Open up your possibilities

Philips GEMINI TF Big Bore PET/CT system

PHILIPS

sense **and** simplicity

Expanding accuracy and clinical utility

When it comes to expanding clinical utility of PET/CT in oncology care,
Philips GEMINI TF Big Bore is practically open for everything.

The first of its kind

The Philips GEMINI TF Big Bore is optimized for diagnostic imaging and radiation oncology to provide enhanced patient care throughout the oncology care cycle.

GEMINI TF Big Bore is our first PET/CT system designed to:
- Provide exceptional Time-of-Flight PET image quality and applications coverage while meeting stringent standards for radiation oncology
- Deliver the accuracy and workflow optimization demanded by radiation oncology applications
- Combine Brilliance CT Big Bore capabilities with premium PET performance
- Simplify oncology care processes, remove complexities, and improve accuracy throughout the oncology care cycle

Growing clinical evidence demonstrates the value of integrating PET biological information into radiation oncology treatment planning to streamline staging, planning, therapy, and follow-up in oncology care. A recent review of literature[1] indicates an overall improvement in target volume delineation when PET is used in addition to CT.
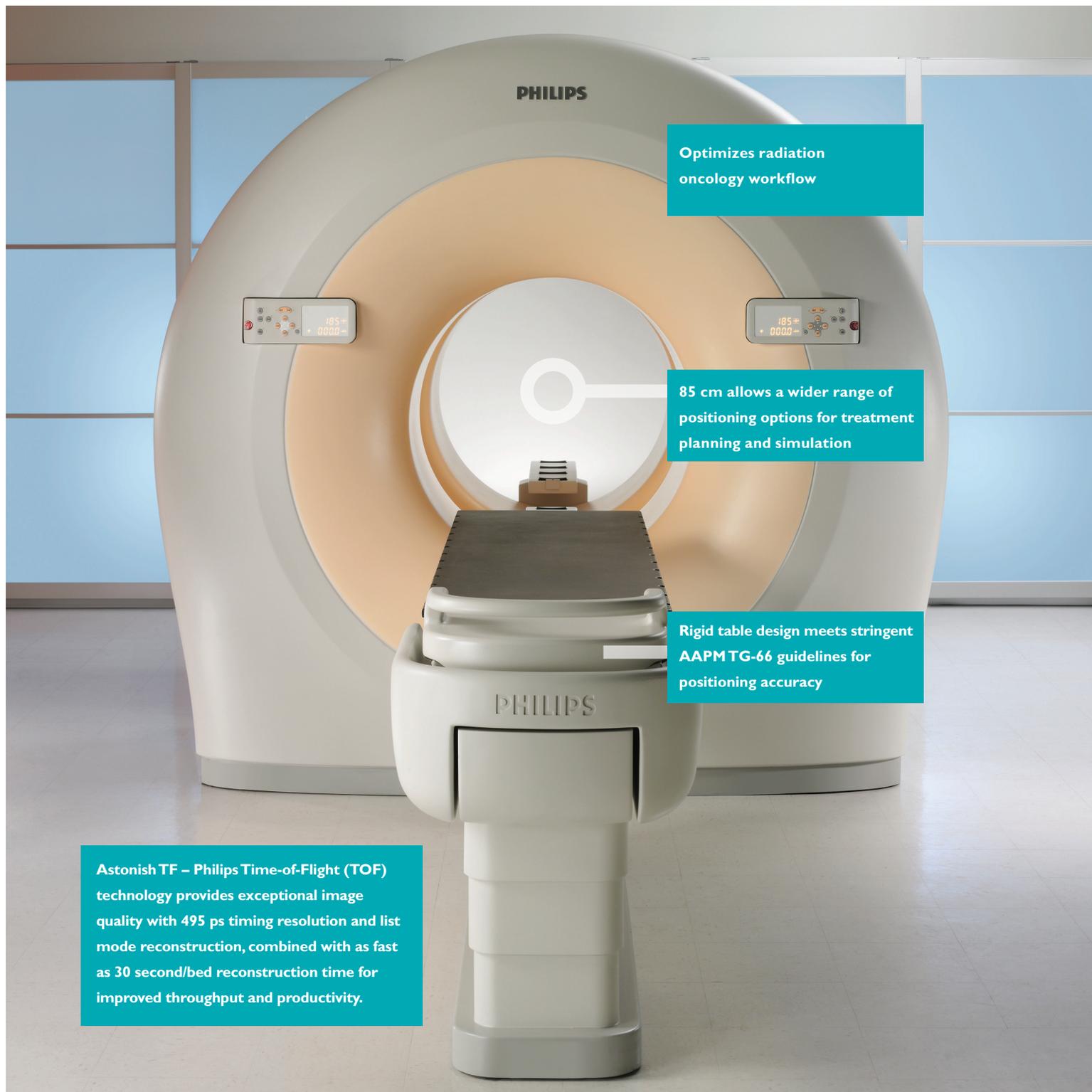
Optimizes radiation oncology workflow

85 cm allows a wider range of positioning options for treatment planning and simulation

Rigid table design meets stringent AAPM TG-66 guidelines for positioning accuracy

Astonish TF – Philips Time-of-Flight (TOF) technology provides exceptional image quality with 495 ps timing resolution and list mode reconstruction, combined with as fast as 30 second/bed reconstruction time for improved throughput and productivity.

1. Carlo Greco, Kenneth Rosenzweig, Giuseppe Lucio Cascini, Oscar Tamburrini, PET/CT in Radiotherapy Treatment Planning for Non-small-cell Lung Cancer, Lung Cancer 2007, Aug 1.

Wide open for radiation

PET can increase accuracy in radiation oncology

The use of PET/CT in radiation therapy treatment planning offers several key opportunities:

• Enhance target volume definition by including disease not evident with CT alone

• Decrease treatment area to allow healthy tissue to be spared

• Reduce contouring variability, allowing radiotherapy to be more accurately delivered and dose to be more safely escalated

• Enhance the treatment plan by incorporating biological information

GEMINI TF Big Bore overcomes limitations of conventional systems

Conventional PET/CT systems are not equipped for radiation therapy planning procedures in several crucial ways:

• Bore sizes not large enough for certain simulation and treatment positions and accessories

• Limited scan FOV suboptimal for radiation therapy planning

• Imaging table positional accuracy not compliant with AAPM TG-66 guidelines

• RTP protocols, connectivity, and simulation tools necessary for radiation oncology workflow are lacking

GEMINI TF Big Bore offers:

• Excellent PET image quality, lower injected dose, and improved productivity with Astonish TF
  – 30% improved contrast
  – Reconstruction as fast as 30 seconds/bed

• The only full 85 cm bore diameter for both PET and CT to accommodate the positioning flexibility provided on leading linear accelerators

• Extended whole body coverage with 190 cm scan length for PET and CT

• Meets the stringent patient positioning and accuracy requirements of radiation oncology, allowing patients to be imaged in optimum treatment position

• Comprehensive tools and protocols to easily integrate PET functional images into radiation oncology, helping consolidate procedures while maintaining premium image quality

• Philips patented OpenView gantry design for greater patient comfort
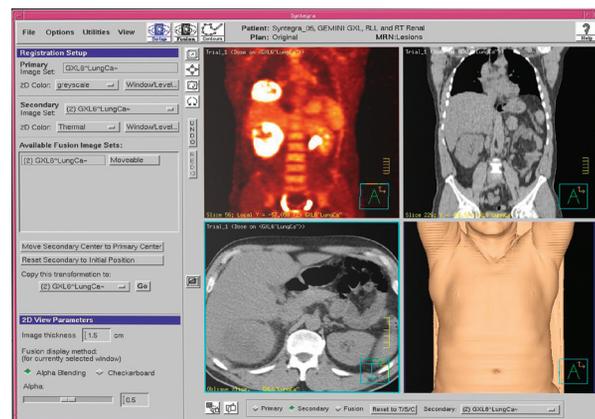
PET image display with CT in Pinnacle[3] for enhanced radiation treatment planning

oncology

GEMINI TF Big Bore PET/CT combines the power of functional imaging with CT simulation

The GEMINI TF Big Bore is our first PET/CT imaging system specifically designed to facilitate the integration of functional imaging in radiotherapy planning to improve the accuracy and reproducibility of targeted tumor volume delineation.

The GEMINI TF Big Bore system offers exclusive technologies and features making it an ideal PET/CT system for tumor detection, staging, simulation, and monitoring tumor response to therapy:

- Clinical versatility of state-of-the-art PET and CT simulation integrated in one system
- Increased confidence in delineating the targeted tumor volume with up to 30% improvement in PET image contrast with Astonish TF, and additional 20% improvement with 4D TOF respiratory motion management
- Greater flexibility in patient positioning and use of immobilization devices with 85 cm bore for PET and CT

Brilliance in CT simulation

Brilliance Big Bore CT sets the standard in CT simulation

Philips Brilliance CT Big Bore Oncology configuration builds on the outstanding success of the Philips AcQsim CT scanner, offering high spatial resolution and providing 16 x 0.75 mm slices per rotation. It delivers exceptional radiation oncology performance and workflow, with excellent CT simulation features and capabilities. Key advantages include 4D respiratory correlated imaging for motion management and tumor localization for isocenter identification and absolute marking.

Philips Brilliance Big Bore CT provides:

- 16-slice per revolution with 2.4 cm coverage to allow quick scanning of larger areas
- Oncology-specific tools such as full-length cursor and oncology protocols to increase throughput
- Absolute patient marking
- Tumor LOC to enhance workflow
- Respiratory-gating foundation for Philips comprehensive 4D TOF PET/CT capabilities

The system provides 60 cm true scan field of view (SFOV) to include all patient skin surface when using the scan for radiation dose calculations.

Tumor location at full inspiration
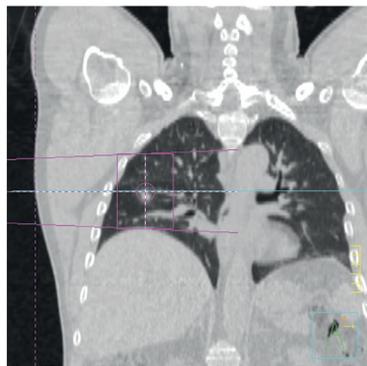

Tumor location at full expiration

Maximum intensity projection over phases

User-friendly environment

The Brilliance Workspace provides an innovative and flexible user environment – developed specifically for multimodality visualization. It provides the full-speed scanning so critical in high-demand environments, freeing the scanner as soon as the scan is complete.

The Brilliance CT tumor localization (Tumor LOC) package increases productivity and improves workflow by reducing CT simulation time and enhancing the patient marking process. It also provides visualization and analysis of treatment volume(s) and offers efficient, advanced contouring of external and critical structures in preparation for radiotherapy treatment planning. Tumor LOC also provides localization of the treatment isocenter, and visualization and analysis of respiratory-correlated datasets.
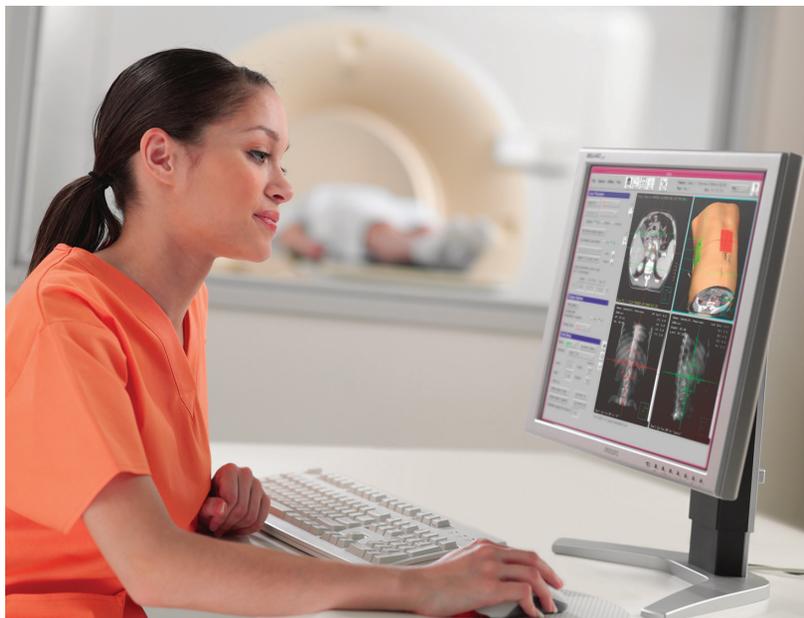

Philips visualization software provides powerful, flexible tools from quantitative analysis to 3D imaging for detection through follow-up. Nearly all planning, scanning, visualization, and archiving can be done at the scanner console.
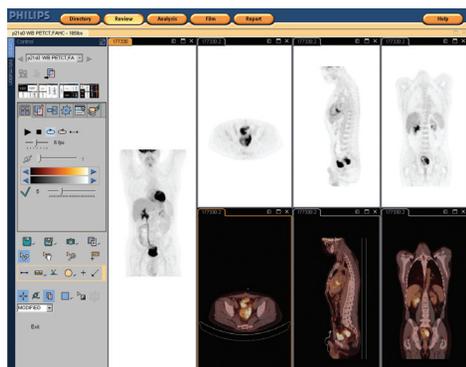
The Philips Fusion Viewer offers a user-friendly review and analysis environment for hybrid imaging.
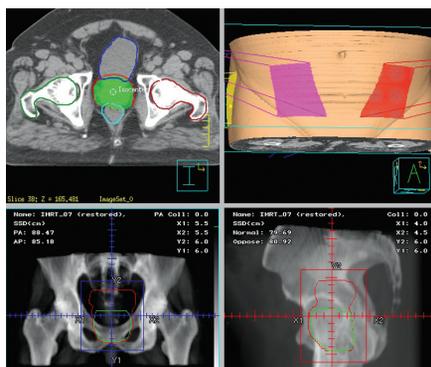
Philips offers advanced visualization and analysis tools for diagnostic review, staging, simulation, treatment planning, and follow up.
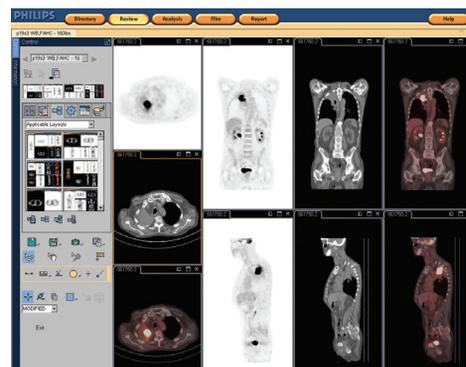
Intuitive layout editor allows you to create new display layouts or to modify existing layouts.

Astonish TF: purity with speed

Astonish TF

Astonish TF unleashes the capabilities of full fidelity Time-of-Flight (TOF) reconstruction resulting in high-quality images in less time. Astonish TF increases the processing speed of the system up to four times faster than previous generation systems. Now, high-quality reconstruction can be utilized to provide greater imaging and accuracy capabilities with TOF technology.

Up to 30% improved contrast

Building on the Philips well-established TOF technology, Astonish TF provides up to 30% improved contrast resolution compared to non-TOF technology. Through the proprietary reconstruction design, list mode reconstruction optimizes image quality and SUV quantification.

As fast as 30 seconds/bed reconstruction times

Through Astonish TF, PET reconstruction is as fast as 30 seconds per bed after acquisition. Routine whole-body scans can be completed within minutes of acquisition. Now, reconstruction speeds allow full optimization of TOF functionality.

**Provides up to 67% lower injected FDG dose**

Astonish TF takes advantage of the inherent ability of Philips TOF technology to lower patient dose. The sensitivity gain achieved through Astonish TF allows for fewer counts required for measured PET activity. This has allowed users to inject whole-body FDG doses at less than 5 mCi.
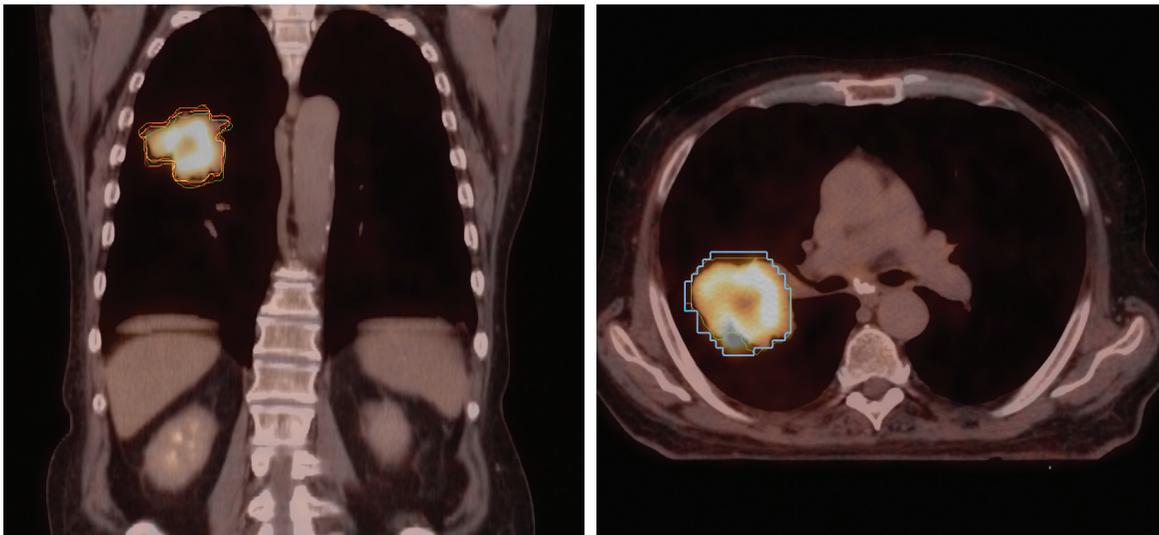

4D TOF respiratory-correlated imaging of combined PET and CT provides enhanced motion management which improves small lesion detectability, accuracy in SUV quantification, and definition of target volume for the purpose of treatment planning.
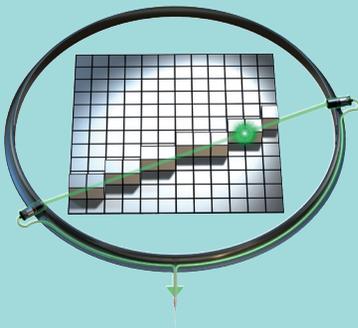
In non-TOF PET imaging, it's possible only to know that a coincident event has taken place on the line of response, but not the actual location of the event.
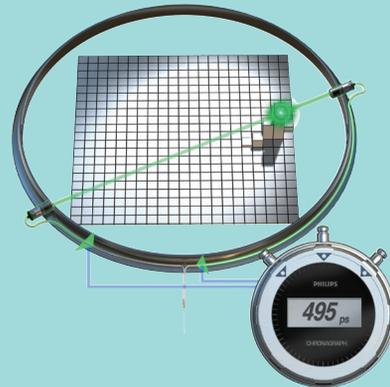
Astonish TF Time-of-Flight technology uses the actual time difference between the detection of coincident events to more accurately identify the origin of the annihilation. TOF reduces noise during the image acquisition, improving the information sent to reconstruction and leading to detectability of small lesions, reduced dose, and rapid scan times.
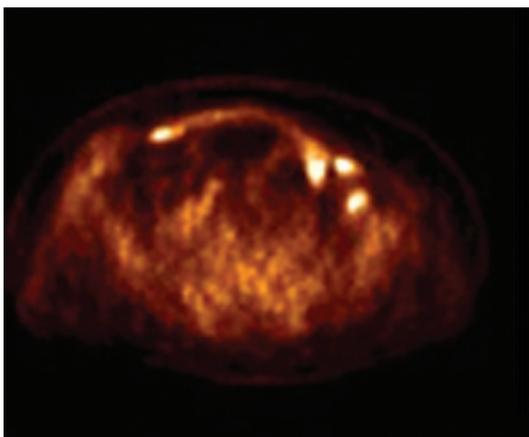
Non TOF
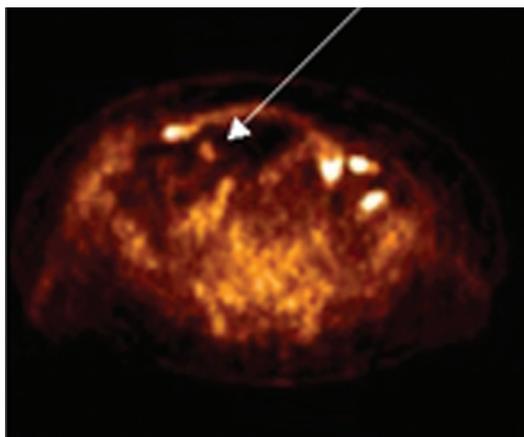
Astonish TF

Oncology simplified

Combining the power of functional imaging with CT Simulation

Philips GEMINI TF Big Bore brings you the value of two premium systems in one, with the flexibility to perform both state-of-the-art CT simulation and diagnostic PET/CT procedures.

Philips has long been a leader in oncology care with advanced solutions such as the Pinnacle[3] treatment planning system, the Brilliance CT Big Bore simulator, and the GEMINI TF PET/CT system. GEMINI TF Big Bore combines the CT simulation capabilities and workflow efficiency of the CT Big Bore with the remarkable TOF image quality of the GEMINI TF, and the radiation oncology insights of Pinnacle[3] to provide a powerful, integrated solution.

The GEMINI TF Big Bore is designed to improve accuracy throughout the oncology care cycle. Combining PET biologic information with CT anatomic information in one scan allows radiation oncologists to better characterize lesions. The system's Astonish TF TOF architecture delivers premium PET image quality providing increased confidence and accuracy in delineating the targeted tumor volume.

GEMINI TF Big Bore combines biological information with CT simulation into one system designed specifically for the needs of radiation oncology with support for enhanced diagnostic image quality.

CT Big Bore
Exceptional simulation capabilities

GEMINI TF PET/CT
Premium TOF PET imaging

• AAPM TG-66 positional accuracy

• Tumor LOC

• 4D TOF respiratory correlated imaging

• Radiation oncology protocols

• Tumor tracking application*

• OpenView gantry

* Optional application offered on the remote processing and review workstation.

Improving accuracy in

The GEMINI TF Big Bore system allows you to improve the accuracy of treatment planning with new levels of speed and efficiency for greater insight throughout the oncology care cycle. The combination of workflow capabilities and radiation oncology optimization consolidates diagnosis, staging, therapy planning, and follow-up procedures onto one system.
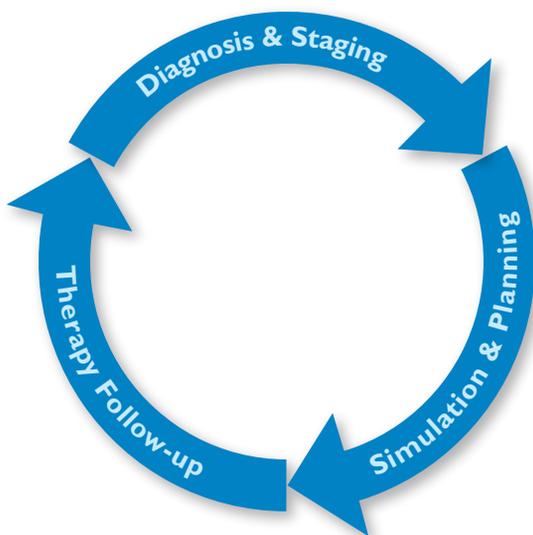
Diagnosis and staging

Philips Astonish TF technology helps to improve image quality, reduce scan times, allows for lower injected dose, and improve workflow. Perform high-resolution whole-body PET scans quickly, even for larger patients, and visualize smaller lesions that might be missed by CT alone.

Simulation and planning

Leverage the capabilities of a premium CT simulator – 85 cm bore size, table positioning accuracy, and advanced protocols – while allowing PET functional data to be easily integrated into simulation. GEMINI TF Big Bore assures connectivity with treatment planning systems such as Philips Pinnacle[3].

Capitalize on the significant workflow and clinical advantages of Brilliance CT Big Bore, such as absolute patient marking, Tumor LOC, and 4D respiratory gating. Position patients in the same manner for both simulation and therapy to enhance treatment accuracy.

Tailor therapy during treatment, restaging or replanning on the same system used for the original simulation, making adaptive therapy easier and more efficient.

Therapy follow-up

Philips Tumor Tracking application provides efficient tools to assist clinicians in monitoring tumor progression or response to therapy using sequential PET or PET/CT scans. This optional analysis tool can perform semi-automatic segmentation of tumors and quantitative measurements to track changes in tumor metabolic activity and volume, helping to simplify disease management and treatment monitoring.

oncology care

"Our oncology scans benefit substantially from Time-of-Flight technology. We use Time-of-Flight on 100% of our oncology patients because this improves spatial resolution and diagnostic accuracy."

George Ebert, MD, PhD, Chief, Imaging Technology,
University of Vermont Medical Group at Fletcher Allen

Respiratory correlated gating

Ungated imaging
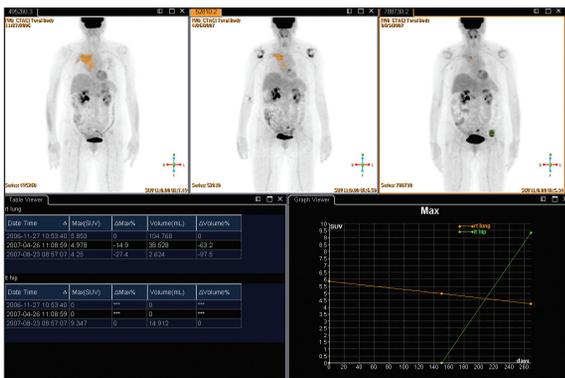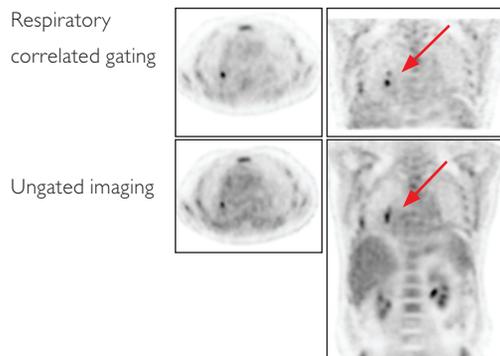
Tumor tracking provides multiple time-point trending analysis of tumor volume and metabolic activity changes over time.*

* Optional

From diagnostic imaging to radiation oncology, GEMINI TF Big Bore opens up the possibilities. GEMINI TF Big Bore maintains premium PET image quality and full applications coverage in radiation oncology, while allowing you to perform high-resolution, high-throughput diagnostic whole-body PET scans as well as cardiac PET scans.

Open for more
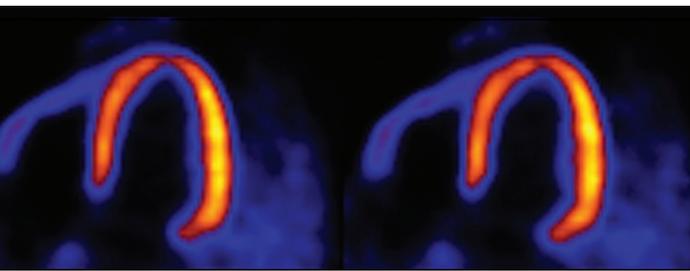
"I can't overemphasize how important it is to have the large bore for patients for cardiac imaging. Many of those patients are obese and if you are applying an attenuation correction CT you need to have a true attenuation map, which is paramount for PET imaging. The system nicely marries the need for cardiac imaging and oncology and gives you the flexibility you need."

Janusz Kikut, MD, Director of Nuclear Medicine and PET,
University of Vermont Medical Group at Fletcher Allen

Awarded the Frost & Sullivan 2008 North America Healthcare Innovation Award in Oncology Imaging
Philips received this prestigious award in recognition of its innovative oncology portfolio, which continues to help redefine the continuum of care for the detection and diagnosis of cancer with its latest clinical solutions.

100% of the top 50 cancer centers choose Philips[2]
From multimodality imaging to advanced simulation to best-in-class planning systems, Philips is simplifying oncology, taking a patient-focused approach to the oncology care cycle.

Philips offers a comprehensive portfolio of integrated solutions for imaging and treatment planning such as the Brilliance CT Big Bore, Pinnacle[3] treatment planning system, Panorama HFO oncology configuration, and GEMINI TF Big Bore PET/CT system.

2. *US News & World Report* ,"America's Best Hospitals 2010".

Please visit www.philips.com/geminitfbigbore for more information