

Shanghai United Imaging Healthcare Co., Ltd.
Copyright © Shanghai United Imaging Healthcare Co., Ltd. All Rights Reserved.

Shanghai, China
2258 Chengbei Rd., Jiading District, Shanghai, 201807.

Email | info.global@united-imaging.com
Business Consultation | +86 (21) - 67076666
After-sales Service | 4006 - 866 - 088

Edition ID | 88000025 - MPD - BRE - 01



uEXPLORER

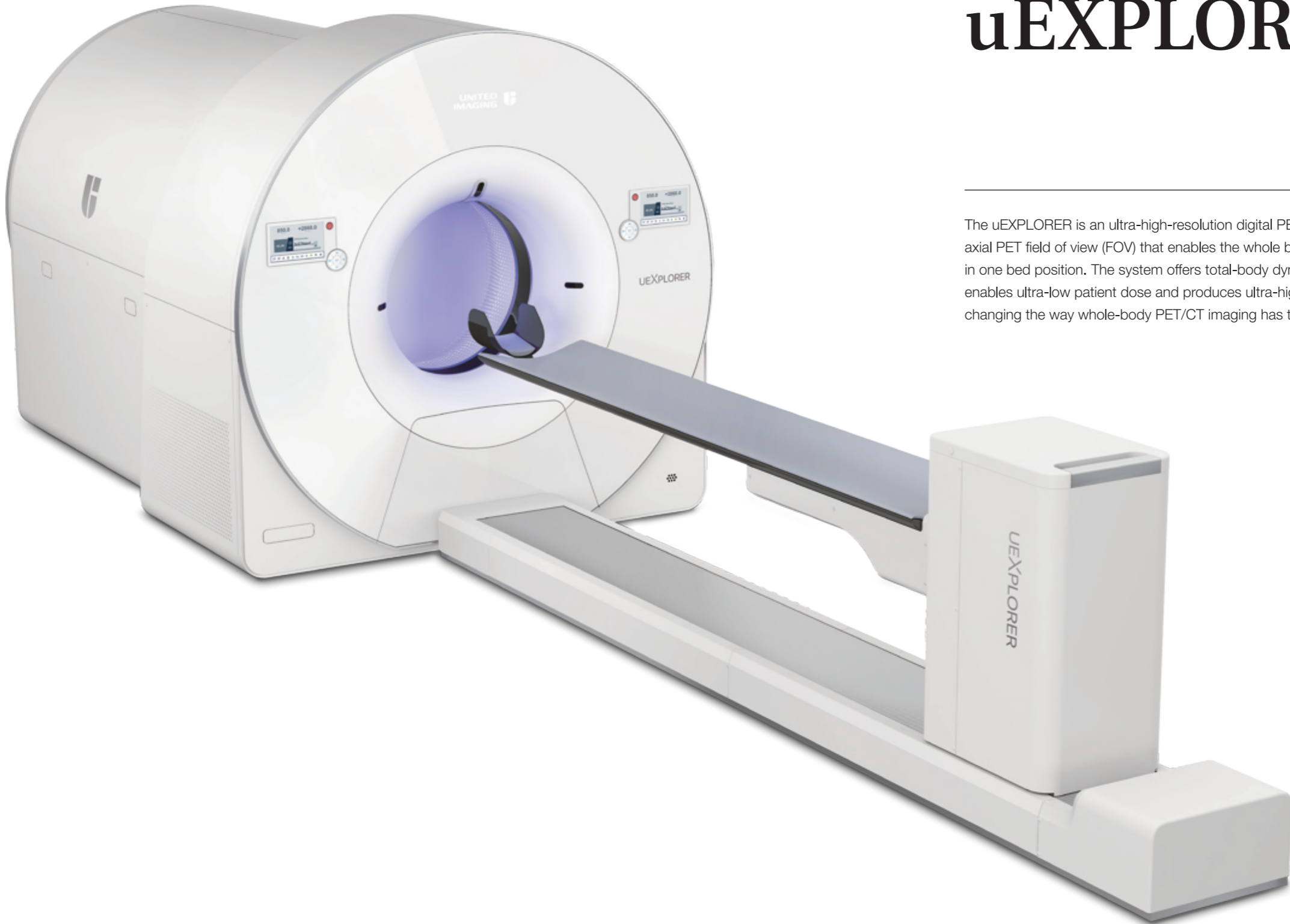
Total-body PET/CT

Born to Explore

ABOUT UIH

At United Imaging, we develop and produce advanced medical products, digital healthcare solutions, and intelligent solutions that cover the entire process of imaging diagnosis and treatment. Founded in 2011 with global headquarters in Shanghai, our company has subsidiaries and R&D centers across China, the United States, and other parts of the world. With a cutting-edge digital portfolio and a mission of broader access to healthcare for all, we help drive industry progress and bold change.

To learn more, visit <https://www.united-imaging.com>



uEXPLORER

The uEXPLORER is an ultra-high-resolution digital PET/CT with a 194cm axial PET field of view (FOV) that enables the whole body to be scanned in one bed position. The system offers total-body dynamic scanning, enables ultra-low patient dose and produces ultra-high image resolution, changing the way whole-body PET/CT imaging has traditionally been performed.

Meet the uEXPLORER

The World's First Total-body PET/CT.

194cm Axial FOV

Single bed total-body PET scan.

91 Billion LORs

2 orders of magnitude data computation.

176cps/kBq
Sensitivity

High system sensitivity.*

564,480
Crystal Elements

Fine crystal pixels.

2.9mm
NEMA Spatial Resolution

Functional images with anatomical details.

160 slice CT
with Z-Detector

Fully integrated design.

Why Total-body/ Dynamic PET Imaging?

With the head to toe coverage and unprecedented sensitivity, uEXPLORER is able to capture dynamic changes of total-body radiotracer distribution changes with ultra-high temporal resolution. Innovative healthcare applications and scientific researches can now be enabled by uEXPLORER.

Improved Lesion Detection

Improved lesion detection of tumor micro-metastases.

Cell Tracking & Function

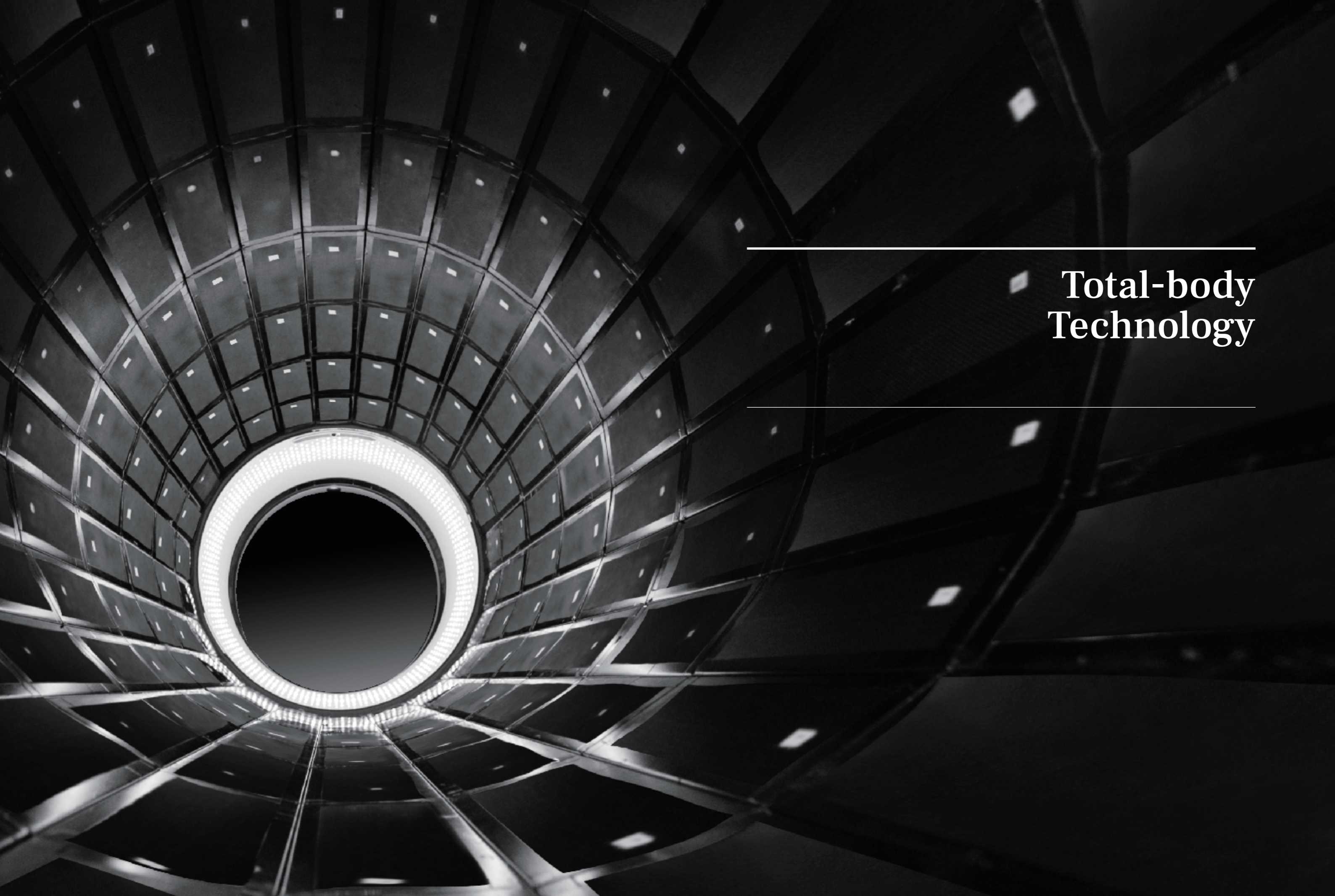
Efficacy evaluation of stem cell therapies and cancer immunotherapies.*

New Pharmaceuticals Development

Early-phase total-body bio-distribution, pharmacokinetics and low-dose evaluation.*

Multisystem Disease Research

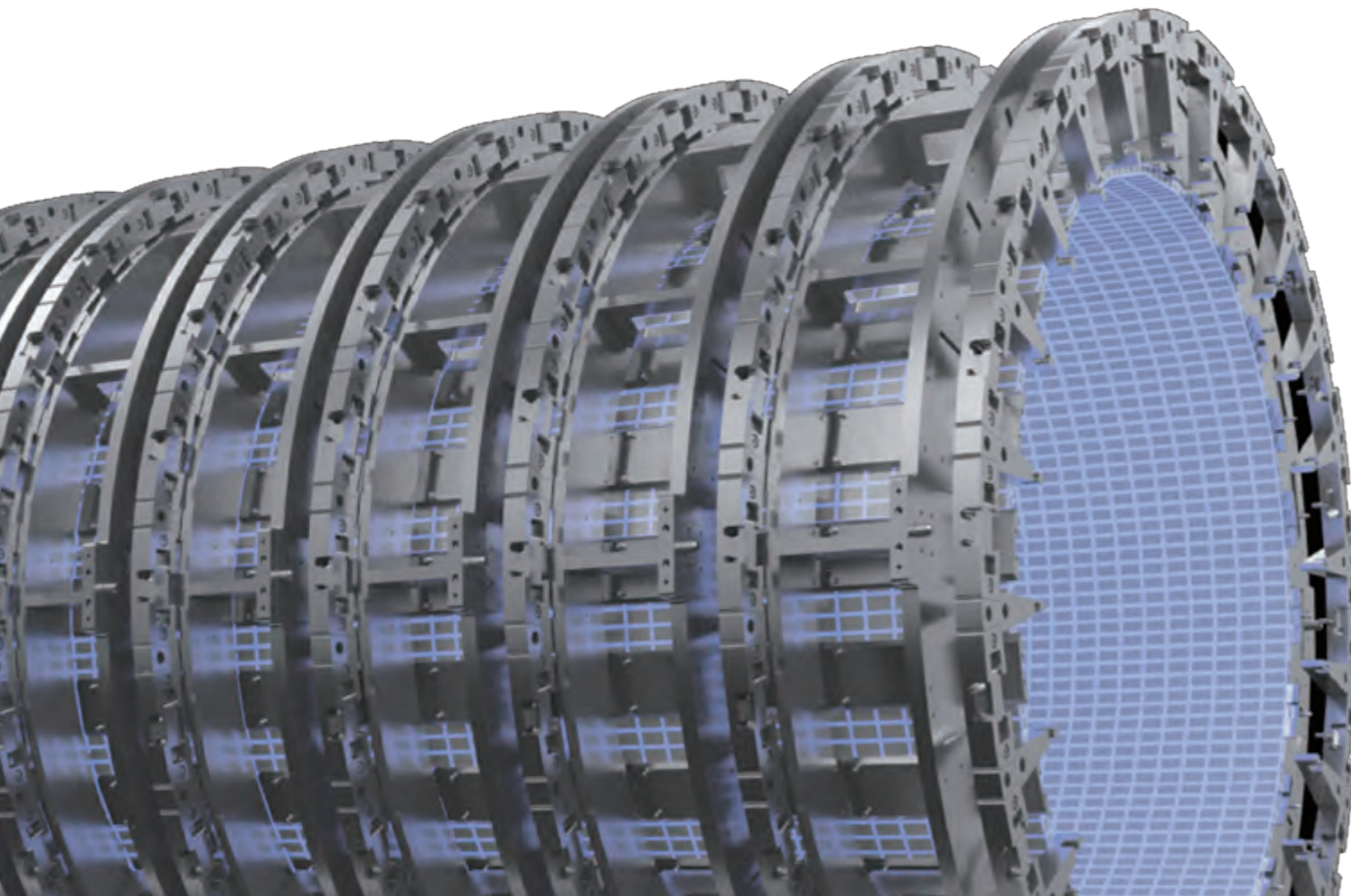
Research of brain-body interactions or multi-organ disease, such as brain-gut connections, metabolic syndrome and endocrine homeostasis.*



Total-body Technology

194cm Axial Field of View

564,480 crystal elements, unit-based design and gapless assembly achieve total-body coverage and minimized cumulative system error, bringing high spatial resolution and precisely fused images.



Unit-based Design

564,480 Crystal Elements

High-precision LYSO crystal.

0.5mm Alignment Precision

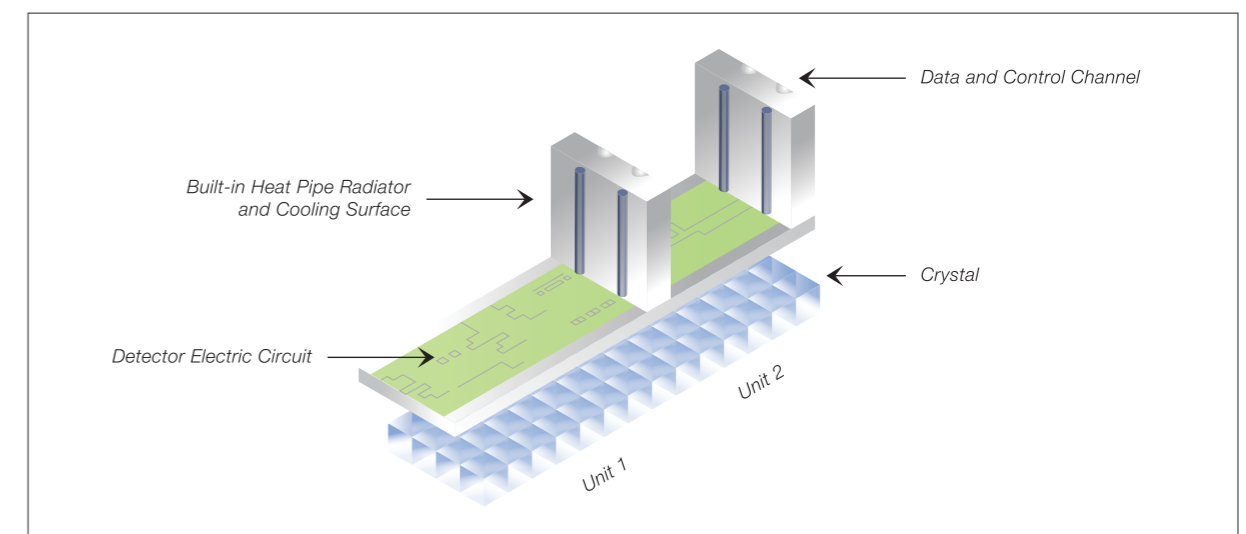
Minimize cumulative system error.

Unit-based Design

Easy installation and maintainance.

Gapless Assembly

PET detector module gapless assembly.



PET Unit Structure

40x Sensitivity Improvement

Improvement of the Detection Efficiency

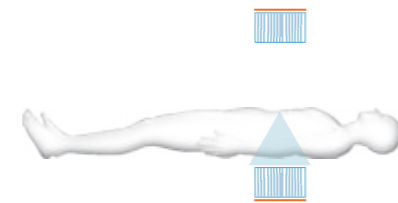
With 194cm axial FOV, uEXPLORER is able to capture orders of magnitude more γ photons.

Cross-unit Coincidence Technology

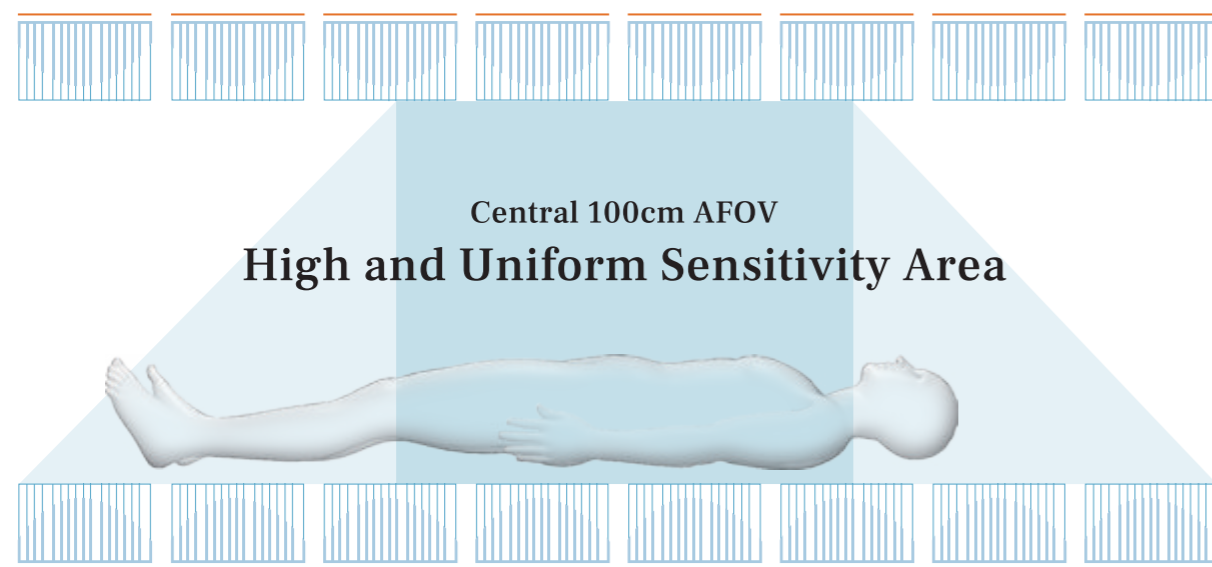
The innovative cross-unit coincidence technology enables signal acquisition not only within each PET detection unit but also across adjacent units, which gives 40-fold overall sensitivity boost over conventional PET/CT systems.

Ultra-high and Uniform Sensitivity

Ultra-high and uniform sensitivity distribution in the center 100cm axial FOV can now be achieved with the total-body coverage, covering all vital human organs.



Conventional PET-CT: 10-30cm AFOV



Central 100cm AFOV
High and Uniform Sensitivity Area

uEXPLORER : 194cm AFOV

※ Measured with a 70cm NEMA NU-2 phantom.

Integrated-Light-Guide Digital Detector

ILG (Integrated Light Guide)

Integrated-light-guide (ILG) design improves light collection efficiency and time resolution for exceptional image quality.

SiPM (Silicon Photomultiplier)

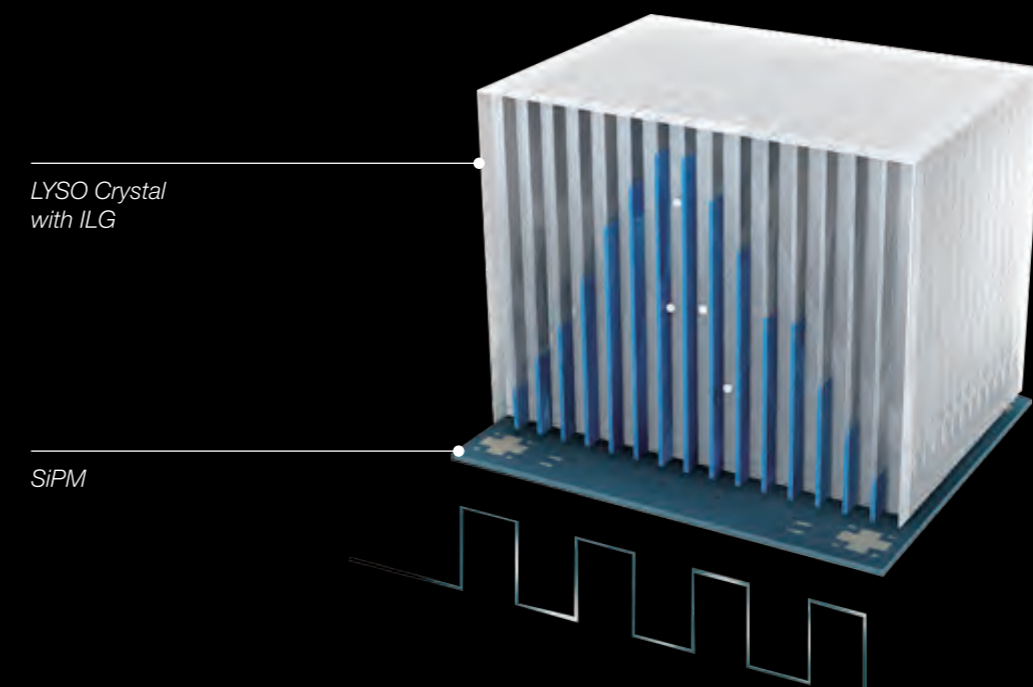
SiPM technology increases photoelectric conversion efficiency to reduce signal loss, yielding vast improvements in image quality.

High-Precision Crystal

Ultrafine microscopic crystals significantly enhance image resolution.

Modular Design

High-level modular design achieves remarkable improvements in system reliability and serviceability.



Fast Total-body Image Reconstruction

uEXPLORER applies state-of-the-art hardware platform in combination with parallel data processing architecture for fast and high quality image reconstruction.

2 Orders of Magnitude

Increased in reconstruction computational operation.*



Innovative Parallel Architecture

- High-performance Parallel Computation Units.
- High Bandwidth Networking.
- Optimized Memory Management.



< 3 Minute

Clinical Total-body Image Reconstruction Time.**



Equipment Room Cabinet

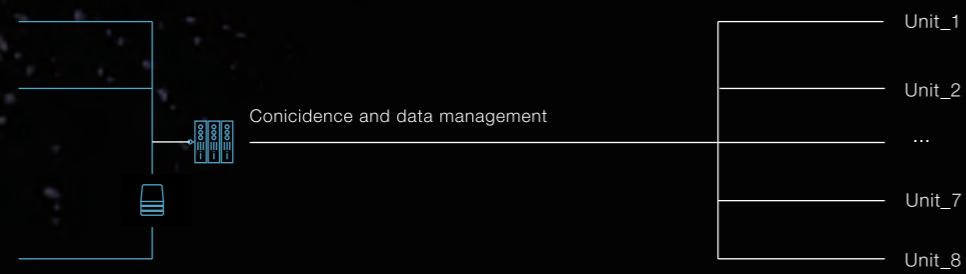
10Gbps Switch

Recon*10

Operating Room

Console

Scanning Room PET/CT Gantry

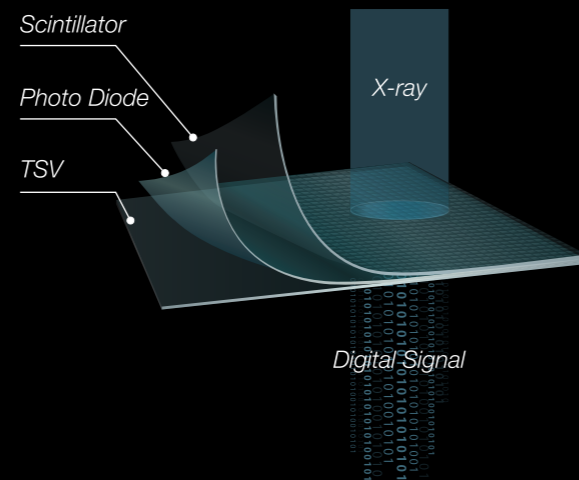


* In comparison to uMI 780.
** To process up to ~6 billion coincidence events for a 5min scan.

160-slice High-performance CT

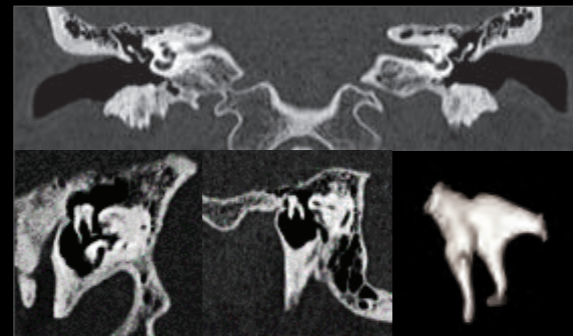
Fully Integrated Z-Detector

The fully integrated design shortens transmission length from centimeter to micrometer scale, resulted in effective suppression of electromagnetic interference and increased X-ray utilization.



0.5mm Detector Element Size

Due to the outstanding electronic noise performance, Z-Detector delivers the high SNR and image quality with 74,880 elements of 0.5mm pixel size in the Z-plane.



0.5mm detector element size unveils fine details of the inner ear

Single-Photon Level Electronic Noise

Z-Detector reduces electronic noise down to a single photon level, improving signal-to-noise ratio (SNR) and providing images with more details.

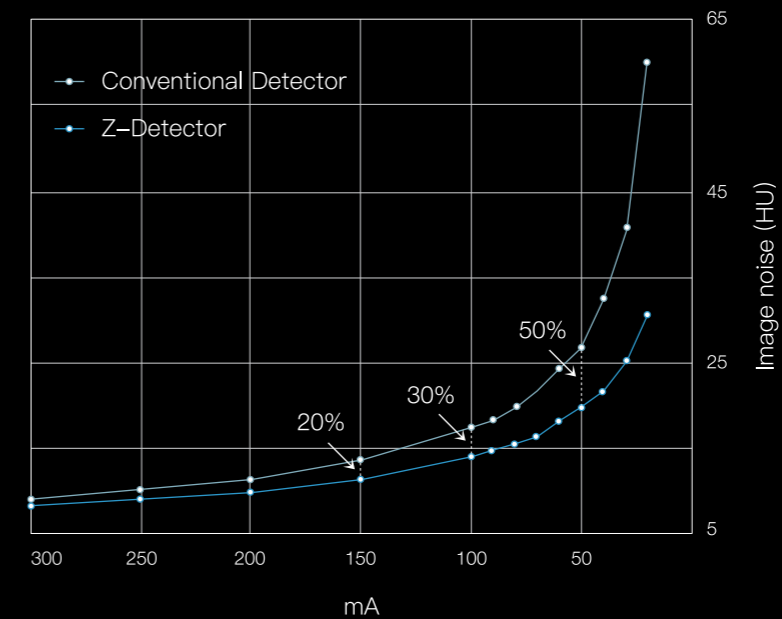
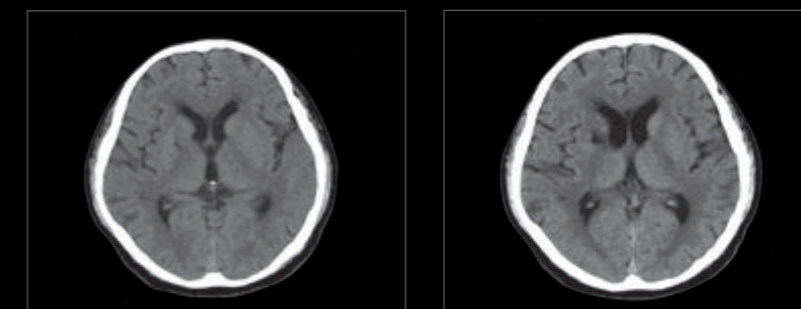


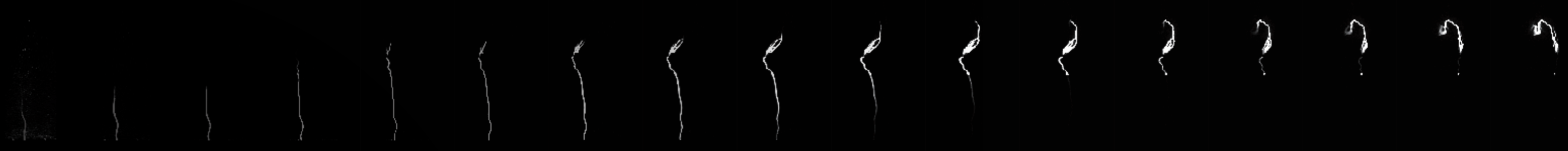
Image noise generated by Z-Detector and the conventional solid-state detector as measured and compared in CT scans using a 180mm water phantom. The graph illustrates that a reduced noise level is obtained by Z-Detector within the entire range of mA settings. Z-Detector is able to achieve close to 50% noise reduction at low mA, making it possible to develop various kinds of low-dose applications with standard-compliant image quality.



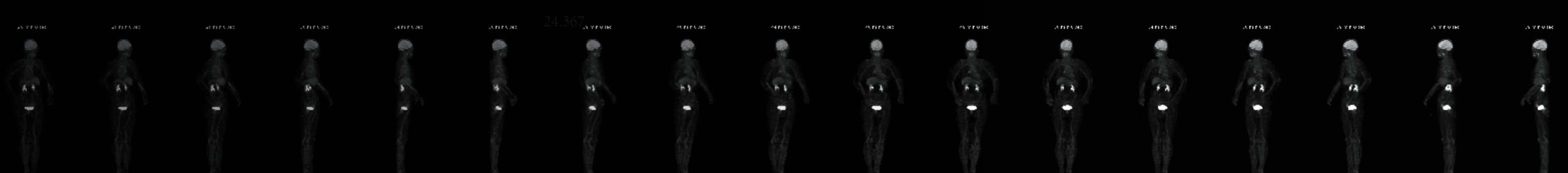
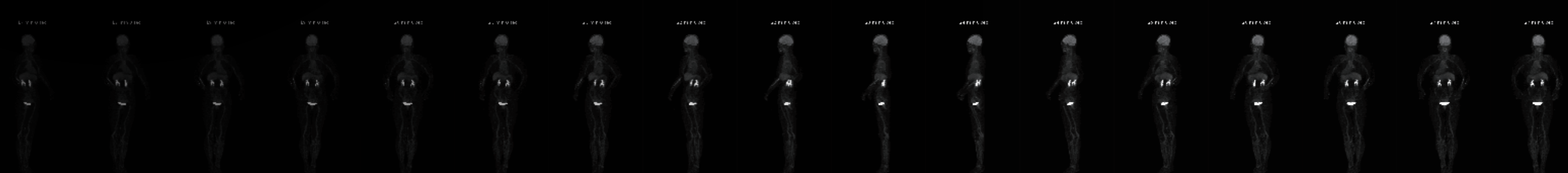
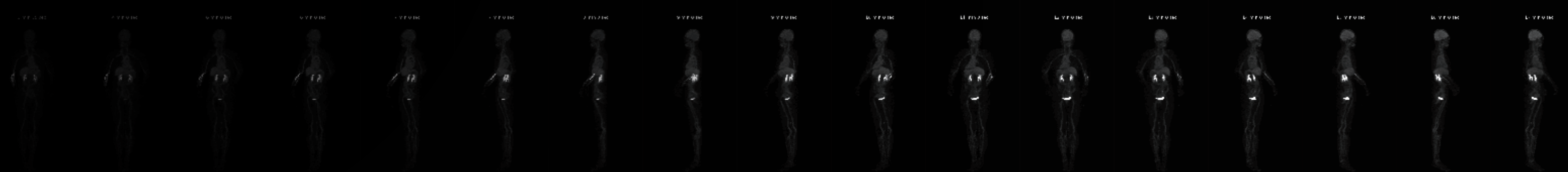
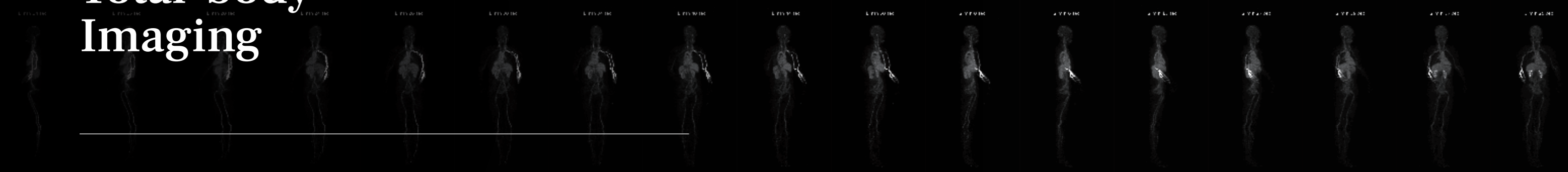
Conventional Detector

Z-Detector

Z-Detector (right) improves low contrast detectability and shows clear grey-white matter differentiation compared to the conventional detector (left).



Total-body Imaging

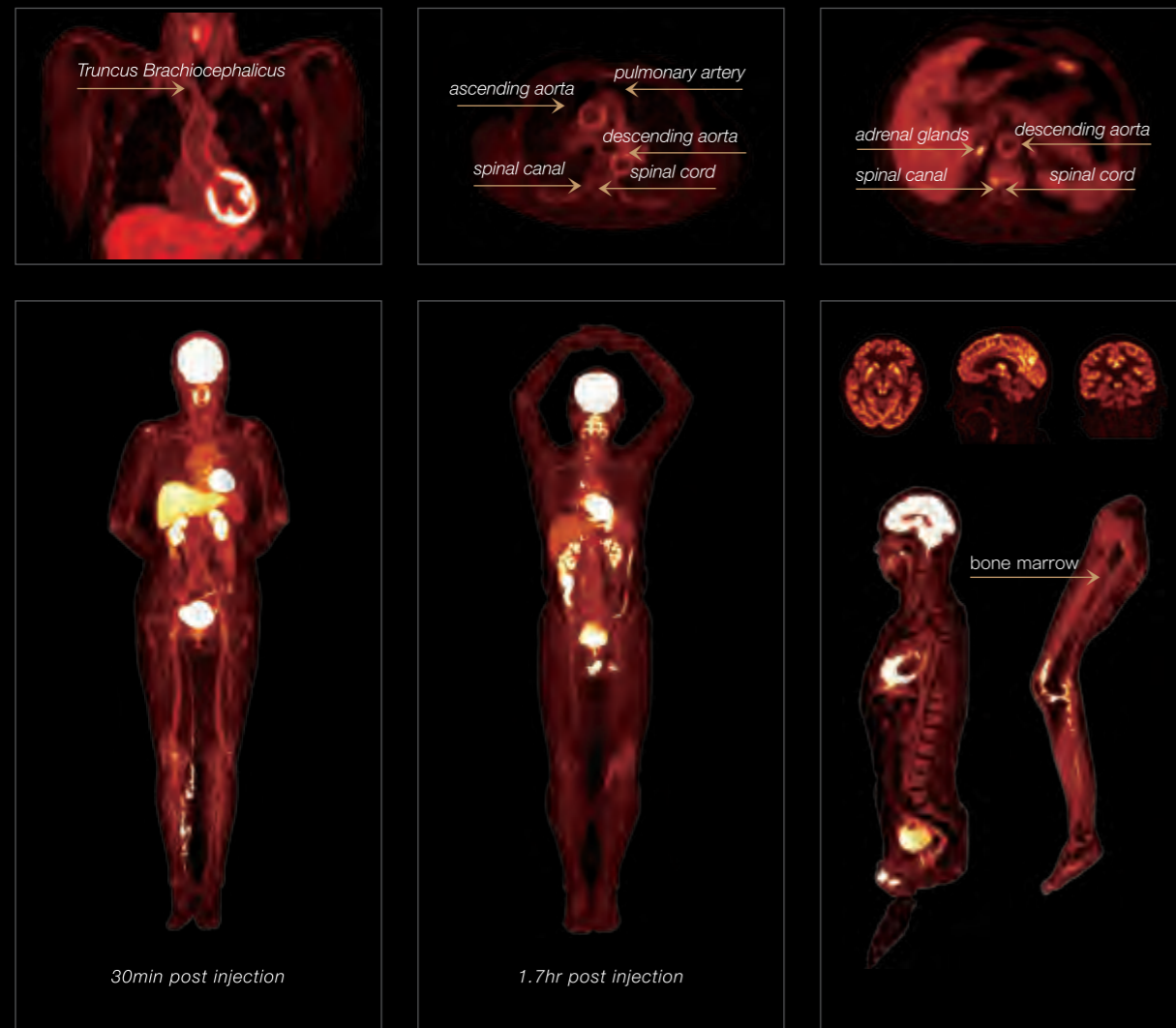


24.367

Functional Images with Anatomical Details

Ultra-high resolution and sensitivity.

High count statistics enables small voxel reconstruction.

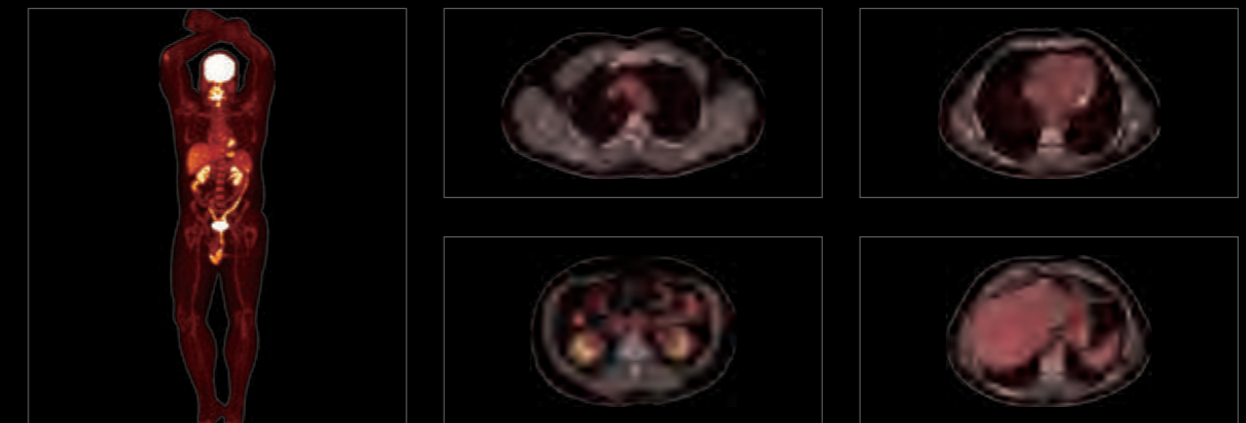


6~7.8mCi ¹⁸F-FDG, 14~20min scan time

Breakthrough Imaging with High Sensitivity

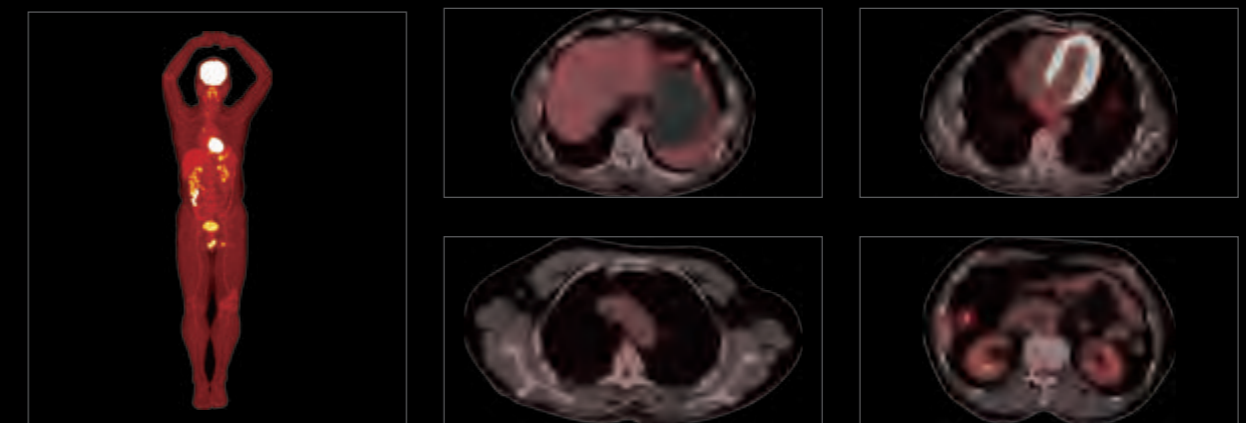
0.2mCi tracer dose total-body scan for a 100kg patient.

0.002mCi/kg tracer dose injection compared to conventional 0.08-0.12mCi/kg dose.



0.2mCi ¹⁸F-FDG, 82min post injection, 20min scan time, BMI 32.7

A high thyroid nodule uptake clearly visible on scans as short as **30 seconds**.

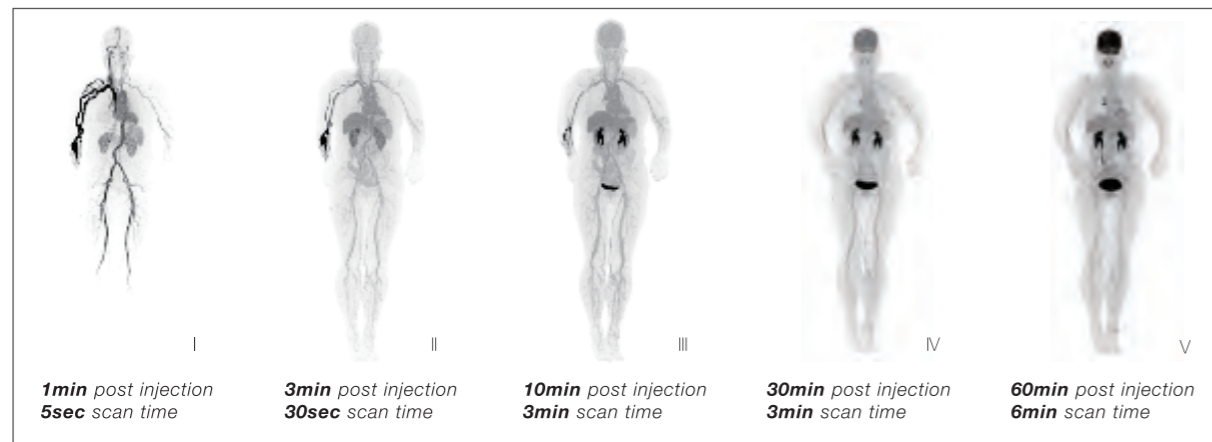


7.8mCi ¹⁸F-FDG, 1.7hr post injection, BMI 24.2

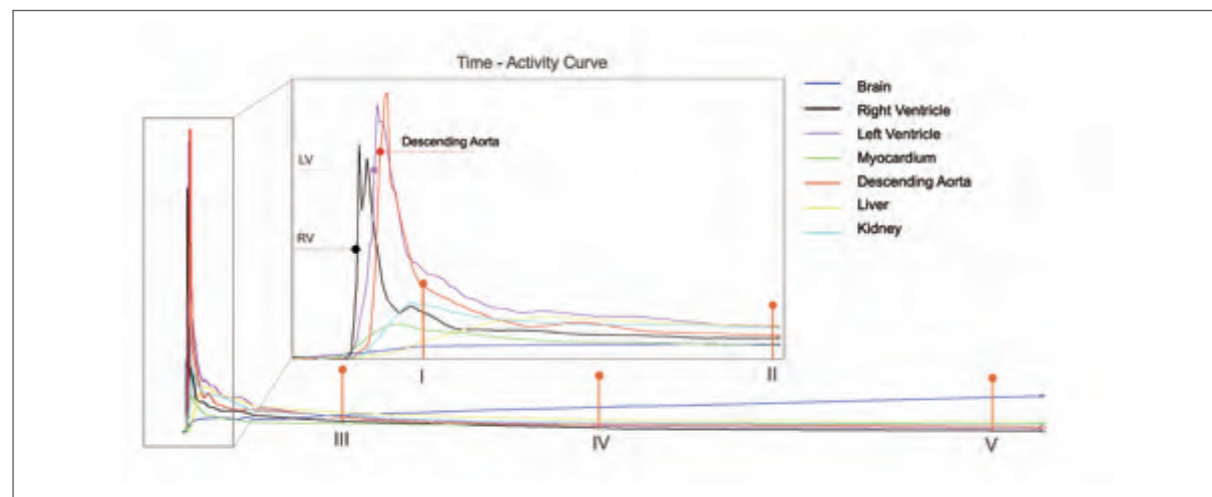
Total-body Dynamic Imaging in One Single Bed

Fast and continuous tracking of tracer distribution in blood, organs, tissues throughout the entire body.

Better support for pharmacokinetic studies, radiation dose evaluation and parametric imaging.



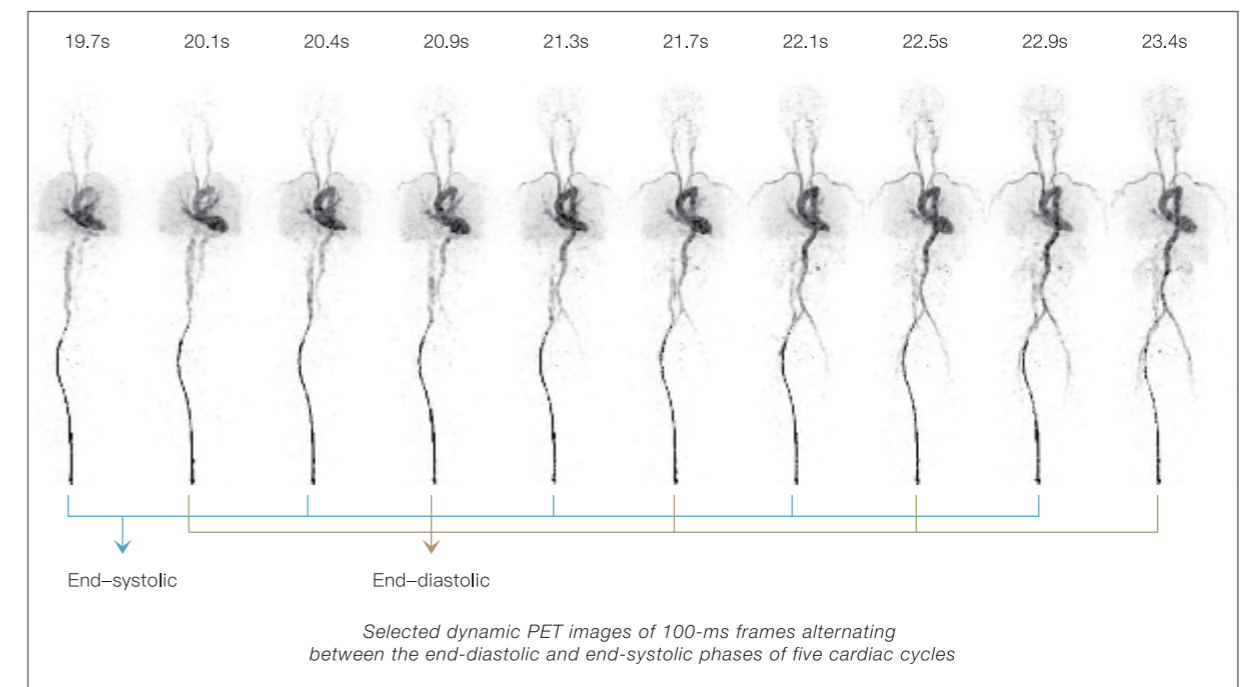
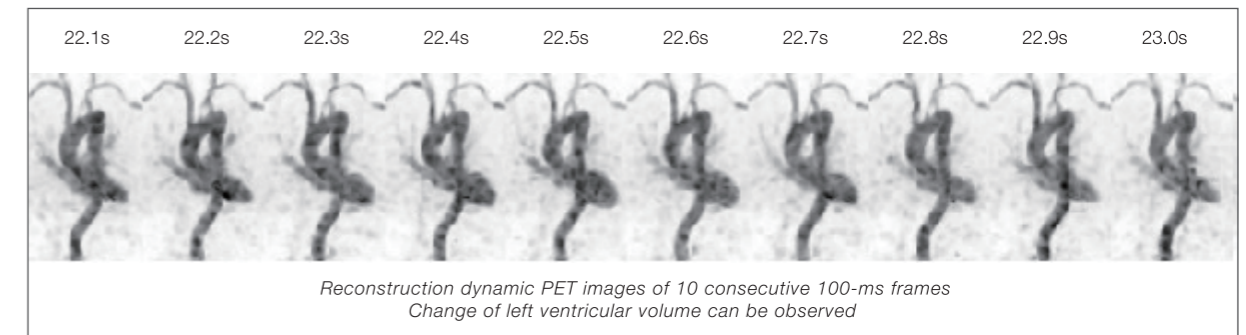
6.3mCi ¹⁸F-FDG, BMI 22.7



Subsecond Total-body Imaging

Clearly capture the fast dynamics of initial radiotracer distribution and cardiac motion in the human body.

Potential applications of studying fast pharmacodynamics, using shorter-lived radionuclides, and performing motion-frozen scans.



6.9mCi ¹⁸F-FDG, 1hr scan time post injection

Imaging Tracer Distribution for Longer

Scanned at up to 6.5 half lives post injection.

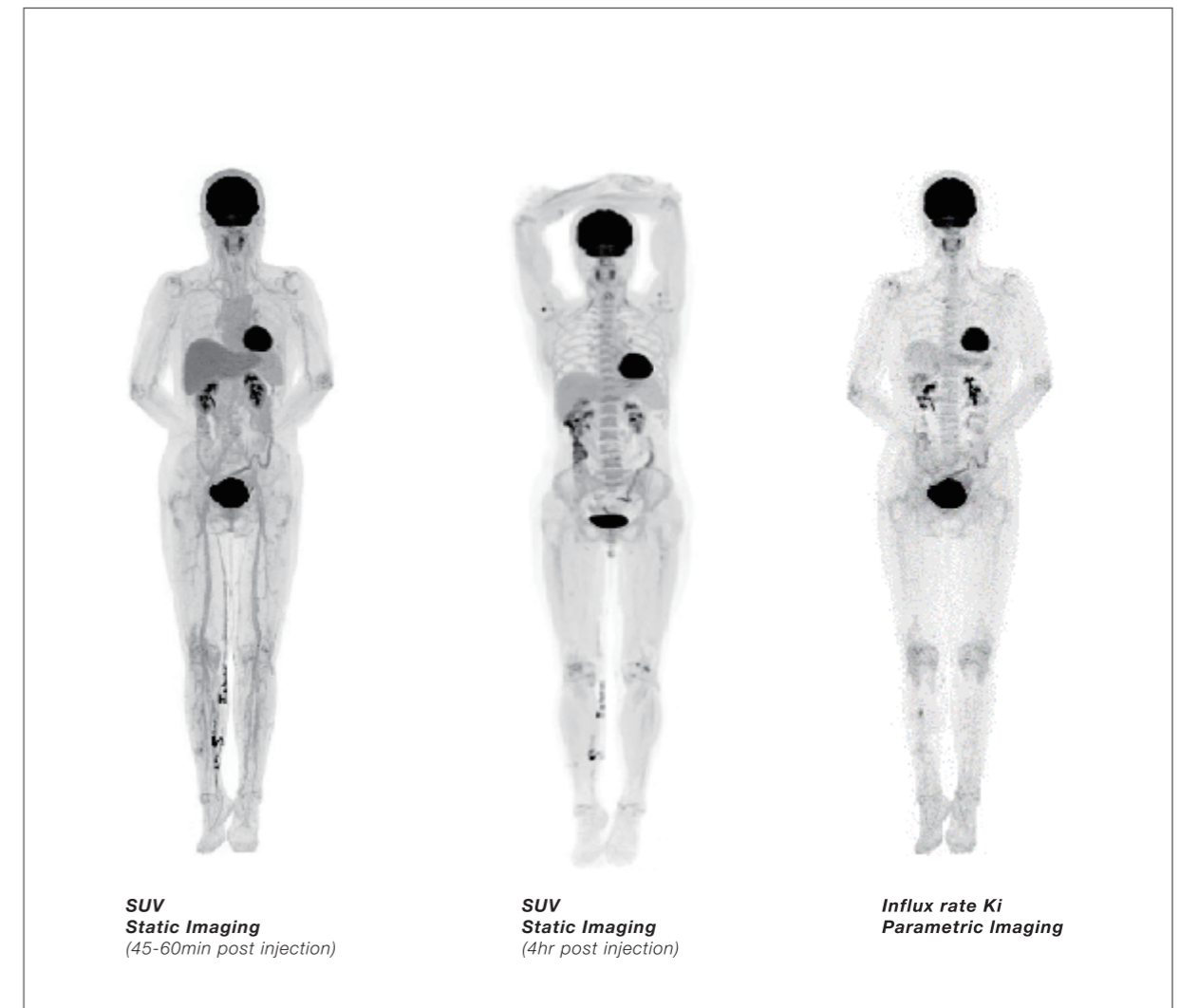
Potential to observe radiopharmaceutical distribution over an extended period of time.



10mCi ^{18}F -FDG, BMI 24.5

Total-body Parametric Imaging

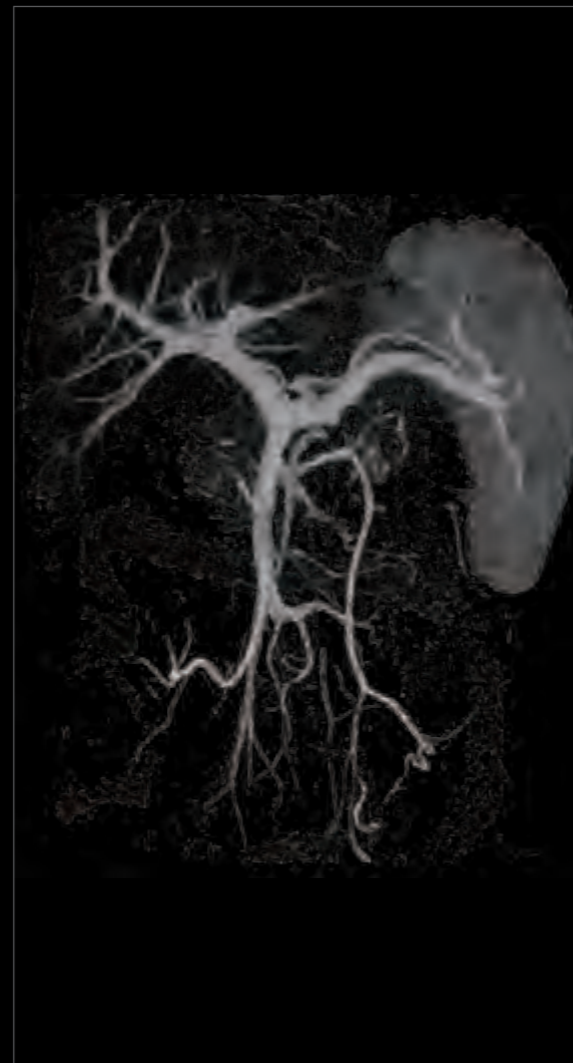
Total-body coverage and high sensitivity enable dynamic parametric imaging with high temporal sampling resolution.



6.91mCi ^{18}F -FDG, BMI 23

Clarity for CT Imaging

Along with the Z-Detector, 70kV scan mode shows clear portal vein and its branches and increased image contrast.

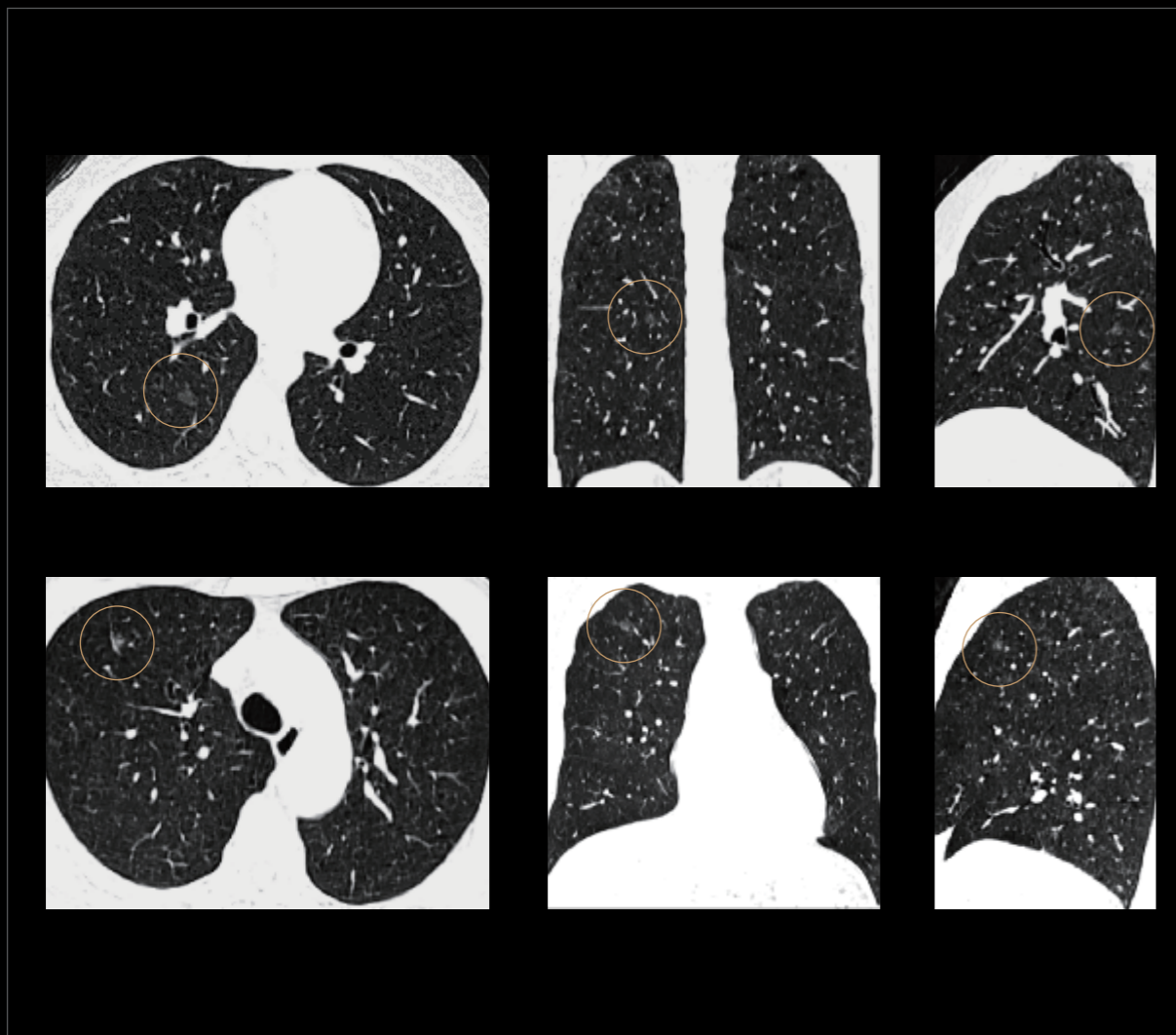


Fast and precise large range CTA shows aorta dissection as well as the stenosis of right iliac artery; contrast enhancement of right iliac artery is significantly lower than that of the left iliac artery.



Low Dose CT Imaging

Clear visualization of the nodule details with low dose chest scan.



100kV, 0.62mSv

Precise imaging of spot and patchy calcifications with coronary CTA.



Spot calcifications at mid-RCA

Patchy calcifications at proximal-LAD

100kV, 1.3mSv

Human-Centered Design



Automated Quality Control

Source-free Automatic Daily Quality Control

Automatically scans for background count rate, voltage power supply, temperature, and humidity.

Single-click for CT detector channel check and air calibration.

Reduces staff's exposure to radiation sources.

Weekly Full Quality Control with Easy-to-Handle Process

Supports both liquid ^{18}F and solid ^{68}Ge sources.

Lower storage condition requirement for sources.

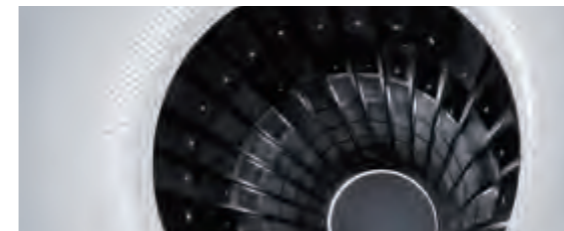
Thorough calibration procedures help to ensure accurate and consistent clinical performance over time.

Easy-to-Use NEMA Tool

Workflow-driven NEMA testing with automated analysis and report generation.

User-oriented design improves the efficiency and success rate of the workflow Parameters including spatial resolution, sensitivity, noise equivalent count rate scatter fraction, accuracy and image quality.

Focus on User Experience



76cm PET Aperture

for Improved Patient Comfort.



Illuminated Patient Bore

for Relaxing Patient Experience.



Dual Internal Cameras

for Patient Monitor.



3 In-bore Intercoms

for Clarity of Patient Communication.



Four Touchscreen Control Panels

for Intuitive User Operation.