

**PHILIPS**

**Pinnacle**

Treatment Planning



**Flexible,  
intuitive  
planning  
environment**



***Introducing...***

# **Pinnacle Evolution**

The next generation of therapy planning

**Pinnacle Evolution** is the next generation of personalized treatment planning technology from Philips that improves the quality, consistency and efficiency of the therapy planning process.

With personalized, patient specific goals integrated from the start, more advanced automated planning tools, and a new way of working, Pinnacle is ready to take on your planning challenges.

# Pinnacle Evolution

## Designed to meet diverse clinical needs

### Speed up planning

Workflow Automation



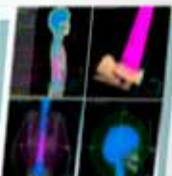
Personalized Planning

### Treat with confidence

Planning and Dose Computation



VMAT



Proton Planning

### Increase throughput

Contouring, Simulation, and Plan Review



Model-based Segmentation



SPICE



Dynamic Planning



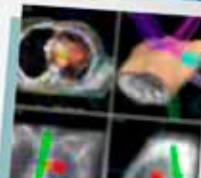
3D Planning



IMRT w/ DMPO



Multi-modality image fusion



Virtual simulation

**Pinnacle treatment planning has earned a 20+ year reputation for performance, reliability, and intuitive workflow.**

The comprehensive system is designed to improve quality and cost-effectiveness, and provides confidence to users and departmental administrators by addressing three key needs: efficiency, accuracy, and scalability. Designed to reduce planning and re-planning time and enhance dose accuracy, Pinnacle provides the foundation to help your facility offer high-quality treatments while controlling costs.

## Key advantages

### Efficiency

- Reduce planning and treatment times

### Accuracy

- Enhance consistency and quality of planning and treatment

### Scalability

- Adjust the performance of centralized computing to the needs and size of your institution

# Efficiency

## Reduce simulation and planning times

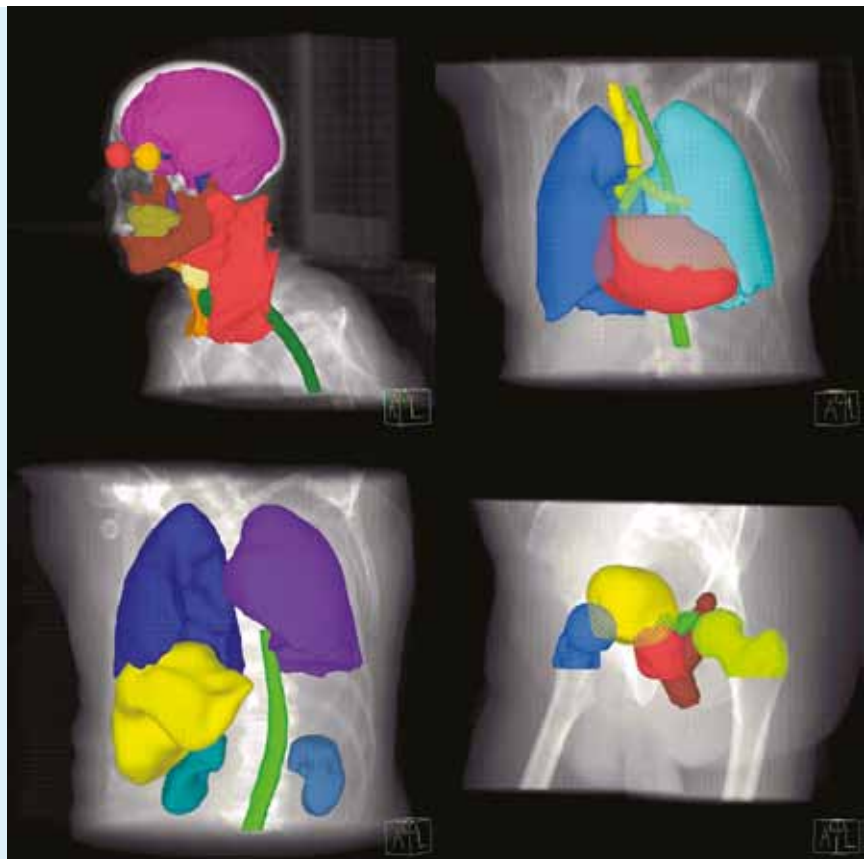
Treatment planning is often labor-intensive, time-consuming, and can produce inconsistent results. Pinnacle provides a wide range of tools to enhance the quality and efficiency of 3D and 4D contouring and simulation using multi-modality images. Pinnacle visualization and automation tools simplify these tasks while generating high quality results, leading to the creation of enhanced treatment plans.

### **Auto-Segmentation with Smart Probabilistic Image Contouring Engine (SPICE) and Model-Based Segmentation (MBS) automated 3D and 4D contouring**

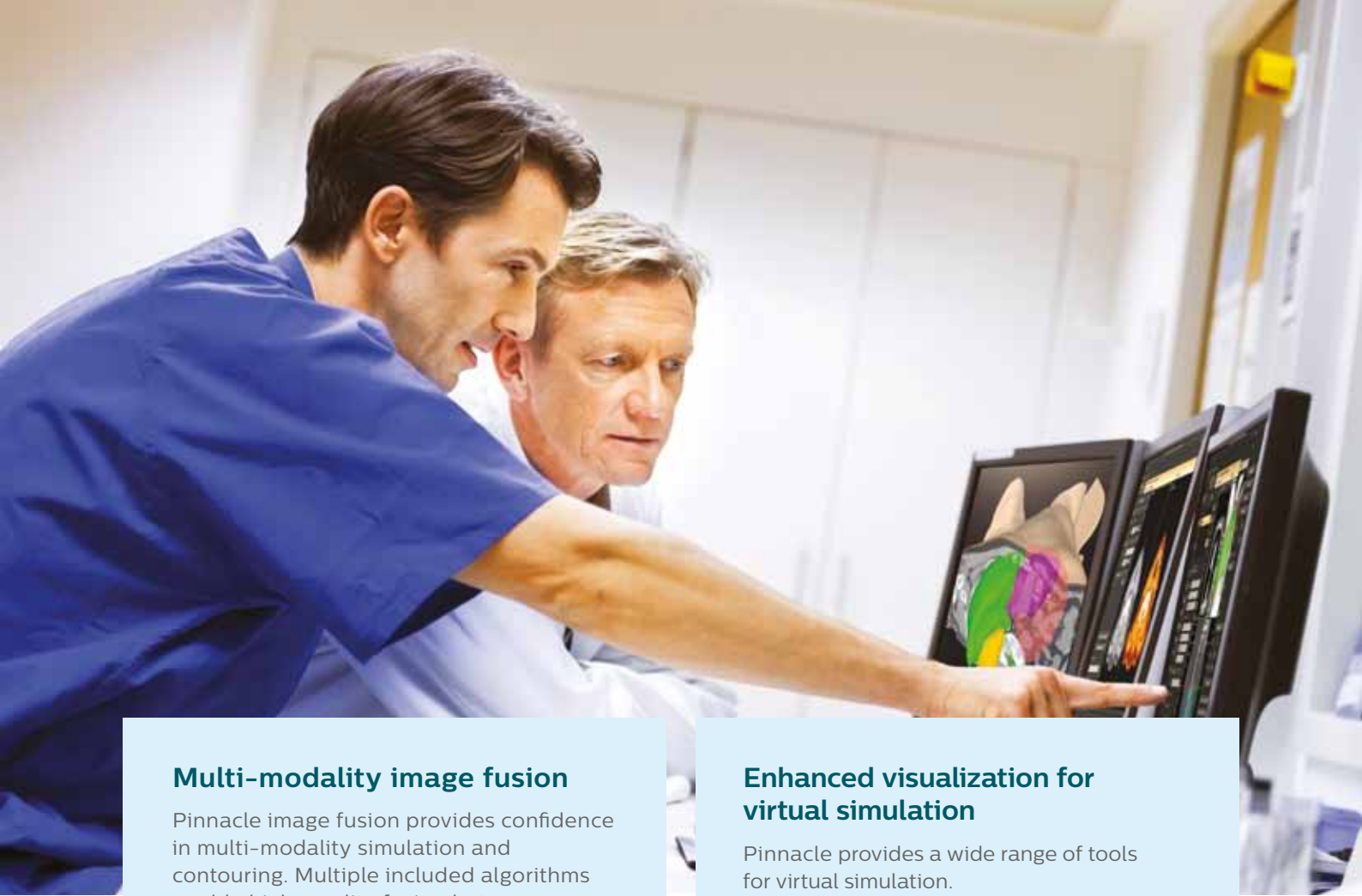
SPICE and MBS complement each other to streamline the contouring process. Both applications use atlas-based segmentations to generate 3D contours.

MBS offers the ability to delineate and create personalized libraries to store anatomical and non-anatomical structures. It also provides the ability to automatically generate the ITV using 4D CT image sets.

SPICE enables auto-contouring of multiple patient images simultaneously with limited user intervention. Contouring calculations run in the background, leaving the user free to pursue other tasks.



Contours generated by Auto-Segmentation with SPICE



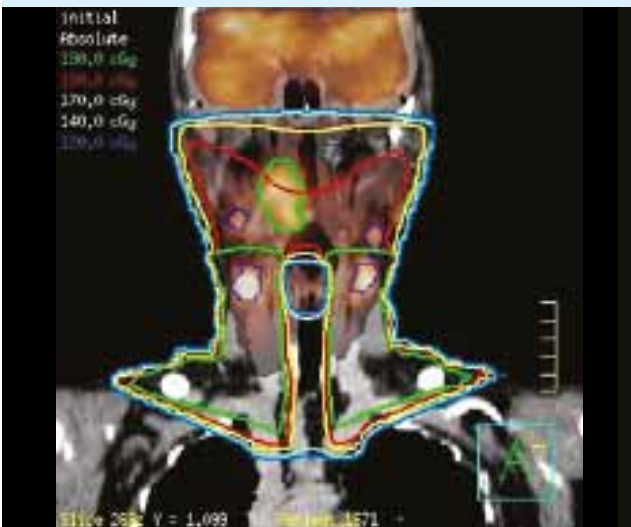
### Multi-modality image fusion

Pinnacle image fusion provides confidence in multi-modality simulation and contouring. Multiple included algorithms enable high-quality fusion between simulation CT, MR, PET, Cone Beam CT and more. Pinnacle aids with target and critical structure delineation, and improves the plan review process by showing dose distribution on multi-modality images.

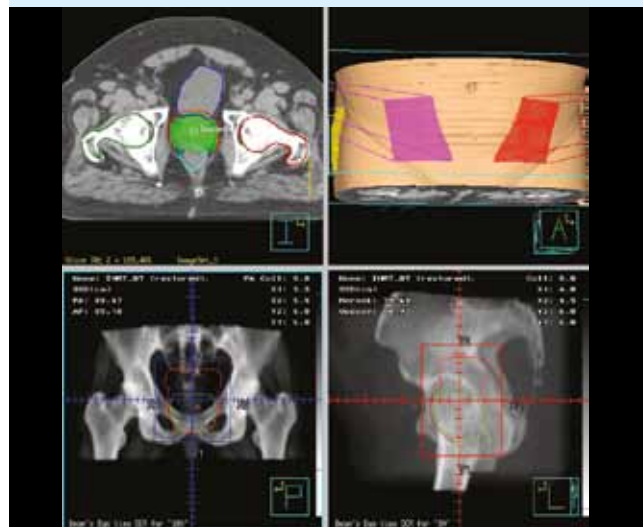
### Enhanced visualization for virtual simulation

Pinnacle provides a wide range of tools for virtual simulation.

- Connects to lasers to enable patient marking
- Provides high quality visualization with DRRs, DCRs and virtual fluoroscopy to help with isocenter placement
- Supports multi-phased CT images to enable 4D simulation.



Dose distribution displayed on fused CT and PET images



Enhanced visualization with DCRs (Digitally Composite Radiographs)

**Pinnacle Evolution introduces!..**

# Personalized Planning

Delivering state-of-the-art, personalized IMRT and VMAT treatment planning

## Personalized planning provides:

**Quality** of the treatment planning process with personalized, patient specific goals integrated from the start

Pinnacle Evolution introduces **Personalized Planning**:

- **Advanced**, protocol based, therapy planning workflow
- Next-generation **automated optimization** algorithms and
- **Complete** integration with PlanIQ Feasibility from Sun Nuclear

**Consistency** of results from the local clinic to the main campus, from the novice to the expert, with advanced automated planning tools

Intelligent algorithms work to achieve consistent, personalized results:

- Redefining first generation Auto-Planning by adding more:
  - **Control**
  - **Versatility**
  - **Power**

**Efficiency** of planning workflow to achieve clinically deliverable, personalized therapy

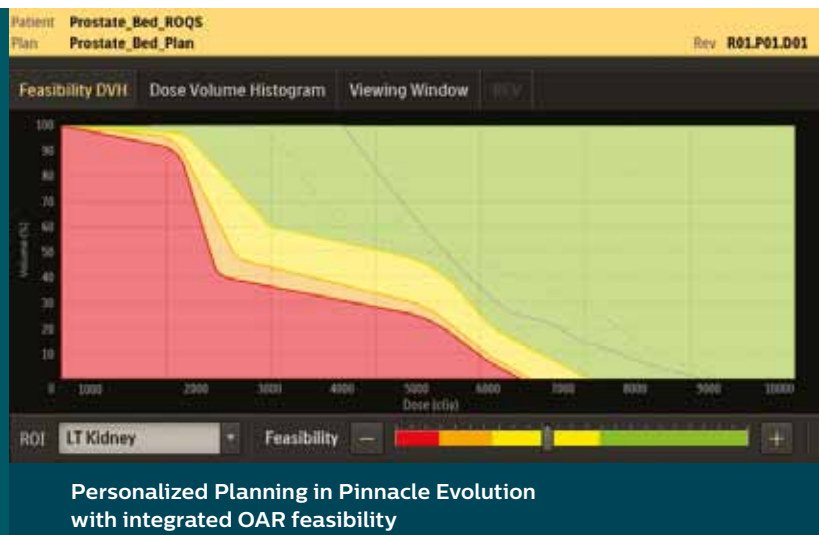
Pinnacle Evolution achieves fast optimizations **and** clinically deliverable, personalized plans with:

- Next generation, Philips **proprietary IMRT and VMAT** optimization
- **Improved performance** with **speed increases of up to 70%<sup>2</sup>**
- **Integrated PlanIQ Feasibility** creates Personalized Plans quickly and confidently right in the planning window

## Key advantages

Achieve patient-specific plan quality

- **Improve** plan quality by using feasible optimization goals
- **Create** patient specific, personalized, therapy plans
- **Reduce** the time needed to create a plan by reducing trial and error



# Dynamic Planning

Fast assessment and automated re-planning



## Reduce re-planning time

Pinnacle Dynamic Planning is designed to make treatment adaptation easy. Fast assessment and automated re-planning tools generate at-a-glance information to help monitor treatment efficacy and create new plans with limited user intervention.

In fact, Dynamic Planning can save 6 hours of work for every head and neck re-plan<sup>3</sup>. Intuitive evaluation tools allow side-by-side comparison of patient images, visualize the impact of a change in a patient on the original contours, due to weight loss, changes in tumor size, etc.

## Key advantages

- Enable **fast and comprehensive assessment** to determine the need to replan
- Facilitate **fast and easy plan adaptation** with limited user intervention
- **Dynamically track** the impact of patient changes to treatment plans
- **Enhance targeting** when planning on patients requiring re-treatments

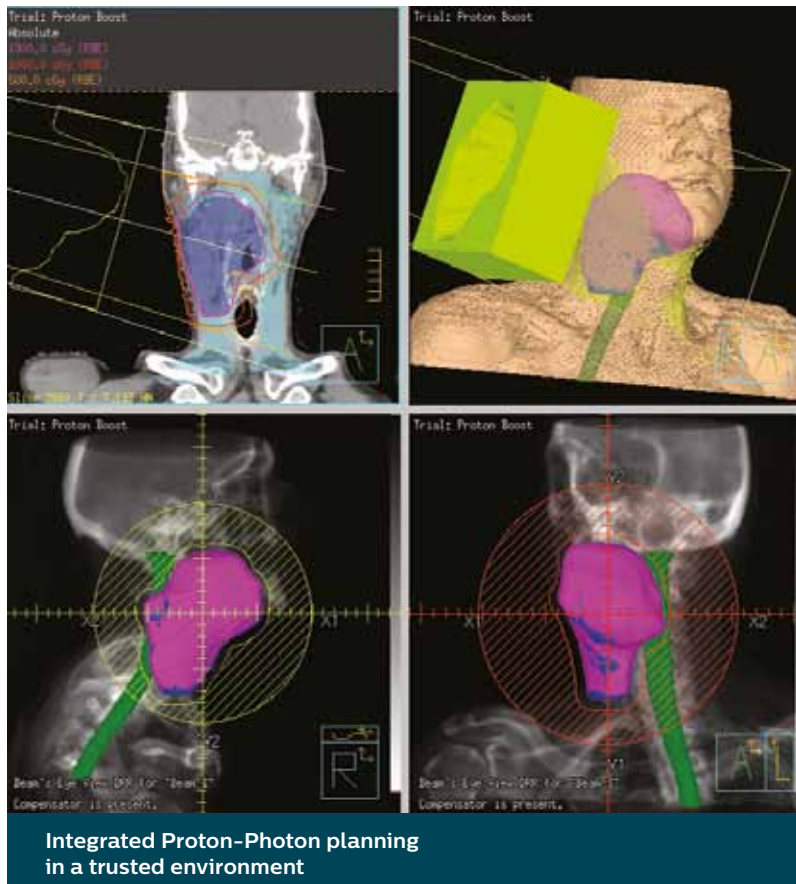
# Accuracy

## Enhance quality and consistency of photon and proton plans

### Key advantages

- Provide confidence for integrated photon-proton planning in a trusted environment
- Accelerate clinical adoption with reduced effort through simplicity of commissioning
- Enhance treatment quality through individually tailored treatment plans

Pinnacle is recognized as a trusted treatment planning system for external beam radiotherapy with photons and protons. With a proven track record in accuracy and reliability, it provides confidence to its users independent of the treatment delivery system.



### Proton Planning

Integrated proton-photon treatment planning

Pinnacle Proton Planning is designed to simplify treatment planning for proton therapy. It integrates proton planning within the conventional external beam treatment planning process.

The combination of specially designed tools and the seamless integration with other Pinnacle applications offers clinicians the chance to select the appropriate treatment options for the patient and complete their work quickly.



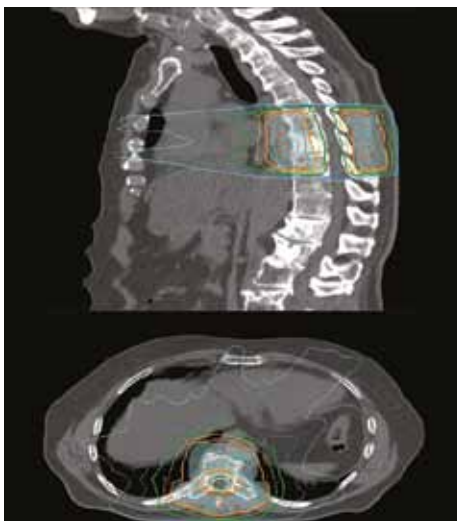


### 3D Conformal, IMRT and VMAT

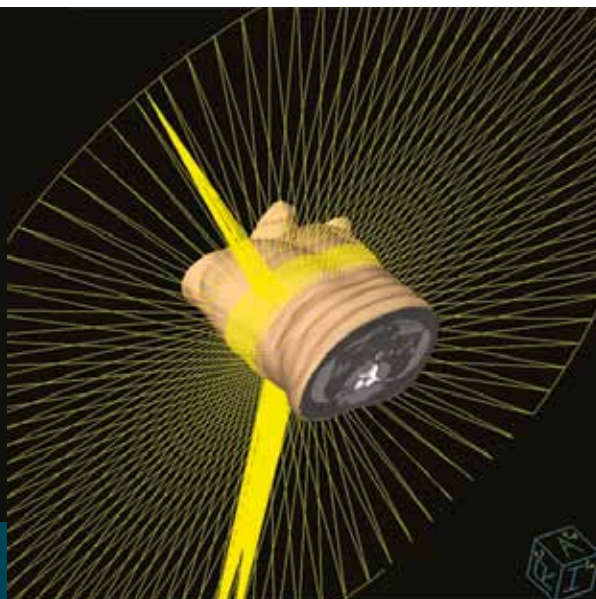
High quality plans, whatever the LINAC

Pinnacle supports a range of treatment deliveries in conventional radiotherapy - from 3D conformal planning

to IMRT and VMAT, and allows combining multiple delivery techniques into one plan. The Collapsed Cone Convolution Superposition (CCCS) dose algorithm provides the reliability and accuracy of the results.



Pinnacle VMAT allows constant or variable dose rate deliveries.



Expand treatment capabilities with our advanced treatment techniques

# Scalability

Enjoy the benefits of high performance and improved access scaled to your needs

## Key advantages

### Fast treatment planning

- Improves computation speeds

### Improved access

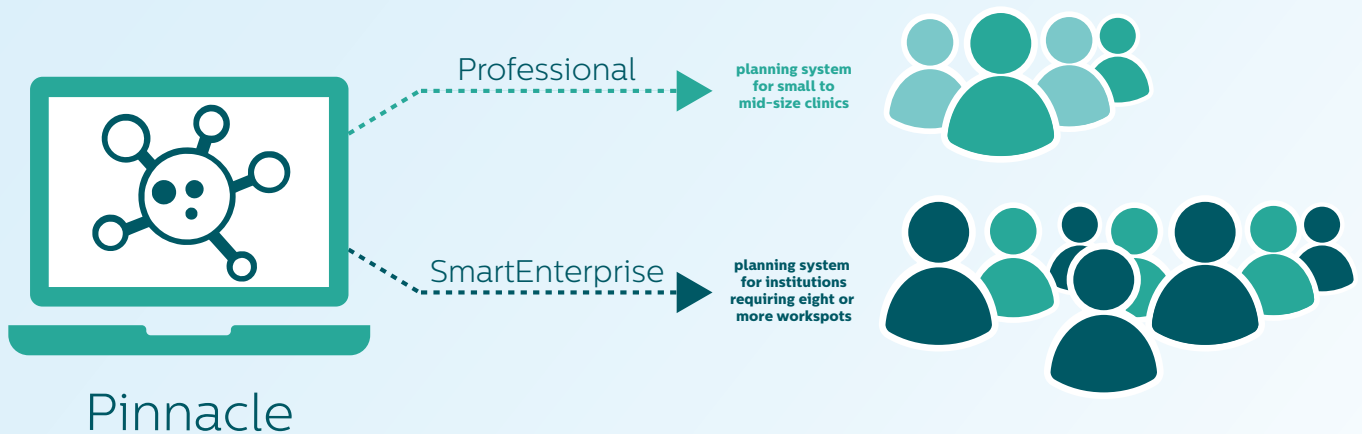
- Access to all Pinnacle applications
- Improved performance at lower bandwidth

### Reduces operational costs

- Thin clients replace independent workstations: reduces license fees & maintenance needs

Pinnacle is offered on three different types of hardware platforms which are scalable to specific needs and the size of your facility. Access your centralized Pinnacle radiation treatment planning system from virtually any location within the department or remotely using PCs or MACs\*. This eliminates the need for larger bandwidth as well as the high maintenance requirements involved with using dedicated workstations. You get full flexibility, while enhancing accessibility, maintenance, and management of the system.

## Flexible deployment



\* Windows: minimum specifications as required by Microsoft Windows 7\*, XP or Vista (32 and 64 bit) Microsoft and Windows are either trademarks or registered trademarks of Microsoft Corporation in the United States and/or other countries  
Macintosh: OS X v10.6 (Snow Leopard) or later. English, French, German, and Dutch localized keyboards only. Apple, Mac and Macintosh are trademarks of Apple, Inc. registered in the United States and other countries.



### **Professional**

Fast & flexible server-class system with scalability to grow

A fast and flexible server-class system to support the Pinnacle application for small to mid-size clinics with up to three LINACs. Access is available from an unlimited number of locations, thanks to floating licenses.

### **SmartEnterprise**

Virtually unlimited scalability to boost capacity for large clinics

Boosts capacity and is ideal for institutions requiring eight or more Pinnacle workstations. System scalability is virtually unlimited. Floating licenses expand access and enhance flexibility. Custom configurations are available, using hardware that best meets your needs.

