Canon

Celesteion

PURE**ViSION Edition PET/CT**

Patient Comfort Put First.


Celesteion

System features that put patient comfort and safety first.

Oncology patients deserve the highest levels of safety and comfort during scans. Our Celesteion™ PUREViSION Edition PET/CT system delivers.

This innovative shared PET/CT system includes extraordinary features such as a 90 cm wide CT bore and 70 cm true field of view for maximum comfort, access and positioning.

Whether doing PET/CT, CT simulation or diagnostic CT, Celesteion's advanced and cost-effective technology helps allow for ease of use and efficient exams, improving clinicians ability to diagnose and treat oncology patients.

Improved Accuracy and Increased Comfort

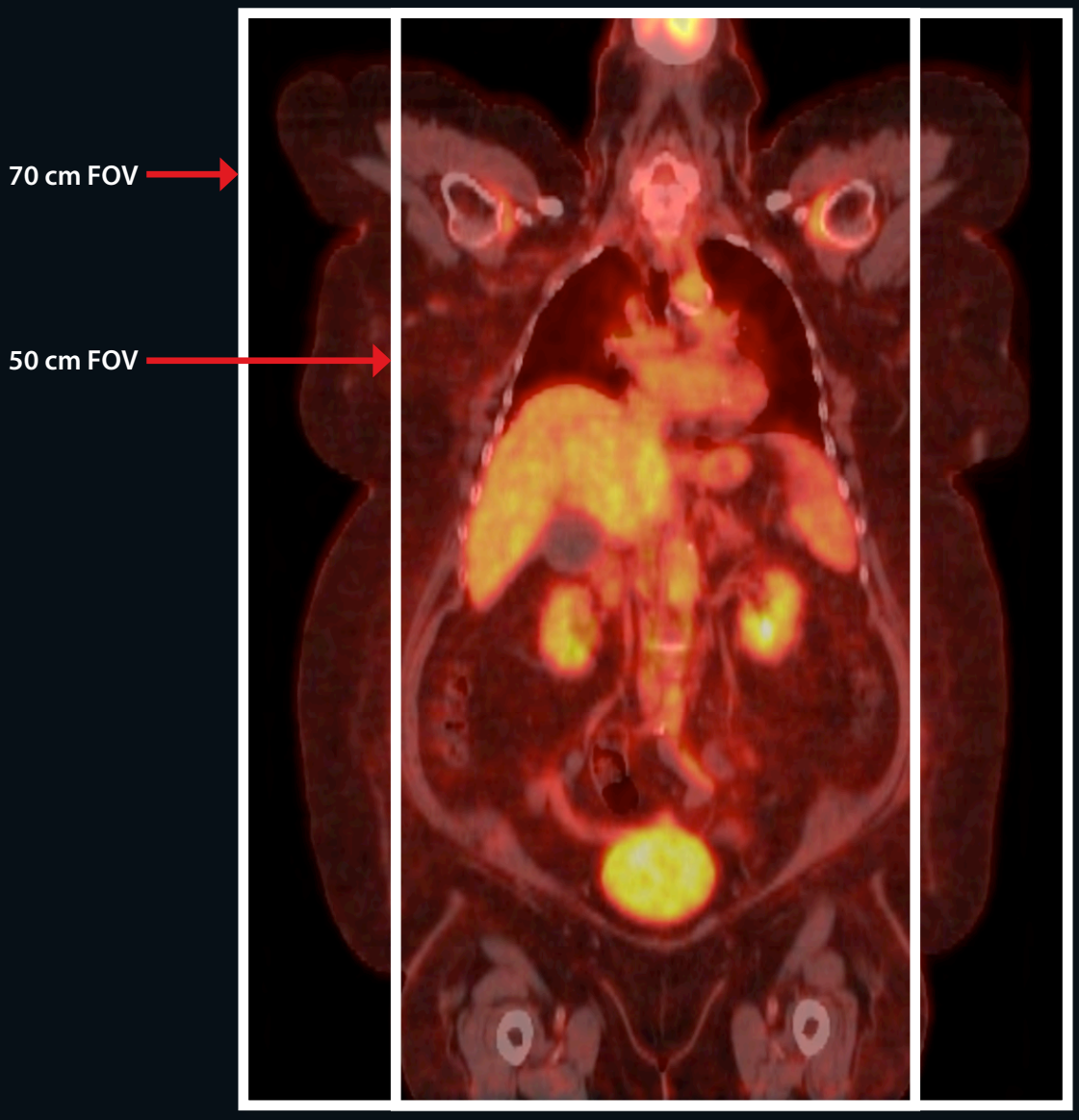
Celesteion's unique patient-centered design delivers an enhanced patient comfort and care, without compromising on quality.

70 cm True Field of View

With oncology patients, accuracy is everything. To meet this need, Celesteion offers a true 70 cm PET and CT field of view (FOV). This allows clinicians to overcome the challenges of a small 50 cm FOV, delivering unique access for better image quality and more accurate treatment plans.

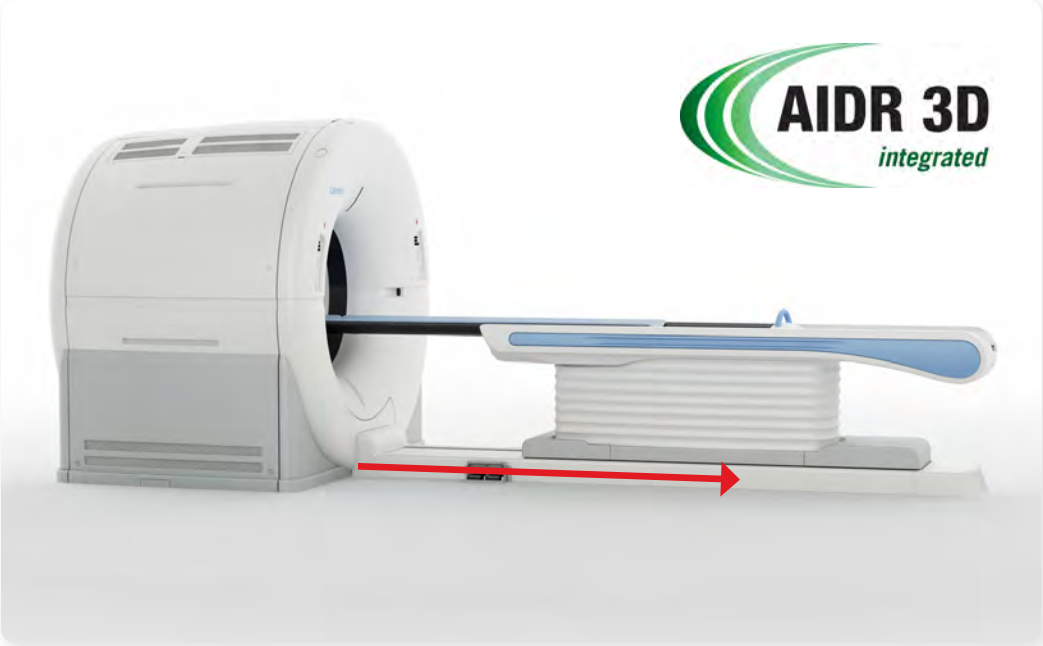
90 cm Wide CT Bore

Celesteion's wide bore is built for maximum patient positioning, comfort and peace of mind. The industry-leading 90 cm CT bore and 88 cm PET bore creates a feeling of openness and allows patients to be positioned for optimal treatment planning and setup. By making patients feel more at ease, clinicians can have more confidence in their images and diagnoses.



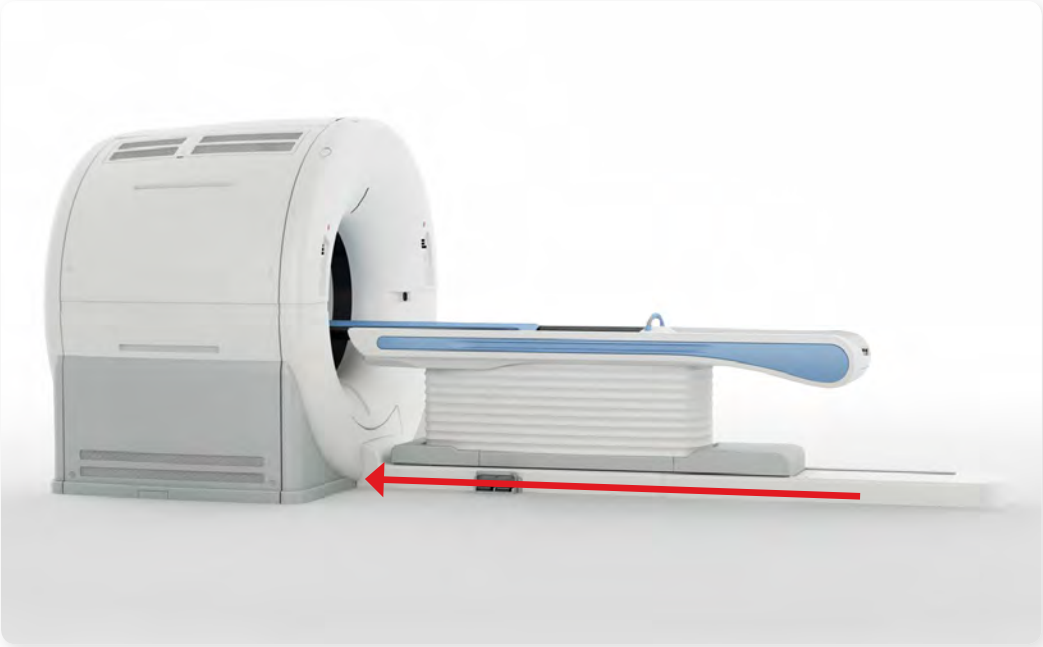
Versatile Couch

Our unique couch design makes it easy and safe to position your patients for a wide range of clinical needs. With the widest couch in the industry, the ability to lower the couch to almost 30 cm from the floor and the unique swift movement from the CT position into the PET position, makes the Celesteion PET/CT a versatile, multi-use scanner.



CT

- 90 cm CT bore
- 70 cm true FOV
- 85 cm EFOV
- 47 cm couch
- 0.5 mm x 16 PUREViSION detector
- 32 slice coneXact™ reconstruction
- 1800 mm scan range
- Adaptive Iterative Dose Reduction (AIDR 3D)
- Single Energy Metal Artifact Reduction (SEMAR™)
- NEMA XR-29 compliant



PET

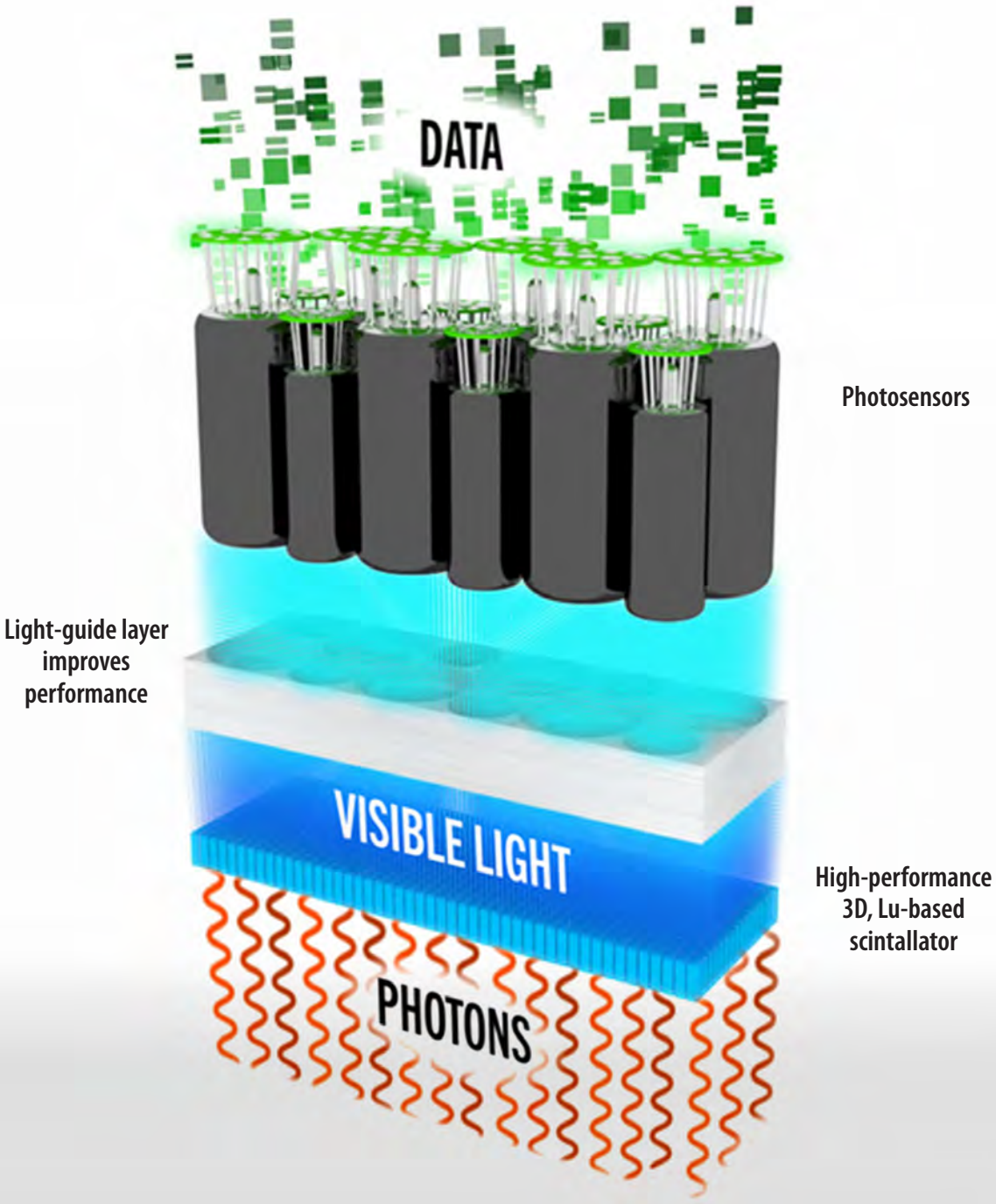
- 88 cm PET bore
- 70 cm FOV
- 196 mm A-FOV
- 1,792 mm scan range
- 394 ps typical Time of Flight (TOF) imaging
- Point Spread Function (PSF)*** reconstruction

***Option

SURE FLiGHT™ PET Detector Technology

Celesteion's PET detector is designed specifically for a large-bore PET, creating the ideal conditions for accuracy. This advanced technology allows for:

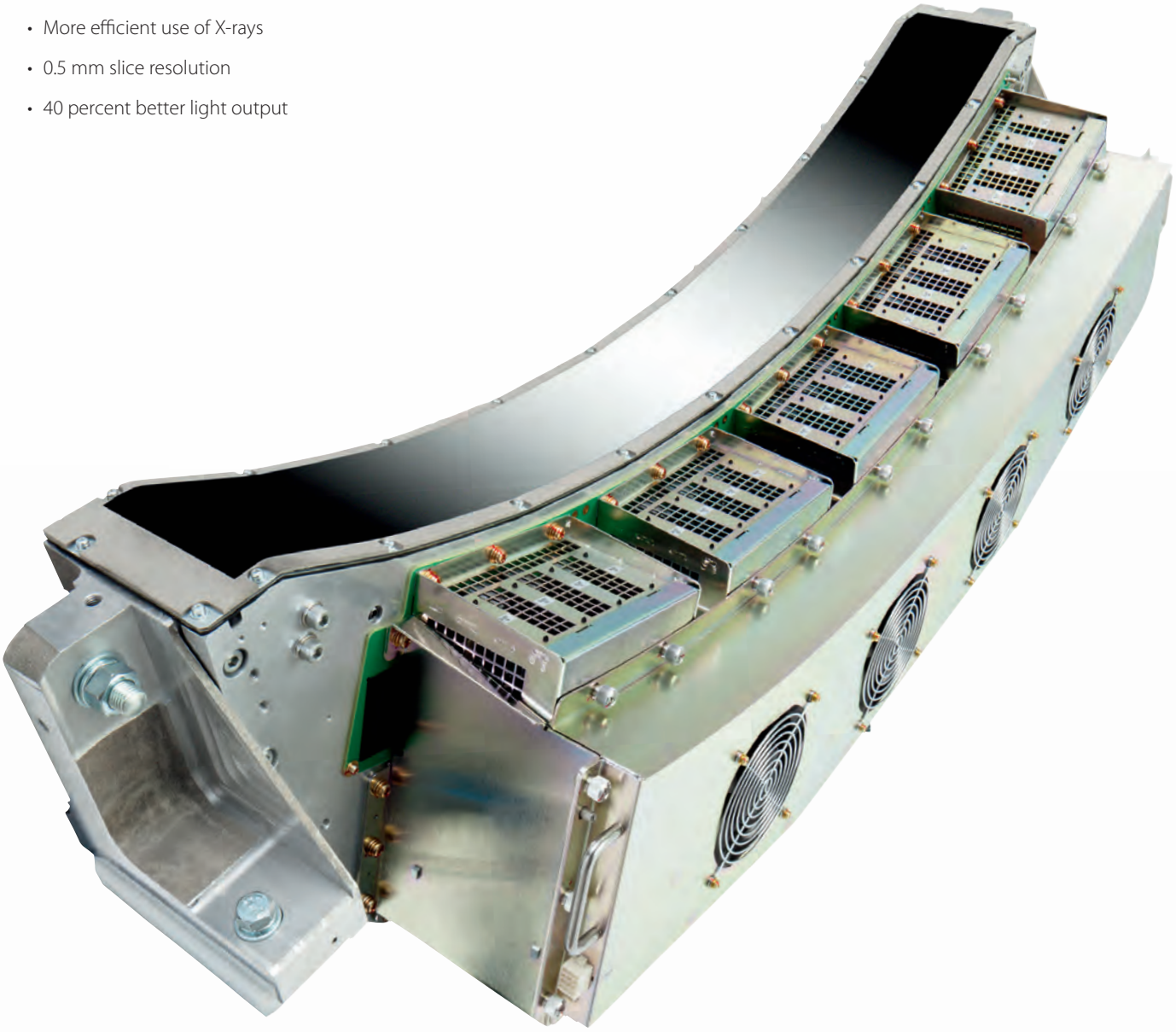
- Optimal use of LU-type scintillator materials
- Unique module and scalable detector design of mixed PMT sizes
- Provides optimal timing performance
- Delivers high count rate performance with optimal scintillator and a unique mixed PMT design



PUREViSION CT Detector Technology

The PUREViSION CT detector is designed to optimize patient care and acquire high-quality CT images. The 16 row 0.5 mm elements balance image quality, speed and patient dose, delivering isotropic images in all planes. Clinicians and patients alike benefit from:

- More efficient use of X-rays
- 0.5 mm slice resolution
- 40 percent better light output



SURE FLiGHT Reconstruction Technology

Celesteion's unique imaging means better outcomes for patients. TOF and PSF create the optimal conditions for accurate and reliable scanning.

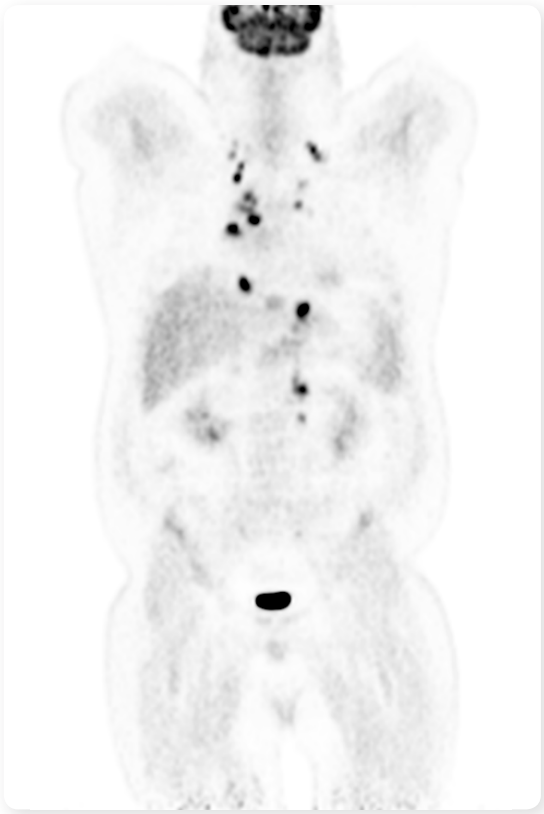
Time of Flight

Our TOF technology delivers 394 ps typical timing resolution, allowing for better visualization of tumors. This is especially useful for large patients, where the IQ deteriorates with non-TOF scanners.

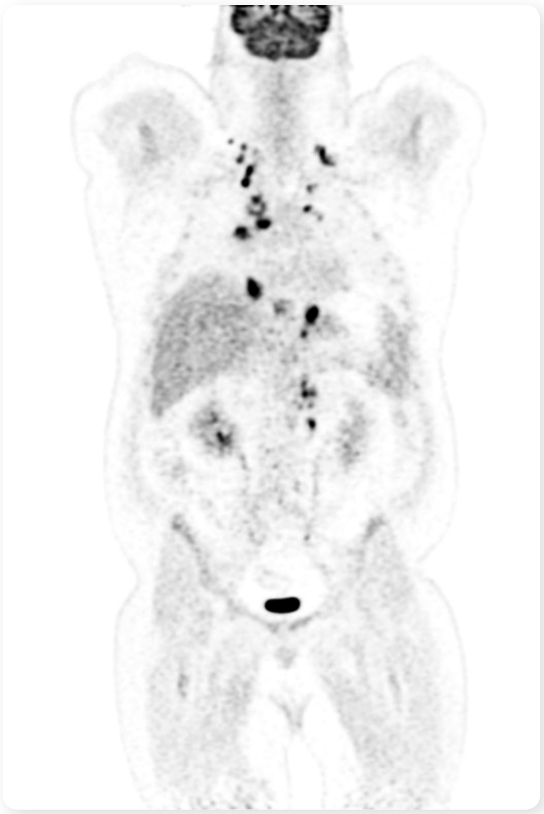
Point Spread Function

PSF reconstruction generates sharper images and higher contrast, allowing better visualization and more accurate quantification of small tumors in routine clinical studies.

Non TOF



TOF



TOF

TOF + PSF***

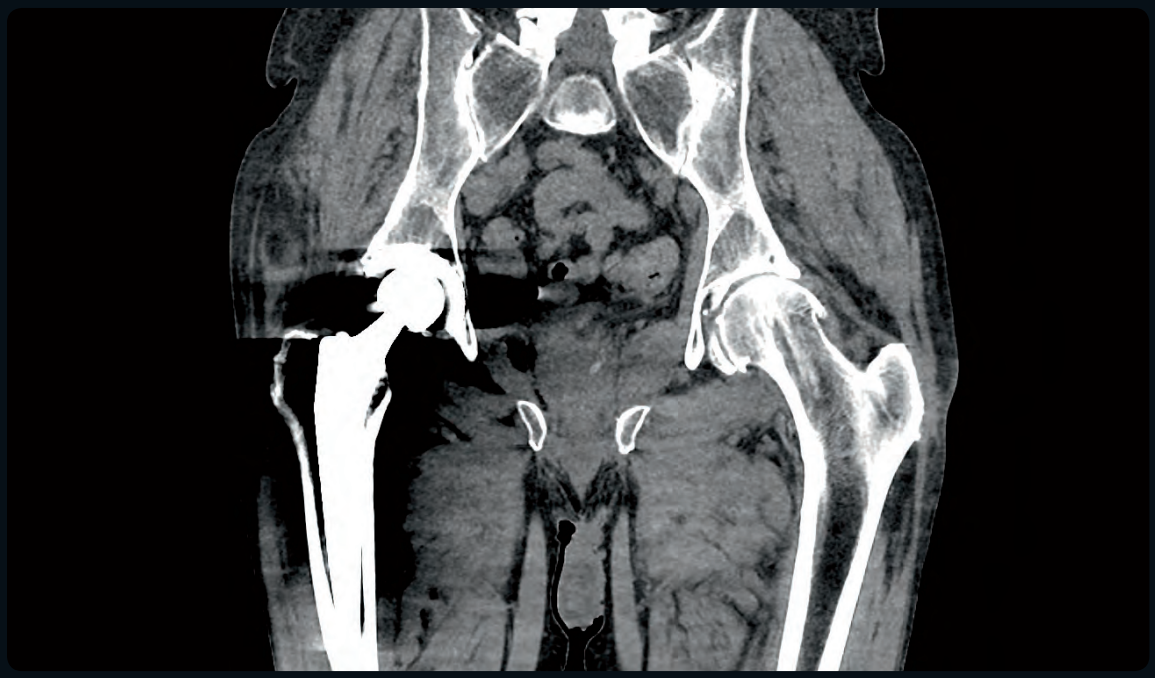
***Option

Better Images, Every Time

SEMAR

SEMAR utilizes a sophisticated reconstruction technique to reduce artifacts caused by metal and improve visualization of the implant, supporting bone and adjacent soft tissues.

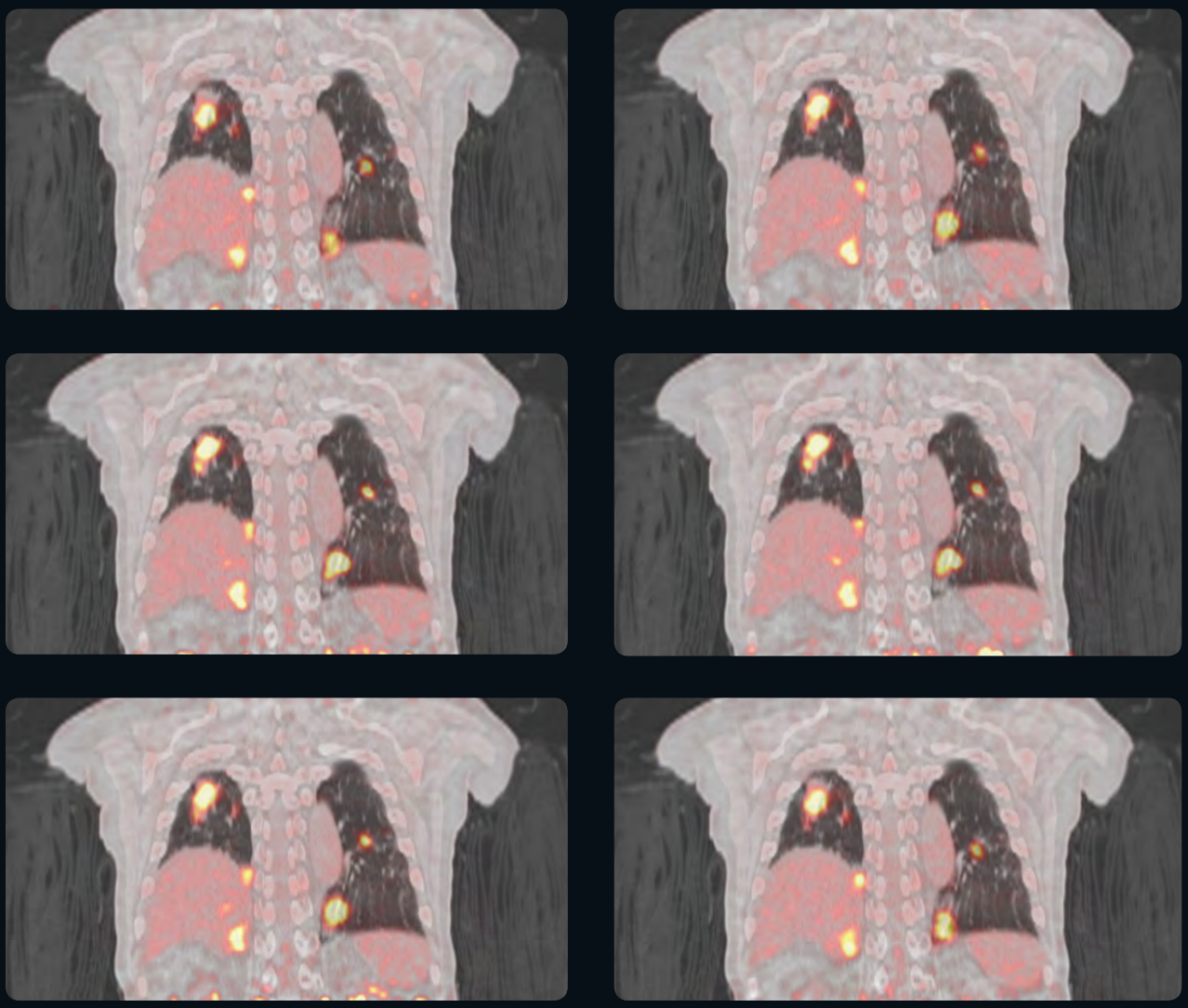
Original



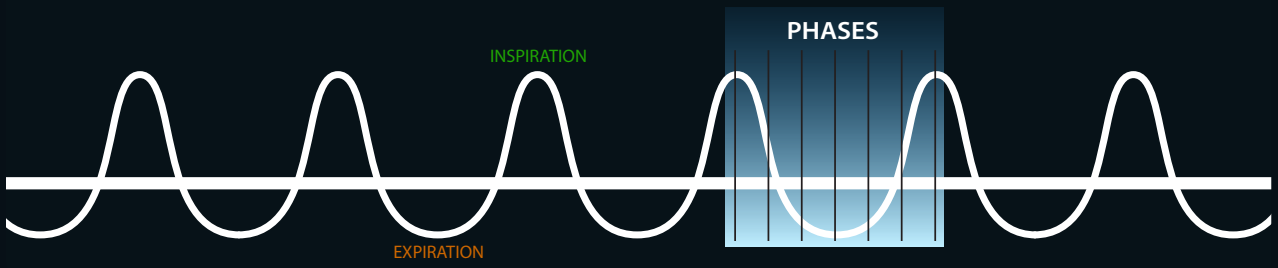
SEMAR

Respiratory Gating***

By synchronizing exposure to the patient's breath, gating creates detailed images for lung cancer patients. With these detailed images, clinicians have the information they need for treatment planning.



Respiratory Waveform

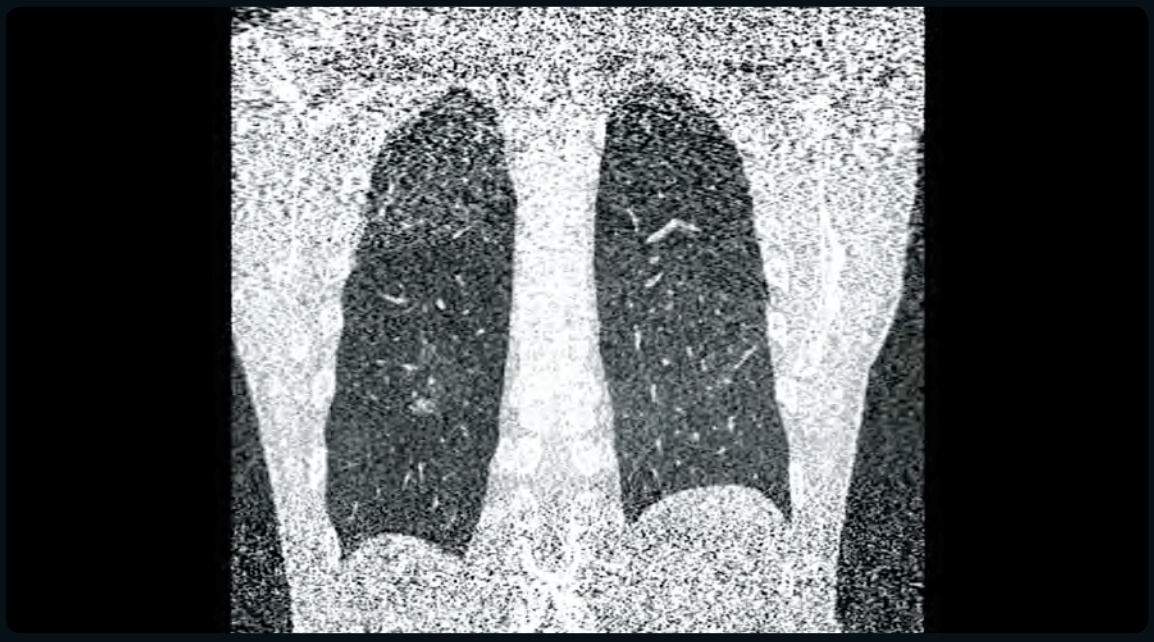


***Option

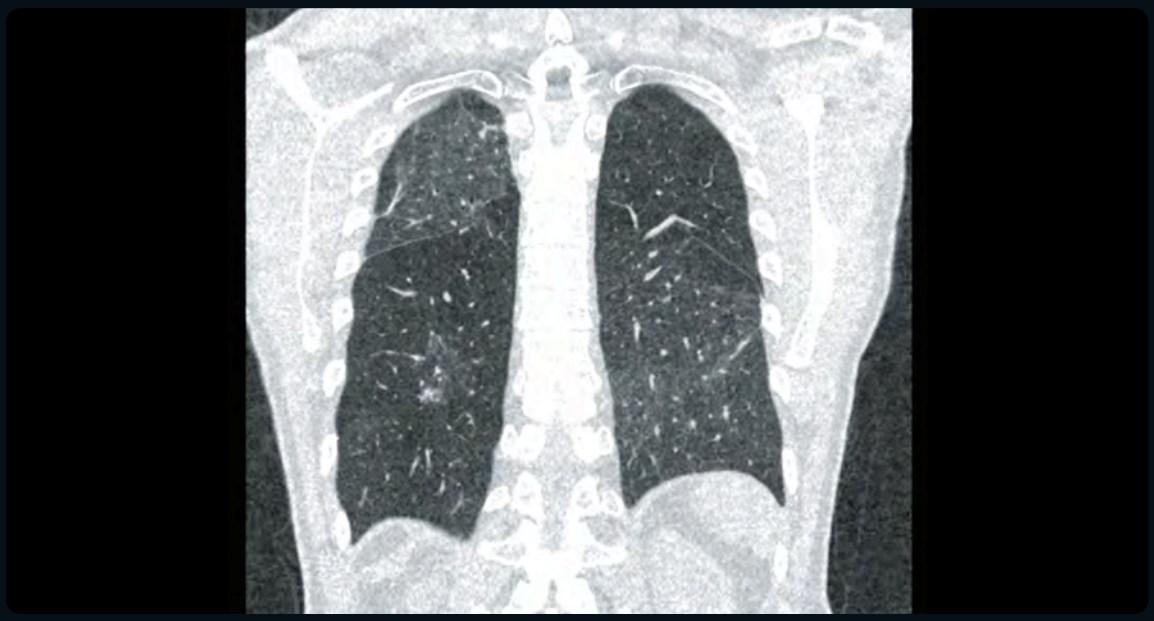
AIDR 3D

Our AIDR 3D is designed to lower radiation and maximize image quality.

Without AIDR 3D

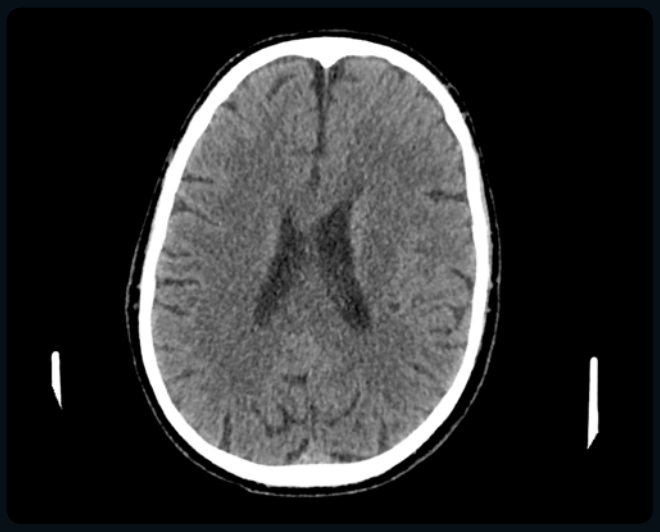


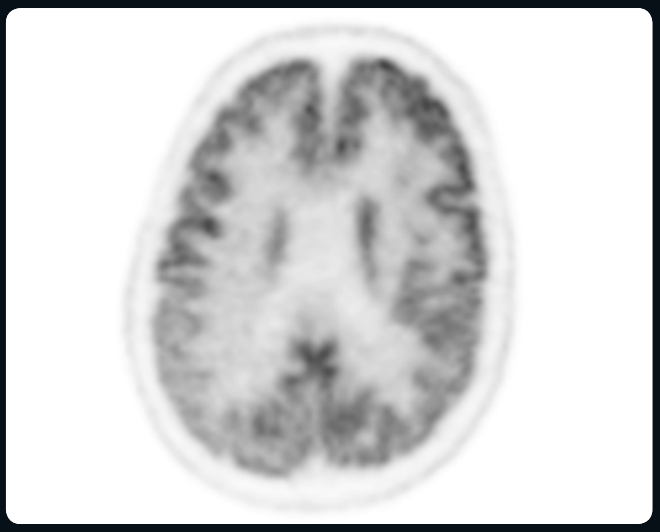
With AIDR 3D

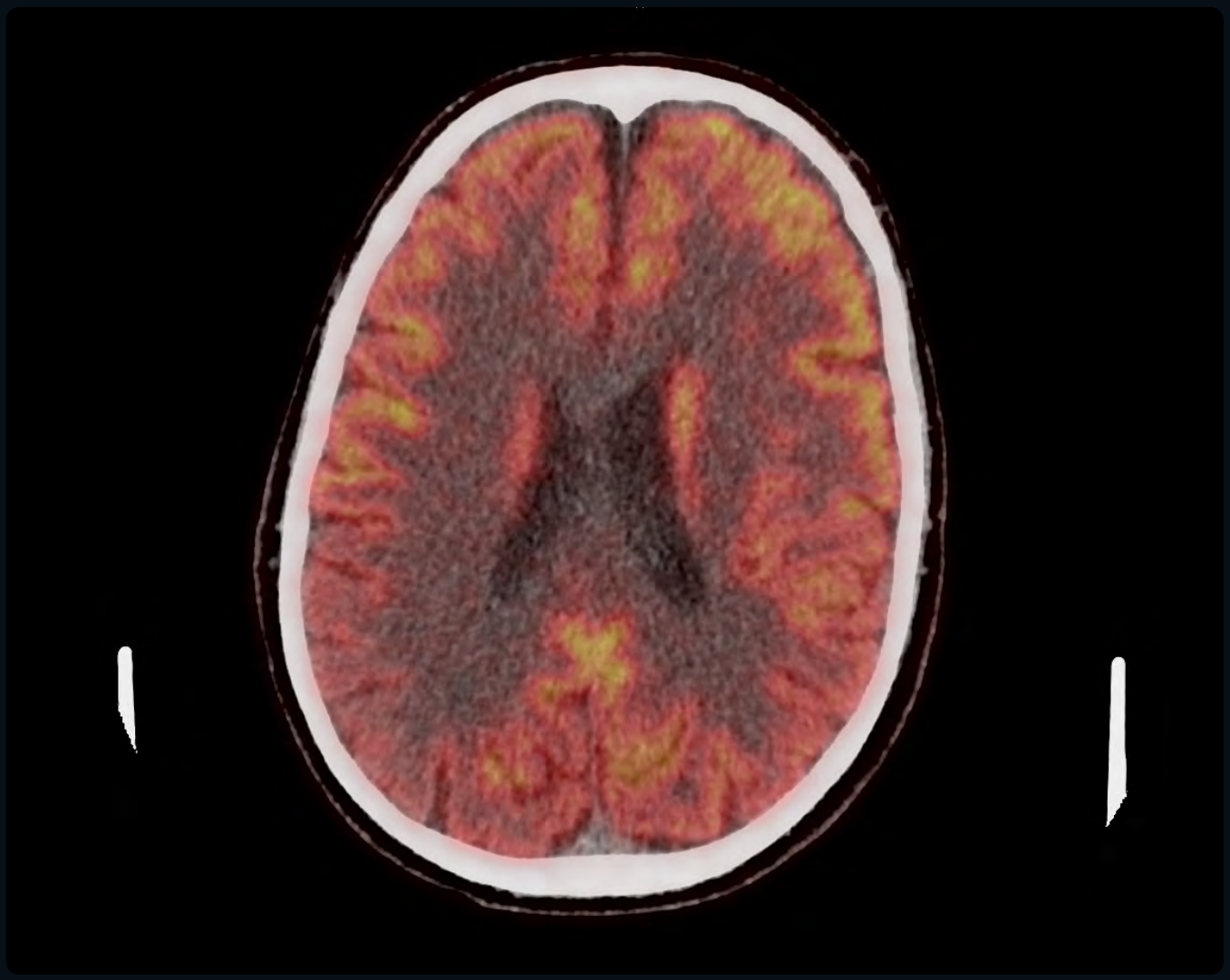


In clinical practice, the use of AIDR 3D may reduce CT patient dose depending on the clinical task, patient size, anatomical location and clinical practice. A consultation with a radiologist and physicist should be made to determine the appropriate dose to obtain diagnostic image quality for the particular clinical task.

^{18}F-FDG Brain Imaging

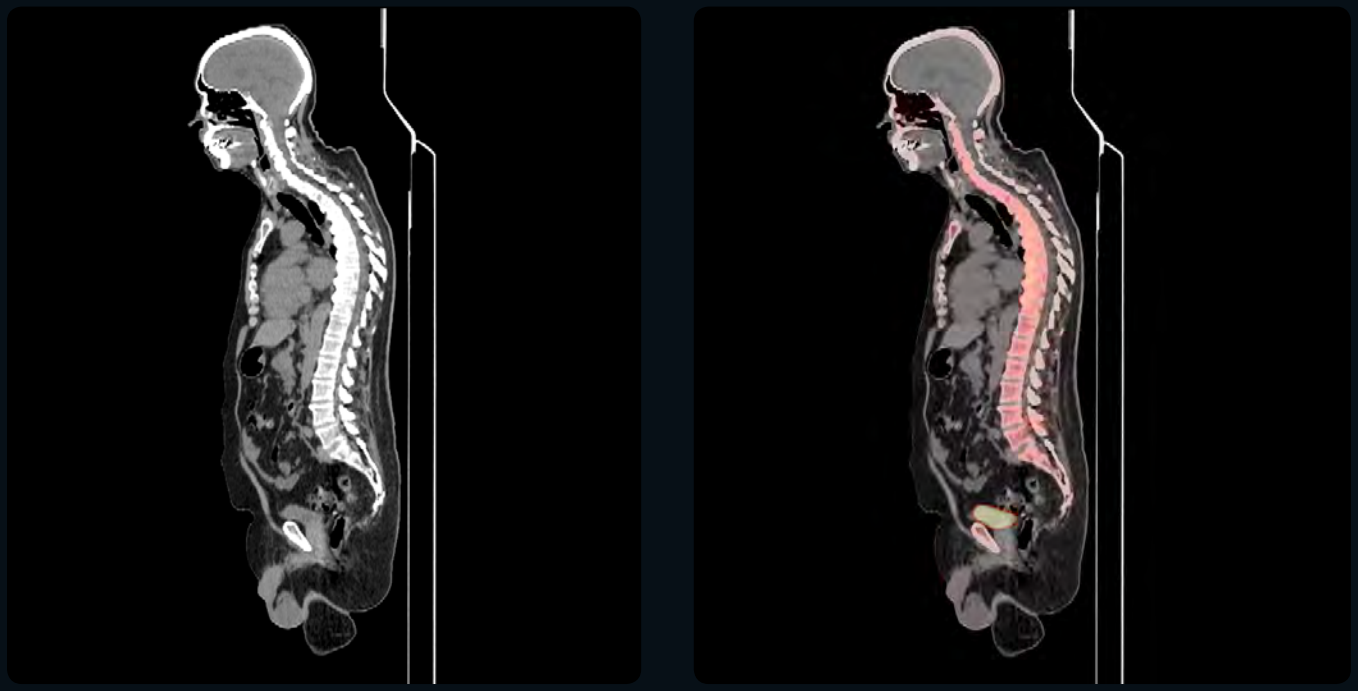






^{18}F-NaF Bone Skeletal Imaging

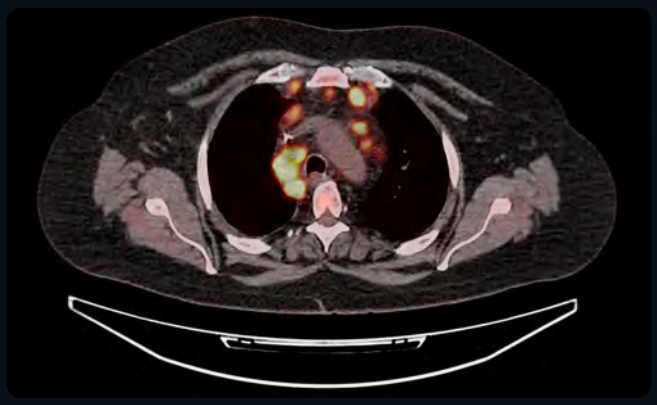
High-BMI with routine dose protocol

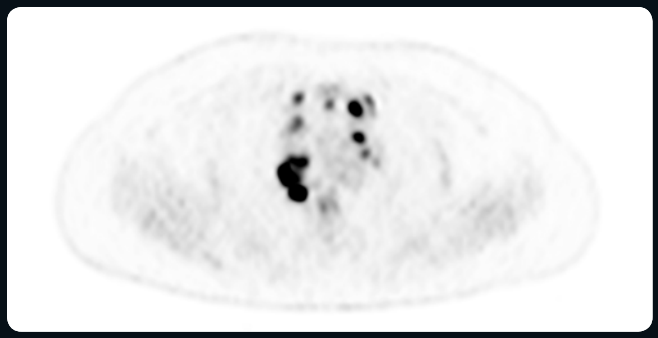


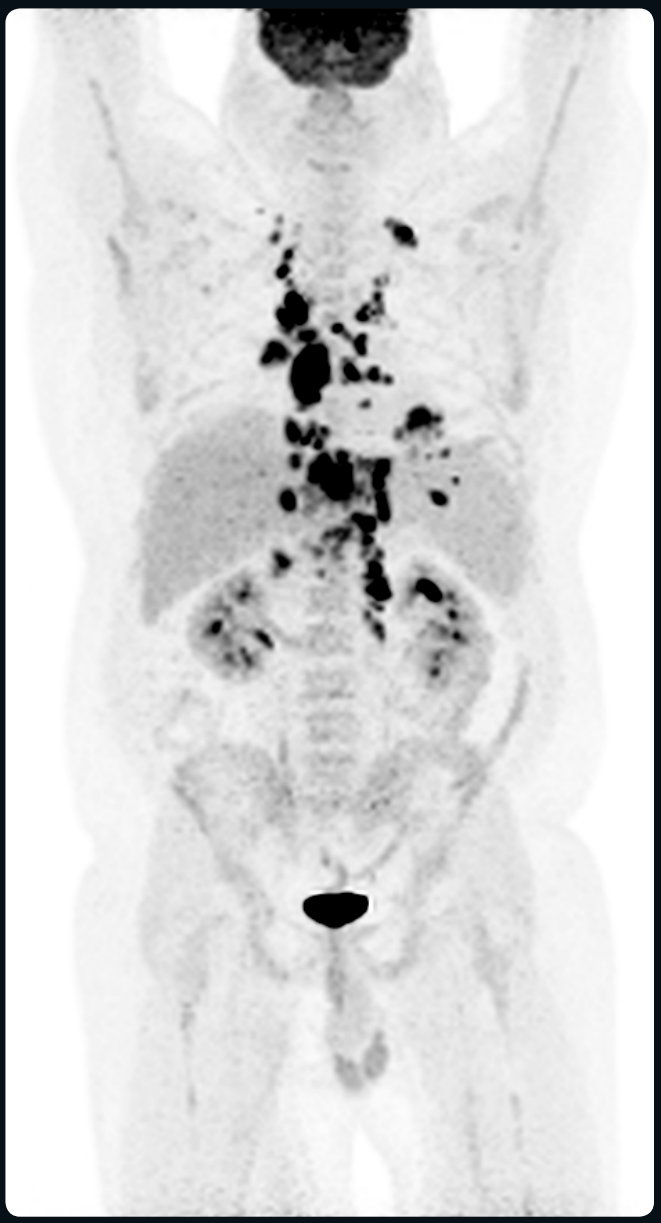
Average-BMI with low dose protocol

^{18}F-FDG Whole-Body Imaging

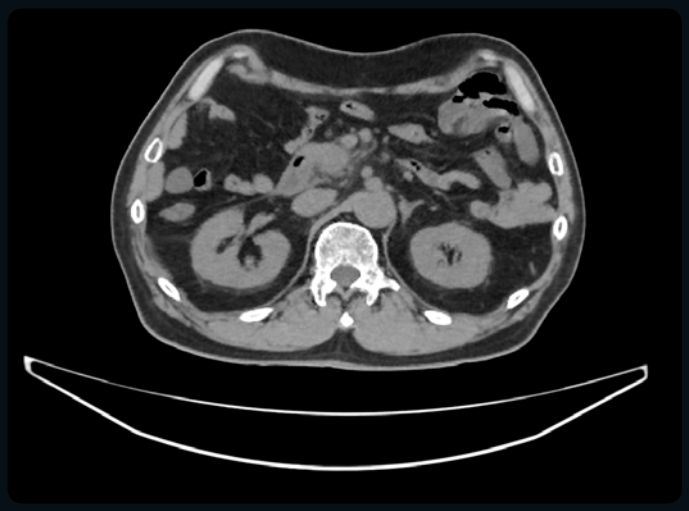
High-BMI with routine dose protocol

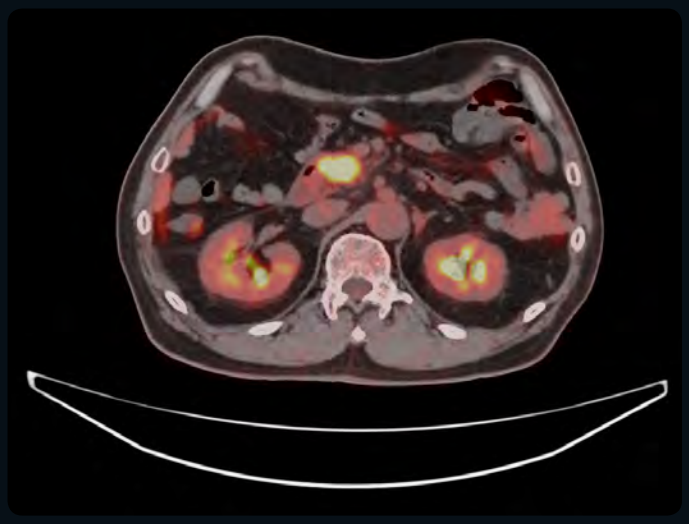






High-BMI with low dose protocol





An innovative shared system that performs both CT and PET scans, Celesteion puts patient comfort and safety first.

With the widest bore in the industry and a unique FOV, this advanced scanner is a cost-effective way to increase ease, efficiency and accuracy for oncology patients.

Celesteion PET/CT Performance Specifications

PET Performance

Scan	**Number of Crystals**	**30720**
	Crystal Size	**4 mm x 4 mm**
	Crystal Material	**Lu-based**
	Gantry Aperture	**88 cm**
	Transaxial FOV	**70 cm**
	Axial FOV	**19.6 cm**
	System Energy Resolution	**11.2% typical**
	TOF Timing Resolution	**394 ps typical**
Count-rate	**Effective System Sensitivity**	**13.5 cps/kBq typical (D=20 cm)* 23.7 cps/kBq typical (D=35 cm)**
	Effective Peak Noise Equivalent Count Rate (NECR)	**≥ 172 kcps (D=20 cm)** ≥ 302 kcps (D=35 cm)**
Spatial Resolution	**NEMA-2012 Resolution FWHM @ 1 cm**	**≤ 5.1 mm**
PSF Reconstruction Spatial Resolution***	**Radial: FWHM@10cm**	**1.98 mm**
	Radial: FWHM@20cm	**1.96 mm**
	Radial: FWHM@30cm	**2.05 mm**
	Tangential: FWHM@10cm	**2.04 mm**
	Tangential: FWHM@20cm	**2.02 mm**
	Tangential: FWHM@30cm	**2.08 mm**
	Axial: FWHM@10cm	**2.01 mm**
	Axial: FWHM@20cm	**1.98 mm**
	Axial: FWHM@30cm	**1.93 mm**

CT Performance

Scan	**Gantry Aperture**	**90 cm**
	Scan FOV	**70 cm (85 cm Ext. FOV)**
	Rotation Rate	**0.5 sec**
	PUREViSION CT Detector	**16-row (3.2 cm)**
	Slice Thickness	**0.5 mm**
	Number of Slices	**32 with coneXact**
	Tube Current Modulation	**SUREExposure™ 3D**
	X-ray Tube Maximum Output	**72 kW**
	X-ray Tube Heat Capacity	**7.5 MHU**
Dose	**Dose Reduction Functions**	**AIDR 3D**
	Dose Management	**• XR-29 Compliant • Dose Check (NEMA XR-25) • DICOM SC Exposure Summary • DICOM SR Compliant Dose Report**
Image Quality	**Reconstruction Method**	**• Cone Beam • Fan Beam • SEMAR (Single Energy Metal Artifact Reduction)**
	Image Noise (Standard Deviation)	**< 0.7%**
	Spatial Resolution @ Cut Off	**18 lp/cm******
	High-Contrast Resolution	**0.35 mm**
	Low-Contrast Detectability	**2 mm @ 0.3% at 14.4 mGy 3 mm @ 0.3% at 7.2 mGy**

NOTE:

* Calculated based on TOF sensitivity gain = $(\text{SNR gain})^2 = D/\Delta x$, D: patient size, Δx: TOF spatial uncertainty.

($\Delta x = c\Delta t/2$, c = speed of light = 3×10^{10} cm/sec, Δt = TOF FWHM = 394 ps = 3.94×10^{-10}sec, Δx = 5.91 cm. NEMA sensitivity = 4.0 cps/kBq ,
For D = 20 cm, $(\text{SNR gain})^2 = 20/5.91 = 3.4$, effective sensitivity = 4.0x3.4 = 13.5 cps/kBq
For D = 35 cm, $(\text{SNR gain})^2 = 35/5.91 = 5.9$, effective sensitivity = 4.0x5.9 = 23.7 cps/kBq)
System energy resolution, TOF timing resolution, effective system sensitivity and PSF reconstruction spatial resolution are all typical values.

**Effective Peak NECR: based on NEMA (non-TOF) Peak NECR and TOF SNR gain calculated above. (NEMA Peak NECR≥51 kcps, effective peak NECR=NEMA peak NECR x (TOF sensitivity gain) ≥ (51x3.4)=172 kcps with D=20 cm and (51x5.9)=302 kcps with D=35 cm)

***Option

**** For reference

WARNING: Any reference to X-ray exposure, intravenous contrast dosage, and other medication 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. Use the As Low As Reasonably Achievable (ALARA) radiation dose principle to balance factors such as the patient's condition, size and age; region to be imaged; and diagnostic task.

Disclaimer: In clinical practice, the use of the AIDR 3D feature 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.

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