Přehled technických novinek z pohledu společnosti Siemens
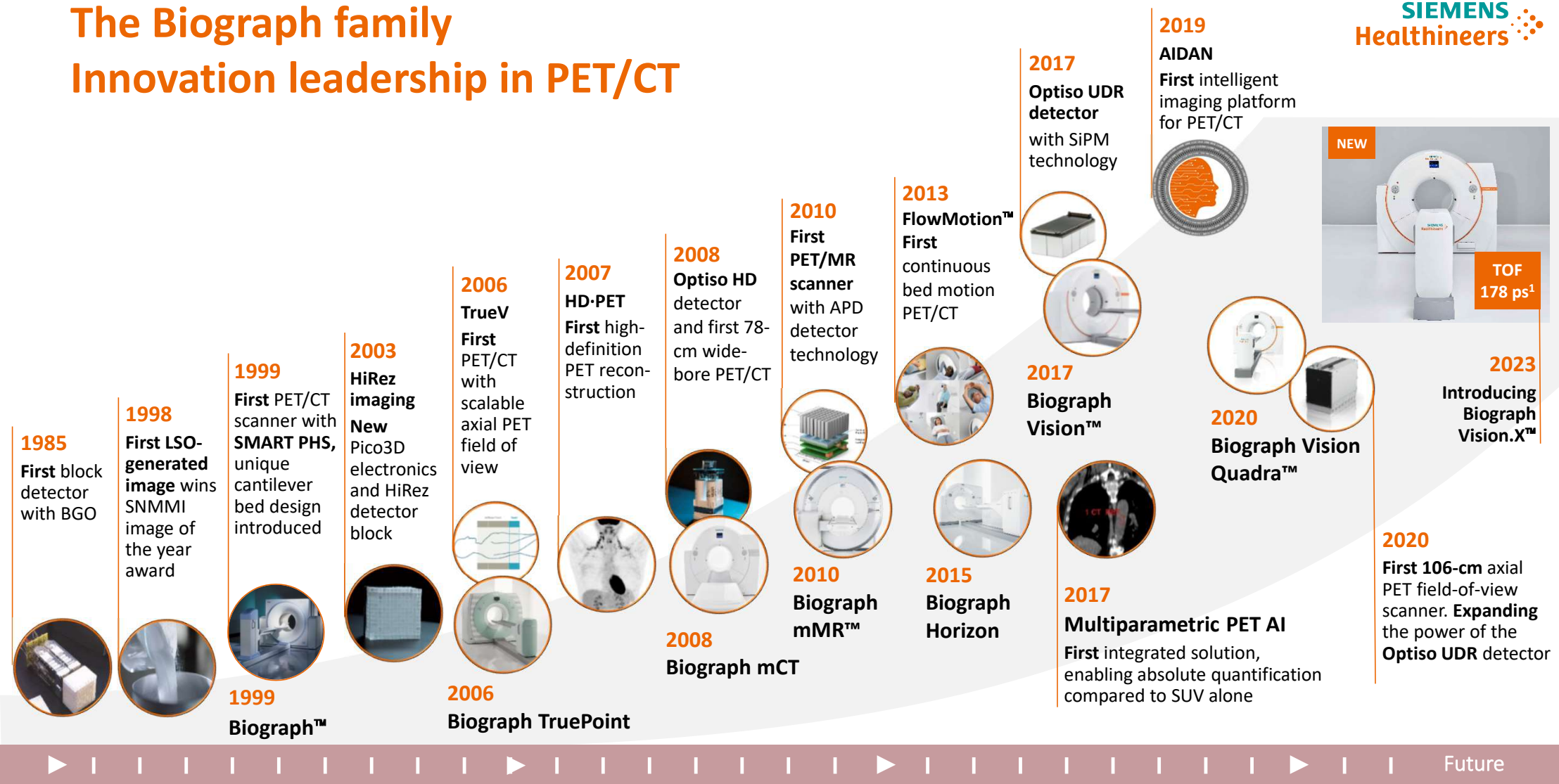
The Biograph family
Innovation leadership in PET/CT

SIEMENS Healthineers

2019
AIDAN
First intelligent imaging platform for PET/CT

2017
Optiso UDR detector
with SiPM technology

2013
FlowMotion™
First continuous bed motion PET/CT

2010
First PET/MR scanner
with APD detector technology

2008
Optiso HD detector and first 78-cm wide-bore PET/CT

2007
HD·PET
First high-definition PET recon-struction

2006
TrueV
First PET/CT with scalable axial PET field of view

2003
HiRez imaging
New Pico3D electronics and HiRez detector block

1999
First PET/CT scanner with **SMART PHS,** unique cantilever bed design introduced

1998
First LSO-generated image wins SNMMI image of the year award

1985
First block detector with BGO

NEW

TOF 178 ps[1]

2023
Introducing Biograph Vision.X™

2020
Biograph Vision Quadra™

2020
First 106-cm axial PET field-of-view scanner. **Expanding** the power of the **Optiso UDR** detector

2017
Biograph Vision™

2017
Multiparametric PET AI
First integrated solution, enabling absolute quantification compared to SUV alone

2015
Biograph Horizon

2010
Biograph mMR™

2008
Biograph mCT

2006
Biograph TruePoint

1999
Biograph™

Future

Some of these products and features are not commercially available in all countries. Future availability cannot be guaranteed.
[1] Fastest measured value on a single system. Based on competitive literature available at time of publication. Data on file.
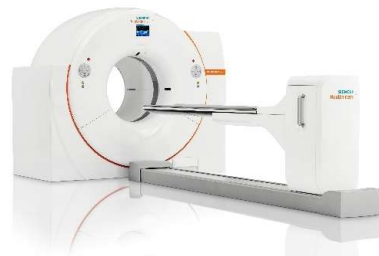
Biograph Vision PET/CT family

Biograph Vision™ 450

Biograph Vision 600

Biograph Vision.X™

Biograph Vision and Biograph Vision.X are not commercially available in all countries. Future availability cannot be guaranteed.

Biograph Vision
Going beyond digital with the Optiso UDR detector

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3.2 mm LSO crystals

214/178 ps[1] time of flight

100 cps/kBq[1] effective sensitivity

100% SiPM sensor coverage[1]

Optiso UDR
Beyond digital

Accuracy
Performance
Reproducibility

Accuracy

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Accurately identifying the appropriate disease stage is key to defining the right treatment
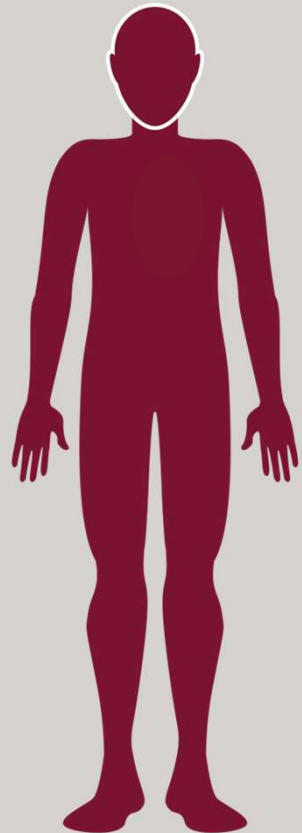
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| Disease location	Therapy option
Local?	**Surgery?**
Regional?	**Radiation?**
Distant?	**Chemo?**

Today's challenge

- Identifying additional local lesions, lymph node involvement or small metastases can change patient staging and influence therapy decisions

- **Poor spatial resolution can affect**
    - Lesion detectability
    - Image quality

Insufficient spatial resolution can negatively affect lesion detectability and staging.

Biograph Vision and its features and applications are not commercially available in all countries. Their future availability cannot be guaranteed.
Please contact your local Siemens Healthineers organization for further details.

Unrestricted © Siemens Healthcare GmbH, 2018 MI-4180

Transcend digital with
Optiso UDR detector
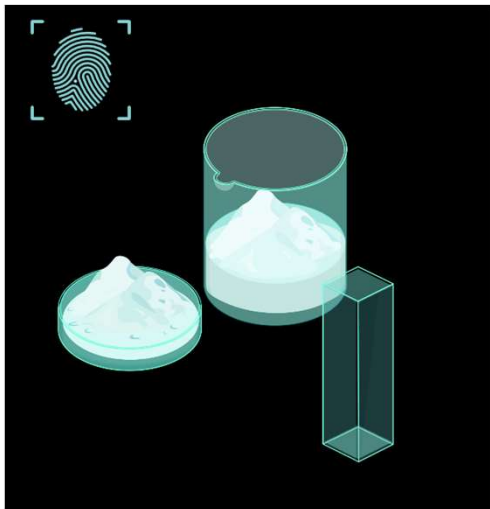
LSO scintillator

3.2-mm crystals

SiPM technology with 100% coverage[1]

Optiso UDR detector

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

Optiso

UDR detector

revolutionizing precision in PET/CT

We are determined to do more than just continue the momentum of improving technology in increments. We're inspired to make breakthrough improvements that would revolutionize PET/CT. The result?

Transcending digital with the Optiso Ultra Dynamic Range (UDR) detector.

• Optiso UDR detector technology reveals a new world of precision—to help you detect small lesions and devise accurate treatment strategies

1

2

3

4

5
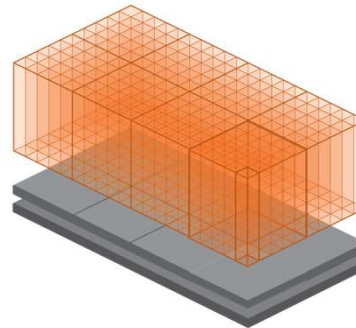
1. Lutetitium oxyorthosilicate (LSO), a fast and efficient scintillator, is grown and cut in-house through a vertically integrated manufacturing process to ensure the highest quality.

2. 3.2-mm crystal elements are individually selected and deliver high 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-ps[1] and 3.9x higher effective sensitivity[2] for faster scans and lower dose

4. A small block size delivers higher[1] effective peak NECR for improved clinical performance.[2]

5. High-flow direct-cooling of the detector plate allows the detector to operate at room temperature[1] for outstanding performance, serviceability and improved patient comfort.

[1] Based on internal measurements at time of publication. Data on file.
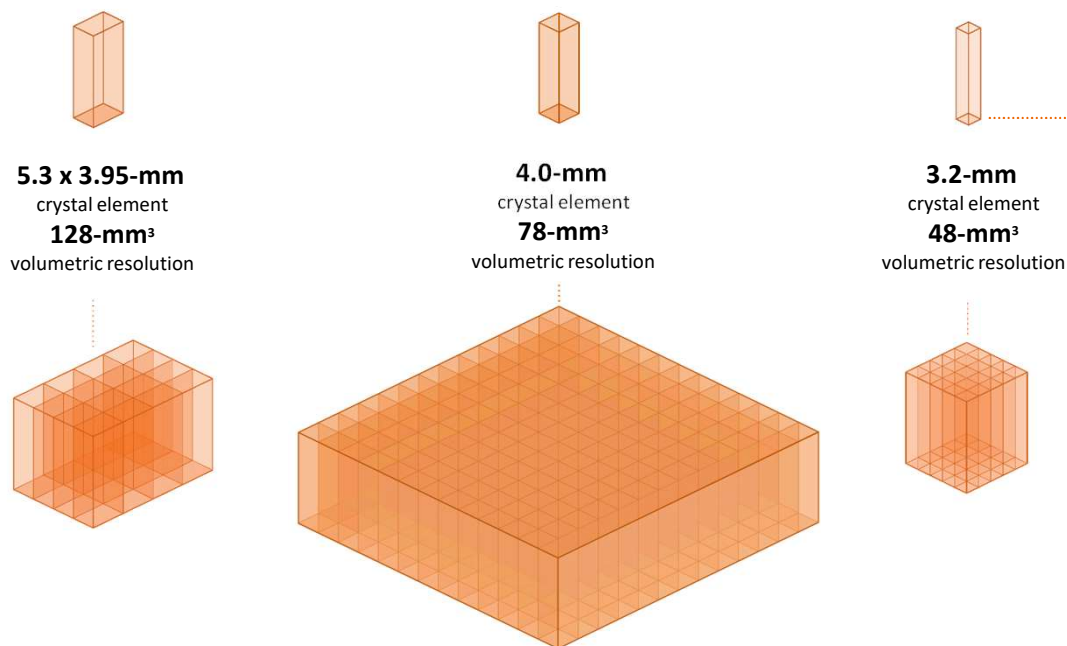[2] Compared to current Siemens state-of-the art technologies. Data on file.

LSO scintillator   3.2 mm crystals   100% coverage

Reducing crystal size improves spatial resolution and detectability
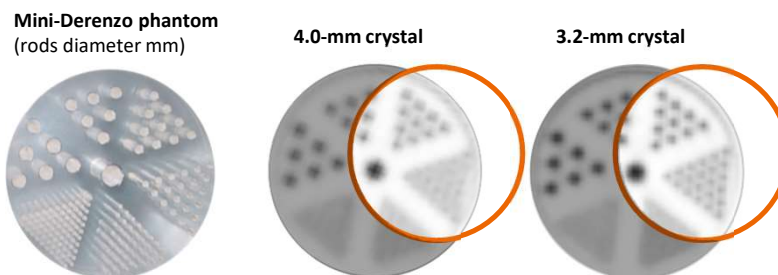
3.2-mm crystals

for improved, more precise imaging

Smaller crystal elements and block size improve small-lesion detectability by delivering better volumetric resolution. 3.2-mm crystals allow you to see smaller lesions to help you confidently stage, risk-stratify, and develop appropriate treatment strategies sooner.

- Small crystal elements improve signal-to-noise ratio and quantitative accuracy

- 60% better volumetric resolution[1]

5.3 x 3.95-mm
crystal element
128-mm³
volumetric resolution

4.0-mm
crystal element
78-mm³
volumetric resolution

3.2-mm
crystal element
48-mm³
volumetric resolution

60%
Better volumetric resolution[1]

Mini-Derenzo phantom
(rods diameter mm)

4.0-mm crystal

3.2-mm crystal

[1] Compared to competitive literature available at time of publication. Data on file.

LSO scintillator   100% coverage   Optiso UDR detector

Clear visualization of the 2.4 mm cylinders of the Mini-Derenzo phantom with Biograph Vision

Diameter (mm)

4.0
3.2
4.8
2.4
1.2
1.6

**4 mm crystal**

Biograph Vision 3,2mm crystal
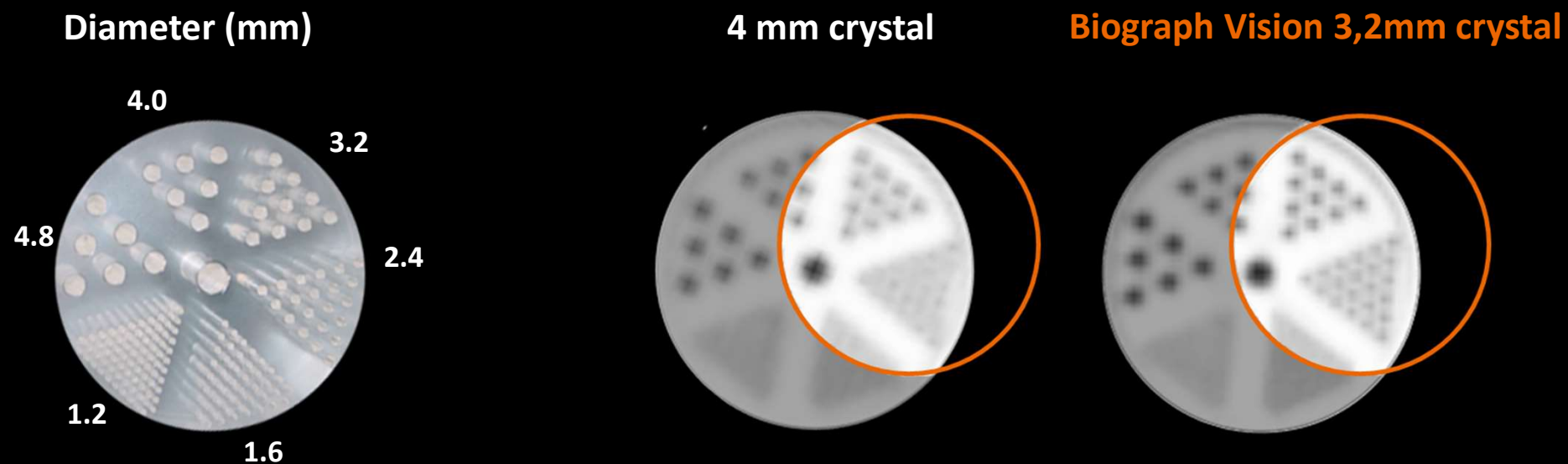
SiPM technology with
100% coverage

for optimized performance

Time-of-flight (TOF) performance depends on collecting light from all photons in the scintillation. The Optiso UDR is designed so SiPMs cover the entire lutetitium oxyorthosilicate (LSO)-array area, allowing all light from the scintillation to be detected. This leads to 100% coverage[1] and enables fast temporal resolution.

- Biograph Vision™ provides 214-ps (picosecond) temporal resolution[1] for best-in-class TOF and effective sensitivity[2]

- Biograph Vision 3.9x TOF gain[3] amplifies scanner sensitivity for faster scans and lower dose

Biograph Vision
214-ps
timing resolution
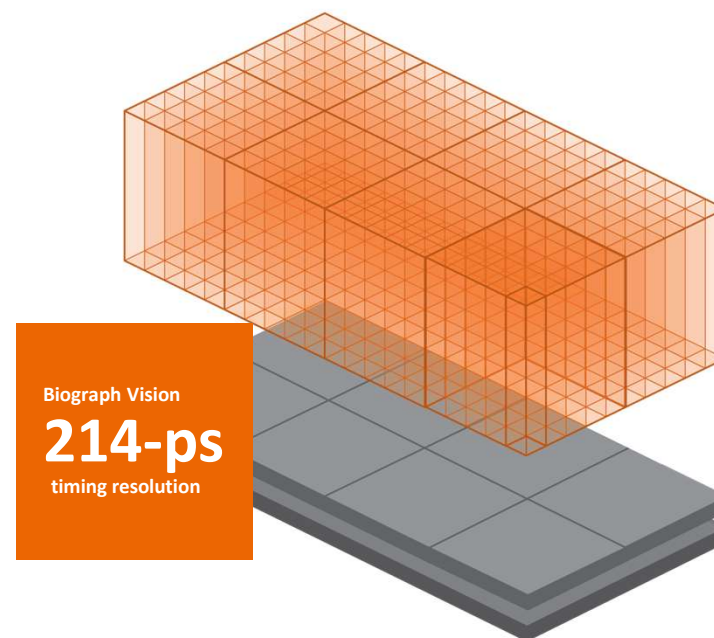
[1] Based on internal measurements at time of publication. Data on file.
[2] Compared to competitive literature available at time of publication. Data on file
[3] Compared to current Siemens Healthineers state-of-the-art technologies. Data on file.

Biograph Vision is not commercially available in all countries. Its future availability cannot be guaranteed.

◀ Main gallery

■ LSO scintillator   ■ 3.2 mm crystals   ■ Optiso UDR detector

Time of flight (TOF) PET

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TOF is the ability to measure the time difference between the arrival of the two coincidence photons in the PET detector and use that information to:

- Improve lesion detectability and overall image quality

- Improve clinical efficiency by enhancing sensitivity, enabling faster scans and lower dose

- Improve effectiveness of all PET corrections (attenuation, scatter, randoms, MoCo, etc) and image reconstruction

Faster time of flight delivers higher sensitivity gain

No TOF

no gain

LSO/PMT TOF

Short segment of response

LSO/SiPM TOF

Shortest segment of response

NoTOF

LSO/PMT TOF

LSO/SiPM TOF
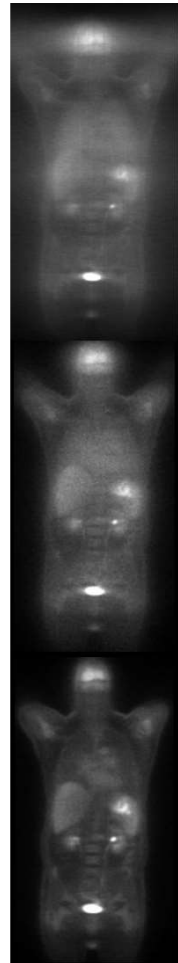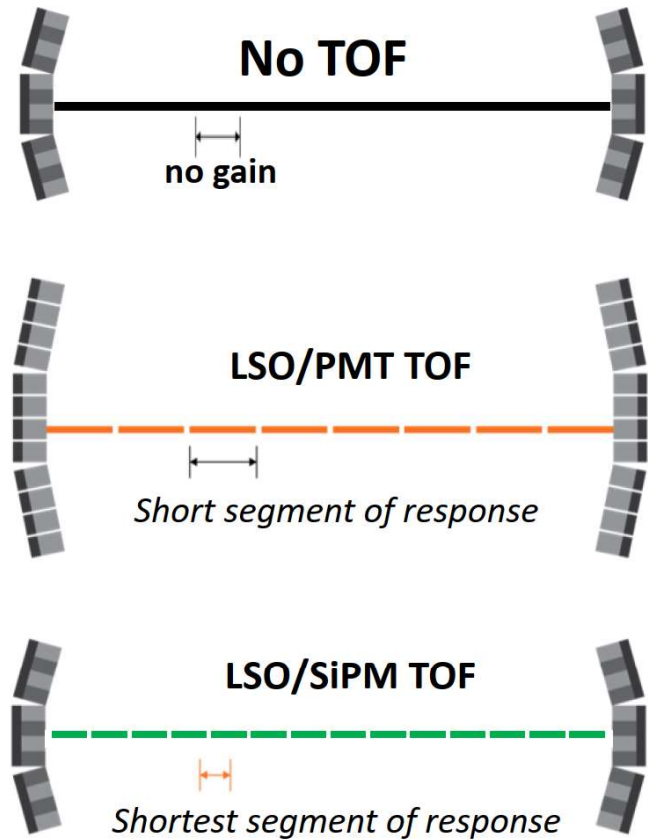
**Direct histogram PET image
Image reconstruction input**

TOF gain

D = 20 cm phantom diameter

$$ToF_{Gain} = \frac{2D}{c\Delta t}$$

D = object size
c = speed of light
Delta (t) = TOF resolution

2.4	2.6	3.5	3.9	4.3	5.2	5.9	6.2	7.5
565	505	385	345	310	280	228	214	178

TOF resolution (ps)
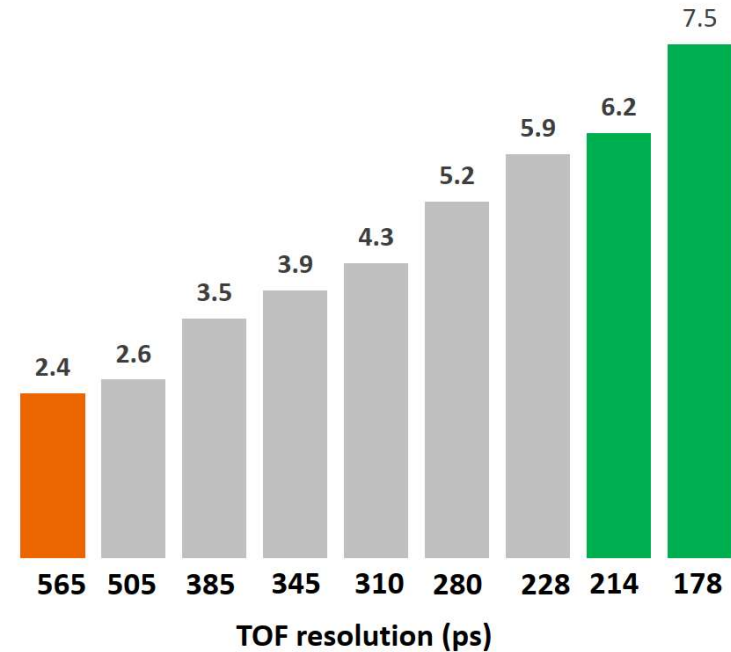
Budinger, Thomas F., "Time-of-Flight Positron Emission Tomography:
Status Relative to Conventional PET", *Journal of Nuclear Medicine*, 1983;24:73-78.

Data courtesy of Lausanne University Hospital

Faster TOF reduces noise, which increases detectability of small lesions
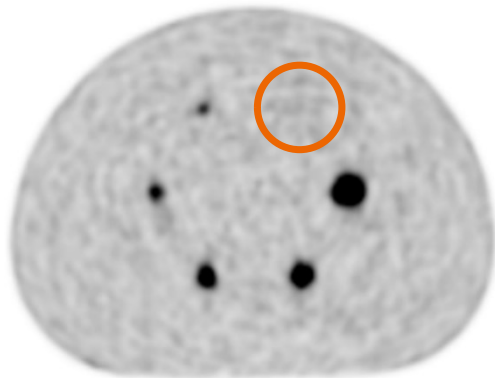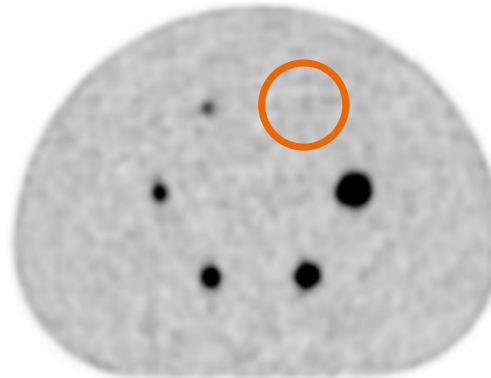
non TOF   **TOF (540ps)**   **TOF (214ps)**
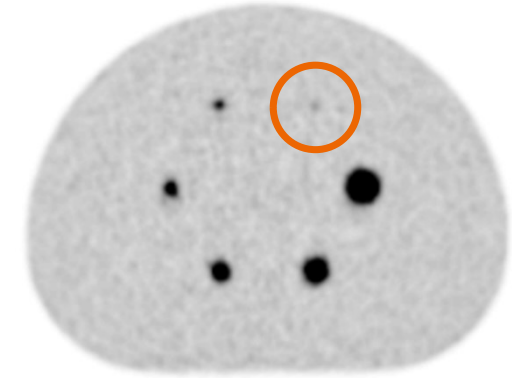
High-resolution torso phantom
Sphere size (mm): 5.0, 7.9, 9.9, 12.4, 15.4, 19.8
6:1 contrast-to-background

Left and middle image acquired on Biograph mCT. Right image acquired on Biograph Vision.
Biograph Vision and its features and applications are not commercially available in all countries. Their future availability cannot be guaranteed.
Please contact your local Siemens Healthineers organization for further details.

Performance

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Image quality or patient dose?

An ongoing compromise

Low dose or **Image quality** or **Speed**

Today's challenge

- Delivering high diagnostic value images at lower doses
- Addressing throughput demands

Balancing speed, dose and image quality requires the user to compromise somewhere.

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Biograph Vision's high performance enables high-quality scans with less dose and in less time

3.9X

higher effective sensitivity[1]

Significantly reduce:
- Injected dose
- Scan time

without compromising image quality

"We have now already, as compared to the older system, reduced the activity we inject... Now it's probably 30% faster with about 30% less dose which is something very acceptable."[1]

Prof. John Prior, MD, PhD

Head of Department, Nuclear Medicine

Centre Hospitalier Universitaire Vaudois CHUV, Lausanne, Switzerland

Faster time-of-flight amplifies scanner sensitivity for faster scans and lower doses

Effective sensitivity = NEMA Sensitivity * TOF Gain

214 ps timing resolution[1]

100% coverage[1] of the LSO array

TOF Gain[2]

Timing resolution (ps)	Gain
540	2.5
385	3.5
345	3.9
214	6.2

Timing resolution (ps)

[1]Based on internal measurements available at time of publication. Data on file. [2]Gain calculated for a 20 cm cylindrical object.
Biograph Vision and its features and applications are not commercially available in all countries. Their future availability cannot be guaranteed.
Please contact your local Siemens Healthineers organization for further details.

Better effective sensitivity improves total cost of ownership by enabling scans with reduced tracer dose

43% reduction of FDG injected dose

compared to previous system at Centre Hospitalier Universitaire Vaudois (CHUV)

Changed ther protocol from 3.5 MBq/kg (0.043 mCi/lb) to 2 MBq/kg (0.025 mCi/lb)

4.4 mCi for a 180 lb patient

Dose cost savings*

(accumulated in thousand $)

Year	1	2	3	4	5	6	7
	215	430	645	860	1 075	1 290	**1 505**

Year
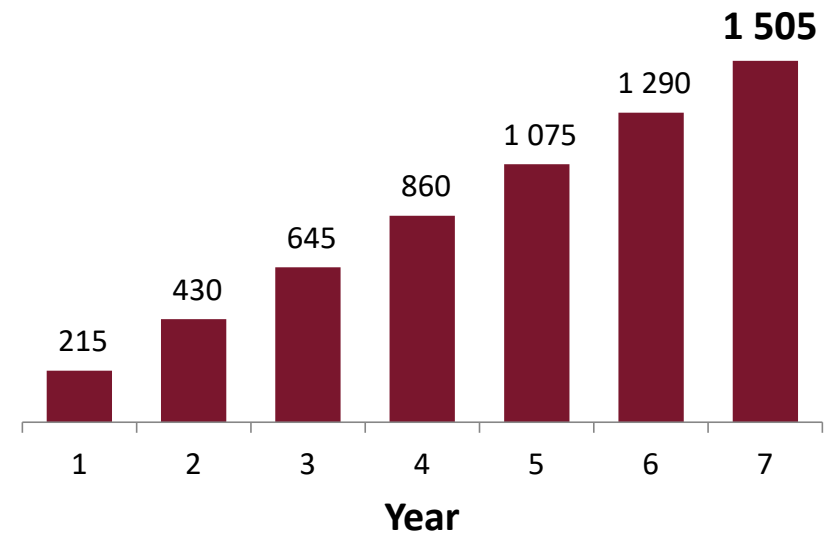
* Savings simulated assuming a cost of $ 200.00 per dose and an average of 50 patients/week

The statements by Siemens' customers described herein are based on results that were achieved in the customer's unique setting. Since there is no "typical" hospital and many variables exist (e.g., hospital size, case mix, level of IT adoption) there can be no guarantee that other customers will achieve the same results.
Biograph Vision and its features and applications are not commercially available in all countries. Their future availability cannot be guaranteed. Please contact your local Siemens Healthineers organization for further details.

Reproducibility

Low resolution can prevent new lesions from being detected and can lead to inaccurate quantitative values

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146k

Yearly cost of treatment with Imatinib mesylate (IM) in US dollars[1]

15%

of patients displayed primary resistance to IM treatment[2]

Discerning non-responders as early as possible in cancer treatment can maximize effective patient care and outcomes

Today's challenge

- Low resolution can impact lesion detectability

- Quantitative values are not always accurate or reproducible

- Low resolution and quantitative accuracy limit the ability to evaluate the progression of the disease and adjust treatment

[1] http://www.ascopost.com/issues/may-25-2016/the-arrival-of-generic-imatinib-into-the-us-market-an-educational-event/ accessed on 02/Apr/2018; [2]Farag, et al, Early Evaluation of Response Using 18F-FDG PET Influences Management in Gastrointestinal Stromal Tumor Patients Treated with Neoadjuvant Imatinib, J Nucl Med 2018

Biograph Vision and its features and applications are not commercially available in all countries. Their future availability cannot be guaranteed. Please contact your local Siemens Healthineers organization for further details.

AIDAN Platform

Intelligent imaging platform for PET/CT

AIDAN is powered by unique technologies

ALPHA (Anatomical Landmarking and Parsing of Human Anatomy) a sophisticated AI engine supporting optimized workflows on both scanners and reading solutions.

SMART patient handling system (PHS) an exclusive bed design with magnetically drive precision. Zero differential deflection for accurate attenuation correction and TG-66 compliant to support positioning of radiation oncology devices.

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

AI-based features at the scanner are based on unique ALPHA technology

ALPHA uses landmarks and reference regions to learn anatomical locations and can recognize features like human visual recognition.

- Algorithm learns from a library of thousands of expert annotated examples

- Use of redundancy: large number of points, spatial relationships, and multiple scales

- Robust regardless of disease, body position and habitus, image range and quality

ALPHA is the foundation for AI-based PET applications at the scanner.

Data courtesy of Praxis für Fusionierte Bildgebung, Halle (Saale), Germany.
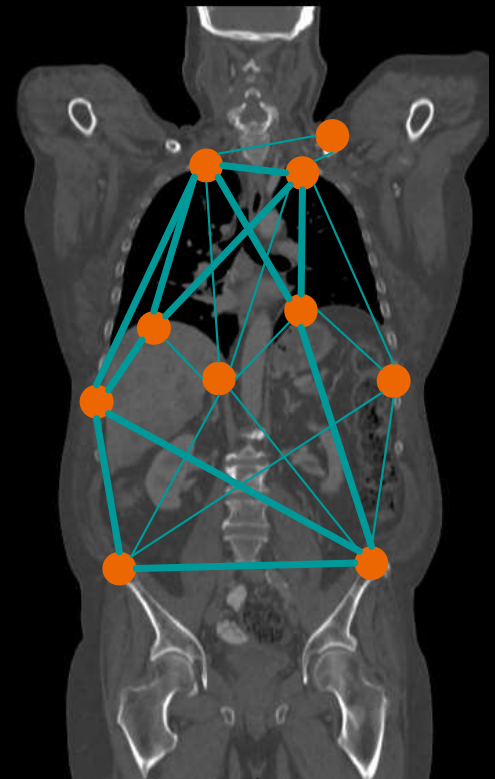
The Biograph family—with AIDAN
PET/CT AI-powered applications

The AIDAN platform unlocks a host of advanced features such as:

FlowMotion™ AI[1]
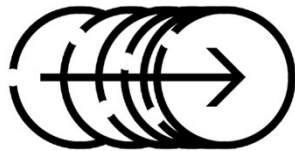
Standardize protocols and personalize scans through a dedicated AI algorithm that automatically defines ranges based on each patient's unique anatomy.

OncoFreeze™ AI[1]
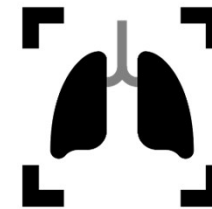
Deliver images free of motion without extended scan time or external devices—with the click of a button.

1 These products and features are not all available on Biograph Vision Quadra. Their future availability cannot be guaranteed. Please contact your local Siemens Healthineers organization for further details. AIDAN is not commercially available in all countries. Its future availability cannot be guaranteed. Please contact your local Siemens Healthineers organization for further details.

FlowMotion AI: Moving the standard to personalized care

High resolution

Normal speed

Fast speed

Continuous flowing bed motion

AIDAN

FlowMotion AI automatically defines scan ranges based on patient anatomy, with the click of a button

WB/H&N

The dedicated AI algorithm, based on ALPHA technology, is designed to automatically define scan ranges based on patient anatomy, independent of the user.

- **Faster workflow[1]**

- **More personalized scan[1]**

- **Reproducible results from any operator**

- **Optimum range for scan settings help avoid cut-offs or over radiation**

AIDAN

[1] Compared to PET/CT systems without FlowMotion™

Dedicated AI algorithm enabling FlowMotion AI Based on ALPHA Technology

What ALPHA does

- **A**utomatic **L**andmarking and **P**arsing of **H**uman **A**natomy
- Derives anatomical landmarks based on CT topogram images
- Robust regardless of disease, body position and habitus, image range and quality

How it works

- Algorithm learns from a library of thousands of expert annotated examples
- Use of redundancy: Large number of points, spatial relationships, multiple scales

What it does in FlowMotion AI

Recognizes the patient anatomy and automatically defines scan ranges based on individual organ, aiming for a faster and more personalized workflow at the scanner[1]

[1] Compared to PET/CT systems without FlowMotion
Data courtesy of Praxis für Fusionierte Bildgebung, Halle (Saale), Germany.
The features herein are pending 510(k) clearance, and are not yet commercially available in the United States or other countries worldwide on Biograph Horizon, Biograph mCT and Biograph Vision. Their future availability cannot be guaranteed. The features herein do not yet fulfill all the essential requirements according to the European Medical Device Directive (93/42/EEC) and its national implementations for Biograph mCT and Biograph Vision. They are not yet commercially available in the EU. Future availability cannot be guaranteed. Please contact your local Siemens Healthineers organization for further details.

OncoFreeze AI: Deviceless solution for images virtually free of motion without extending scan time
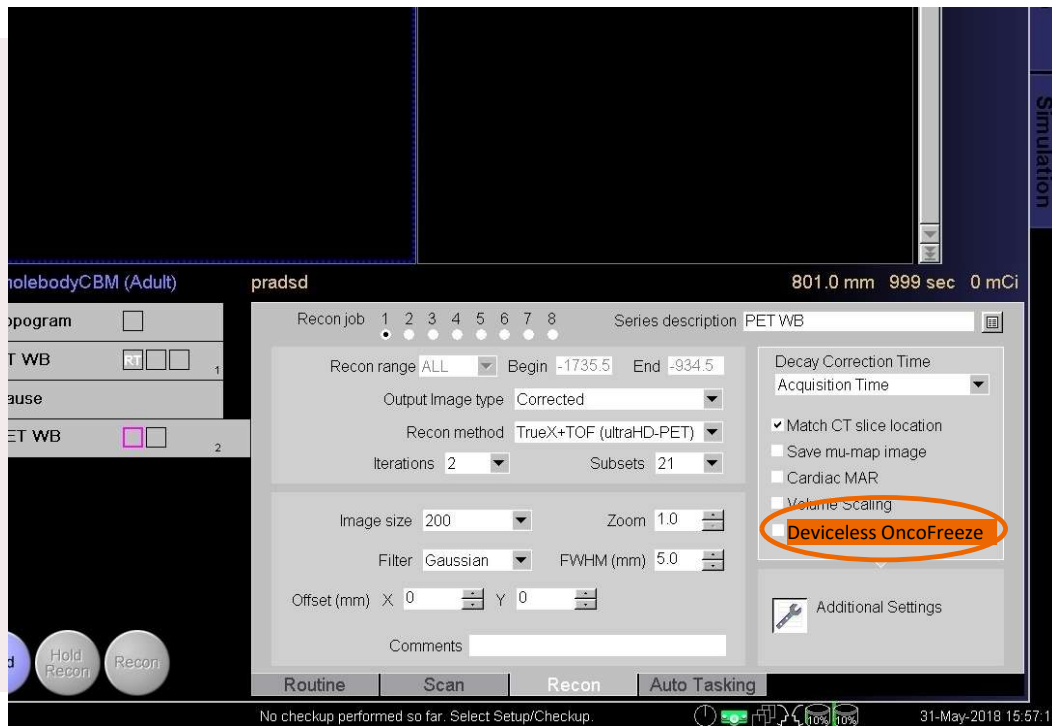
OncoFreeze AI offers the ability to provide motion-free PET images by enabling a simple check box.

The features herein are pending 510(k) clearance, and are not yet commercially available in the United States or other countries worldwide on Biograph Horizon, Biograph mCT and Biograph Vision. Their future availability cannot be guaranteed. The features herein do not yet fulfill all the essential requirements according to the European Medical Device Directive (93/42/EEC) and its national implementations for Biograph mCT and Biograph Vision. They are not yet commercially available in the EU. Future availability cannot be guaranteed. Please contact your local Siemens Healthineers organization for further details.

Today's challenges to provide respiratory motion management for every patient
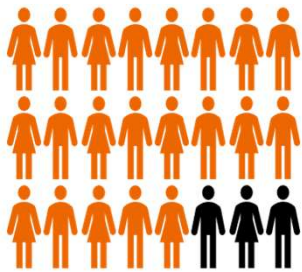
Number of patients affected

90% of oncological disease is located in areas subject to respiratory motion[1]
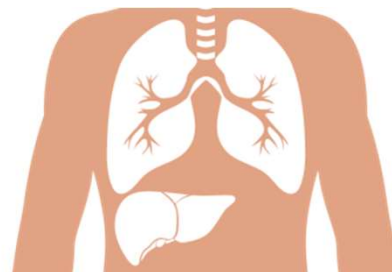
Clinical Impact

Without respiratory gating, 40% of lung lesions may even go undetected[2]

Setup with conventional methods

Up to 11 minutes added to every respiratory gated scan

Additional scan time required
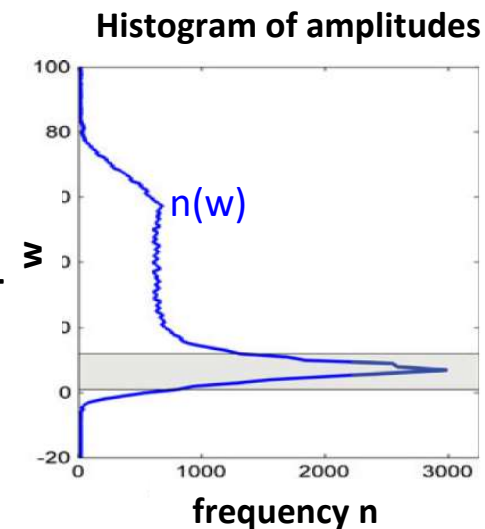
Up to 3 times longer to scan areas that can be impacted by respiratory motion
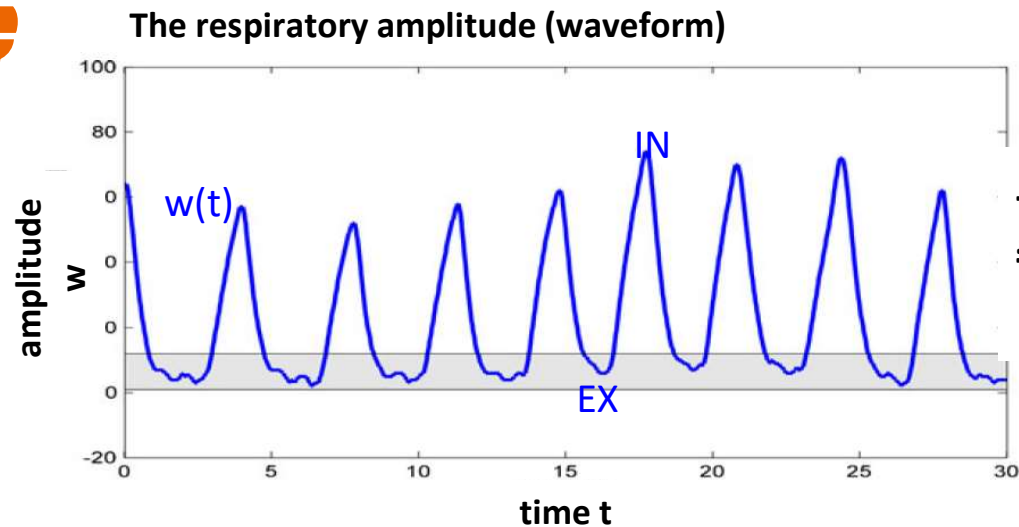
[1]BIO-TECH SYSTEMS, INC. Report 2008.
[2] Garcia Vicente AM, et al. (18) F-FDG PET-CT respiratory gating in characterization of pulmonary lesions: approximation towards clinical indications. Ann Nucl Med. 2010 April 24 (3) 207-14

Deviceless waveform

Artificial intelligence enables the system to identify a waveform generated from respiratory motion without the need for an external device.

This eliminates the need for additional setup to acquire a respiratory waveform to generate motion-frozen or moving PET reconstructed images.

The respiratory amplitude (waveform)

Histogram of amplitudes

Dedicated AI algorithm enabling OncoFreeze AI Based on ALPHA Technology

What ALPHA does
- **A**utomatic **L**andmarking and **P**arsing of **H**uman **A**natomy
- Derives anatomical landmarks based on CT topogram images
- Robust regardless of disease, body position and habitus, image range and quality

How it works
- Algorithm learns from a library of thousands of expert annotated examples
- Use of redundancy: Large number of points, spatial relationships, multiple scales

What does it do in OncoFreeze AI

ALPHA technology will identify specific anatomical landmarks, to determine the zone to be corrected for respiratory motion automatically for each patient.

Data courtesy of Praxis für Fusionierte Bildgebung, Halle (Saale), Germany.
The features herein are pending 510(k) clearance, and are not yet commercially available in the United States or other countries worldwide on Biograph Horizon, Biograph mCT and Biograph Vision. Their future availability cannot be guaranteed. The features herein do not yet fulfill all the essential requirements according to the European Medical Device Directive (93/42/EEC) and its national implementations for Biograph mCT and Biograph Vision. They are not yet commercially available in the EU. Future availability cannot be guaranteed. Please contact your local Siemens Healthineers organization for further details.

NEW

Introducing Biograph Vision.X

with next-level performance

Introducing Biograph Vision.X PET/CT
Next-level PET/CT performance

NEW

TOF
178 ps[1]

Biograph Vision.X™ with exclusive, high-performance detector technology

- Industry-leading **178-ps[1]** time of flight (TOF)

- Outstanding **performance gain up to 20%[2]**

- The fastest time of flight (TOF) performance in the industry[1]

[1] Fastest measured value on a single system. Based on competitive literature available at time of publication. Data on file.
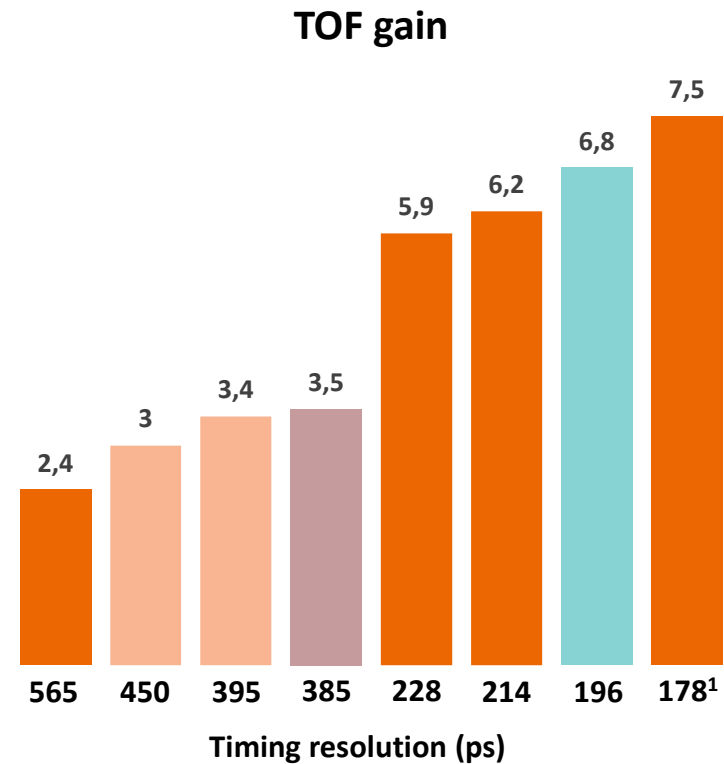[2] Measured value on a single system. Data on file.
Biograph Vision.X is not commercially available in all countries. Future availability cannot be guaranteed.

Faster time of flight (TOF) amplifies scanner sensitivity for faster scans and lower doses

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Healthineers

178-ps
timing resolution[1]

TOF gain

2,4	3	3,4	3,5	5,9	6,2	6,8	7,5
565	450	395	385	228	214	196	178[1]

Timing resolution (ps)

[1] Fastest measured value on a single system. Based on competitive literature available at time of publication. Data on file.
Biograph Vision.X™ is not commercially available in all countries. Future availability cannot be guaranteed.

SIEMENS Healthineers

The Symbia family

Setting the standard for SPECT and SPECT/CT imaging

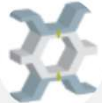# Innovative SPECT and SPECT/CT solutions
Better outcomes and lower costs

Better outcomes

Lower costs

2013
First and only xSPECT™ system
Integrated SPECT and CT data
First and only high-resolution bone imaging with
Accurate and reproducible quantification
Symbia Intevo™
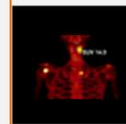
2014
Smallest SPECT room size in its class
Up to 29% smaller
Symbia Evo, Symbia Evo Excel

2006
First and only automated collimator changer
To optimize workflow

2008
First and only ultra-fast cardiac SPECT
4x more counts to double the speed

2004
First integrated ECG
To optimize workflow
First diagnostic SPECT/CT
Greater anatomical detail
Symbia™ SPECT/CT

2003
First 3D iterative reconstruction
Fast acquisition, lower dose

2017
First SPECT/CT metal artifact reduction
Image every body[1]
Symbia Intevo Bold™

2020
Standardized quantification
Low-, medium-, and high-energies
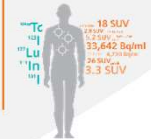
2022
Symbia Pro.specta™ with myExam Companion™
Fast, **64-slice CT imaging with automatic SPECT motion correction**

2016
Standardized quantification
For multiple isotopes

1995
First automatic SPECT body contour
To get the best image resolution

1989
First AUTOFORM™ collimator technology
Up to 26% higher sensitivity

1970s
First dual detector SPECT
To scan twice as fast

1960s
First commercial Anger camera
To image organ functionality

First and only automated quality control
To optimize workflow

The Symbia family
Flexibility to meet your needs today and in the future

Symbia Evo™ Excel	Symbia Evo	Symbia Pro.specta™ with myExam Companion™

Core SPECT technology: HD detectors, AUTOFORM™ collimators, high sensitivity and fine reconstructed resolution, pallet deflection reduction, 227 kg (500 lb) support, Autocontour, detector flexibility

Clinical productivity: Automatic Collimator Changer, Automatic Quality Control, IQ•SPECT™
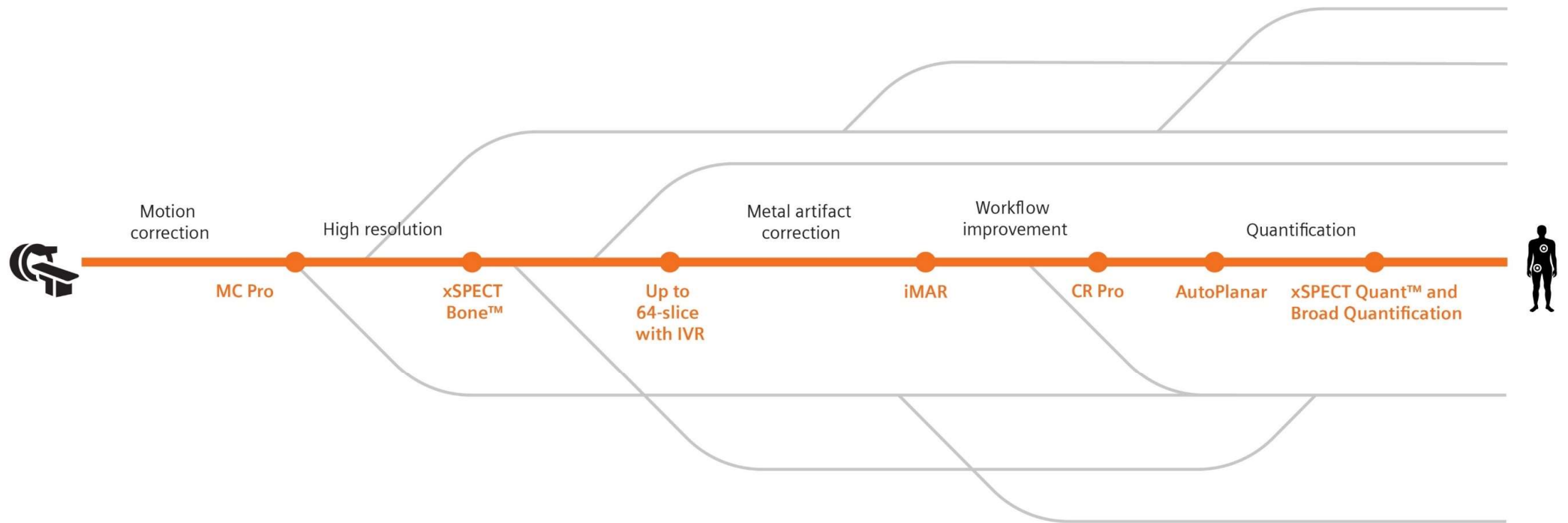
Automatic SPECT motion correction	**Low-dose diagnostic CT**: 32/64 with iMAR	**Intelligent imaging** with myExam Companion

xSPECT™ technologies:
xSPECT Bone™, xSPECT Quant™, Broad Quantification™

Symbia Pro.specta SPECT/CT with myExam Companion Intelligent imaging in SPECT/CT

Motion correction

High resolution

Metal artifact correction

Workflow improvement

Quantification

MC Pro

xSPECT Bone™

Up to 64-slice with IVR

iMAR

CR Pro

AutoPlanar

xSPECT Quant™ and Broad Quantification

Symbia Pro.specta™ and its features are not commercially available in all countries. Due to regulatory reasons, their future availability cannot be guaranteed. Please contact your local Siemens Healthineers organization for further details.

Spending hours per week handling and moving equipment negatively impacts workplace satisfaction

Top three priorities

of nuclear medicine departments

- **Improve patient satisfaction**
- **Improve workflow and productivity**
- **Manage department costs**

Time unnecessarily spent with equipment takes technologists away from patients.

Source: IMV 2018, Nuclear Medicine Outlook Report, October 2018

Symbia Productivity Package
Optimize workflow. Increase patient satisfaction.

Symbia™ Productivity Package

streamlines your workflow by automating collimator change and quality control, so more time can be spent performing patient-centric activities.

Automatic Collimator Changer

- Operator independent
- Less risk of equipment damage
- Conserve space
- 5 minutes gained per exchange

Automatic Quality Control

- Quality control runs overnight
- Results in the morning
- Reduced operator exposure
- Patient-focused start to each day

Automatic Quality Control
Gain up to one hour each day for more value-added tasks

SIEMENS
Healthineers

Convert hundreds of hours each year
from manually performing quality control
to helping your patients.

Automatic Quality Control (AQC)

- Automatically run quality control overnight

- Get results first thing in the morning

- Start each day focused on your patients

- Reduce operator radiation exposure

Conventional calibration and system quality control consumes up to 1 hour per day

Daily quality control		Weekly quality control		Monthly quality control	
Prepare point source	15 min	Prepare point source	05 min	Prepare point source	30 min
Remove collimators	05 min	Remove collimators	05 min	Multi-head registration	30 min
Peak	01 min	Tuning	20 min	Remove collimators	05 min
Low count	12 min	Insert collimators	05 min	Tuning	01 min
Insert collimators	05 min	Multi-head registration	05 min	High count flood	120 min
				Insert collimators	05 min

Total daily time spent = 38 min

Total weekly time spent = 40 min

Total monthly time spent = 191 min

Daily + weekly + monthly
—————————————————
Annual workdays

1 hour per day

Automatic Collimator Changer
Simplify workflow. Eliminate variability.

Change collimators and reconfigure detectors with a just a few clicks to streamline workflow and improve the experience.

**Automatic Collimator Changer (ACC)**

- Change collimators up to 50% faster with ACC[1]

- Eliminate variability from manual handling

- Lower risk of equipment damage

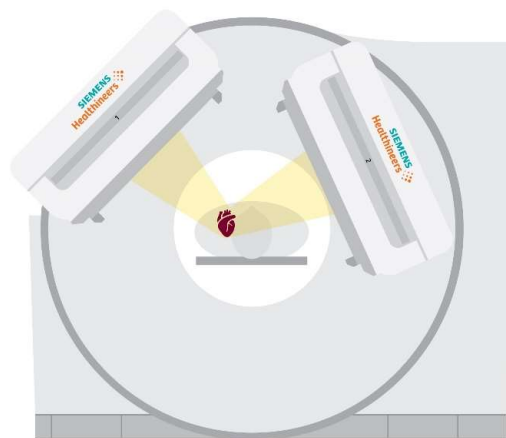- Conserve space by reducing the need for additional collimator carts

[1] Based on internal testing. Data on file.

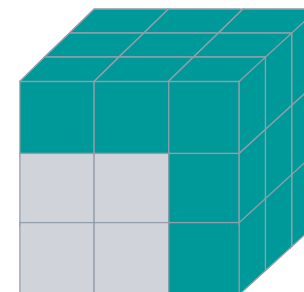# Minimum dose. Maximum speed.
The fundamentals of IQ•SPECT technology

Unique magnifying collimators
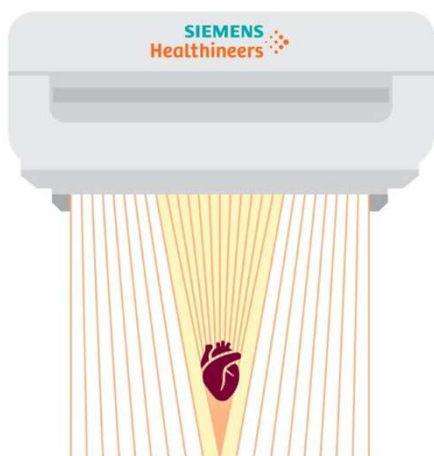
Cardio-centric acquisition
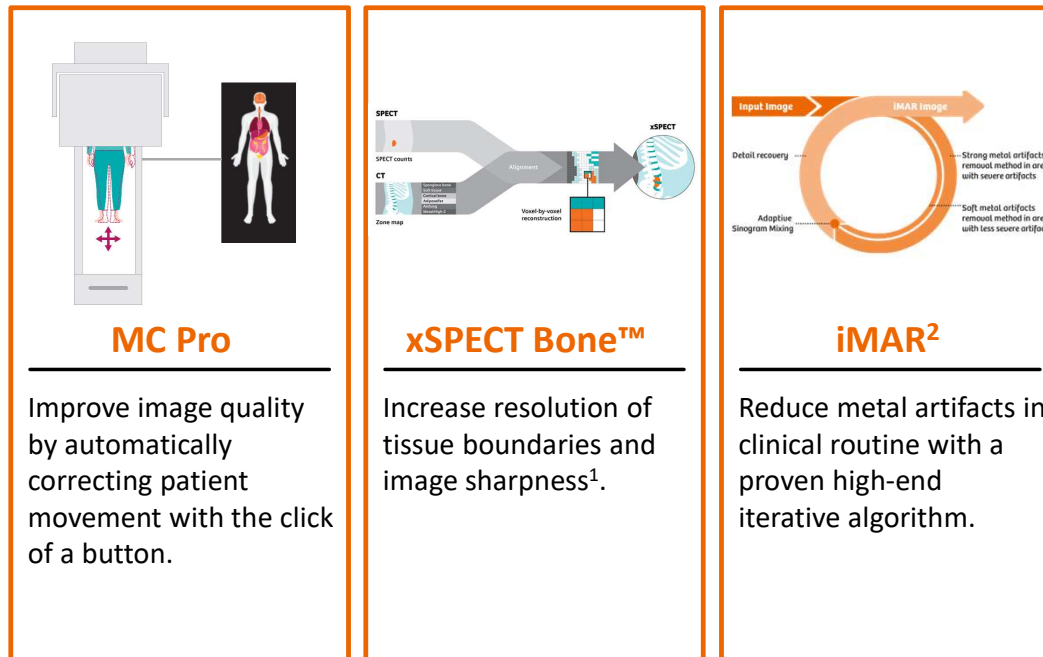
Advanced reconstruction

Advanced IQ•SPECT reconstruction
Dose protocol and acquisition time by patient

	Conventional		IQ•SPECT™	
	Dose	Time	Dose	Time
Standard	Full	16 min.	Full	4 min.
Pediatric	Half	16 min.	Half	8 min.
Bariatric	Full	16 min.	Full	8 min.

Enhance your nuclear medicine department with intelligent oncology SPECT/CT imaging

MC Pro

Improve image quality by automatically correcting patient movement with the click of a button.

xSPECT Bone™

Increase resolution of tissue boundaries and image sharpness[1].

iMAR[2]

Reduce metal artifacts in clinical routine with a proven high-end iterative algorithm.

[1] Compared to conventional iterative reconstruction methods
[2] iMAR is designed to yield images with a reduced level of metal artifacts compared to conventional reconstruction if the underlying CT data is distorted by metal being present in the scanned object. The exact amount of metal artifact reduction and the corresponding improvement in image quality achievable depends on a number of factors, including composition and size of the metal part within the object, the patient size, anatomical location and clinical practice. It is recommended, to perform iMAR reconstruction in addition to conventional reconstruction. Symbia Pro.specta™ and its features are not commercially available in all countries. Due to regulatory reasons, their future availability cannot be guaranteed. Please contact your local Siemens Healthineers organization for further details.

Symbia Pro.specta SPECT/CT with myExam Companion
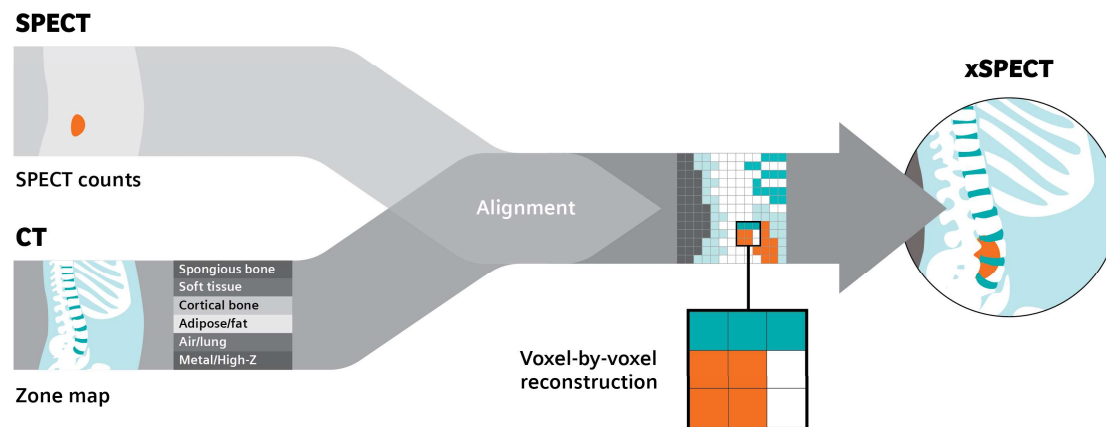# MC Pro: Automatic motion correction for SPECT applications
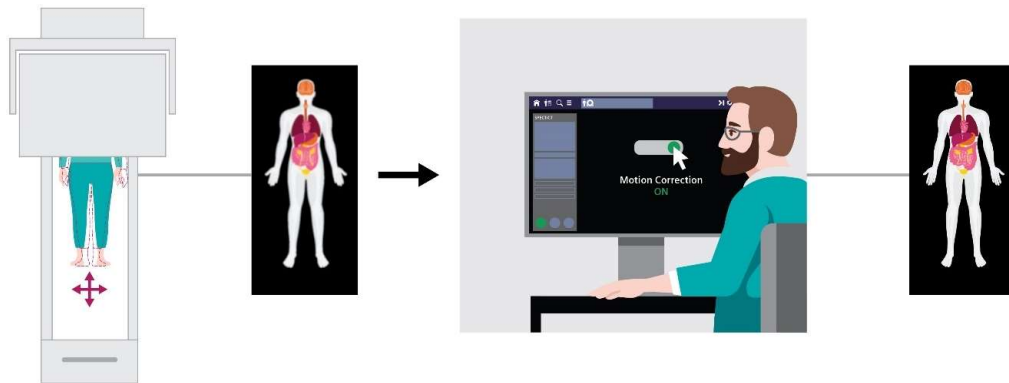
Eliminate user variability when performing motion correction with MC Pro

- Apply motion correction automatically for SPECT applications with a simple on/off selection

- Improve image quality for most studies by automatically correcting for patient movement

- Achieve greater consistency across users and exams with automatic motion correction

xSPECT Bone differentiates tissue boundaries for high-resolution bone imaging

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SPECT

SPECT counts

CT

Spongious bone
Soft tissue
Cortical bone
Adipose/fat
Air/lung
Metal/High-Z

Zone map

Alignment

Voxel-by-voxel
reconstruction
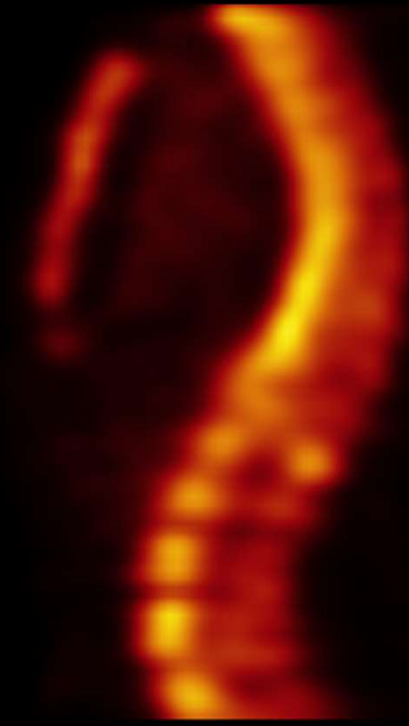
xSPECT

xSPECT Bone™

- Uses CT as the frame-of-reference for image reconstruction

- Extracts a zone map with definition around different tissue segments to better delineate the boundaries of pharmaceutical uptake

The result: sharper definition of bony margins to generate the degree of image quality needed to reveal a patient's true condition in a single exam
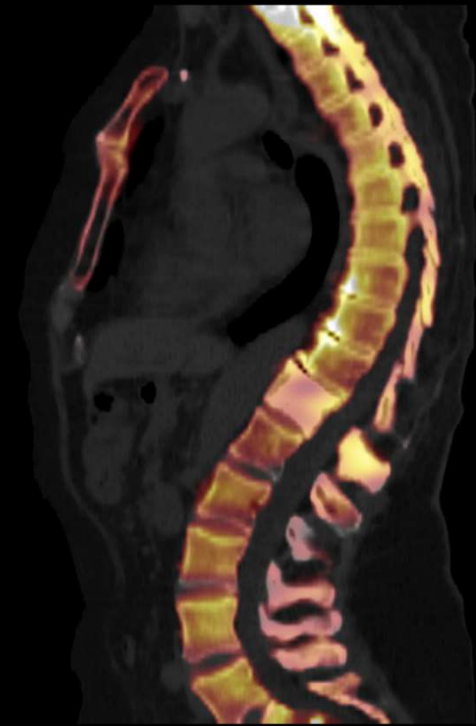
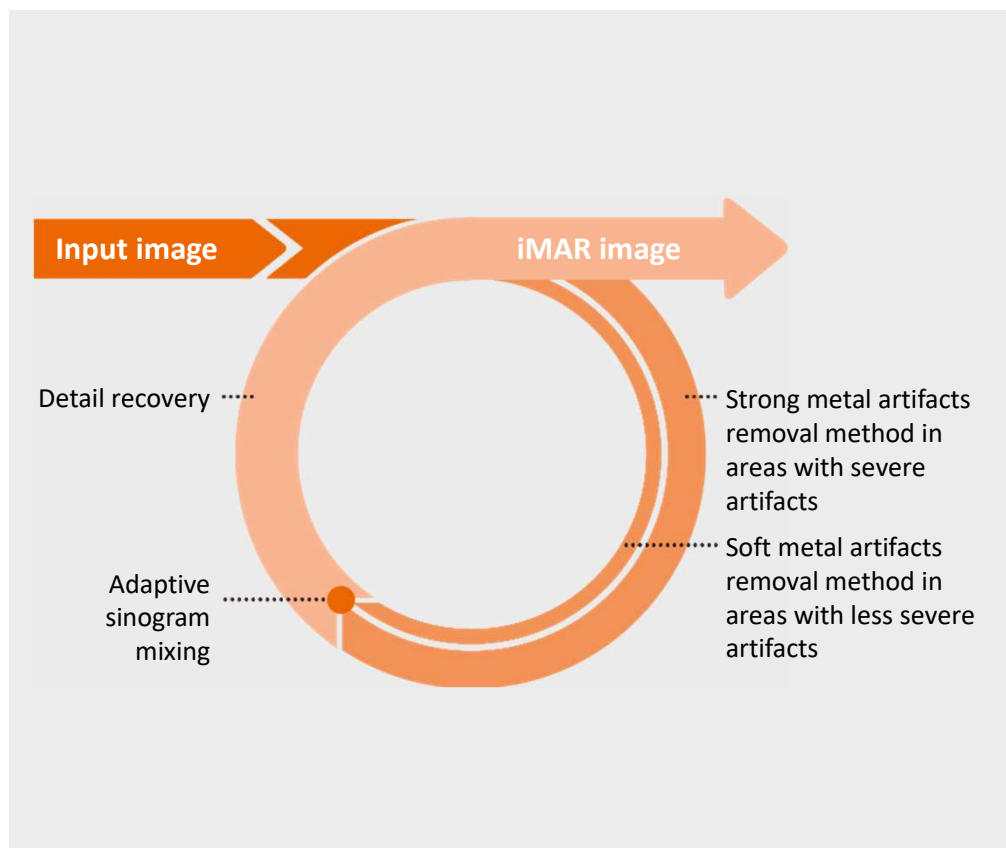# xSPECT Bone image alone shows clear vertebrae uptake
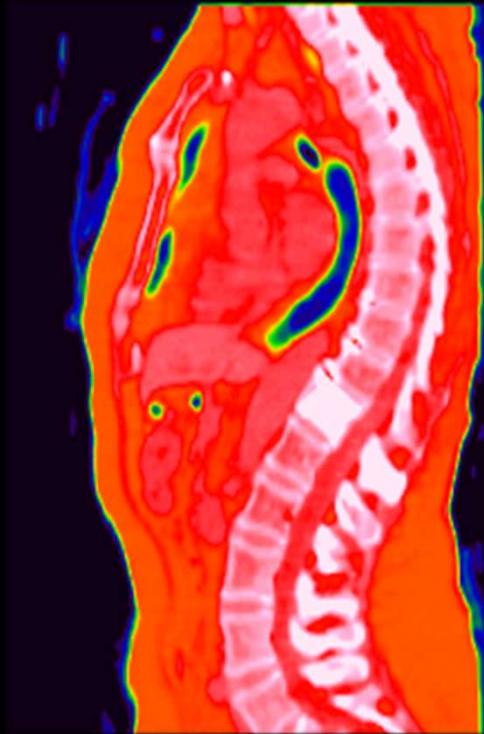
CT

3D iterative with CTAC

xSPECT Bone™/CT

Reduce metal artifacts in clinical routine
iMAR[1] (iterative Metal Artifact Reduction)

Input image

iMAR image

Detail recovery ····

····· Strong metal artifacts removal method in areas with severe artifacts

Adaptive sinogram mixing ·········

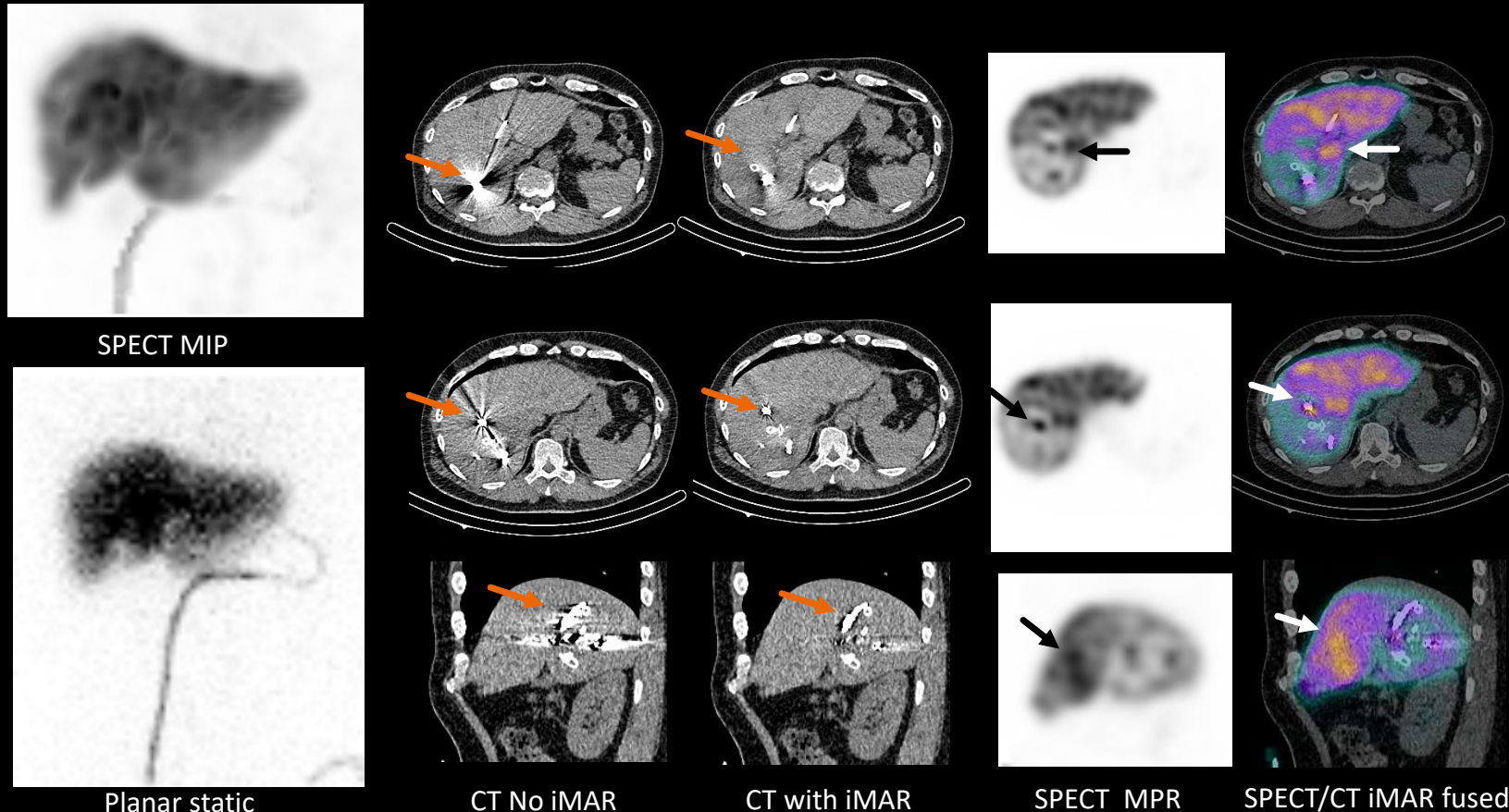········· Soft metal artifacts removal method in areas with less severe artifacts

Reduce metal artifacts in clinical routine with a proven high-end iterative algorithm

- Improve your process efficiency with an algorithm that can handle different metal implants

- Leverage your ability to address more challenging cases (e.g., dental fillings, pacemakers)

- Extend your referral base by delivering outstanding image quality in orthopedics

[1] iMAR is designed to yield images with a reduced level of metal artifacts compared to conventional reconstruction if the underlying CT data is distorted by metal being present in the scanned object. The exact amount of metal artifact reduction and the corresponding improvement in image quality achievable depends on a number of factors, including composition and size of the metal part within the object, the patient size, anatomical location and clinical practice. It is recommended, to perform iMAR reconstruction in addition to conventional reconstruction.

iMAR improves biliary drainage catheter visualization in ^{99m}Tc HIDA SPECT/CT following liver tumor embolization

SPECT MIP

Planar static

CT No iMAR

CT with iMAR

SPECT MPR

SPECT/CT iMAR fused

Data courtesy of Queen Elizabeth Hospital, Birmingham, United Kingdom.
iMAR is designed to yield images with a reduced level of metal artifacts compared to conventional reconstruction if the underlying CT data is distorted by metal being present in the scanned object. The exact amount of metal artifact reduction and the corresponding improvement in image quality achievable depends on a number of factors, including composition and size of the metal part within the object, the patient size, anatomical location and clinical practice. It is recommended, to perform iMAR reconstruction in addition to conventional reconstruction.
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- Patient with cholangiocarcinoma treated with right-sided dual-venous embolization
- Biliary drainage catheter draining externally left in situ
- Hepatobiliary scan with dynamic and static SPECT/CT performed to assess function of remnant liver tissue
- CT with iMAR eliminates metal artifact from biliary drainage catheter enabling clear visualization of catheter tip

Symbia Pro.specta™ SPECT/CT

SPECT
Scan acquisition:
60 stops per detector,
10 seconds/stop
OSEM3D 24i,4s 128x128 matrix

Injected dose:
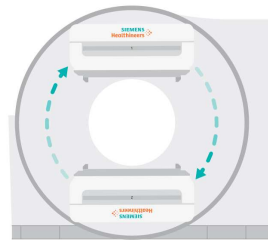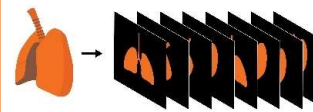^{99m}Tc-HIDA 3.8 mCi (142 MBq)

CT
Scan parameters:
120 kV/40ref mAs 0.33 sec rotation
32x0.7 mm collimation
2 mm recon
BR40 S3 iMAR

53

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Enhance your nuclear medicine department with intelligent oncology SPECT/CT imaging

CR Pro

Perform acquisitions with a continuous rotation to enable faster scan times.

AutoPlanar

Create virtual planar images from a single SPECT tomo acquisition; potentially reduce total imaging time.

Symbia Pro.specta SPECT/CT with myExam Companion
CR Pro and Gated CR Pro: Faster scans with continuous rotation

Symbia Pro.specta™ is the first SPECT/CT to perform continuous-rotation acquisitions for all SPECT applications, including gated studies

- **CR Pro** reduces whole-body SPECT studies by 16 minutes[1]

- **Gated CR Pro** reduces cardiac study time by up to 25%[2]
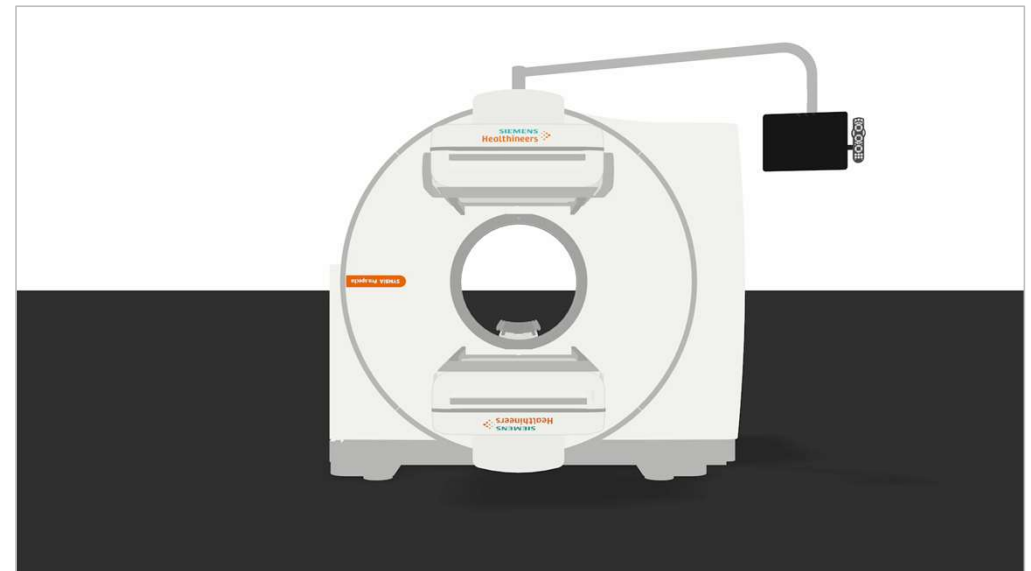
[1] Assumes a 5-bed study.
[2] Based on typical clinical workflow compared to a step-and-shoot gating acquisition.
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Symbia Pro.specta SPECT/CT with myExam Companion
AutoPlanar: automatically create planar images

SPECT/CT VRT

SPECT MIP

Virtual planar
anterior

Virtual planar
posterior

Automatically create supporting planar images without the need to perform a separate acquisition

- Up to 8 virtual static planar images (anterior, posterior, lateral, etc.) can be created from a SPECT acquisition

- Up to 2 virtual whole-body planar images (anterior and posterior) can be created from a whole-body SPECT acquisition

Děkuji za pozornost

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