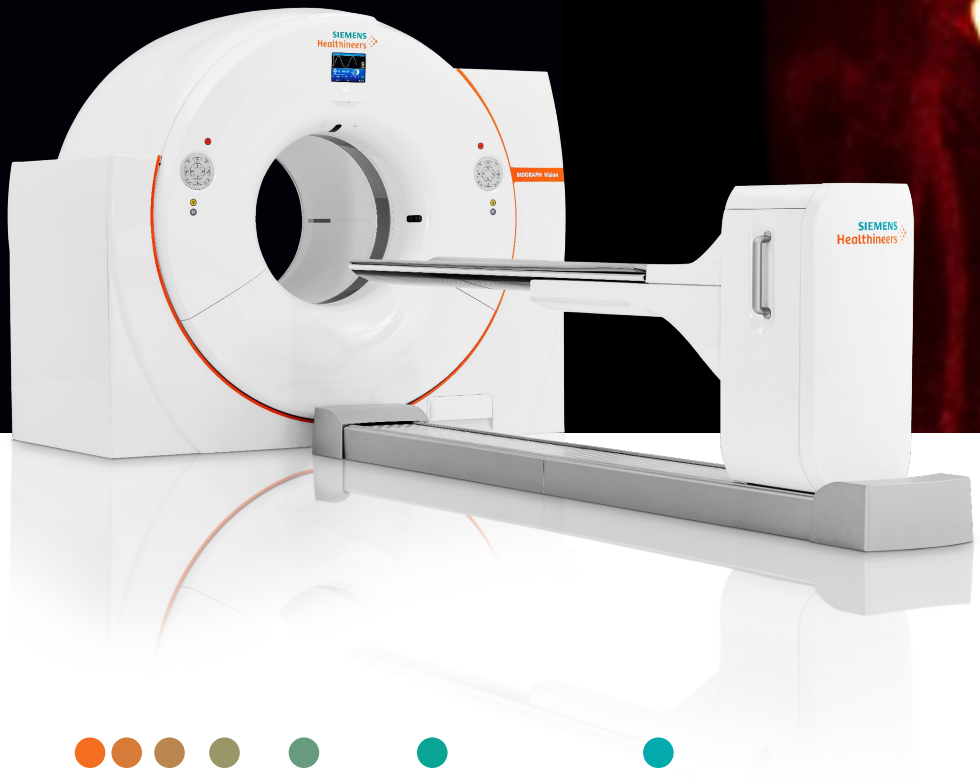
Biograph Vision PET/CT

Precision-driven performance

siemens-healthineers.com/biographvision

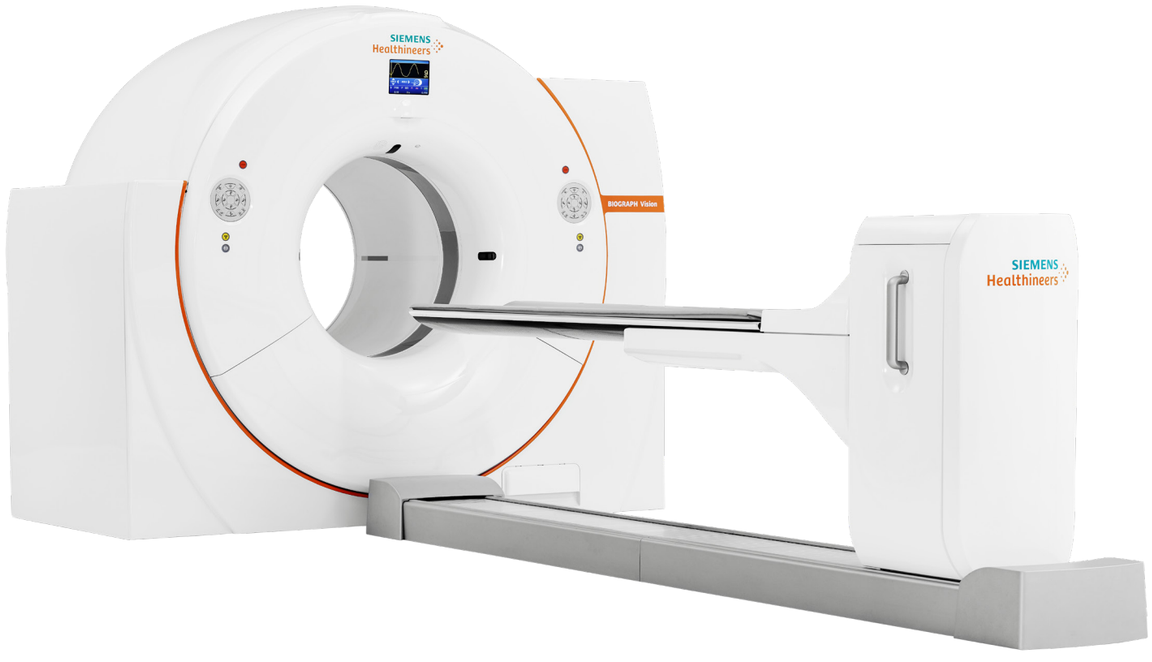


SIEMENS Healthineers

Leverage advancing technology for improved outcomes

PET/CT continues to improve the practice of medicine.

As healthcare shifts toward personalized diagnosis and treatment, healthcare innovators continue to drive technological advancement to positively affect clinical outcomes. PET/CT has vastly improved the practice of medicine, and each technological step can do more than just incrementally continue its momentum.



Technological advancements create opportunity and with the right implementation can deliver benefits to patients and healthcare systems.

Redefine PET/CT imaging with the precision-driven performance of Biograph Vision™. With industry-leading technical specifications, Biograph Vision delivers next-level image quality that transforms accurate decision-making. State-of-the-art detectability opens new clinical and research avenues while expanding your range of radiotracers at optimum doses. Now users can scan faster, reduce dosages, and enhance patient comfort.

Redefined technical precision

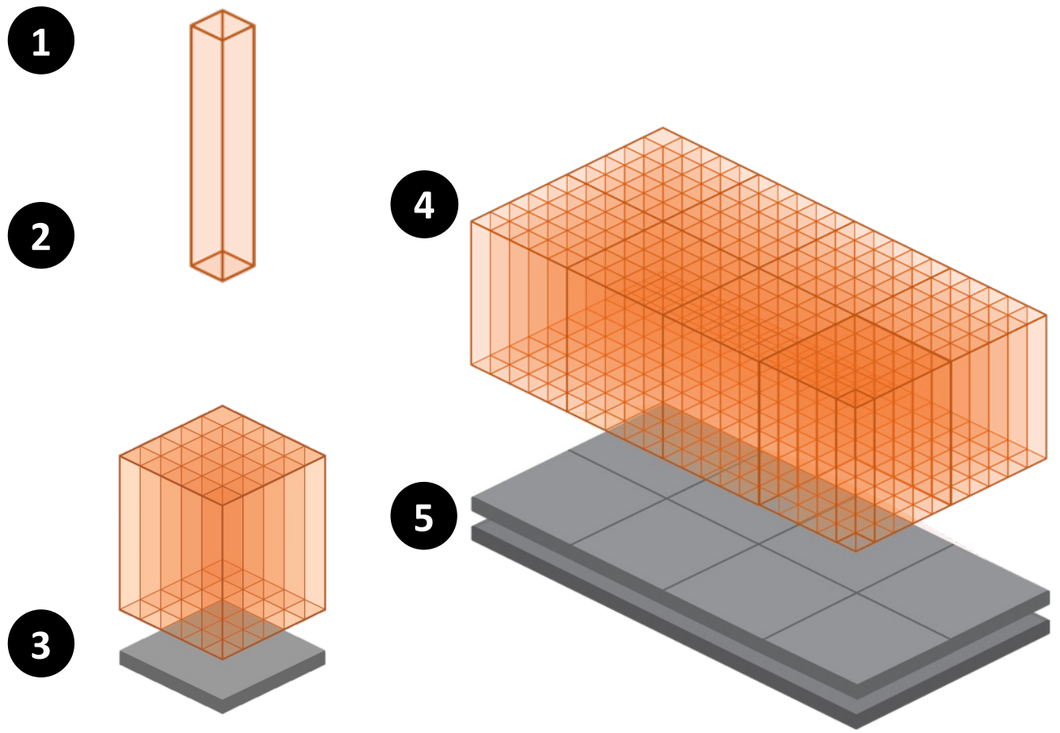
Unlocked imaging versatility

Empowered operational performance

Biograph Vision empowers you to redefine PET/CT imaging with precision-driven performance.

Redefined technical precision

Biograph Vision's groundbreaking technological performance redefines the limits of imaging. Featuring 3.2 x 3.2-mm lutetium oxyorthosilicate (LSO) crystals that are 100% covered by SiPMs[1], Biograph Vision's Optiso Ultra Dynamic Range (UDR) detector technology delivers high 48-mm^3 volumetric resolution[1] and industry-leading 214-picosecond (ps) time-of-flight (TOF) performance[2]. Biograph Vision leverages the full potential of SiPM technology to reveal the bigger picture for more accurate and confident decision-making.



Optiso UDR

The detector is the most important component of a PET/CT system. It defines the quality of the incoming data. The developers at Siemens Healthineers re-envisioned conventional digital detector design to improve spatial and temporal resolution, leveraging the full potential of SiPM and going beyond simply replacing a single component.

1 **A fast, efficient scintillator, LSO** is grown and cut in-house through a vertically integrated manufacturing process to ensure the highest quality.

2 **3.2 x 3.2 x 20-mm crystal elements** are individually selected and deliver high 48-mm^3 isotropic spatial resolution; higher spatial resolution may result in improved lesion detectability.

3 **100% coverage[1] of the crystal area** with SiPM sensors results in a timing resolution of 214 picoseconds[1], providing 3.9 times higher effective sensitivity[2] for faster scans and lower dose.

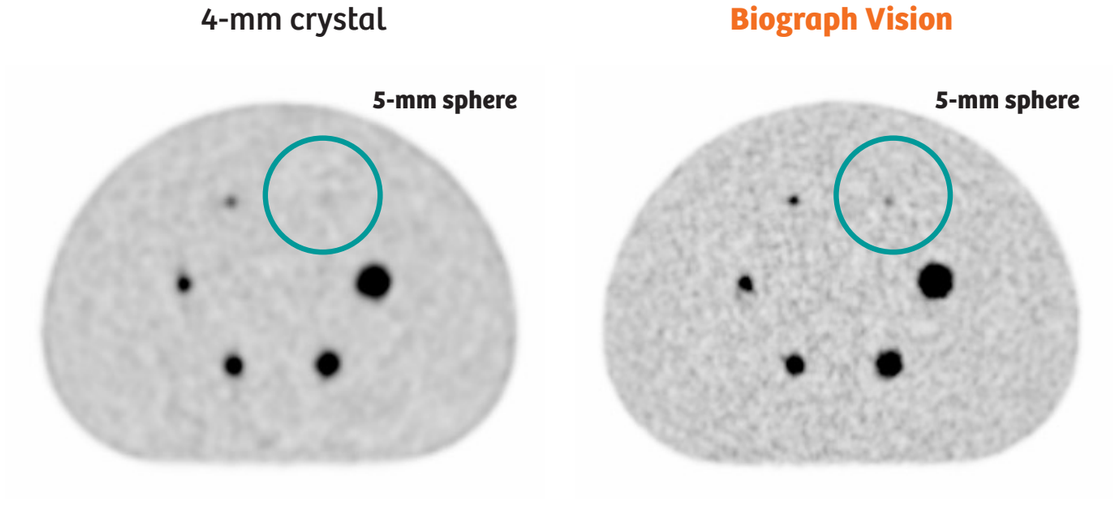
4 **A small block size delivers > 1789 kilo counts per second[1] effective peak NECR** for improved clinical performance.

5 **High-flow direct-cooling of the detector electronics assembly** allows the detector temperature to remain stable at room temperature for outstanding performance and serviceability, as well as improved patient comfort.

Redefined technical precision

Spatial resolution: Small crystals, big impact

Improving spatial resolution with smaller crystal sizes is one of the most effective ways to deal with partial volume effect (PVE). With 3.2 x 3.2-mm crystals, Biograph Vision delivers high spatial resolution to reduce the impact of PVE. This helps you quantify more accurately and more confidently understand disease progression.



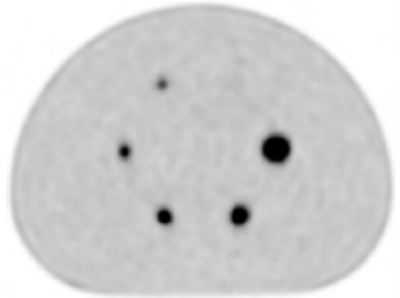
High-resolution torso phantom
Sphere size (mm): 5.0, 7.9, 9.9, 12.4, 15.4, 19.8
6:1 contrast-to-background

Temporal resolution: Exceptional TOF

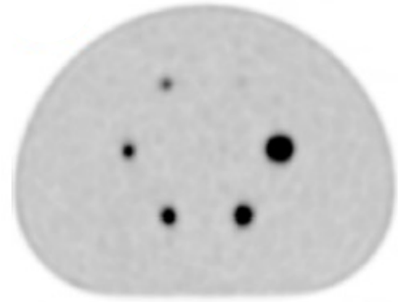
Faster temporal resolution allows for smaller segments of response, which increase the accuracy of locating the annihilation event. TOF performance depends on collecting light from all photons in the scintillation.

Biograph Vision is designed so SiPMs cover the entire LSO array area, allowing all light from the scintillation to be detected. This leads to 100% coverage and enables fast temporal resolution.[1]

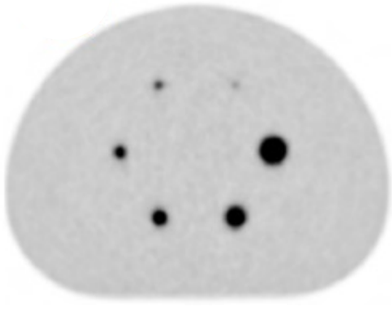
Images A and B acquired on Biograph™ mCT. Image C acquired on Biograph Vision.



A | No TOF



B | 540-ps TOF



C | 214-ps TOF

Advanced PET/CT imaging in one platform

Biograph Vision is designed to help you set the standard in PET/CT. Diagnose, treat, monitor, and research disease more confidently with strong foundational technology and artificial intelligence (AI)-enabled capabilities, as well as enhanced image quality and optimized workflows.

Biograph Vision with AIDAN, our intelligent imaging platform, lets you leverage the demanding processing power of AI-based solutions to perform PET/CT exams with more efficiency—optimizing clinical operations and the patient experience with just a click of a button.

Biograph Vision PET/CT scanners can help you deliver the best clinical services for your patients.

Experience precision PET/CT imaging[3]

ultraHD•PET
Improve image signal-to-noise by utilizing TOF combined with the resolution recovery of HD•PET. This option can be used to enhance image quality and/or reduce patient acquisition time.

FlowMotion™ AI
Create standardized imaging workflows for fast, reproducible, and personalized results, with disease-based protocols that intelligently adjust to the patient's anatomy.

Multiparametric PET AI
Expand the available parameters and acquisition flexibility, facilitate more reproducible images, and enable absolute quantification.

OncoFreeze™ AI
Locate and correct anatomy impacted by respiratory motion and increase clinical confidence without additional setup or patient interaction.

QualityGuard™
Save technologist time by eliminating the need for an external source for daily and weekly PET quality control using intrinsic radioactive properties of LSO to calibrate automatically.

FAST CARE CT technologies
Optimize dose, image quality, and streamline workflow. Innovations such as CARE Dose4D™, CARE kV, SAFIRE, iMAR, Tin Filter, and more.

Unlocked imaging versatility

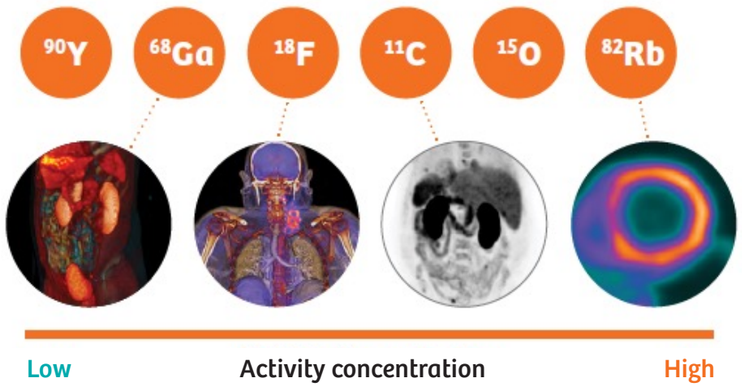
Unlock more clinical and research capabilities with Biograph Vision's state-of-the-art detectability. Biograph Vision provides high image resolution and sensitivity for more precise quantification that can positively impact health outcomes. Ultra Dynamic Range (UDR) provides outstanding performance for a wide spectrum of count rates, enabling a broader variety of radiotracers at optimal doses.

What is UDR?

A truly flexible PET/CT system can adapt to the requirements of a wide variety of radioisotopes. As the availability of different tracers grows and PET/CT gets more involved in theranostics, systems should optimally work in a large range of radioactivity, from very low to very high.

Optiso UDR detectors use multiple technologies to provide optimal performance in a wide range of count rates. Fast TOF and high effective sensitivity provide excellent performance in low- and medium-activity ranges such as ^{90}Y, ^{18}F, and ^{68}Ga applications.

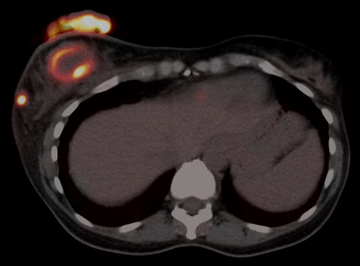
A small block detector with low dead time makes it suitable to operate in the high-activity concentrations found in studies with very short-lived tracers, such as ^{82}Rb and ^{15}O.

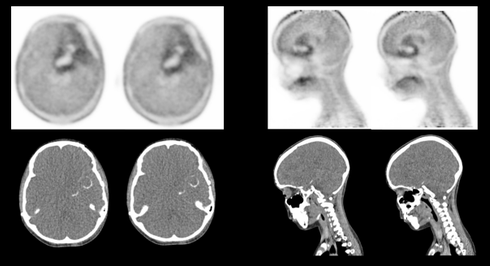


Unlocked imaging versatility

Oncology

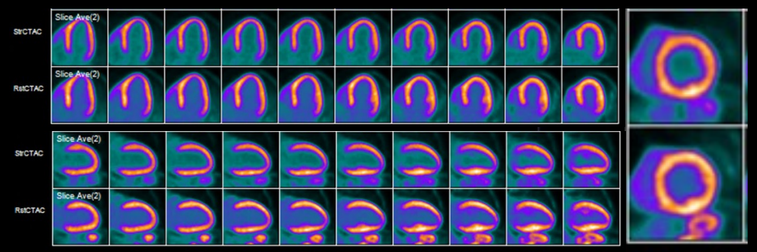
Biograph Vision's fast 214-ps TOF, combined with 3.2-mm crystal elements that deliver a 440 x 440 acquisition matrix, makes it easier to see small lesions that can significantly improve lesion-detection performance for oncologic PET/CT imaging. Biograph Vision's superb image quality provides exceptional results for a wide range of radiopharmaceuticals and imaging needs, including whole-body dynamic imaging, RT planning, and much more.

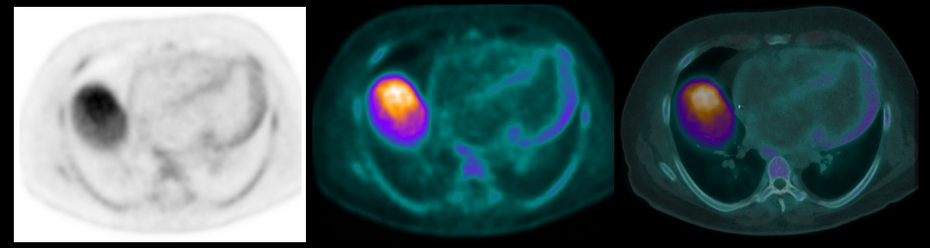




Cardiology

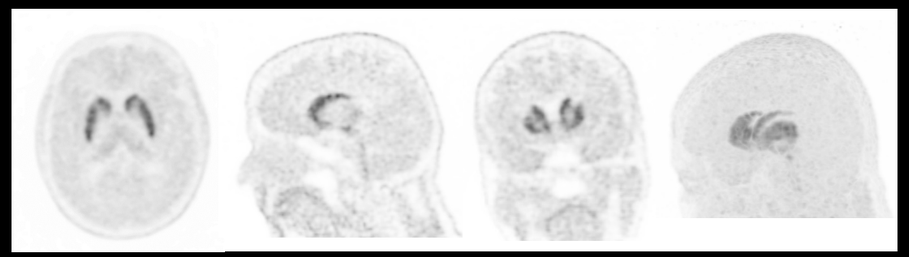
Biograph Vision's Optiso UDR detector provides excellent performance in applications that require dealing with high activity concentrations, such as myocardial bloodflow (MBF) with ^{82}Rb. Demonstrating high image quality with sharp definition of ventricular margins with low noise. 3.2-mm crystal elements support high-resolution PET imaging for sarcoid, which can often appear ill-defined on PET/CT imaging.





Neurology

Biograph Vision small crystal size and fast TOF with high-resolution 880 x 880 matrix reconstruction deliver high contrast with sharp definition of brain structures that may improve visual and quantitative assessment.

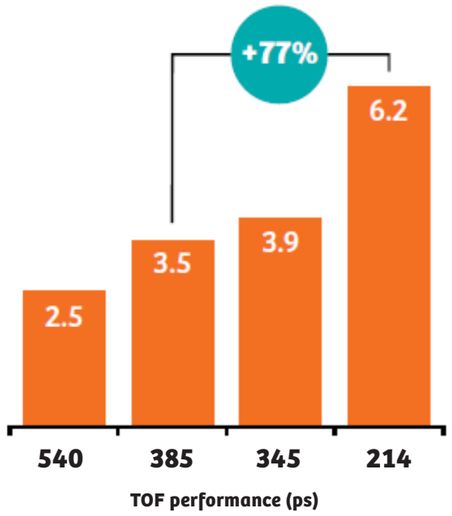


Data courtesy: see final page.

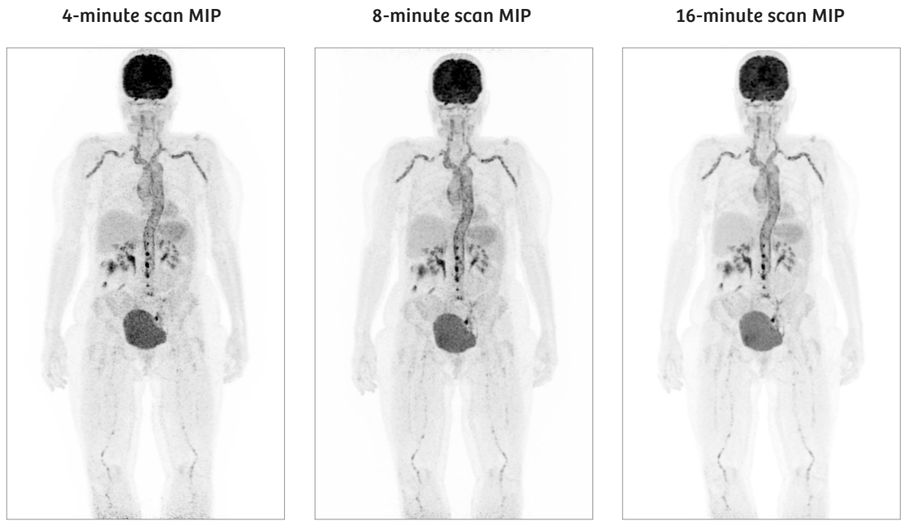
Empowered operational performance

Biograph Vision empowers users to reduce scan time and injected dose to boost productivity, avoid unnecessary exposure, and increase patient comfort with the market's highest effective sensitivity[2] at 100 cps/kBq. Enhance patient and user experience with intelligent imaging capabilities that drive greater throughput while providing more consistent and accurate results. No matter the user, the patient, or the procedure, Biograph Vision delivers exceptional outcomes.

TOF sensitivity gain[5]



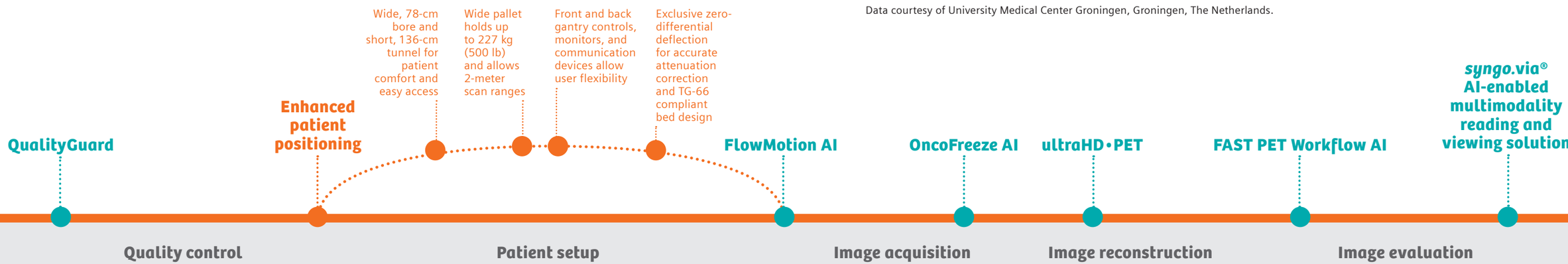
High-quality, low-dose whole-body exams in under 5 minutes



Biograph Vision requires significantly less injected tracer dose compared to current state-of-the-art technology[2] without compromising image quality or scan speed. This reduces patient exposure.

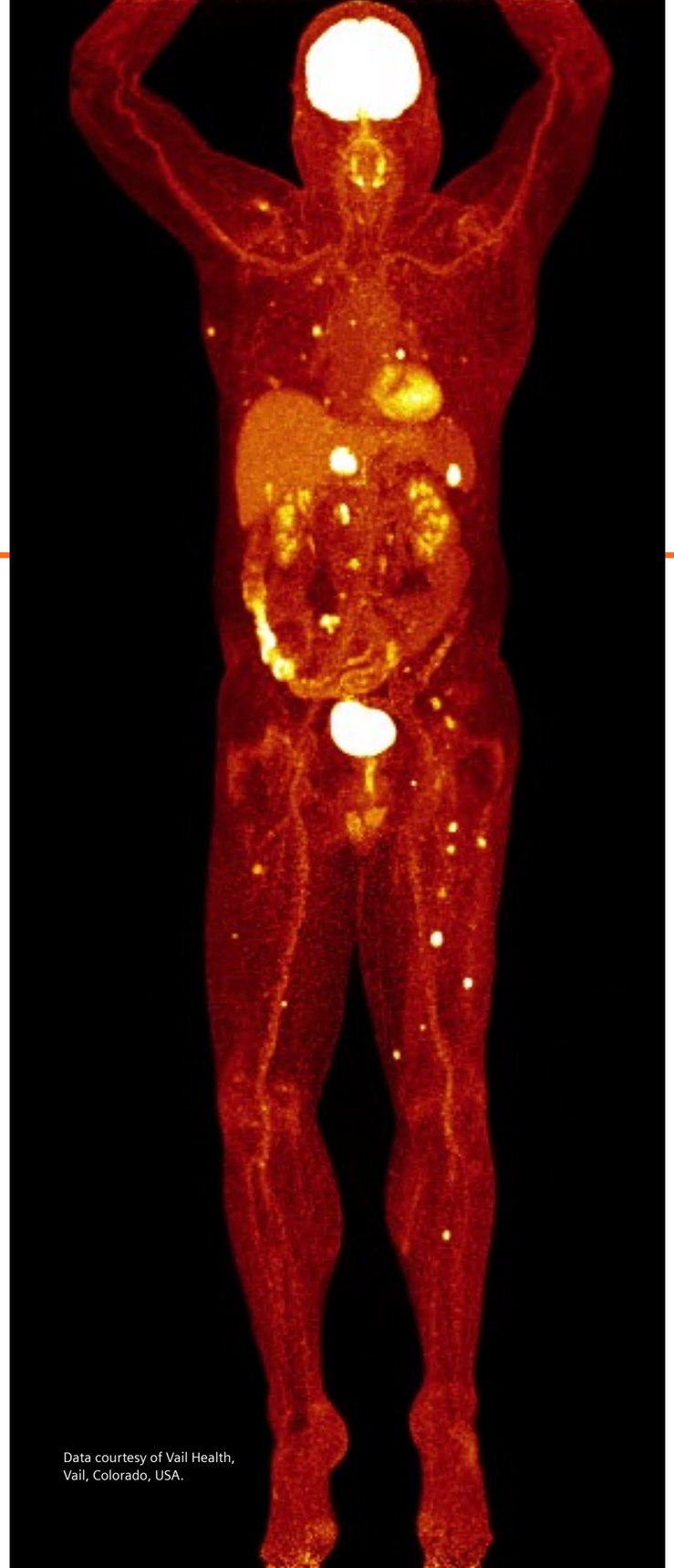
Data courtesy of University Medical Center Groningen, Groningen, The Netherlands.

Streamlined workflow with intelligent imaging



“There is a potential in better discriminating lesions from physiological background activity. And maybe upstaging your patients from, let’s say, uncertain up to the presence of a disease.”

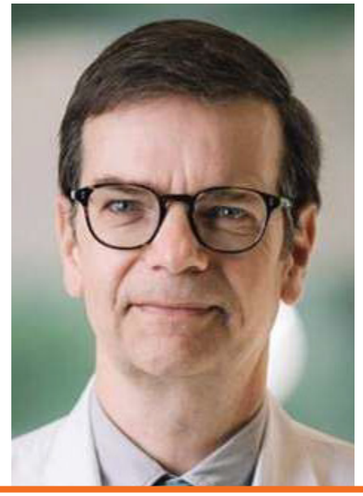
Walter Noordzij, PhD, MD
University Medical Center Groningen
Groningen, The Netherlands



Data courtesy of Vail Health,
Vail, Colorado, USA.

“... because of the high sensitivity of the system, we can achieve good image quality and low noise, even if injecting

Silvano Gnesin, PhD
Radiophysicist, Nuclear Medicine Department
Lausanne, Switzerland



“We can reduce the injected activity by about one-third at least. This was also not at the cost of the acquisition time. The acquisition time could be also reduced, so we were really pleased to be able to work on those two variables and to make better images, faster, with less activity.”

John Prior, MD, PhD
Head of Department, Nuclear Medicine
Lausanne, Switzerland

“... by improving the spatial resolution... you also have less partial volume effect, so you get sharper images and more accurate quantification.”

Prof. Ronald Boellard, PhD
University Medical Center Groningen
Groningen, The Netherlands

Biograph Vision

Set the standard in PET/CT with precision-driven performance

Data courtesy of Indiana University Methodist Hospital, Indiana, USA.

Clinical image featured on cover: data courtesy of Vail Health, Vail, Colorado, USA.

[1] Based on internal measurements available at time of publication. Data on file.

[2] Compared to current state-of-the-art technologies. Data on file.

[3] Optional.

[4] Worldwide data on file.

[5] Gain is calculated for a 20-cm cylindrical phantom.

Clinical images featured in order top left to bottom right on page 12 and 13:

Data courtesy of Mainline Health, Philadelphia, Pennsylvania, USA.

Data courtesy of Centre Hospitalier Universitaire Vaudois, Lausanne, Switzerland.

Data courtesy of Osaka City University, Japan.

Data courtesy of University Medical Center Groningen, Groningen, The Netherlands.

The statements by Siemens Healthineers customers described herein are based on results that were achieved in the customer's unique setting. Because there is no "typical" hospital or laboratory and many variables exist (eg, hospital size, samples mix, case mix, level of IT, and/or automation adoption) there can be no guarantee that other customers will achieve the same results.

Biograph Vision is not commercially available in all countries. Its future availability cannot be guaranteed. Please contact your local Siemens Healthineers organization for further details.

Siemens Healthineers Headquarters
Siemens Healthcare GmbH
Henkestr. 127
91052 Erlangen, Germany
Phone: +49 9131 84-0
siemens-healthineers.com

Published by
Siemens Medical Solutions USA, Inc.
Molecular Imaging
2501 North Barrington Road
Hoffman Estates, IL 60192
USA
Phone: +1 847 304-7700
siemens-healthineers.com/mi

Legal Manufacturer
Siemens Medical Solutions USA, Inc.
Molecular Imaging
2501 North Barrington Road
Hoffman Estates, IL 60192
USA
Phone: +1 847 304-7700
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