Canon

Aquilion ONE

INSIGHT Edition

Advanced imaging simplified.

Insightful solutions to complex problems

Imagine a world in which CT images are higher resolution, with less noise, providing deeper clinical insights for a confident diagnosis.

Imagine technologies that empower you to work smarter and faster, even in the face of unprecedented pressures.

Imagine the clinical benefits that the latest CT innovations can provide with minimal training for your staff.

Canon Medical is proud to offer the solutions to make this a reality with the all-new Aquilion ONE / INSIGHT Edition. Built with our latest Deep Learning Reconstruction technology and INSTINX workflow enhancements, the new scanner both simplifies complicated scans and elevates those that are more routine. With the INSIGHT Edition, we have streamlined the system design and workflow experience to enable fast, safe, and efficient CT exams while keeping the needs of your patients top of mind. The system is easy to operate regardless of level of experience or how specialized the scan.

Advanced imaging simplified

Optimizing workflow with INSTINX*

Now every operation is more intuitive and can be learned faster than ever before. This ease of use contributes to work satisfaction, time savings and flexible allocation of resources. Every detail of the workflow has been thoroughly researched, refined, and tested at our customer sites around the world. Canon Medical introduces INSTINX, a total workflow experience redesigned from the ground up to set new standards in efficiency and consistency.

INSTINX *Instinctive user experience*

* INSTINX is a brand concept developed to highlight the new standards in efficient and consistent workflow made possible with Canon's technology.

powered by **Altivity**

Super resolution with PIQE

Precise IQ Engine (PIQE) is a Deep Learning Reconstruction algorithm that maximizes the inherent resolution of a CT to provide Super Resolution 1024 matrix images for cardiac and body examinations with increased spatial resolution and excellent low contrast detectability.

Hybrid Iterative Reconstruction

PIQE
1024 matrix

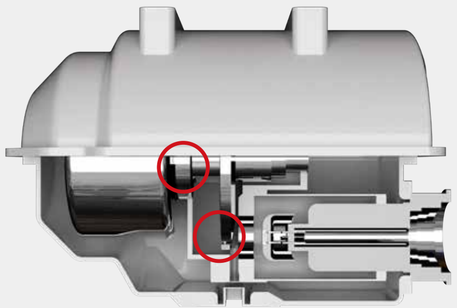
Exceptional scanning with standout solutions

Aquilion ONE / INSIGHT Edition's all-new imaging chain features our new CoolNovus X-ray tube and PUREINSIGHT detector designed for the extreme force generated by ultra-fast 0.24 s gantry rotation speed.

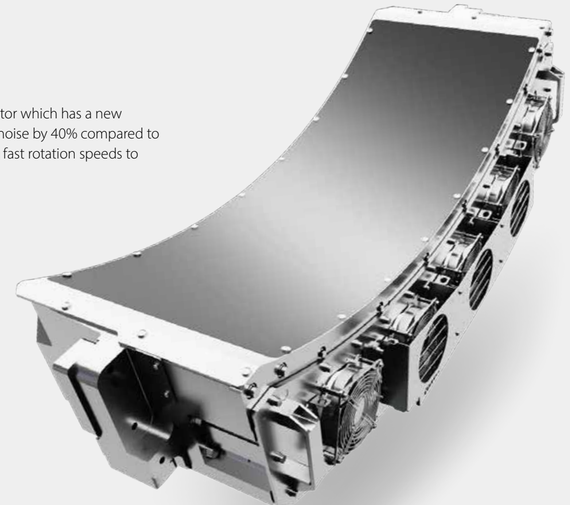
0.24 s

Make one-beat cardiac scanning more robust at high heart rates and perform trauma and pediatric scans faster with 0.24 s rotation speed. Built to withstand the extra g-force created, the new gantry frame reduces vibration during rotation for more accurate imaging.

The Canon CoolNovus X-ray tube is designed for precision operation at 50 g-force with outstanding heat dissipation technology. The liquid metal bearing rotor offers many benefits including reduced friction allowing higher rotation speeds, less wear and longer tube life, rapid heat transfer for faster anode cooling and lower noise and vibration for better image quality. The INSIGHT Edition delivers 70 kV scanning for better contrast visualization in vascular imaging leading to optimization of contrast for the patient. The 1400 mA output provides excellent scans for trauma patients, obese patients and for ultrafast chest scans.



The new PUREINSIGHT detector is our latest generation 320 × 0.5 mm detector which has a new photodiode array and data acquisition system that can reduce electronic noise by 40% compared to conventional scanners. The new housing suppresses displacement during fast rotation speeds to provide more accuracy.



Simplify operations

Keep your focus on your patient with intuitive operation and intelligent automated workflows.

INSTINX - A patient-centric end-to-end CT workflow

Quick patient positioning

Intuitive, AI-assisted operations

Consistent, high-quality results

Quick patient positioning

Position patients quickly with Aquilion ONE / INSIGHT Edition's in-built positioning cameras and lateral slide. The intuitive touch panel operation ensures you can keep your focus on the patient. The flared gantry design and 80 cm bore provide easy access for emergency or interventional examinations, and reduce claustrophobia for patients.

Patient positioning

Easy patient positioning and patient monitoring provided by dual built-in cameras.

Gantry touch screen controls

Touch panels put you in control. In conjunction with the gantry cameras, the touch panel enables one touch patient positioning and displays ECG and scan countdown for operator safety.

Open gantry design with large bore

Easy access from the front or rear of the gantry makes Aquilion ONE / INSIGHT Edition the ideal choice for imaging trauma patients and when performing interventional procedures.

Lateral slide*

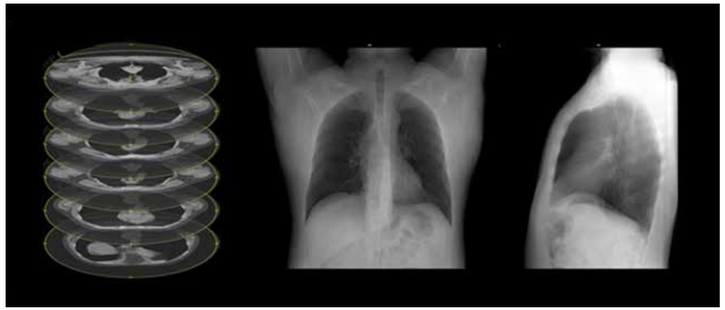
Scanning a large volume of patients throughout the day takes a lot of effort from your team. Let the Aquilion ONE / INSIGHT Edition do the heavy lifting for you with smart technology. The Tech Assist Lateral Slide feature can reduce the risk of injury to patients or technologists by mechanically moving the table left or right ensuring isocenter positioning at the touch of a button.

* Option

Intuitive, AI-assisted operations

3D Landmark Scan

Take the guesswork out of the scan planning with the axial image preview provided by the 3D Landmark Scan, an ultra-low dose helical scan using SilverBeam Filter that replaces traditional 2D scout views at no additional dose.



3D scan planning with axial thin slice and full anterior and lateral projection views

Clinical Benefits

Higher quality

- Confidently verify the scan range and FOV for any case – with axial image preview.

Reduced dose

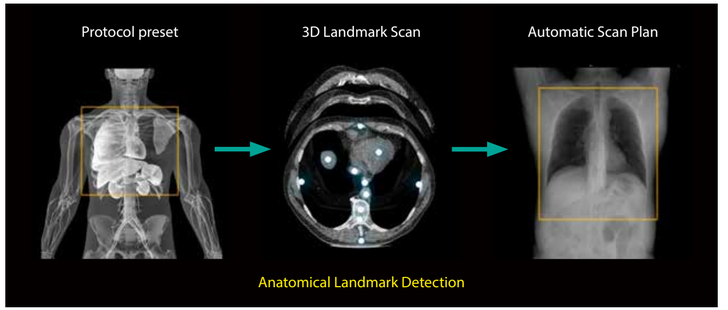
- No need to acquire a test bolus slice – just scroll and select the exact location for ROI trigger placement.

Less time

- Set up interventional procedures directly with the 3D Landmark Scan axial images.

Automatic Scan Planning

Enjoy fully automatic scan planning for all routine exams to save time, reduce workflow steps and ensure consistent results for all patient exams. The scan planning step in INSTINX is performed once within the protocol setup using a human avatar encoded with anatomical start and end positions for all routine exams. These same landmarks are identified in the patient's 3D Landmark Scan data using AI-enabled Anatomical Landmark Detection (ALD) technology to provide highly accurate and fully automatic scan planning.



INSTINX moves the scan planning step into the protocol – and reproduces this exactly for each patient.

40 % reduction
in workflow steps

Consistent, high-quality results

Seamless transition to advanced image analysis

Vitrea Advanced Visualization* seamlessly integrates with Aquilion ONE / INSIGHT Edition, providing powerful post-processing analysis via advanced visualization tools. Vitrea is loaded with a suite of post-processing applications providing advanced image analysis in an easy-to-use, automated design.

Vitrea


Multi Modality Viewer

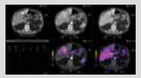

Musculoskeletal

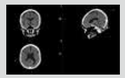

Circle of Wills

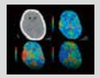

Vascular Aorta


Runoff


Larynx Airway


Subtraction Viewer


Auto MPR Brain


Brain Perfusion 2D with Bayesian


Brain Perfusion 4D


Liver Analysis


Colon Analysis

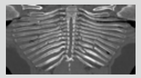

Multi-Chamber Functional Analysis


Fat Measurement


Lung Analysis


Lung Density Auto MPR Brain


Image Denoising


Open Rib


Endovascular Stent Planning


TAVR planning


EP planning


Dental Option


iCAD VeraLook CT Colon CAD


MeVis Visia CT Lung CAD

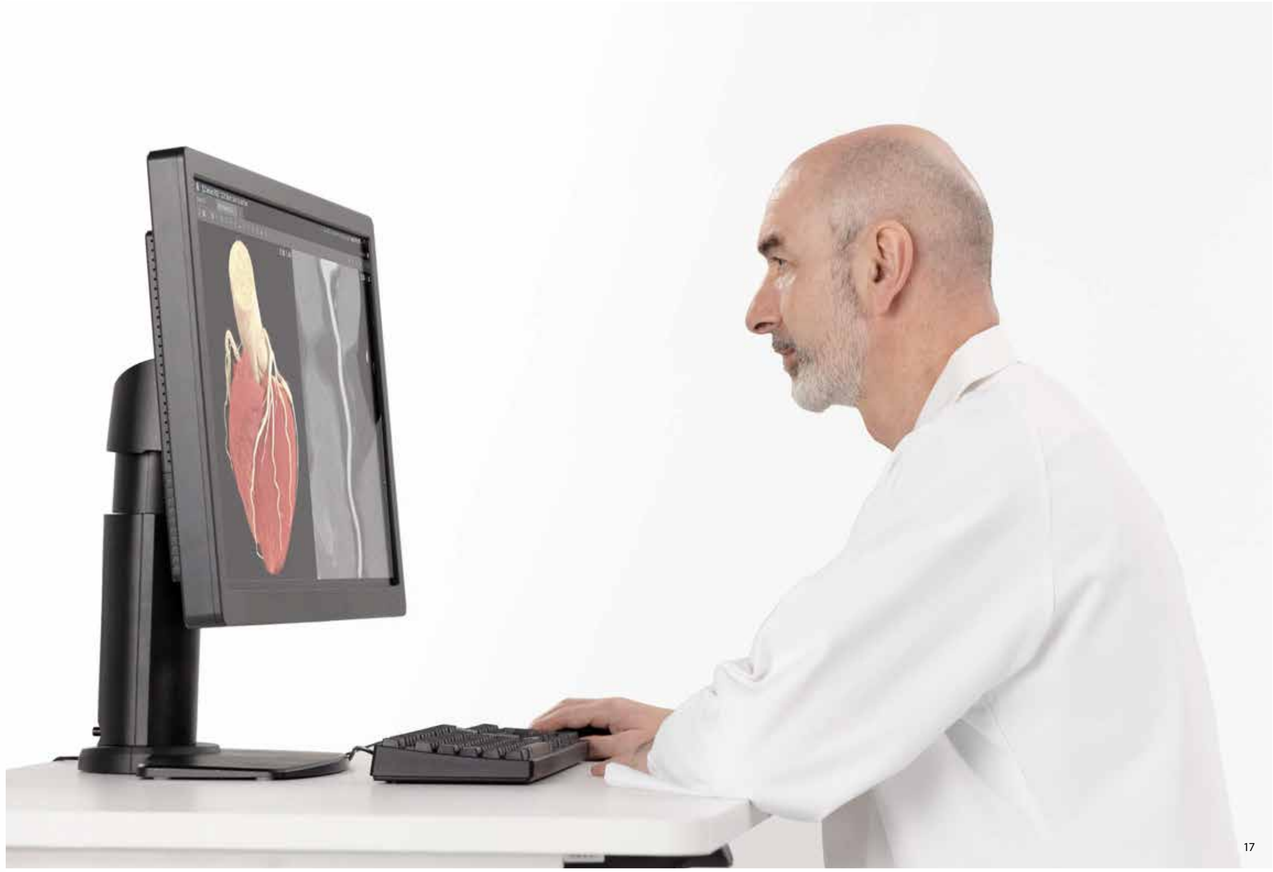

VScore


Cardiac Analysis


Cardiac Functional Analysis


SURE Plaque

* Vitrea is a separate Canon product available for purchase.



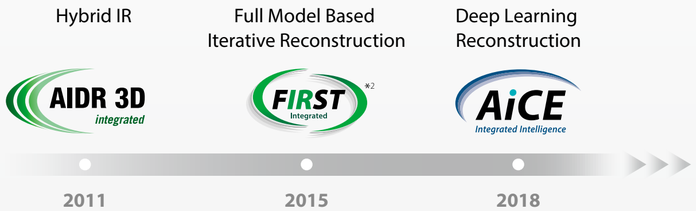
Gain insights

Robust, consistent diagnostic results each time, for every scan, every application, and every operator.

Advanced image reconstruction

Since 2011, Canon Medical has been at the forefront of utilizing novel technologies to improve CT image quality. In 2018, the immense computational power of Deep Learning Neural Networks was first applied to image reconstruction by Canon with the development of Advanced intelligent Clear-IQ Engine (AiCE). AiCE DLR was initially developed for Aquilion Precision, Ultra-High Resolution CT, and then migrated to other systems in Canon's CT portfolio.

AiCE delivers exceptional dose reduction of up to 81%*1 for all routine exams. Deep Learning Neural Networks can also be trained to improve spatial resolution.



*1 Calculated on Aquilion ONE / PRISM Edition
*2 Forward projected model-based Iterative Reconstruction SoluTion

Training Phase in Factory

Using high-quality images AiCE learns to differentiate between signal and noise in low-quality images

Low-quality Input Data

High-quality Input Data

Operational Phase in Clinic

Low-dose Input

High-quality AiCE Output

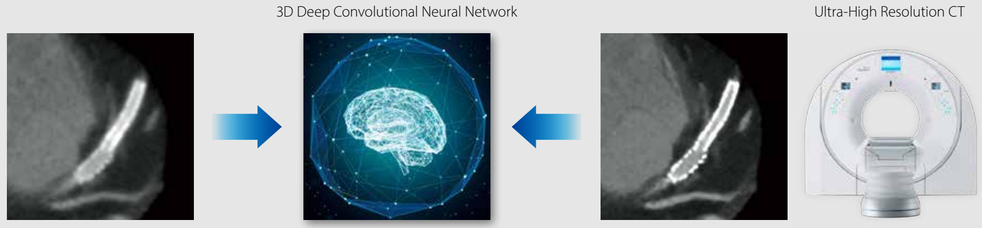
Using the intelligence from the Training Phase, AiCE has the potential to aid in fast and confident clinical results by providing high-quality images

Super resolution insights

PIQE is a Deep Learning Reconstruction algorithm developed by Canon Medical that maximizes the inherent resolution of a CT to provide Super Resolution 1024 matrix images for cardiac and body examinations with increased spatial resolution and excellent low contrast detectability.

The PIQE 1024 matrix images show sharper anatomical detail for better delineation of small anatomical structures, and sharper borders between structures for a more definitive diagnosis. The 1024 matrix allows PIQE images to be enlarged up to four times the size of a 512 image, without a loss of resolution.

Training PIQE – Super Resolution Deep Learning



PIQE is trained to reconstruct UHR-CT 0.25 mm images acquired with the Aquilion Precision from a down-sampled version of the same data at 0.5 mm. This next generation, three-dimensional neural network allows PIQE to maximize the spatial resolution of routine scans and provide a new standard in CT image quality.

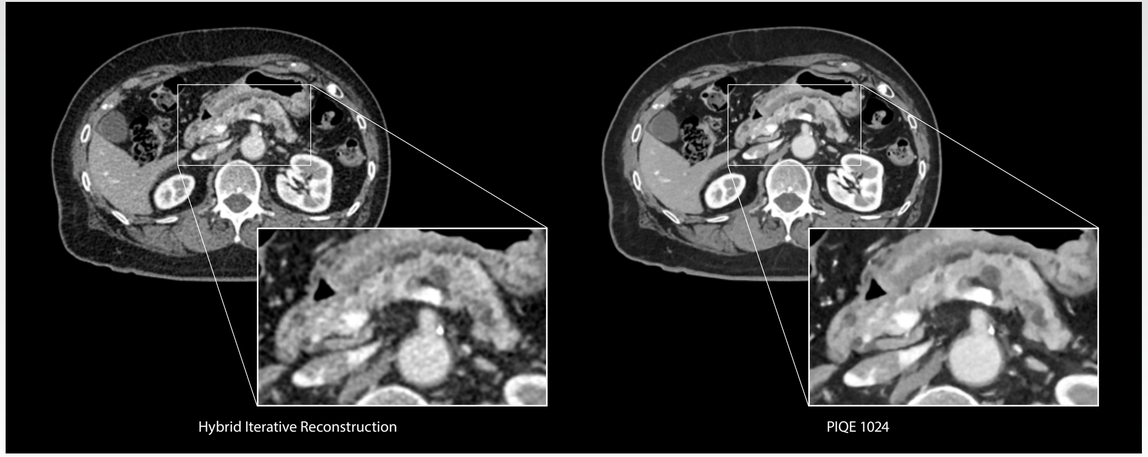
Super resolution insights

Overcome the challenges of visualizing small structures without loss of low contrast resolution or additional radiation dose with PIQE 1024.

PIQE Cardiac delivers sharp cardiac images for better visualization of stents, calcification and plaque.

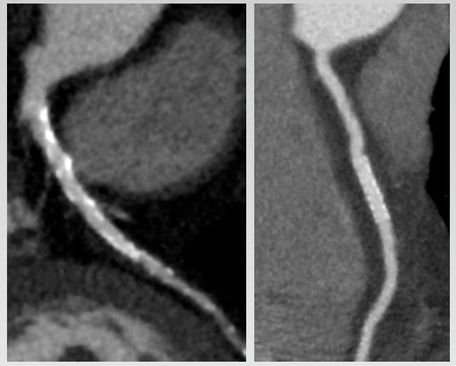
PIQE Body provides sharp borders between lesions seen in the liver or kidneys. Images are sharp with less noise, making diagnosis of cysts easier.

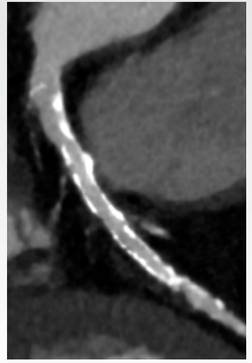
- Sharp anatomical detail
- No additional dose
- Less noise
- Low contrast detectability
- Reduced calcium blooming
- Cardiac isophasic uniformity

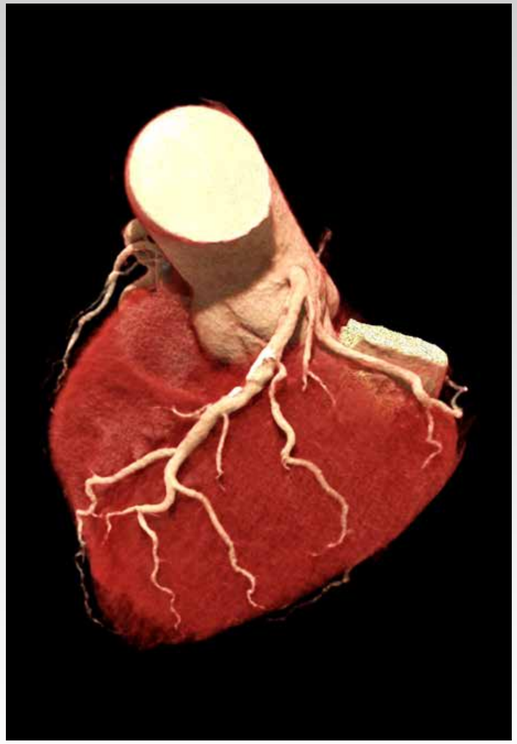


Hybrid Iterative Reconstruction

PIQE 1024







LAD

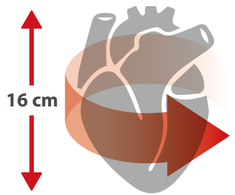
RCA

Global Illumination Rendering

Cardiovascular insights

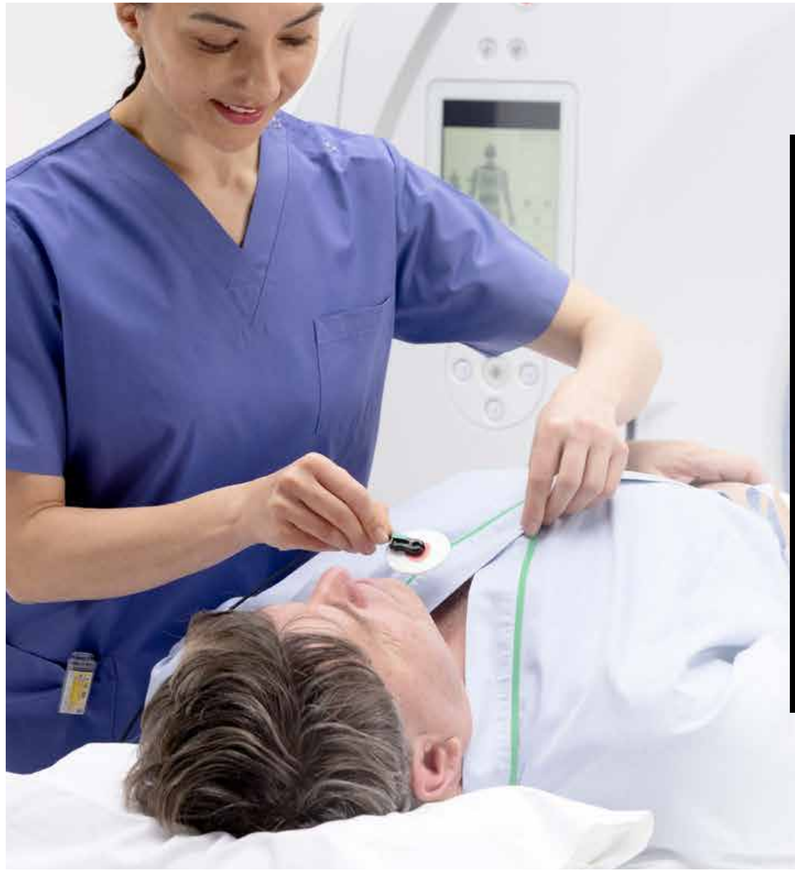
When applied to cardiac examinations, PIQE provides excellent visualization of the vessel lumen in the presence of stents to clearly evaluate neointimal hyperplasia and in-stent restenosis. The low noise properties also provide clear and sharp visualization of calcified and non-calcified plaque within the vessel wall to better characterize any arterial stenosis.

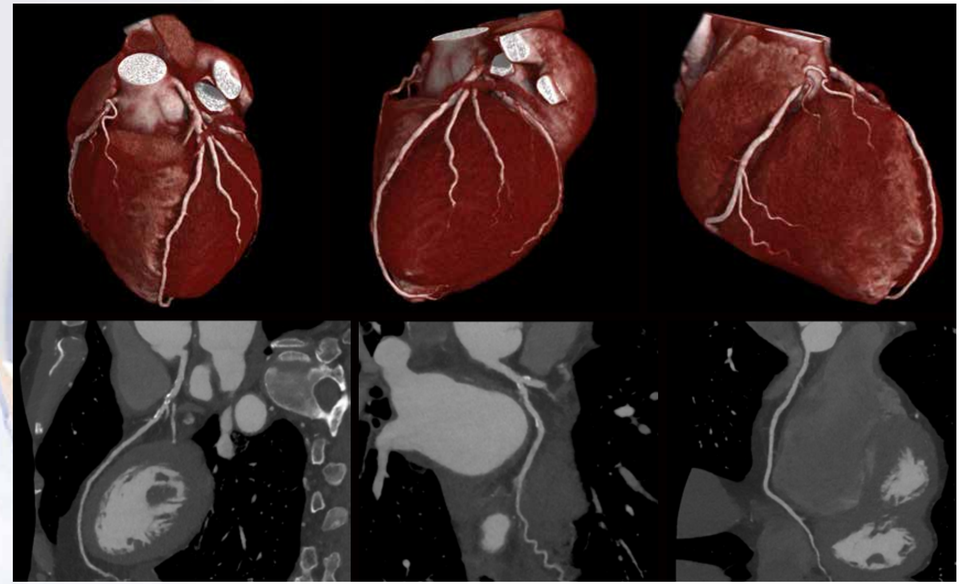
The powerful combination of PIQE with Aquilion ONE / INSIGHT Edition's ONE beat cardiac with ultra-fast 0.24 s rotation speed will deliver high-quality coronary CTA examinations for all your patients.



Example of an unexpected short heartbeat during acquisition. The exposure is aborted and repeated in the next normal heartbeat.

Example: The first beat is arrhythmic, with an unexpectedly short R-R interval. The system can recognize this during scanning in real time and acquires the following beat.





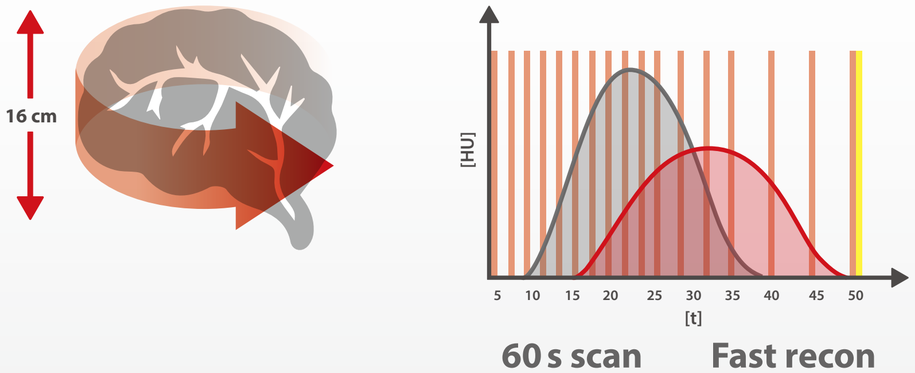
70-year-old man with chest pain. Prospective ECG gated one beat scan reconstructed with PIQE 1024. Effective dose 2.0 mSv

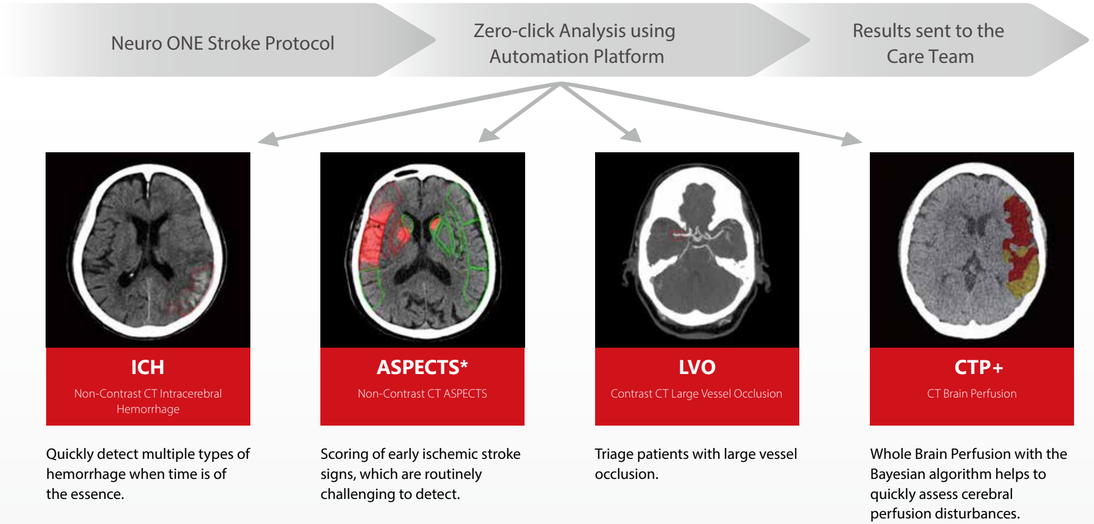
* Option

Acute stroke insights

Aquilion ONE / INSIGHT Edition provides total neurovascular assessment to evaluate the best treatment options available for your patients – in a single dynamic volume scan that takes just one minute to perform. This dynamic volume scan performs multiple single rotation volume scans that cover the entire brain, providing accurate perfusion maps as well as a dynamic 4D DSA series of the intracranial circulation. The Automation Platform provides fully automatic analysis and sends the results to the care team to help physicians make the right choice at the right time for their patients.

The Neuro ONE protocol is the one-stop option for acute stroke imaging. A single one minute dynamic volume scan automatically provides whole brain perfusion and 4D DSA for fast diagnosis and rapid treatment.





Quickly detect multiple types of hemorrhage when time is of the essence.

Scoring of early ischemic stroke signs, which are routinely challenging to detect.

Triage patients with large vessel occlusion.

Whole Brain Perfusion with the Bayesian algorithm helps to quickly assess cerebral perfusion disturbances.

Stroke CT on the Automation Platform* automatically analyzes CT images to fully characterize stroke conditions and provide instant, zero-click results to emergency and stroke teams to aid in clinical evaluation and treatment. Stroke CT integrates a set of four stroke applications to ensure you get the most accurate representation of what's going on with your patient.

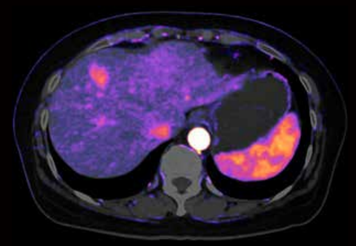
* Automation Platform is a separate Canon product available for purchase separately.

Enhanced oncology insights

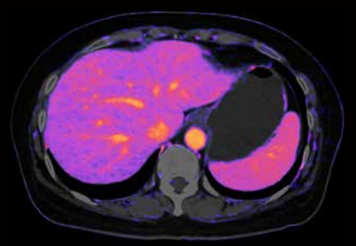
Aquilion ONE / INSIGHT Edition empowers you to detect, stage and track tumors with Iodine Mapping SCT* available for every routine multi-phased exam. Aquilion ONE / INSIGHT Edition's 80 cm aperture, 4D respiratory gated scanning* and powerful advanced imaging applications provide the tools needed from early detection and treatment planning to intervention and treatment response verification.

Iodine Mapping SCT*

Iodine mapping SCT, enhances your diagnostic confidence in daily oncology reporting by automatically creating an iodine map for any single source, single energy, multiphase protocol.



Arterial Phase



Venous Phase

CT Guided Intervention*

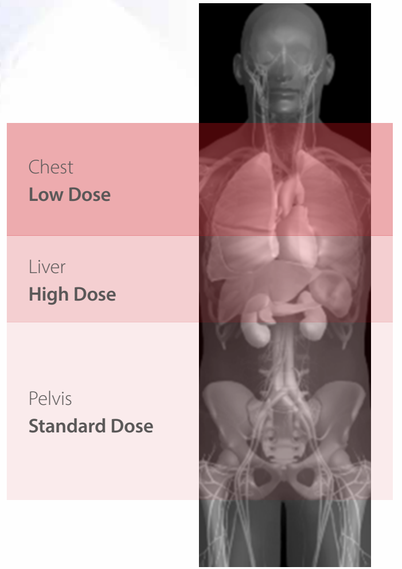
The touch panel provides more control and flexibility to the radiologists with an aim to provide faster, safer procedures.

Extended FOV*

Easy patient access with 80 cm bore and full 80 cm extended FOV reconstruction offers flexible patient positioning for radiotherapy simulation scans.

Dose where you need it
vHP 3 phase* – Optimal Exposure

Chest, Abdomen, Pelvis scan



Variable helical parameters (vHP) allow 3 scans to be performed in one, seamlessly transitioning between scan parameters that are optimized for each body region to ensure high quality images for the lowest dose, important for patients undergoing regular follow up scans.

* Option

Spectral insights

The key challenge to an effective Spectral solution is to acquire exposures at different energies (kV) at the same angle of rotation and the same instance of time. Canon Medical has solved this challenge by utilizing a rapid kV switching method with patient-specific mA modulation in combination with Deep Learning Reconstruction to perform Spectral helical and volume scanning that delivers excellent energy separation and low-noise properties.

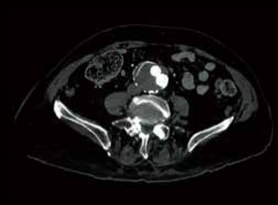
Furthermore, the 16 cm volumetric Spectral scan and 50 cm full FOV allows for whole organ coverage for Spectral acquisition in a single rotation.

Interactive analysis including quantification of Spectral data for a more detailed and confident diagnosis is available with our range of Vitrea applications which can be integrated into most PACS.

"Deep Learning Spectral CTA offers state-of-the-art image quality and improves the conspicuity and characterization of arterial structures."

"DLR helps to deliver homogeneous iodine maps with sharp margins that can be achieved at low keV and also at high keV. Which means that you can achieve relatively good image quality over a wide range of monochromatic levels and material specific images."

Prof. Mickaël Ohana MD, PhD
Nouvel Hôpital Civil,
Strasbourg University Hospital,
Strasbourg, France

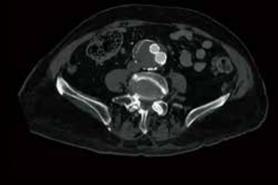


50 keV SEMAR

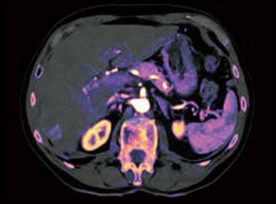
55 keV

70 keV (Body window)

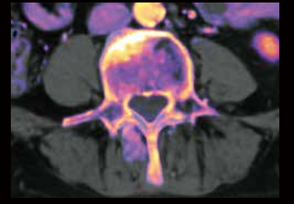
70 keV (Body window)



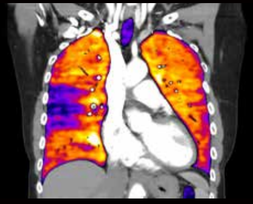
70 keV SEMAR



Iodine map



Iodine map



Iodine map

70 keV (Body window)

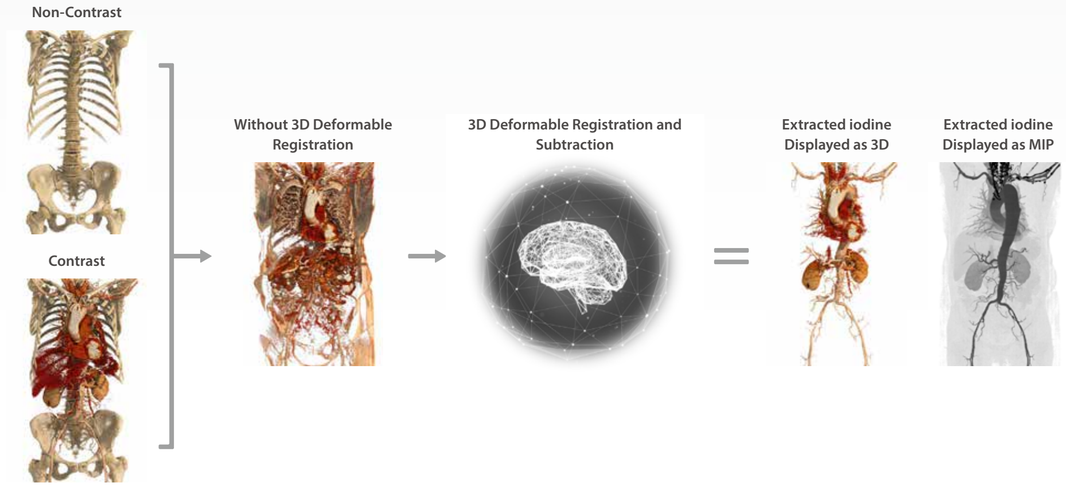
70 keV MSU overlay

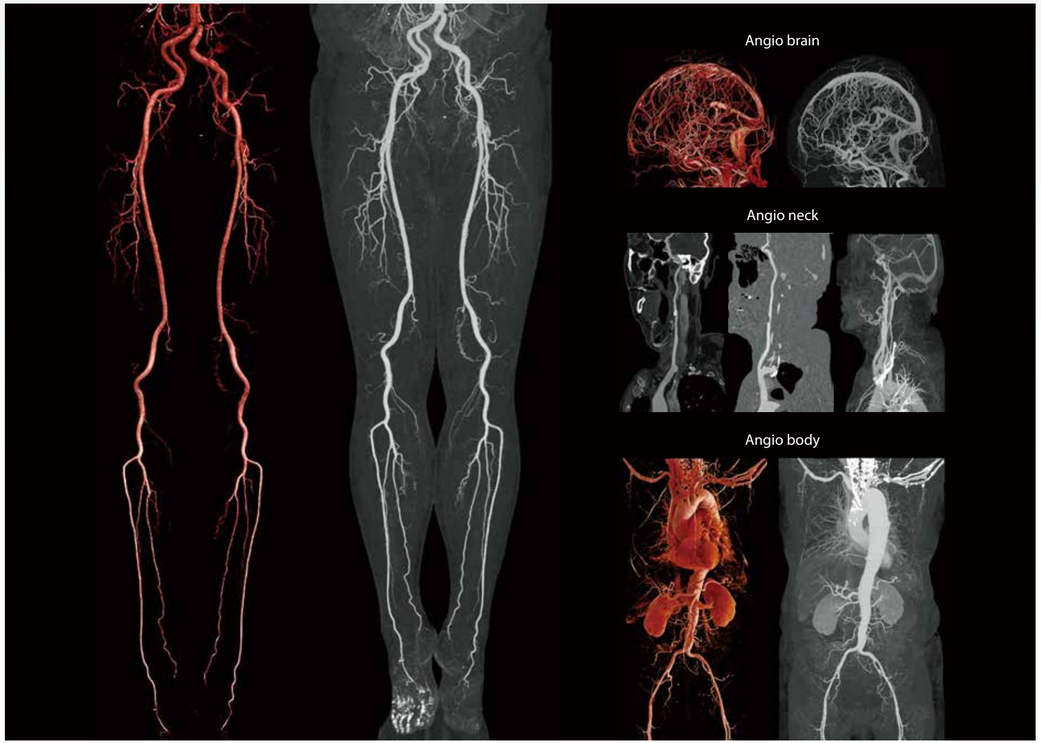
* Images created by Vitrea Advanced Visualization Workstation.

Enhanced vascular insights

Take routine CTA examinations to the next level with Angiography SCT which enables pixel perfect removal of bone and vessel calcification in CTA examinations providing unsurpassed visualization of the vessel lumen.

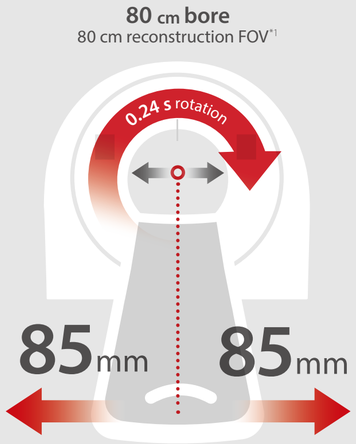
The Angiography SCT scan mode uses a deformable registration algorithm to subtract pre-contrast from post-contrast scans to produce highly accurate 3D DSA CT images of iodine-enhanced vasculature. These results are produced fully automatically and delivered directly to PACS, allowing easy integration into your daily workflow for a more confident diagnosis.



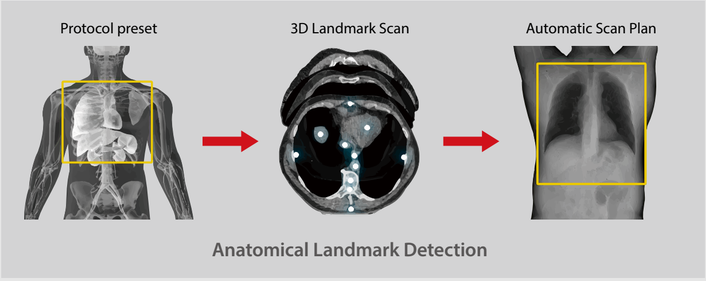


Trauma insights

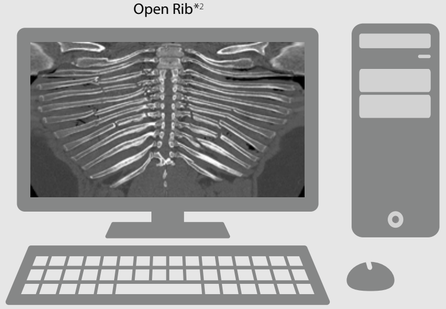
Emergency CT examinations are usually performed in the presence of the acute care team, whose entire focus is ensuring that the patient remains stable while obtaining a rapid diagnosis. This is a high pressure environment, especially for inexperienced technologists. With automatic scan planning, operators can be confident that a scan will be completed efficiently with robust results that ultimately may save a patient's life.



Quick Patient Positioning



Intuitive, AI Assisted Operations



Consistent High-Quality Results

"Our Aquilion ONE is the primary CT for emergency care patients, as such, this system is available for 24 hours per day. During a high pressure trauma situation in the middle of the night, even our most junior CT technologist is able to easily position and scan patients with excellent results."

Mr. Matthew Benbow
Superintendent Radiographer of CT and MRI,
Royal Bournemouth Hospital, UK

*1 With eFOV
*2 Open Rib is available on Vitrea Advanced Visualization

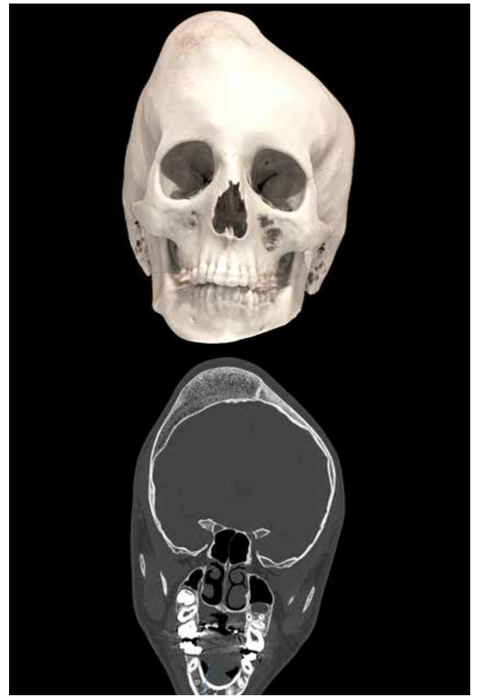
Pediatric insights

The imaging of pediatric patients presents unique challenges. Children face greater risks from the effects of ionizing radiation because their developing cells are more sensitive to radiation damage. In addition, when imaging children, motion and respiration can be a challenge as they may not be able to stay still or follow verbal instructions.

Aquilion ONE / INSIGHT Edition's 16 cm z-axis coverage, allows for infants' and toddlers' chests or abdomens to be scanned in just one rotation of 0.24 s without the need for table movement, which reduces radiation dose and may reduce the need for sedation.

In children where longer scan ranges are needed, 160 row ultra-helical scanning at 0.24 s rotation speed and 450 mm/s table speed is available keeping breath hold times as short as possible.

Chest/abdomen scan on an 11-month-old reconstructed with PIQE 1024 Body

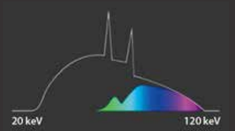


Global Illumination Rendering and coronal image with AiCE Bone of a 12-year-old child

Lung cancer screening insights

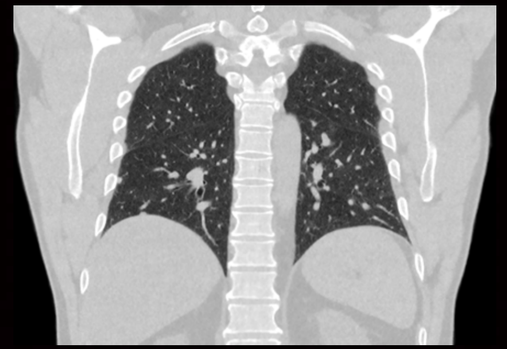
Experience high-quality CT at lung cancer screening dose with the SilverBeam Filter. Designed to work in combination with our AiCE Deep Learning Reconstruction, it delivers the sharpness and clarity required for a confident diagnosis at dose levels approaching those of a chest X-ray.

SilverBeam Filter
Optimizes beam energy for Lung Cancer Screening



CT quality at a dose on the order of a chest X-ray
SilverBeam + AiCE reconstruction

AiCE DLR identifies signal from noise, removing noise and enhancing signal



High-quality, low dose lung cancer screening case at 0.3 mSv

Interventional insights

Conduct faster, more focused interventional procedures with our new CTF interface that enables one-handed operation thanks to the ergonomically designed control interface and a 27 inch in-room display monitor. The 80 cm bore with flared gantry design and lateral couch movement provides positioning flexibility and easy patient access.

Plus, with Canon Medical's iterative reconstruction you now have real-time access to the high-quality, low-dose images you need to increase the speed and safety of all your interventional procedures.

"The new CTF controller is easy to use and provides faster workflow."

Ewoud Smit MD, PhD
Radiologist
Radboud University Medical Center,
Nijmegen, the Netherlands

* Option

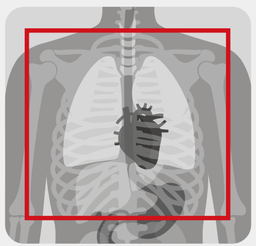
Optimize return on investment

Results from Day One: no complex set-up or steep learning curve. Seamless, confident operations for all.

Reduce time and ensure consistent results

More consistent
scan planning between technologists and **reduction in the number of clicks** with ALD*1

40% reduction
in workflow steps



97%
accuracy in scan range setting with 3D Landmark Scan*2

*1 Based on a study performed at Hakujyuji Hospital, Japan with 40 cases, ten technologists comparing manual scan planning on Aquilion ONE with automatic scan planning on Aquilion Serve for body examinations.
*2 Based on an ALD evaluation of 240 3D Landmark Scans (40 Head, 200 Body) 3D Landmark Scan data. Cases in which the relevant anatomic landmark(s) were not present (9) were excluded. 97% accuracy is based on results within +/- 1 cm of target start, end, and FOV position, confirmed by two experienced CT technologists.

Aquilion ONE / INSIGHT Edition's intuitive and automated workflow solution drives fast throughput and high productivity while ensuring a level of consistency that is the hallmark of any successful diagnostic imaging business.

Save time, serve more patients, and relieve overloaded staff. Our streamlined workflow and easy to use platform enhance productivity and enable efficient staff allocation.

"Anatomical Landmark Detection can automatically perform scan planning, setting the scan range and FOV based on the patient's actual anatomy as identified on the 3D Landmark Scan. This makes it easy for anyone to perform any scan and shortens the exam time for increased throughput."

Hiroyuki Yamaguchi
Section Chief, Department of Radiological Technology, Hakujuji Hospital, Fukuoka, Japan

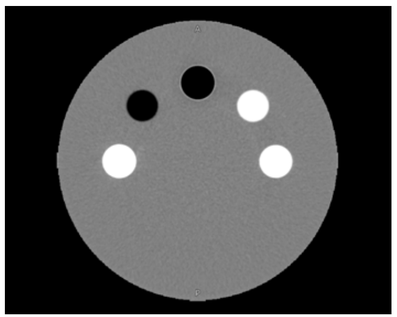
"I spent just three hours learning with the applications specialist and could then confidently scan with the INSTINX Platform on my own on the very first day I was trained. By the next day I was teaching one of my colleagues. That's how easy it is."

Gabrielle James
Radiographer in Charge, South Coast Radiology, Burleigh, Queensland, Australia

Thoughtful design for maximized performance

Automated Quality Assurance

Step by step quality assurance phantom scanning procedure and automatic analysis of CT number, Noise and MTF*1 provide robust and reproducible results regardless of the operator. Review results over time to gain insights into your CT scanner's image quality and performance.

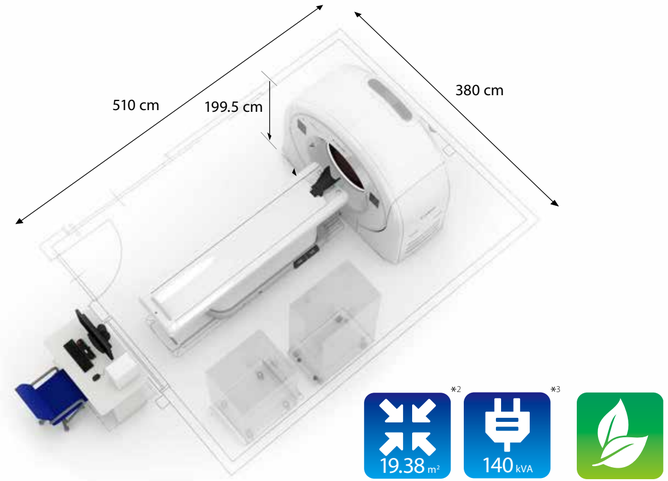


ONE hybrid

A thoughtful design feature that minimizes power consumption and reduces the carbon footprint, the hybrid drive converts energy during deceleration of the gantry, generating electricity which is recycled to power gantry components.

Designed to fit most clinical environments

At just 19.38 m² *2, Aquilion ONE / INSIGHT Edition is one of the smallest and most space-efficient CT systems in its class. Installation is easy, and it can fit into most standard CT rooms.

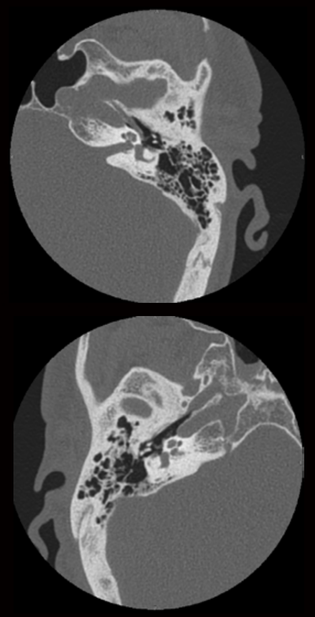


*1 Some exams require the purchase of phantoms and phantom holder
*2 Option, with 1200mm stroke
*3 Option

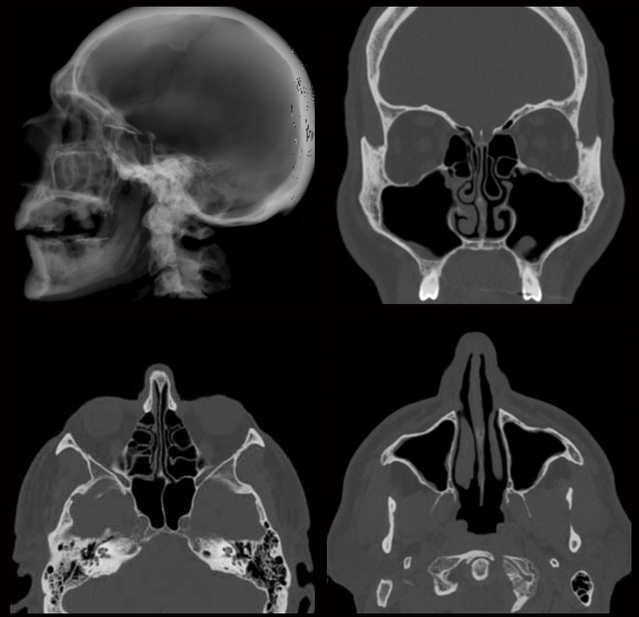
Approach toward an eco-conscious design

While our goal is to continue to bring innovative new products such as Aquilion ONE / INSIGHT Edition to the market each year, we do so in a conscientious way and with the intention of contributing to a sustainable global environment.
Based on a product development and design process that complies with IEC 60601-1-9 "Environmental product design for medical equipment", we are working on energy saving, resource saving, space saving, use of recycled materials, reduction of hazardous chemical substances, improvement of recyclability of products, reduction of packaging materials, and so on.
These efforts cover the entire product life cycle, from production to disposal. We are also working on eco-design, including innovations to increase the user efficiency of our products in order to improve the productivity of our customers' examinations.
Our products comply with ErP, REACH, and RoHS.

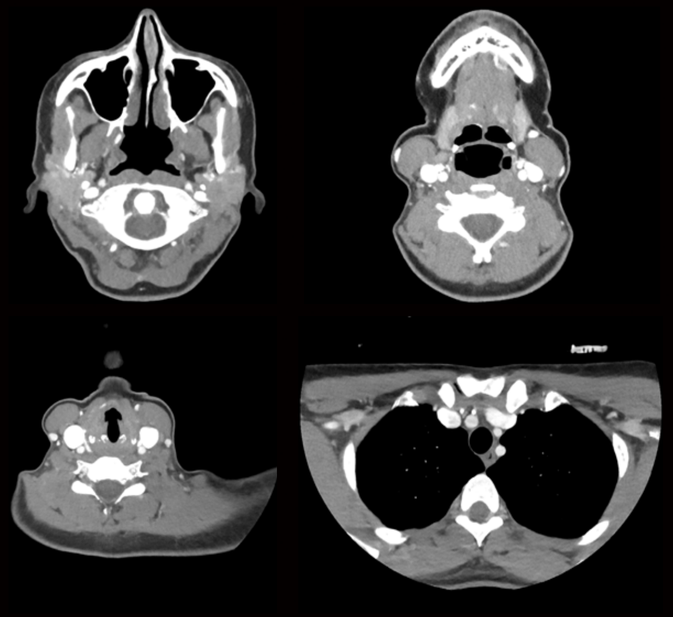
Clinical images



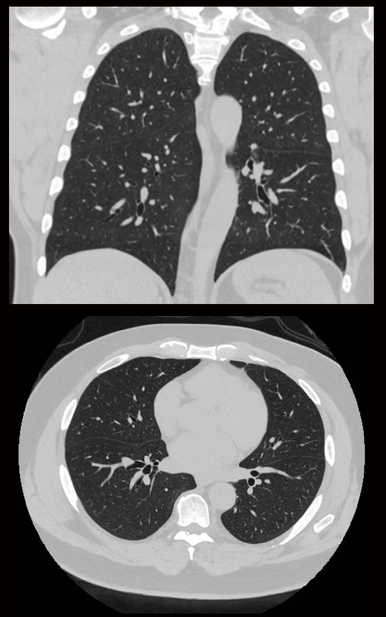
IAC reconstructed with AICE Inner Ear



Sinuses reconstructed with AiCE Bone



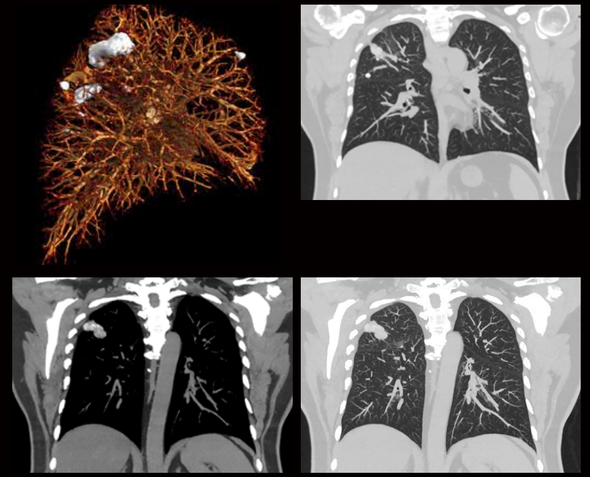
Neck Scan at 0.24 s rotation speed with PIQE 1024 Body



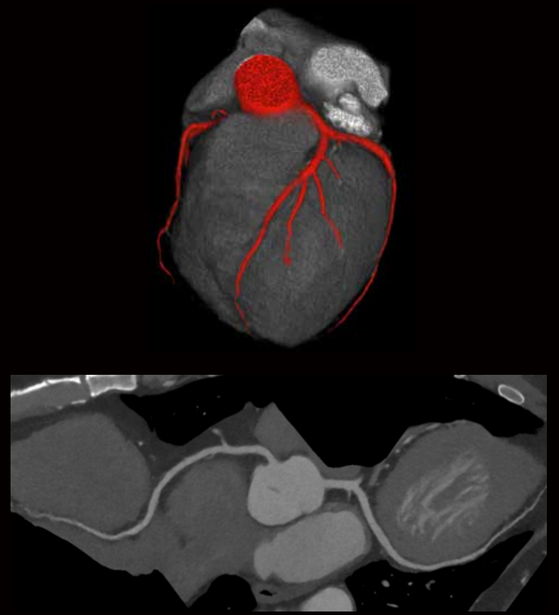
Chest scanned at 0.24 s rotation speed

Clinical images

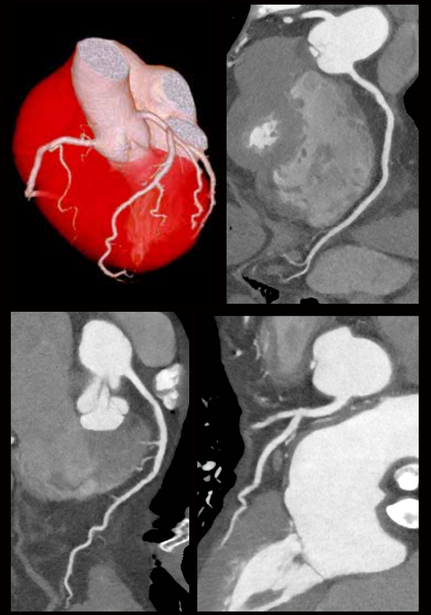
70 kV chest scan reconstructed with AiCE Lung



Chest reconstructed with PIQE 1024 Body and AiCE Lung



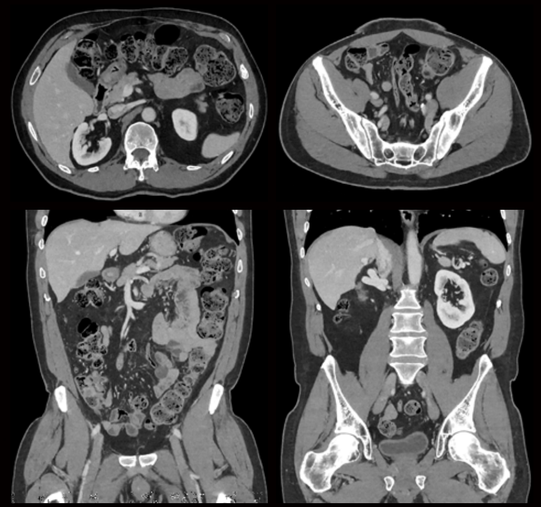
0.24 s one beat cardiac scan reconstructed with PIQE 1024 Cardiac



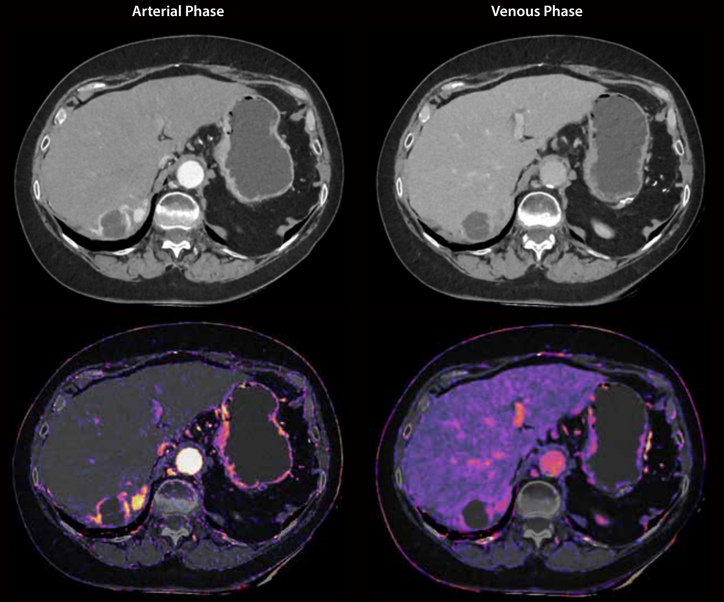
0.24 s one beat cardiac scan reconstructed with PIQE 1024 Cardiac

Clinical images

Abdominal CTA reconstructed with PIQE 1024 Body



Venous phase abdomen reconstructed with PIQE 1024 Body



Iodine mapping with PIQE 1024 Body

Chest/abdomen scan on an 11-month-old reconstructed with PIQE 1024 Body

Main specifications		
Detector		PUREINSIGHT detector
		320 rows, 0.5 mm, 16 cm z-axis coverage
X-ray Tube & generator		kV 70-135, Maximum mA 1400
Gantry	Rotation time	0.24 s*1, 0.35 s
	Bore size	80 cm
	Bore depth	36.3 cm
	Physical Tilt	±30°
Patient couch	Speed	450 mm/s
	Load	315 kg*2
	Max. scan range	150-200 cm*2
Reconstruction speed		Max. 80 fps
Reconstruction	Iterative reconstruction	AIDR*3 3D Enhanced
	Deep Learning Reconstruction	PIQE*1, AiCE*1
Installation	Power capacity	140 kVA*1, 100 kVA
	Space	19.38m^2 *1

*1 Requires option license
*2 Option, with 1200 mm stroke
*3 Adaptive Iterative Dose Reduction

Clinical results may vary due to clinical settings, patient preparation and other factors.

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

The views and opinions expressed in this brochure are those of the clinicians and do not necessarily reflect the views of Canon Medical Systems Corporation.

Altivity

Altivity is Canon Medical's new approach to AI innovation. It is a multimodality, overarching brand, which pulls together all the AI technology that Canon Medical provides under one name.

Aquilion ONE

INSIGHT Edition

CANON MEDICAL SYSTEMS CORPORATION
https://global.medical.canon

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Canon Medical Systems Corporation meets internationally recognized standards for Quality Management System ISO 9001, ISO 13485.
Canon Medical Systems Corporation meets the Environmental Management System standard ISO 14001.

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