

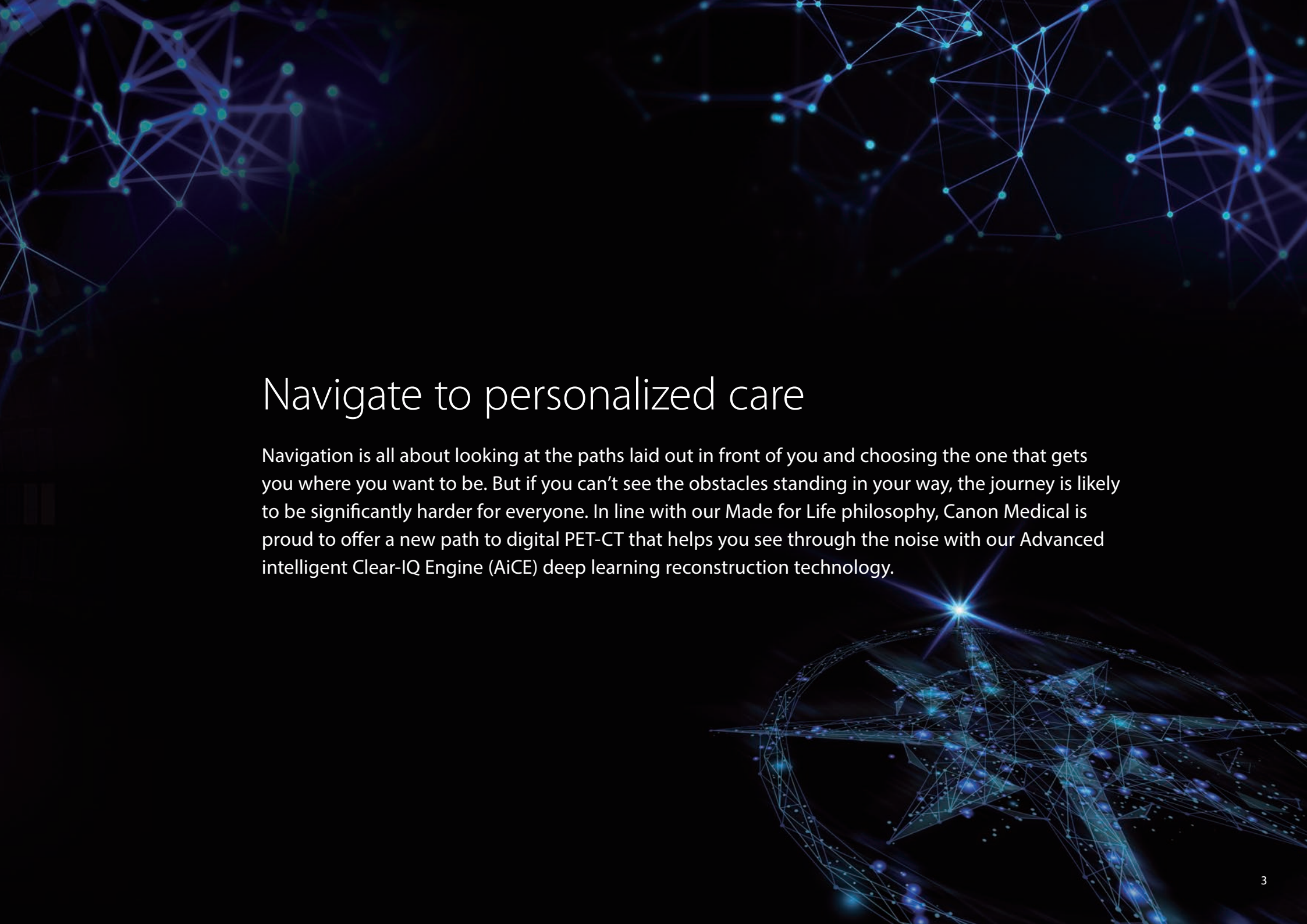
Canon



Cartesion Prime SP

Navigate to personalized care





Navigate to personalized care

Navigation is all about looking at the paths laid out in front of you and choosing the one that gets you where you want to be. But if you can't see the obstacles standing in your way, the journey is likely to be significantly harder for everyone. In line with our Made for Life philosophy, Canon Medical is proud to offer a new path to digital PET-CT that helps you see through the noise with our Advanced intelligent Clear-IQ Engine (AiCE) deep learning reconstruction technology.

Welcome to the age of AI-assisted digital PET-CT

Cartesion Prime SP has been developed to transform PET-CT with our Advanced intelligent Clear-IQ Engine* (AiCE) Deep Learning Reconstruction (DLR) technology that can be used for PET and CT reconstruction.

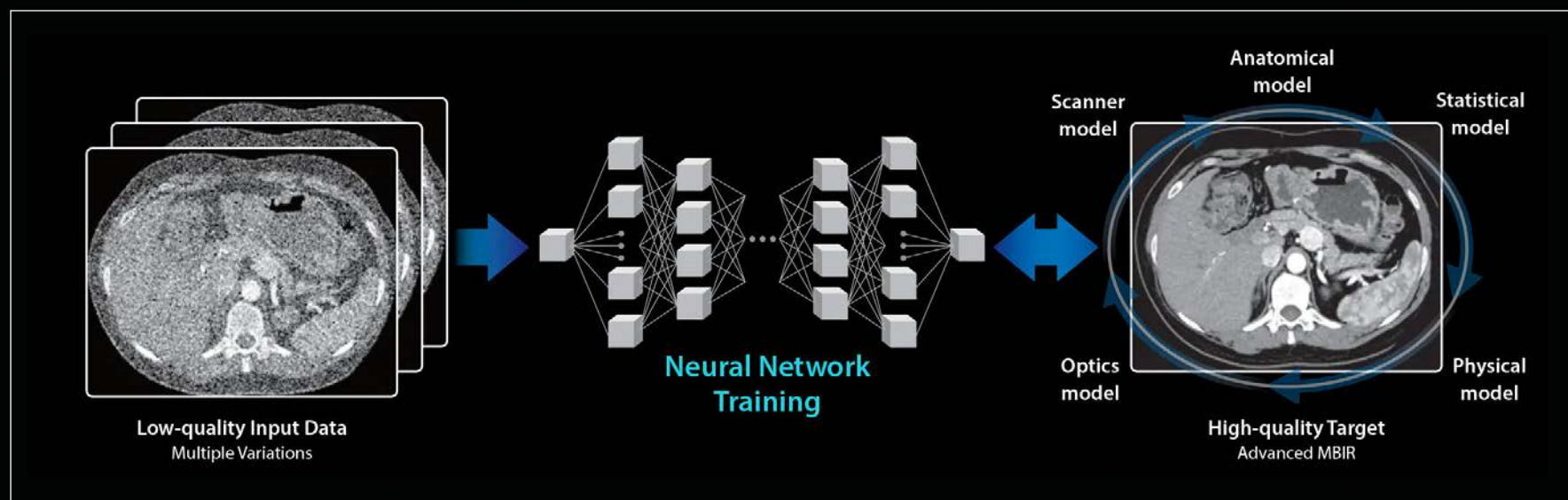
To aid in fast and confident clinical results, compared to Gaussian filtering, AiCE DLR can provide superior performance in:

- Image quality
- Quantification accuracy
- Count dependency
- Preservation of quantification

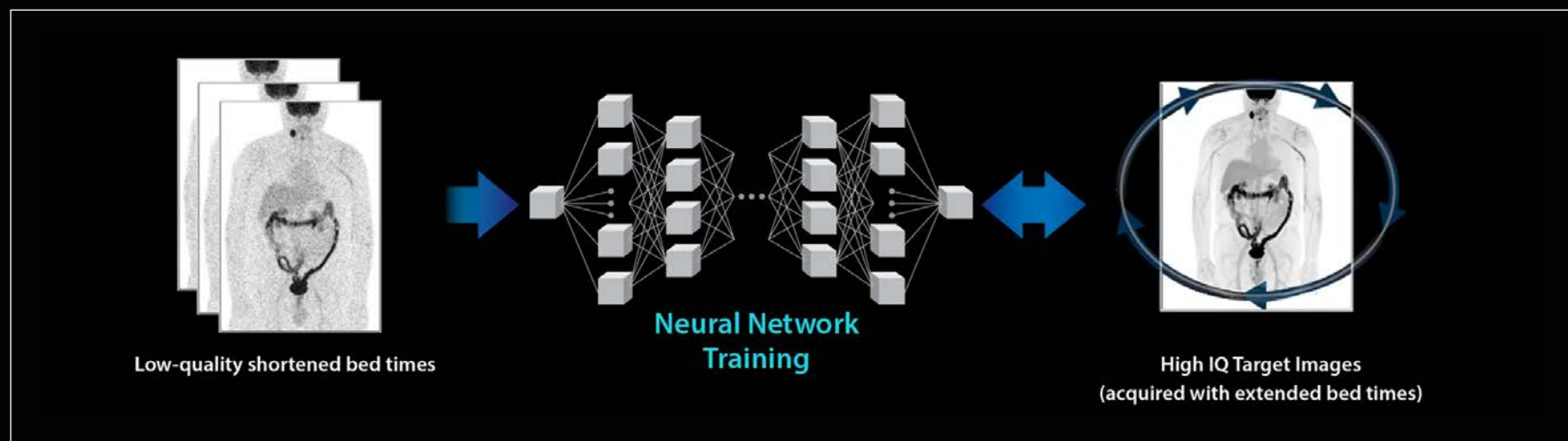


* Optional

AiCE for CT Technology



AiCE for PET Technology



* Data on File. Individual costs associated with purchase, siting, and maintenance will vary by vendor, institution and contractual agreements.

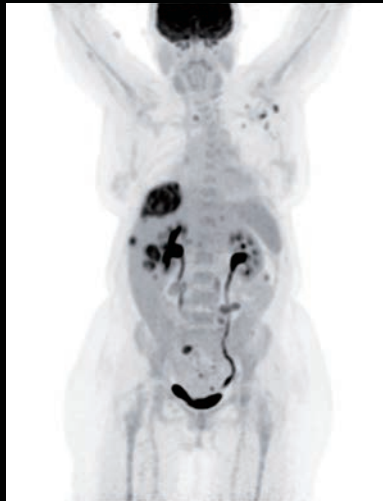
Distinct, high-quality PET-CT images



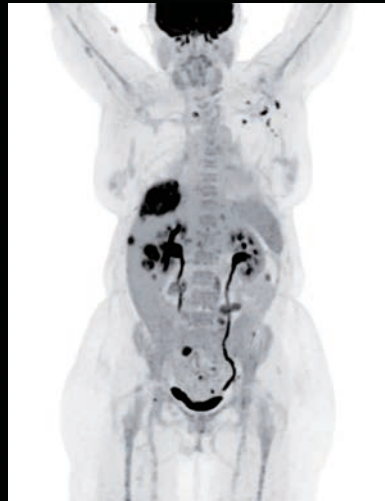
Gaussian post-filtered OSEM



AiCE



Gaussian post-filtered OSEM



AiCE

Dose 278 MBq (7.5 mCi), ^{18}F -FDG

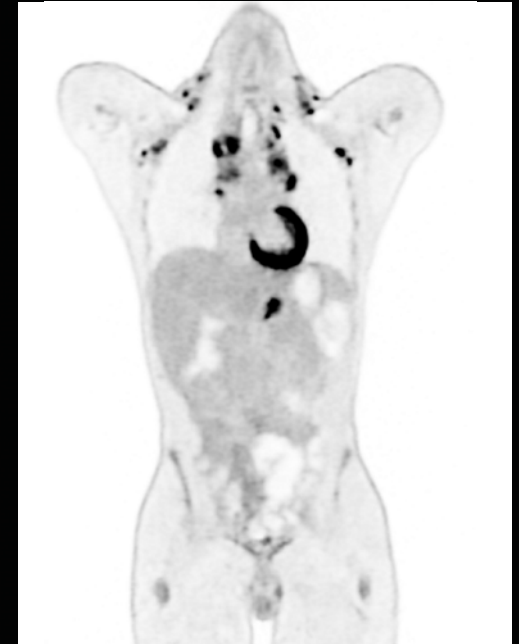
Uptake 56 minutes

Recon Gaussian post-filtered OSEM (OSEM+ToF+PSF, 4 iterations, 12 subsets, 6 mm Gaussian)

Recon Advanced intelligent Clear-IQ Engine (AiCE)



OSEM+PSF+GF
120 sec/bed



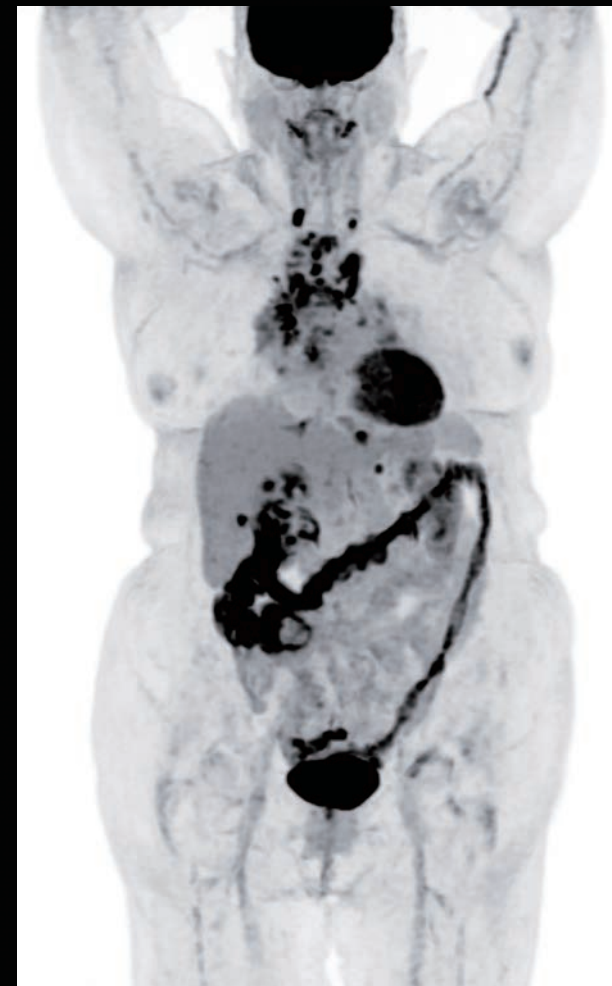
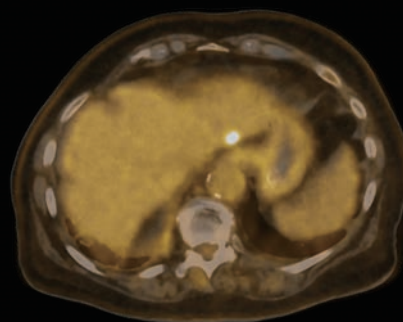
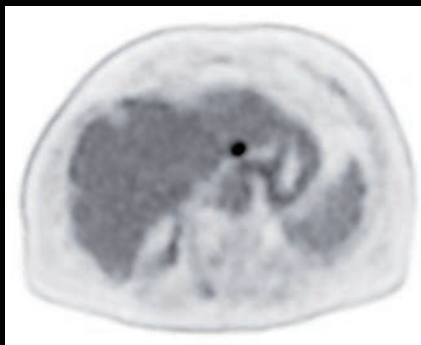
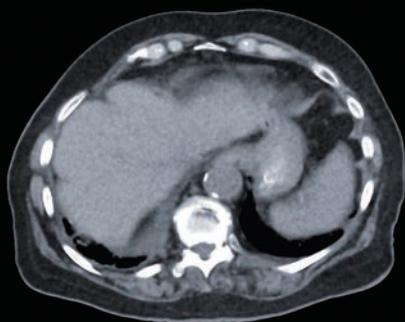
AiCE
45 sec/bed

Dose 7.6 mCi. ^{18}F -FDG

Uptake 62 minutes

Recon Gaussian post-filtered (OSEM+ToF+PSF, 4 iterations, 12 subsets, 6 mm Gaussian), 120 sec/bed, 12 minutes total scan time

Recon Advanced intelligent Clear-IQ Engine (AiCE), 45 sec/bed, 4.5 minutes total scan time



AiCE

AiCE

AiCE

AiCE

Dose 266.4 MBq (7.2 mCi), ^{18}F -FDG

Uptake 53 minutes

Recon Advanced intelligent Clear-IQ Engine (AiCE)

Courtesy of Steinberg Diagnostic Medical Imaging, USA

The clinical results described here are the experience of the authors. Results may vary due to clinical setting, patient presentation, and other factors.



Cartesion Prime



CT
133.0 mm
+0.0 mm
0.0 mm



Cartesion Prime

Canon





Chart the right clinical course

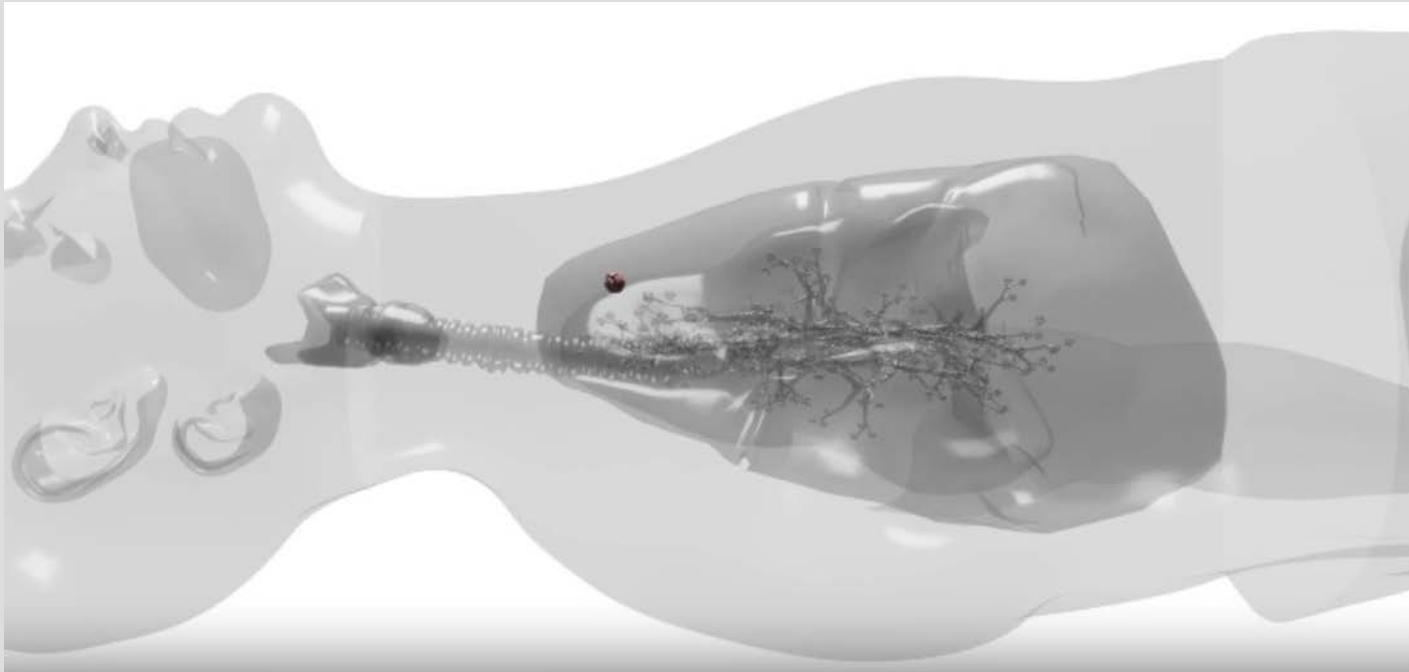
With Cartesion Prime SP's digital PET and AI-assisted technologies, you can confidently diagnose, assess treatment response, and put your patients on the right path for them.

Advance with digital PET

Cartesion Prime SP is designed to deliver excellent image quality with accurate quantification, improve throughput, optimize* dose, and reduce total cost of ownership.

We have made this possible by harnessing the abilities of digital PET to realize high photon detection efficiency, increased sensitivity, timing resolution, and compact packaging.





Data Driven Deviceless Gating*

- Automated motion management for PET
- Hardware set up for Respiratory gated acquisition has been eliminated
- Respiratory motion is calculated from internal motion

Motion-corrected PET images can be used to aid clinicians in detection, localization, evaluation, diagnosis, staging, restaging, and follow-up of disease.

* Optional

The ^{SURE}Count detector

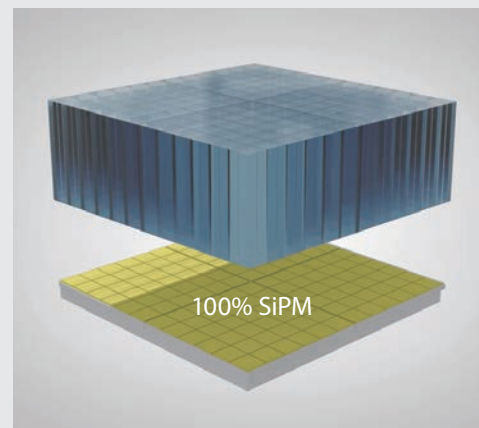
Each of our technologies built into the ^{SURE}Count detector have been designed to help you read images quickly and easily for maximum time and cost savings across the board.

SiPM photosensors

The use of SiPM photosensors has inspired design choices that can impact image quality, scan times, and dose efficiencies; all of which lead to better patient care. Because there are many ways to design a PET detector with SiPM, the ability of a PET detector to maximize its impact goes beyond just including SiPM. ^{SURE}Count, Cartesion Prime SP's digital PET detector, is developed to leverage the potential of SiPM photosensors while taking full advantage of the design of the entire PET detector from coverage to cooling.

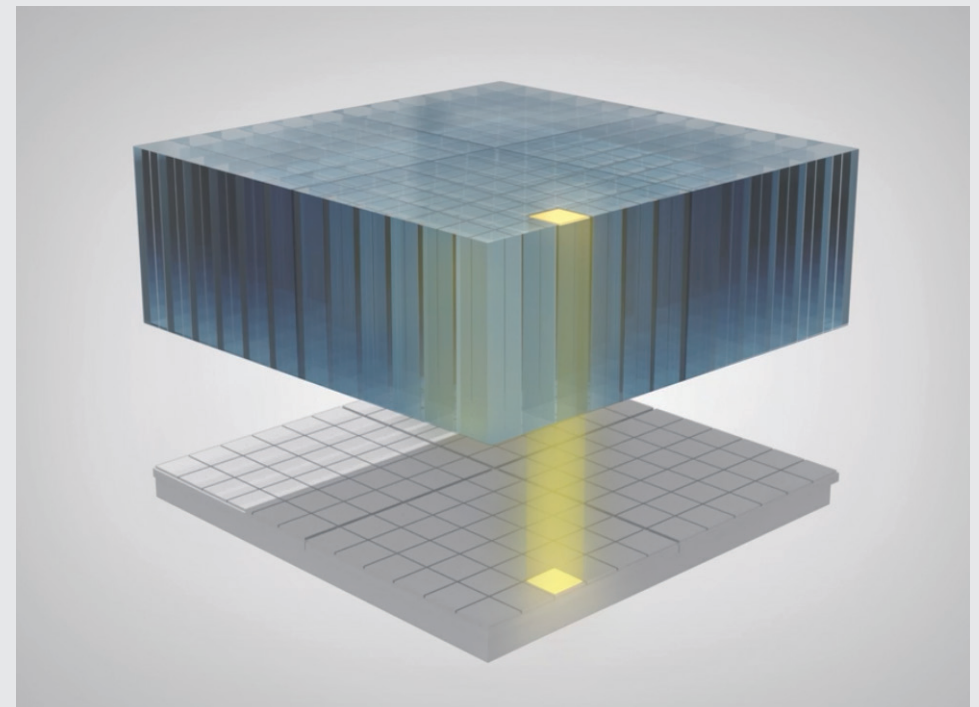
100% coverage

The SiPM covers the entire scintillator area. This ensures high photon-detection efficiency and improves the sensitivity and timing resolution of the scanner.



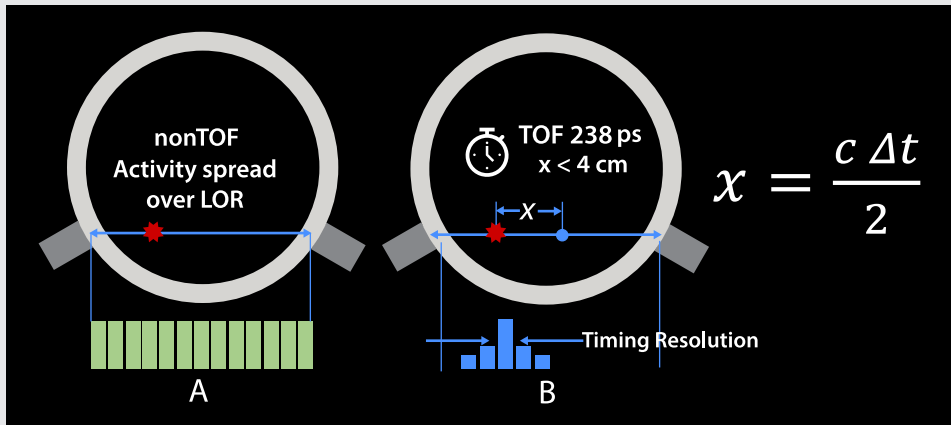
One-to-one coupling

One-to-one coupling is literally giving each individual crystal its own SiPM photosensor. When one-to-one coupling is not utilized, the crystals have to share SiPMs while they are all busy creating the light that will ultimately make a patient image. By giving each crystal its own SiPM photosensor, this design can help the resolution of the final patient image.



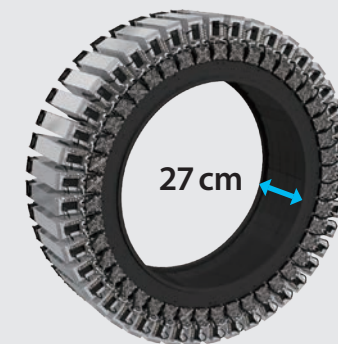
238 ps ToF resolution*

The timing resolution improvements on the Cartesion Prime SP can have a significant impact on image quality, scan time, and dose efficiency. However, just having SiPM does not mean this improvement can be realized to its full potential. With design choices like 100% coverage, one-to-one coupling, and Compton event recovery, Canon Medical has been able to achieve an impressive 238 ps ToF performance*.



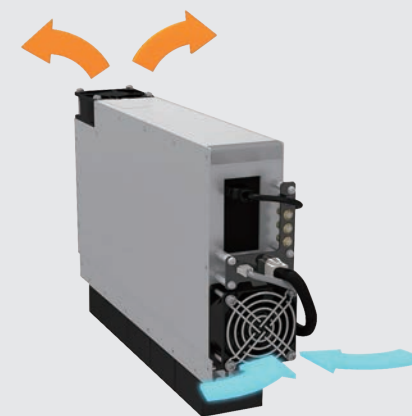
27 cm Axial FOV

Having a very large axial Field of View (FOV) can be used for many performance improvements in PET imaging. With a 27 cm axial FOV, Cartesion Prime SP can deliver on the ability to provide faster scans that translates to a more comfortable experience for patients. The large axial FOV also improves the scanner's sensitivity, which supports dose efficiencies for patients.



Air-cooling technology

Air-cooling is an attractive option for optimizing operational efficiencies by avoiding the costs and complexity associated with water cooling.



* Typical system performance

¹ Based on internal measurements available at time of publication

² Based on competitive literature available at time of publication





Keep patient and operator care on track

By putting both the patient and the operator at the center of every design decision, a better experience can be achieved with faster, more comfortable scans, and a more streamlined workflow.

A patient-centric design

Cartesion Prime SP is designed to address many aspects of the patient experience that focus on comfort during the scan process.

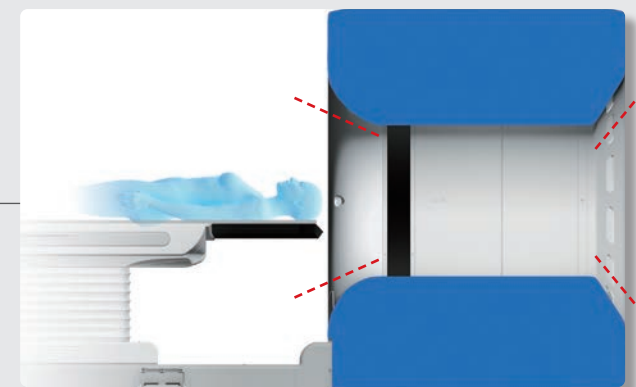
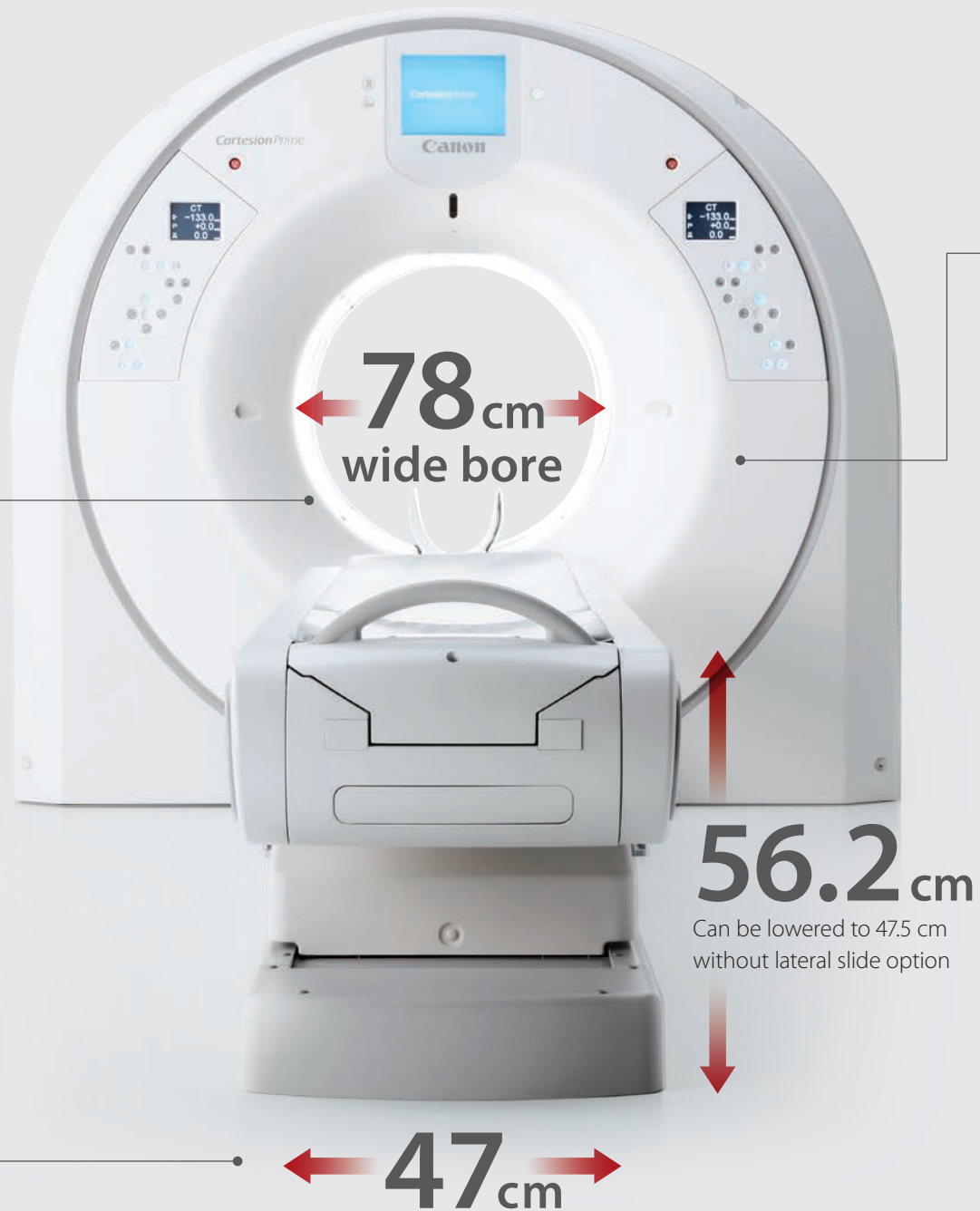
The scanner includes a wide 78 cm bore with a flared-gantry design, as well as a wide patient couch that creates a more open and comfortable environment. With a low minimum scanner bed height, patients will be able to more easily and safely navigate getting on and off the scanner bed when assistance is needed.



Wide bore



Wide couch



Flare gantry design on front and back

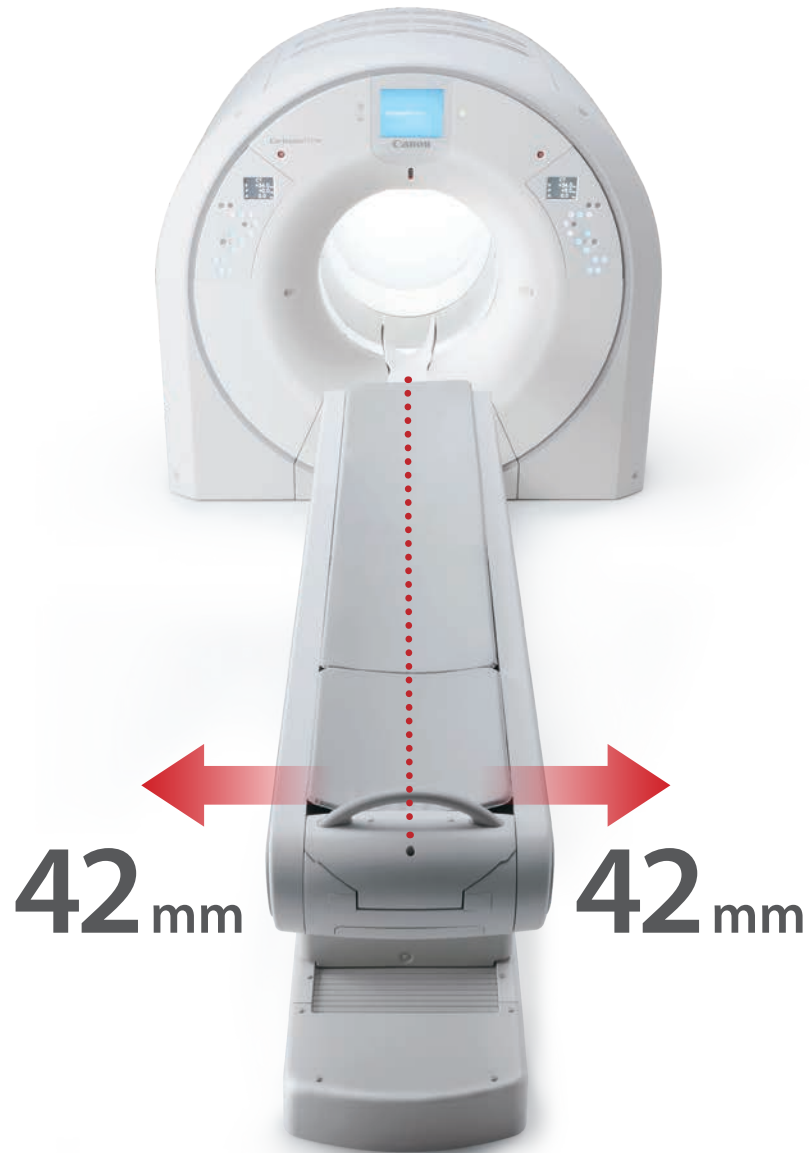


Low minimum height

An operator-centric design

Cumulative radiation risks and throughput issues are among the challenges that operators face when performing imaging procedures. Cartesion Prime SP incorporates a variety of functions based on technologies that were developed for the high-end Aquilion Prime SP CT scanner to significantly help reduce exposure dose to the operator.





The Tech-Assist Lateral Slide* enables faster exams and improved workflow while accurately positioning the patient in iso-center for best image quality and dose modulation. It also helps to reduce exposure dose to the operator as adjustments to the patient's position can be done at the same push of a button.

SUREPosition and Tech-Assist Lateral Slide

Improve the accuracy, safety, and efficiency of your PET-CT scans with innovative technologies that let you remotely position your patients from the console:

- Safer for technologists
- Faster patient setup
- More comfortable for patients
- Accurate iso-center scanning



SUREPosition remotely adjusts the patient to iso-center ensuring best practice in PET-CT accuracy – without the need for repeating the scanogram.

* Option





Guide your business with confidence

With a small, lightweight, air-cooled system that optimizes scan times and streamlines your workflow, you'll have everything you need to boost efficiency across every aspect of your business.

A system tailored to your business needs

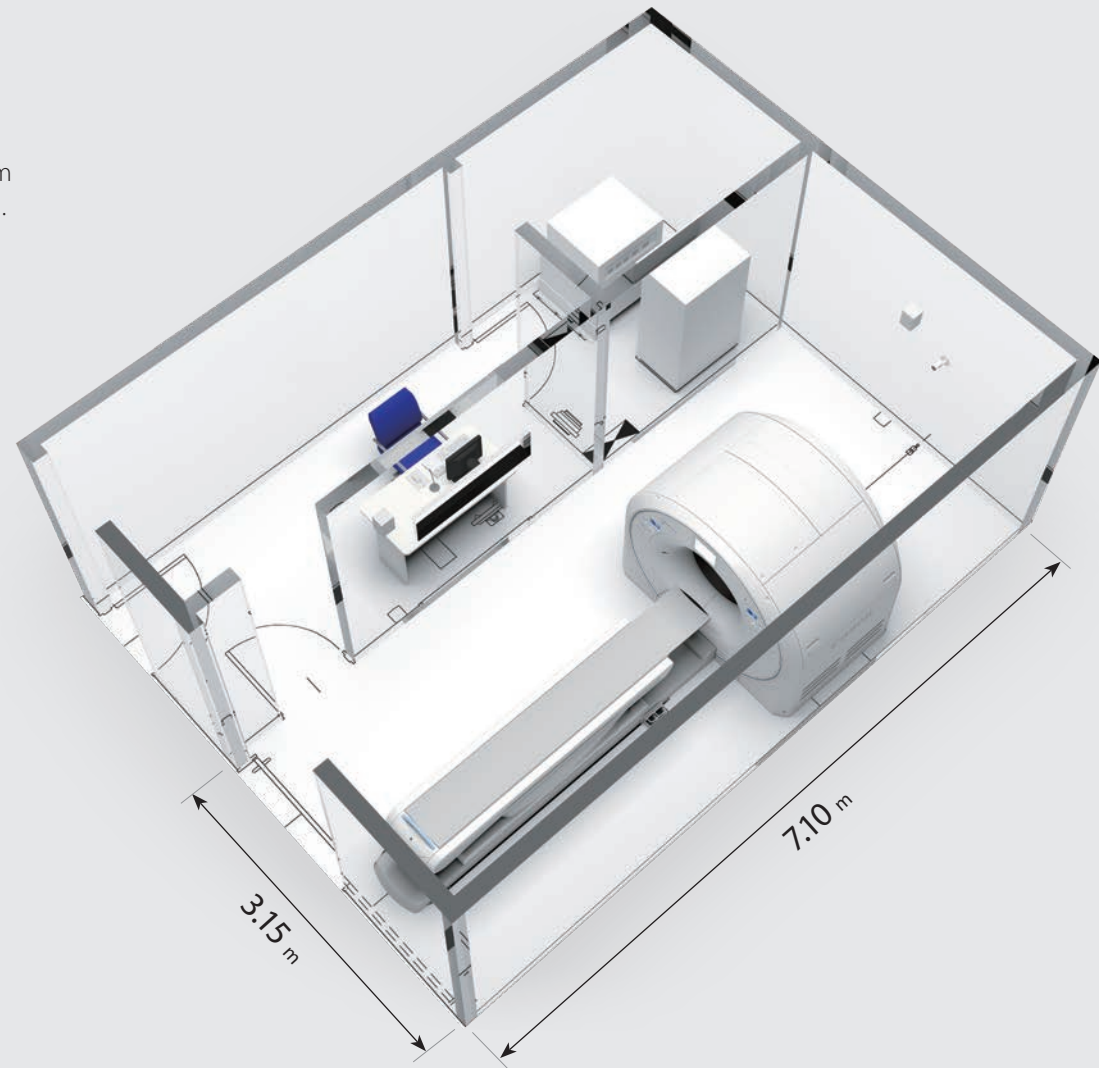
Cartesion Prime SP offers the ability to site a digital PET-CT in smaller rooms and with air-cooling technology. Both of these design choices can help alleviate some of the challenges found with other digital PET designs that require larger spaces and water cooling to run the scanner.

Compact room design

At just 22.4 m², Cartesion Prime SP is a space-efficient digital PET-CT system that fits in a smaller installation space and gives you more room to work in.



Minimum Footprint



Air-cooling technology

Choosing air cooling allows for more opportunities to fit a digital PET-CT into existing spaces. This provides flexibility to manage your investment by not having to support costly room renovations or the added complexity for new construction when water cooling is required.



Save on replacement chiller costs and additional service charges to maintain the chiller over your system's lifetime.

While the chiller cost is included in most systems, it does add additional dollars to the total cost of a PET/CT and may have to be replaced during the life of the scanner.

Chiller
\$75,000*

Additional maintenance costs are associated with chillers to inspect the lines and operation of the unit every year.

Maintenance
\$110,000*

* Data on File. Individual costs associated with purchase, siting, and maintenance will vary by vendor, institution and contractual agreements.

More opportunity with the Aquilion Prime SP CT

Cartesion Prime SP leverages Canon Medical's high-end Aquilion Prime SP CT system to combine advanced technologies in PET with the premium CT features that come standard with every scanner.

From fast patient throughput to robust cardiac scanning and complete diagnostic capabilities, the Aquilion Prime SP is the CT system of choice for all your imaging needs.

Plus, with innovative AI-assisted image reconstruction technologies built in, this powerful PET and CT duo can help you expand your clinical capabilities, enhance your productivity, and better capitalize on your investment.

Our premium Aquilion Prime SP CT features:

- **Advanced intelligent Clear-IQ Engine (AiCE)**

AiCE uses Deep Learning technology to match the spatial resolution and low-noise properties of advanced model-based iterative reconstructions.

- **Advanced hardware**

Get ^{PURE}VISION 0.5 mm × up to 80-row detector and ^{PURE}VISION Optics hardware found on our high-end systems for ultimate performance.

- **Wide bore**

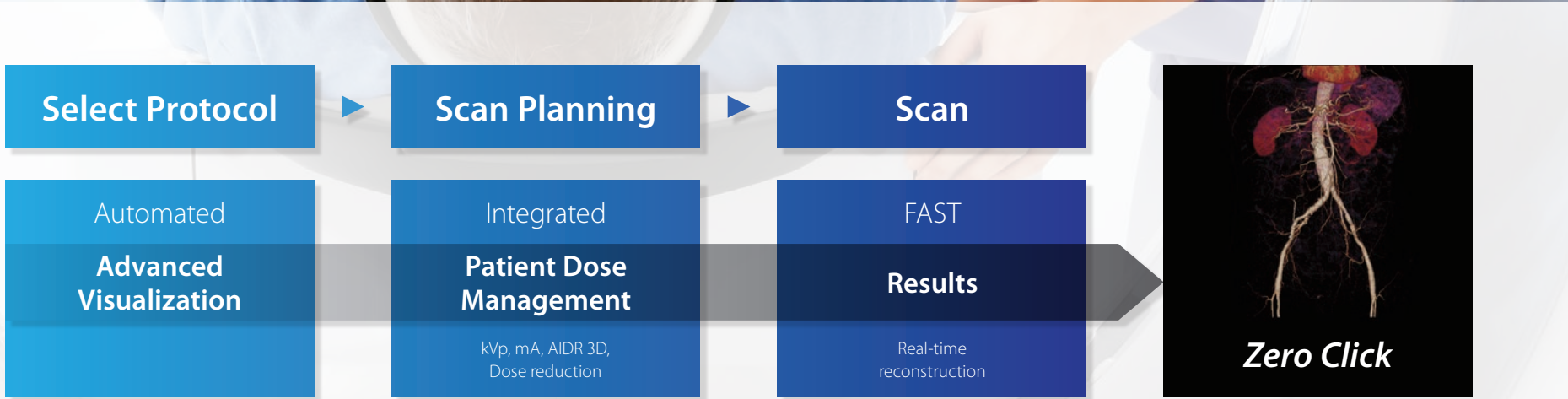
A 78 cm bore offers high levels of patient access and comfort.

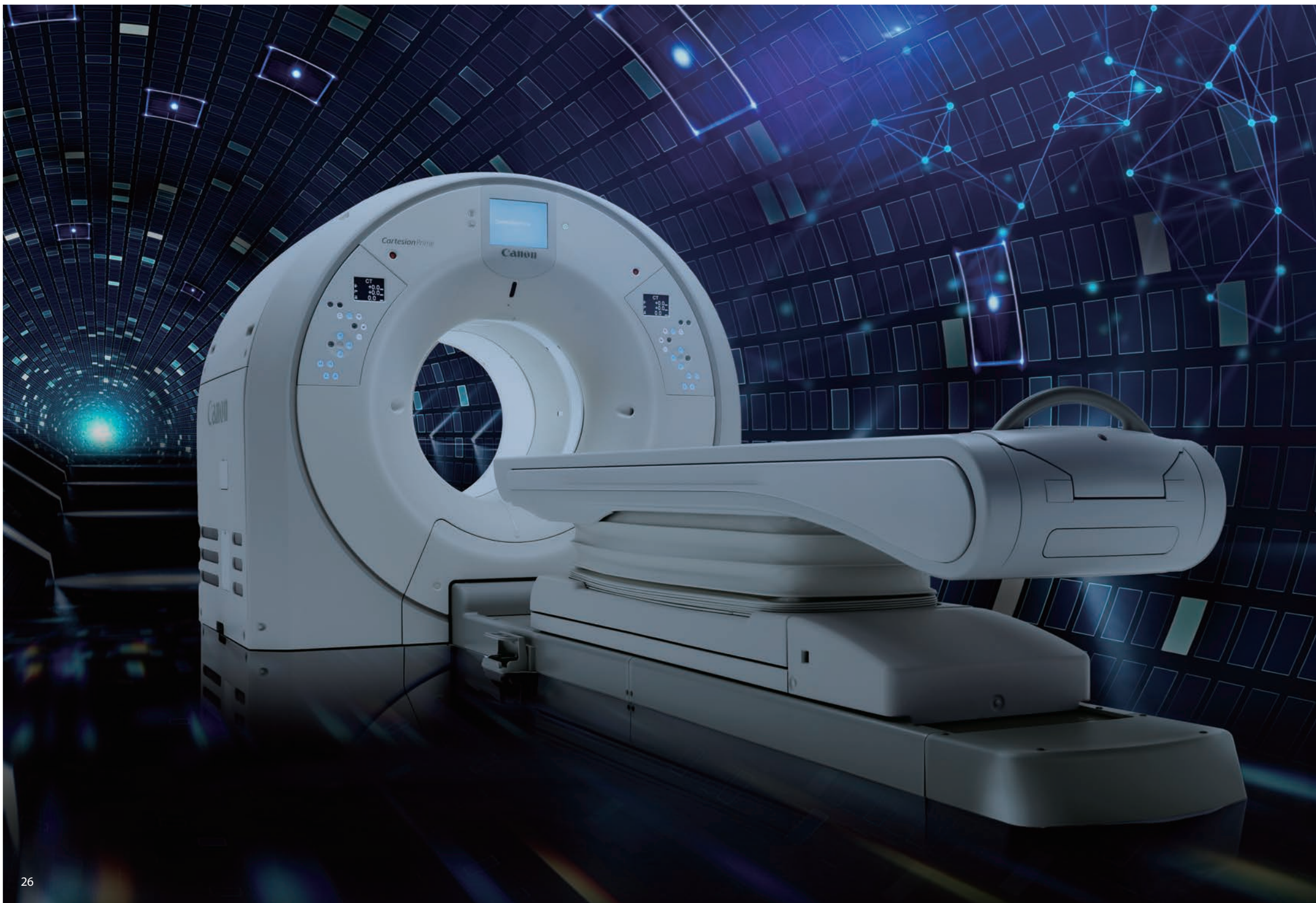
- **Standard features**

Dose reduction, metal artifact reduction, and features to enhance workflow come standard with every system.

- **Advanced optional features**

To support a true dual-use environment, find advanced features like dual energy, iodine mapping, and the ability to support cardiac CT applications.





PET Performance		
Scan	Crystal size	4.1 × 4.1 × 20 mm
	Crystal material	Lutetium-based
	Gantry aperture	78 cm
	Transaxial FOV	70 cm
	Axial FOV	27 cm
	System energy resolution	11.4% (typical)
	ToF timing resolution	238 ps (typical)
Count-rate*2	System sensitivity	> 13 cps/kBq
	Peak NECR	> 200 kcps
Reconstruction	Deep learning reconstruction	AiCE*4,5
	Radial: FWHM @1 cm	< 5.0 mm
	Radial: FWHM @10 cm	< 5.5 mm
	Radial: FWHM @20 cm	< 7.0 mm
	Tangential: FWHM @1 cm	< 5.0 mm
	Tangential: FWHM @10 cm	< 5.5 mm
	Tangential: FWHM @20 cm	< 6.0 mm
	Axial: FWHM @1 cm	< 5.0 mm
Spatial resolution*2 (PSF)	Axial: FWHM @10 cm	< 5.5 mm
	Axial: FWHM @20 cm	< 6.0 mm
	Radial: FWHM @1 cm	1.50 mm
	Radial: FWHM @10 cm	1.80 mm
	Radial: FWHM @20 cm	1.94 mm
	Tangential: FWHM @1 cm	1.32 mm
	Tangential: FWHM @10 cm	1.30 mm
	Tangential: FWHM @20 cm	1.36 mm
Spatial resolution (PSF)	Axial: FWHM @1 cm	1.69 mm
	Axial: FWHM @10 cm	1.95 mm
	Axial: FWHM @20 cm	1.35 mm

CT Performance		
Scan	Gantry aperture	78 cm
	FOV	50 cm (70 cm Ext. FOV*1)
	Rotation speed	0.35 sec
	PUREVISION detector	40 (2.0 cm) or 80 rows*6 (4.0 cm)
	Slice thickness	0.5 mm
	Number of slices	40, 80, up to 160*6 with coneXact
	Tube current modulation	SUREExposure 3D
Dose	X-ray tube maximum output	60 or 72 kW*6
	X-ray tube heat capacity	Effective 144 kW max. equivalent with AIDR 3D)
	Dose reduction functions	AIDR*3 3D Enhanced
	Deep learning reconstruction	AiCE*4,5
Image quality	Dose management	• XR-29 compliant • Dose check (NEMA XR-25) • DICOM SC exposure summary • DICOM SR compliant dose report
	Reconstruction method	• Cone beam • Fan beam • SEMAR (Single Energy Metal Artifact Reduction)
	Image noise (Standard deviation)	< 0.5%
	Spatial resolution@ cut off	21.5 lp/cm (For reference)
Image quality	High-contrast detectability	0.31 mm
	Low-contrast detectability	2 mm @ 0.3% at 15.7 mGy

NOTE:

*1 Not intended for diagnostic purposes for CT exams

*2 Measured according to NEMA Standards Publication NU2-2018

*3 Adaptive Iterative Dose Reduction

*4 Advanced intelligent Clear-IQ Engine (Option)

*5 Option

*6 Depends on system configuration

Disclaimer: Any reference to X-ray exposure is intended as a reference guideline only. The guidelines in this document do not substitute for the judgment of a healthcare provider. Each scan requires medical judgment by the healthcare provider about exposing the patient to ionizing radiation. In clinical practice, the use of the AIDR 3D features may reduce CT patient dose depending on the clinical task, patient size, anatomical location, and clinical practice. A consultation with a radiologist and a physicist should be made to determine the appropriate dose to obtain diagnostic image quality for the particular clinical task.

Due to local regulatory processes, some of the products included in this brochure may not be available in each country. Please contact your sales representative for the most current information.

Cartesion Prime SP



CANON MEDICAL SYSTEMS USA, INC.

<https://us.medical.canon> | 800.421.1968

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Canon Medical Systems Corporation meets the Environmental Management System standard ISO 14001.

Disclaimer: Some features presented in this brochure may not be commercially available on all systems shown or may require the purchase of additional options.

Please contact your local Canon Medical Systems representative for details. The AI technology was trained during the development phase. When implemented into the product, the AI function no longer self-learns.

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