restore is complete, a window opens listing the restored data.
- 12 Click **Close** to close the window. Then click **Close** to close the **Restore** window.

Restore using the index file

- 1 Click **Restore** on the **Launch Pad** menu. The **Restore** window opens.
- 2 Click the **Restore From Index** tab.
- 3 In the **Destination** field, select **Create New Institution** to restore the data to a new institution. Select **Restore into Current Institution** to restore the data into the current institution.

NOTE

You cannot restore physics data into an existing institution. You can restore into a new institution and transfer the machines as required.

- 4 Select the way the software should display the backed up data in the pane from the **Sort Index By** list.

NOTE

If you want to search the index, enter a word or numbers in the field next to the **Search Index** button. Select whether the software should search for the same case and match only the entire word. Click **Search Index** to start the search. In the list the software highlights the items that match the search criteria.

- 5 In the top pane, click the arrow next to the desired institution. **Patients**, **Physics**, and other items that can be restored appear.

- 6 Click the arrow next to **Patients** or **Physics** to display all the patients or machines and isotopes. If you want to restore data for selected patients and physics machines, click the appropriate names in the lists of patients and machines.

Drag the cursor to make contiguous selections in a list. Hold down the **Control** key as you click to make non-contiguous selections.

Use the **Add to List** button below the current list (top pane) and the **Remove Selected** button below the list of data to restore (bottom pane) to move data. Use the **Remove All** button to remove all the items from the restore list (this allows you to start the list again).

- 7 Click **Restore**.

If you restore from electronic media, a window opens indicating the volume name that contains the backup files. If multiple institutions from multiple media sources are to be restored, the window opens for each media type.

Once the restore is complete, a window opens listing the restored data.

- 8 Click **Close** to close the window. Then click **Close** to close the **Restore** window.

Master index maintenance

The maintenance features allow you to manage the master index of the backups performed on the system. The maintenance you perform is not to delete data from a backup, but to manage or remove files from the master index. The master index shows you the backed up data, the volume name (and media type), the date of the backup, the contents, and the description you entered at the time of backup.

- 1 Click **Restore** on the **Launch Pad** menu. The **Restore** window opens.
- 2 Click the **Maintenance** tab.
- 3 Click **View HTML Index** to launch a web browser and view the backup indices.
- 4 If the HTML index does not match the displayed index, click **Regenerate HTML Index Files**.
- 5 Select the way the software should display the backed up data in the pane from the **Sort Index By** list.

NOTE

If you want to search the index, enter a word or numbers in the field next to the **Search Index** button. Select whether the software should search for the same case and match only the entire word. Click **Search Index** to start the search. In the list the software highlights the items that match the search criteria.

- 6 In the pane, click the arrow next to the desired institution. **Patients**, **Physics**, and other items that can be restored appear. Click the arrow next to **Patients** or **Physics** to display all the patients or machines and isotopes.
- 7 Do you want to remove certain institutions from the HTML index?
 - If yes, drag the cursor to make contiguous selections in a list. Hold down the **Control** key as you click to make non-contiguous selections. Go to step 8.
 - If no, go to step 9.

**CAUTION**

Deleting or clearing institutions removes them from the master index. You can recover the information while restoring data by reading the headers with the **Add Header to Index** field set to **Yes**.

- 8 To remove the selected institutions, click **Delete Institution(s) From Index**. To remove all information from the index files, click **Clear Entire Backup Index**.
- 9 Click **Close** to close the **Restore** window.

Fields and buttons

The following fields and buttons are available in the windows referenced in this section.

Title	Description
Add Header to Index	Select Yes if, when the header file is read, the header information should be added to the master index. If the backup was performed on the same system, the header is already in the master index (if it was not removed as part of system administration). Use this option to restore an institution from another system or to rebuild lost index files.
Add to List	Click this button to add the highlighted record to the list of data to restore.
Backup Device	The device from which you will restore the data.
Browse	Click this button to find a directory or file that you want to use for the backup.
Clear Entire Backup Index	Click this button to remove all entries from the master index. This permanently deletes the selected indices unless you reread the header from the backups.
Delete Institution(s) From Index	Click this button to remove the institution records from the master list. This does not delete the actual backup.
Destination	Select Create New Institution to restore the data to a new institution on the current system. Select Restore into Current Institution to restore the data into the current institution. Physics data cannot be restored into an existing institution.
Eject CD/DVD	Click this button to open the CD/DVD tray.
Format	The backup format—SunOS and Solaris have different formats. Select SunOS Format for backups created in Pinnacle ³ 3.0du6, 4.0b, or 4.0f.
Match Case	Select Yes to search for text exactly as you entered it.
Match Entire Word	Select Yes to search only for the word, not for the text within other words.
Read All Headers	This appears if you are using a tape drive. Select Yes to read the headers of ALL the backups on the media. This may take a while if you have numerous backups on a single media source. For tapes with only one institution, set this to No since the software only has to read one header.
Read Header Info	Click this button to read the backup file information that is stored in the header of the file.
Regenerate HTML Index Files	Click this button to recreate the master HTML index of backups. This does not recover deleted index records.
Remove All	Click this button to remove all data from the restore list.

Title	Description
Remove Selected	Click this button to remove the highlighted record from the restore list.
Restore	Click this button to restore the selected data into a new or existing institution.
Restore From	The UNIX file or device that contains the backup file you want to restore.
Restore Patients	Click this button to restore the patients you highlighted in the list.
Restore Physics	If the backup file contains physics data, use this field to select whether the physics data should be restored.
Rewind Current Device	Click this button to rewind the media in the device. This is used only for tape drives.
Search Index	Click this button to search through the index for the text you entered in the field to the left of the button.
Select Header File	If you are restoring from a UNIX file, click this button to browse to the file from which you will restore data.
Sort Index By	You can sort the master index by volume name, institution name, or backup date.
View HTML Index	Click this button to launch a web browser and view the backup index.

5 System Administration

Overview

This chapter explains system administration procedures that you can perform.

Configuration Options



To see configuration options that are used to perform administrative tasks, click the **Configure** button in the **Launch Pad** menu.

- **Preferences**—Select the default behavior of the software. See the *Pinnacle³ Planning Reference Guide* for more information.
- **Default Tool**—Select the default software version to use.
- **Select Printers**—Set up printers for use with the system.
- **Delete Images**—Delete DICOM image sets and examine DICOM file issues.
- **SysAdmin Password**—Enter the password to enable the system administration options. This button changes to the **Change Password** button after you enter the password.
- **Change Password**—Change the system administration password. This button appears in place of the **SysAdmin Password** button after you enter the password.
- **Backup Devices**—Set up new tape drives and other backup devices.
- **Backup/Restore Conf**—Set defaults for data backup and perform backup database maintenance.
- **Institution Disk Setup**—Set up the directory “mount point” for each institution’s data.
- **Scanners**—Set up new scanners you add to the system.
- **Check Patient DB**—Check the integrity of the Launch Pad database.
- **Rebuild Patient DB**—Rebuild the patient database in Launch Pad in the event of a database corruption. The rebuild corrects all problems found by the **Check Patient DB** tool.
- **Licensing**—Enter the license key that enables your software features.
- **Script Playback**—Play back “scripts” of repetitive operations. This option is only available in research mode.
- **File Maintenance**—Limit the number of temporary files and exported files that are stored on the system. Change the directories that are used to store exported files from other software applications, such as RadCalc and PlanIQ.

Reconfigure Automatic Import

If you change the name of an institution that has already been set up for automatic import or add a new institution, you must reconfigure the DICOM settings on the server to enable the automatic import functionality for the institution.

Use the system administration password

Enter the password

To prevent unauthorized use, some system administration options are protected by a password.

- 1 Click the **Configure** button in the **Launch Pad** menu. The **Configuration Options** window appears.
- 2 Click the **SysAdmin Password** button.
- 3 Type the password in the window that appears, and then click the **OK** button.

The **Configuration Options** window appears. All system administration options are now available for use.

Change the password

- 1 Click the **Change Password** button in the **Configuration Options** window. The **Change Password** window appears.
- 2 Enter the old password and click the **Continue** button. The **Enter New Password** window appears.
- 3 Enter the new password and click the **Continue** button. The **Verify New Password** window appears.
- 4 Enter the new password and click the **Continue** button. The **Password Changed** window appears to confirm the change. Click the **OK** button.

Set the default tool

If you have multiple versions of the Pinnacle³ software installed on your system, you can select a particular version of Pinnacle³ software that you want to use for a specific planning session. You can also set the default software version that should be used by new planning sessions and the physics tool.

NOTE

When you create a new plan, you can change the version of the planning tool for that plan in the **Edit Plan Data** window from the default to one of the other software versions available on your system, if necessary.

- 1 On the **Launch Pad** menu, click the **Configure** button. The **Configuration Options** window opens.
- 2 Click the **Default Tool** button. The **Tool and Version** window opens. The window lists the Pinnacle³ software versions that are available on your system.
- 3 To select a specific version of the Pinnacle³ software for use during the current planning session, select the version in the **Tool and Version** option list.
- 4 Select the version of the software that you want to use as the default from the **Default** option list.
- 5 If you want to change the foreground and background colors of the planning and physics windows, type different colors in the **FG Color** and **BG Color** fields.
- 6 Click the **Close** button to save your changes and close the **Tool and Version** window.

License the software

Contact Customer Support for assistance in licensing your software. The following procedure outlines the basic steps that Customer Support will help you perform; Customer Support provides the license key.

- 1 In the **Launch Pad** menu, click the **Configure** button. The **Configuration Options** window appears.
- 2 Click the **SysAdmin Password** button.
- 3 Type the system administration password in the window that appears, and then click the **OK** button.

All system administration options are now available for use.

- 4 Click the **Licensing** button. The **Licensing** window appears.
- 5 Click the **Site Information** button. The **Licensing - Site Information** window appears.

NOTE

If this is a new installation, a site name entry window appears before the **Licensing - Site Information** window appears.

- 6 Verify the site information with Customer Support, then click the **Close** button.
- 7 Click the **Key Installation** button. The **Licensing - Install License** window appears.
- 8 Enter the license key and the application code.
- 9 Click the **Install License Key** button, then click the **Close** button.
- 10 Click the **Equipment ID Installation** button. The **Install Equipment ID** window appears.
- 11 Enter the Equipment ID and click the **Apply** button. On a successful event, Equipment ID successfully installed message appears.
- 12 Click the **OK** button. In the **Licensing** window, click the **Close** button.

Define directory mount points for institutions

Each time you create an institution, the software automatically creates a mount point, a directory entry where patient data is saved. Think of a mount point as a “pointer” to a particular location on a disk drive.

The default mount point is adequate until the default disk drive begins to fill. If necessary, Customer Support can set up new mount points to distribute and save data to different drives. Customer Support can set separate mount points and directory paths for each institution. Click the **Institution Disk Setup** button in the **Configuration Options** window to view the window that is used to set up mount points.

NOTE

Only field service representatives should set up new mount points. Contact Customer Support if you have questions about mount points.

Set up printers

Add printers

- 1 In the **Launch Pad** menu, click the **Configure** button. The **Configuration Options** window appears.
- 2 Click the **Select Printers** button. The **Printer Selection** window appears.
- 3 Click the **Add Printer** button. The **Edit Printer** window appears.
- 4 Enter the printer name in the **Printer Name** field.
- 5 To change the print command for the printer, type the new command in the **Print Command** field. The file name is automatically appended to the print command. For example, if you specify "lpr", the command "lpr <file name>" is used. The default system text printer is always identified by "lp".

To add a color printer, type the following as the printer command:

```
lp -c -d printname
```

where `printname` is the name of the printer.

- 6 To choose a non-standard paper size, click the **Paper Size** button and select a different size from the menu that appears. **Letter** is the default paper size for the standard printer, but you can specify **Legal**, **Tabloid**, **A3**, or **A4**.
- 7 When you finish, click the **Close** button, then click the **Save Printers** button in the **Printer Selection** window.

Edit printers

- 1 Click the **Configure** button in the **Launch Pad** menu. The **Configuration Options** window appears.
- 2 Click the **Select Printers** button. The **Printer Selection** window appears.
- 3 Select the printer you need to edit from the **Available Printers** list.
- 4 Click the **Edit Printer** button. The **Edit Printer** window appears.
- 5 Change the printer information as necessary. For information about entering printer information, see the *Add printers* section of this chapter.
- 6 When you finish, click the **Close** button, then click the **Save Printers** button in the **Printer Selection** window.

Delete printers

- 1 Click the **Configure** button in the **Launch Pad** menu. The **Configuration Options** window appears.
- 2 Click the **Select Printers** button. The **Printer Selection** window appears.
- 3 Select the printer you want to delete from the **Available Printers** list, then click the **Delete Printer** button. The name of the printer disappears from the list.
- 4 Click the **Save Printers** button to save your changes.

Set up scanners

If you add a new scanner to your system, or your system configuration changes, you need to note the addition or change in your software.

- 1 Click the **Configure** button in the **Launch Pad** menu.
- 2 Click the **Scanners** button in the **Configuration Options** window. The **Scanners** window appears.
- 3 To install the scanner in the software, click the scanner in the **Scanner Choices** list and then click the **Install** button. The scanner appears in the **Installed Scanners** list.
- 4 To edit the scanner information, click the scanner in the **Installed Scanners** list and then click the **Edit** button. The **Edit IODevice** window appears.
- 5 Enter the appropriate information for the new scanner.
 - For DICOM3File, enter /autoDataSets/DICOM in the **Device** field.
 - For DICOM3CD, enter /autoDataSets/DICOM/CD in the **Device** field.
- 6 Choose whether you want DICOM image files of this type to be automatically deleted from the source directory after they have been imported into a plan. The selection you make for this option determines the default setting for the **Delete DICOM Files After Import** option in the **Select Images For Import** window.
- 7 Click the **Close** button to save the information and close the window.
- 8 If necessary, install the next scanner as described in the previous steps.
- 9 Click the **Close** button and exit the **Configuration Options** window when all scanners are installed.

Delete image sets

After you import image sets into Pinnacle³, you can delete the image sets from the source directory. To permanently delete DICOM image sets, perform the following procedure.

- 1 Click the **Configure** button in the **Launch Pad** menu. The **Configuration Options** window opens.
- 2 Click the **Delete Images** button. The **Delete Images** window opens.
- 3 Is the scanner for which you want to delete images selected in the **Scanner Type** list?
 - Yes—Continue to step 4.
 - No—Select the scanner in the **Scanner Type** list, then click the **Reread Patient/Exam Directory** button. Continue to step 4.

NOTE

If you know that image sets have been acquired or deleted since you opened the window, click the **Reread Patient/Exam Directory** button to refresh the list of image sets.

- 4 Select the image sets that you want to delete.
- 5 Click the **Delete Selected Image Sets** button.

Examine DICOM issues

You can examine the files in your DICOM image directory to determine which, if any, files have issues that prevent the software from importing them. You may want to examine the files for these reasons:

- You are expecting to see certain files in the list of available DICOM images, but the files do not appear in the list.
 - You are performing regular maintenance on your system and you want to identify any files that cannot be imported.
- 1 Click the **Configure** button in the **Launch Pad** menu. The **Configuration Options** window opens.
 - 2 Click the **Delete Images** button. The **Delete Images** window opens.
 - 3 Is the scanner for which you want to examine DICOM files selected in the **Scanner Type** list?
 - Yes—Continue to step 4.
 - No—Select the scanner in the **Scanner Type** list, then click the **Reread Patient/Exam Directory** button. Continue to step 4.
 - 4 Click the **Examine DICOM Issues** button. The **DICOM File Issues** window opens and displays a list of files. The list includes the files in the DICOM image directory that cannot be imported.

- 5 Select a file in the list. A description of the issue with the file displays at the bottom of the window.

NOTE

Consult your local IT staff or the vendor for the device that sent the DICOM image set to determine how to resolve the issue with the file. If the issue cannot be resolved, you may need to acquire new images for the patient.

- 6 To delete a file, click the **Delete Selected Files** button. Or, to delete all files in the list, click the **Delete All Files** button. When the software prompts you to confirm the deletion, click **Yes**.

Set up backup devices

If you add a new backup device to your system, or your system configuration changes, you need to make the addition or change in Pinnacle³.

To back up compressed files on tapes, set up the device for compression. Usually devices that use compression have a *c* in the name. For example: */dev/rmt/0c*.

- 1 Click the **Configure** button in the **Launch Pad** menu. The **Configuration Options** window appears.
- 2 Click the **Backup Devices** button. The **Edit Backup/Restore IO Device** window appears.
- 3 Click the **Add** button to begin setting up the new backup device.

To edit information for an existing backup device, select it in the list of devices at the top of the window.

- 4 Click the **Default** option list to select a default backup device.
- 5 If you want system diagnostic messages to appear in a UNIX shell window, set the **Diagnostic Output Enabled** option to **Yes**. You must open a shell window to see the messages.



CAUTION

Pinnacle³ does not interface directly with HSM systems and HSM software should not be installed on your Pinnacle³ system. If you want to use an HSM system, we recommend that you set up an archive directory device (Archive Dir format). Map to an external server and directory, not a directory on your Pinnacle³ system. You should work with your system administrator to configure the HSM system to use that directory, and test the functionality of Pinnacle³ and the HSM system prior to performing backups.

- 6 In the **Format** options, select the type of backup device.

NOTE

If you have a CD/DVD writer, we recommend that you set up two backup devices: one for CDs and one for DVDs. You can set the appropriate capacity for each type of media. If you set up only one device using the DVD capacity but attempt to write to a CD, you may exceed the CD capacity and may not be able to perform a backup. The only acceptable DVD media is DVD-R.

- 7 Enter the information for the specific backup device. You must complete all the fields listed before you can close the window.
- 8 Click the **Close** button to save the information and close the window.

Set up backup and restore defaults

You can set the temporary directory that Pinnacle³ uses to compile restored data before moving it to an institution and remove backup records from the database.

You can control if the HTML index of backups is updated after every backup. By default, the index is not generated after every backup.

- 1 Click the **Configure** button in the **Launch Pad** menu. The **Configuration Options** window appears.
- 2 Click the **Backup/Restore Conf** button. The **Backup/Restore Configuration** window appears.
- 3 Set the temporary directory or use the **Browse** button to navigate to the temporary directory.
- 4 If you want to delete the list of backup names that Pinnacle³ has already used, click the **Delete Backup Volume DB** button. Pinnacle³ will start over at Backup_1 for default volume names.
- 5 If you want the index to be generated after every backup, set **Regenerate HTML index after backups** to **Yes**.
- 6 Click the **Close** button.

Manage the patient database

Check the patient database

Select the **Check Patient DB** option in the **Configuration Options** window to check the integrity of the Launch Pad database. The database sometimes may need to be resynchronized with the data repositories on your network due to manual data changes or corruption.

You must enter the Launch Pad password before you can check the database.

When you check the database, the following problems will be reported:

- Discrepancies exist between the following data in the database files versus the data on disk: number of institutions, number of patients, patient IDs, patient descriptions, number of plans, and number of image sets.
- The next unique institution ID is not correct, or the next unique patient ID is not correct.
- Patients are located in the wrong directory (e.g., in the Institution directory instead of the Mount directory).

If necessary, use the **Rebuild** tool described in the next section to correct all problems found by the **Check Database** tool.

Rebuild the patient database



CAUTION

Review all patient data and plan parameters after you rebuild the Launch Pad database to make sure all of the data transferred correctly.

Select the **Rebuild Patient DB** option in the **Configuration Options** window to rebuild the Launch Pad database and correct all problems found by the **Check Database** tool. This operation might take a while. After rebuilding, Launch Pad reports the results.

If the software displays a message that it cannot completely rebuild a plan for a patient, contact Customer Support for assistance in rebuilding your database.

Specify file maintenance settings

In the **File Maintenance Settings** window, you can limit the number of temporary files and exported files that are stored on the system. In addition, you can change the directories that are used to store exported files from other software applications, such as RadCalc and PlanIQ.

- 1 In the **Launch Pad** menu, click **Configure**. The **Configuration Options** window opens.
- 2 Click **SysAdmin Password**.
- 3 Type the system administration password in the window that opens, and then click **OK**. All system administration options are now available for use.
- 4 Click **File Maintenance**. The **File Maintenance Settings** window opens.
- 5 Continue to one of the following:
 - *Maintain institution and plan temporary files.*
 - *Maintain exported files.*

Maintain institution and plan temporary files

You can limit the number of temporary plan and institution files that are stored on the system. In the **Institution and plan temporary files** section of the **File Maintenance Settings** window, the default values are 200 for the **Number of files** and 180 days for the **Age** of the files:

- When the number of files exceeds 200, the system automatically deletes the oldest temporary files to reduce the total number to 200.
 - Temporary files are automatically deleted if they have been stored on the system longer than 180 days.
- 1 In the **Institution and plan temporary files** section change the default values, if necessary:
 - **Number of files**—This is the maximum number of plan and institution files that are stored by the system.
 - **Age**—This is the maximum number of days that files for a plan or institution are stored by the system.
 - 2 Click **OK** to close the **File Maintenance Settings** window.

The values you set for the **Number of files** and **Age** of files are applied, separately, to each plan and institution in the software. When either value is exceeded for a plan or institution, only the files for that plan or institution are automatically deleted.

Maintain exported files

NOTE

The instructions in this section are used to maintain the files and directories for PlanIQ and RadCalc. Follow the procedure in this section only if you want to change the initial file maintenance settings. To purchase PlanIQ or RadCalc, contact your Philips sales representative or local distributor.

Use the fields in the **Exported Files** section of the window to configure the file maintenance settings for the PlanIQ and RadCalc applications. The table that follows lists the initial settings.

Name	Directory	File Type	Age Limit
PlanIQ to Pinnacle	<i>/autoDataSets/PlanIQ/PlanIQToPinnacle</i>	*.*	10 days
Pinnacle to PlanIQ	<i>/autoDataSets/PlanIQ/PinnacleToPlanIQ</i>	*	10 days
RadCalc to Pinnacle	<i>/autoDataSets/RadCalc/RadCalcToPinnacle</i>	*.scr	10 days

NOTE

Ensure PlanIQ and RadCalc are set up to export files to the directories specified in the **File Maintenance Settings** window.

- For each of the following, click **Browse** to select the directory that will be used to export or import files:
 - PlanIQ to Pinnacle**—Contains the files for OAR and target goals that are exported from PlanIQ and imported into Pinnacle³.
 - Pinnacle to PlanIQ**—Contains the Personalized Planning files that are exported from Pinnacle³ and imported into PlanIQ.
 - RadCalc to Pinnacle**—Contains the script files for beams that are exported from RadCalc and imported into Pinnacle³.
- In the **Age Limit** field for each directory, type the maximum number of days that files are stored before they are deleted.

If necessary, click **Reset to Default** to restore the initial settings.

NOTE

For each directory, **File Type** specifies the files that are deleted from the system when the **Age Limit** is exceeded. Do not change the following **File Type** settings unless instructed to do so by Philips:

- *.*—All files imported from PlanIQ are deleted.
- *—All Pinnacle³ files exported to PlanIQ are deleted.
- *.scr—All script files imported from RadCalc are deleted.

- Click **OK** to save your changes.

Reconfigure automatic import settings

NOTE

Only software versions 14.0 and higher allow you to configure the automatic import feature with a Philips CT scanner.

The instructions that follow are used to reconfigure DICOM settings for a system that has already been set up for automatic import. To initially set up a system for automatic import, contact Customer Support or your local distributor.

To automatically import image sets from a Philips CT scanner into the software, the server and scanner must be configured to send the image sets to an existing institution. If you change the name of an institution that has already been set up for automatic import or add a new institution, you must reconfigure the DICOM settings on the server to enable the automatic import functionality for the institution. For more information about the automatic import feature, see *Acquire images*.

Reconfigure the DICOM settings for a Professional or Expert server

NOTE

For assistance when performing this procedure, please contact your CT service technician or Customer Support.

Complete the procedure that follows to reconfigure the DICOM settings for a Professional or Expert server.

- 1 Log on to the server as “root”.
- 2 Open a terminal window.
- 3 Type the following:

```
cd /usr/local/adacnew/DICOMStatic/bin/common
```

- 4 Press **Enter**.
- 5 At the prompt, type the following command:

```
./DICOMAddListeningAETitle -a AETitle_name -t AUTO -i  
"institution_name"
```

- For AETitle_name, type the same AE Title that is used for the CT scanner, as it is displayed on the scanner’s console.
- For "institution_name", type the name of the institution that will receive the image sets from the CT scanner. Make sure the name of the institution is enclosed in quotation marks.

NOTE

Automatic import will not function unless the "institution_name" is the same as the institution that will receive the imported image sets. For information about adding or editing an institution, see the *Institutions* chapter.

- 6 Press **Enter**. A directory is created on the server that is used to automatically import image sets from the CT scanner and send them to the institution.

Reconfigure the DICOM settings for a SmartEnterprise server cluster

NOTE

For assistance when performing this procedure, please contact your CT service technician or Customer Support.

Complete the procedure that follows to reconfigure the DICOM settings for a SmartEnterprise server cluster.

- 1 Log on to the server cluster as “root”.
- 2 Open a terminal window.
- 3 Type the following:

```
cd /export/local/i386/adacnew/DICOMStatic/bin/common
```

- 4 Press **Enter**.
- 5 At the prompt, type the following command:

```
./DICOMAddListeningAETitle -a AETitle_name -t AUTO -i  
"institution_name"
```

- For `AETitle_name`, type the same AE Title that is used for the CT scanner, as it is displayed on the scanner’s console.
- For `"institution_name"`, type the name of the institution that will receive the image sets from the CT scanner. Make sure the name of the institution is enclosed in quotation marks.

NOTE

Automatic import will not function unless the `"institution_name"` is the same as the institution that will receive the imported image sets. For information about adding or editing an institution, see the *Institutions* chapter.

- 6 Press **Enter**. A directory is created on the server cluster that is used to automatically import image sets from the CT scanner and send them to the institution.

6 System Security and Data Privacy

Philips Healthcare recognizes that the security of Philips Healthcare products is an important part of your facility's security strategy. However, these benefits can only be realized if you implement a comprehensive, multilayered strategy (including policies, processes, and technologies) to protect information and systems from external and internal threats.

Following industry-standard practice, your strategy should address:

- physical security
- operational security
- procedural security
- risk management
- security policies
- contingency (disaster) planning

The implementation of security varies by site and may employ a number of technologies, including firewalls, virus-scanning software, and authentication technologies.

As with any computer-based system, protection must be provided so that firewalls, other security devices, or both are in place between the medical system and any externally accessible systems. The U.S.A. Veterans Administration has developed a widely used Medical Device Isolation Architecture for this purpose. Such perimeter and network defenses are essential elements in a comprehensive security strategy. Any connection of a device to a hospital network should be done with appropriate risk management for safety, effectiveness, and data and systems security. For guidance on risk management, see the IEC-80001-1 standard.

Additional security and privacy information, including MDS2 information, can be found on the Philips product security web site at www.healthcare.philips.com.

Please review Philips product security policies regarding remote service, patch management, anti-virus software, and more in the "Product Security Policy Statement" and additional information sources available through this website.

NOTE

Philips Healthcare is not responsible for the security of hospital-managed systems (desktop PCs, laptops) where Pinnacle³ is accessed.

For specific information about security within their institutions, operators and owners can consult with the following officers at their location:

- Information Systems Security Officer
- Chief Information Officer
- HIPAA Officer (in the U.S.A.)
- Safety Officer

Regulatory Controls

Protect Patient's Health Information

One of the most important assets to protect with security measures is the patient's health-related information.

Many governments require that you maintain the confidentiality of this information. Therefore, strict security measures must be taken to guard this protected information.

Clinical data transferred across the network is not encrypted. See *Security Issues and Guidelines* for more information.

NOTE

Users in the U.S.A. may find guidelines at www.hhs.gov/ocr/hipaa/.

Prevent Unauthorized Device Modification

Operators of this medical equipment must permit only Philips-authorized changes to be made to the Pinnacle³ system, either by Philips personnel or under explicit published direction from Philips.



CAUTION

The installation of software not authorized by Philips or not specified in the Philips system documentation may adversely affect the operation and security of the system, as well as the networks to which the system is connected. These adverse effects may not be immediately apparent to the user. Therefore, users should not install unauthorized software onto the Pinnacle³ system.



CAUTION

The installed web browser on Pinnacle³ is intended to allow access to online help only. It is not intended for casual web browsing.

Security Issues and Guidelines

Network Security

The Pinnacle³ system must be placed on a secure local computer network that has protections against viruses and other harmful computer system intruders. Make sure the equipment is connected to a local network that uses appropriate protection, such as firewalls, network access controls, and virus scanners.

Do not use your Pinnacle³ system to browse the Internet. Only use the Internet browsers that are provided with your Pinnacle³ system to access the Pinnacle³ software online help.

**CAUTION**

Connection of the system to a network that includes other equipment could result in unidentified risks to patients, users, operators, and others. You must identify, evaluate, and control these risks on-site. Changes to a network (including configuration, additional connections, disconnections, updates, and upgrades) may introduce new risks and require further analysis.

Data Transmission

The production, storage, and transfer of electronic protected health information (ePHI) is governed by HIPAA guidelines. Transferring unsecured ePHI over a network carries the risk of exposure. The following practices can help prevent inadvertent exposure of ePHI:

- Do not e-mail non-encrypted ePHI.
- Use Secure FTP to transmit non-encrypted ePHI.
- Use Secure Shell with X11-forwarding (ssh -X) instead of XDMCP to transmit non-encrypted ePHI.
- Make sure personally identifiable information is not stored in log files.

Remote Service

Philips has a global, web-based network for connecting many of your Philips systems to our advanced service resources. Remote service provides a set of tools that enables Philips Healthcare to perform service actions, entirely or partly, from a remote location. Remote service is designed to reduce system down time and improve investigation of systemic issues.

Positioning of Display Monitors

You can minimize unauthorized visual access to protected information by positioning the system's display monitor so that it faces a wall. This prevents people from viewing protected information from doorways, hallways, and other traffic areas.

To help in limiting unauthorized visual access, an unattended session automatically locks after a set period of time. Locking does not end the session or affect patient data; it causes the screen to show the log on screen only.

Manually lock the monitor when you will be away for an extended period of time. Save data before concealing the screen as a safeguard.



- If the workstation is running the Solaris 10 operating system, a small **Lock** icon appears on the front panel at the bottom of the screen. Click the **Lock** icon to lock the monitor.
- If the workstation is running the Solaris 11 operating system, a **System** menu is included in the collection of menus at the bottom of the window. Select **Lock Screen** on the **System** menu to lock the monitor.

Unlock the monitor by logging on to show the data on the screen.

Room Access Control

Local procedures must be put in place to limit physical access to the medical equipment in order to prevent accidental, casual, or deliberate contact by unauthorized individuals.

Access to the room containing the Pinnacle³ system should be controlled by policy and procedures that identify who is authorized to occupy specific areas. Check with your Safety and Security Office for more information on what measures are in place or how to implement room access controls.

User Accounts

- Pinnacle³ systems support multiple user accounts. Each user should have their own individual user account and password. Users should keep their passwords private and should not share their accounts with other users. We recommend that you use this method to manage your user accounts.
- Pinnacle³ systems support single user sessions using a common clinical user account. We recommend that you do not use one common clinical user account for all of your users.
- System credentials (such as user name and password) must be kept confidential.

The clinical user account password should be changed from the default password.

User Name and Password Protection

Minimum user name and password standards include the following items:

- Implement strong passwords. This is the easiest and most effective method to increase security. Strong passwords consist of at least eight alphanumeric, mixed case characters, plus digits and special characters such as “@” or “*”.
- Never use words that can be found in the dictionary.
- Never post or share user names and passwords.
- Change passwords periodically.

Emergency Access

A special emergency access user account is not supported. If this is a concern, then an alternative is to provide the location of an emergency user name and password in the contingency (disaster) plan. The system is not configured to log such emergency use.

Automatic Log-Off

The system does not support automatic log-off. Users must manually log off the system.

System Hard Drive

Clinical images that reside on the system hard drive are not encrypted; therefore, it is critical to limit local access to authorized users only.

System Backup Media

The system is not intended for permanently storing sensitive patient personal information. Information should be exported to a long-term storage device as soon as possible.

The clinical data that is backed up on removable media is not encrypted and should be stored in a secure location to avoid unauthorized access.

Removable and Portable Media

When using removable media (CD-ROMs, DVDs, and USB drives), be aware of these security issues:

- Inserting removable media can introduce a virus to the medical device. It is recommended to perform a virus scan on removable media before inserting the media into the system.
- If removable media are used to store patient data, protect the information from media obsolescence by planning and performing data migrations to newer storage technologies.
- If the removable media are to be stored for safekeeping, protect the data from “fading” loss by storing it in a suitable environment and performing media renewal as recommended by the manufacturer.
- If the media containing patient data are to be discarded they must be destroyed or disabled so that the data can no longer be accessed.



CAUTION

Removable media that contains images or other medical information must be stored in a secure area that is not accessible by unauthorized individuals.

User Logging and Audit Trails

- The system records clinical user activity event logs and user audit trails used to track user access to clinical data (playback log).
- The system records a number of system-level event logs to assist with system troubleshooting and repair (message log).
- The system maintains records of user logon activity (last log).

Data Integrity Checks


- The system supports basic system-level data and database integrity checks.
- If you suspect improperly altered or destroyed clinical data, notify your local IT security office and Customer Support or your local distributor.



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The online repository of 
is www.philips.com/ifu.

Printed in the United States of America.
4598 006 88901 A * AUGUST 2019