SIEMENS

siemens.com/somatom-definition-edge

SOMATOM Definition Edge

International version. Not for distribution in the US.

“Exceeding expectations” VS. “Accepting the average”

Second best is not an option.

SOMATOM Definition Edge

”Exceeding expectations“ VS. ”Accepting the average“

Second best is not an option.

Confronted with increasingly complex clinical requirements and rising numbers of patients, medical institutions are expected to perform at the limits of their capacity every day. Healthcare innovation leader Siemens invites them to expand their clinical capabilities – and not only meet, but exceed those expectations.

Exceeding expectations in Cardiology, you will be able to expand your clinical capabilities – not only by catching the bolus when performing TAVI planning, but also by improving contrast media efficiency, introducing highly precise plaque differentiation, and enabling reliable, high-speed triple rule-out scanning.

Exceeding expectations in Emergency Medicine, you will be able to optimize process efficiency with solutions that let you not only improve emergency workflow, but also substantially reduce door-to-image time, whether for pediatric or obese patients.

Exceeding expectations in Oncology, you will be able to improve patient outcomes not only by precisely identifying tumors, but also by reliably evaluating therapy response and implementing improved low-dose therapy control and early detection.

The new **SOMATOM Definition Edge** expands your clinical capabilities and helps you and your institution perform to your full potential. Because when it comes to your patient’s well-being, second best is not an option.

Benefits

Exceeding expectations in Cardiology

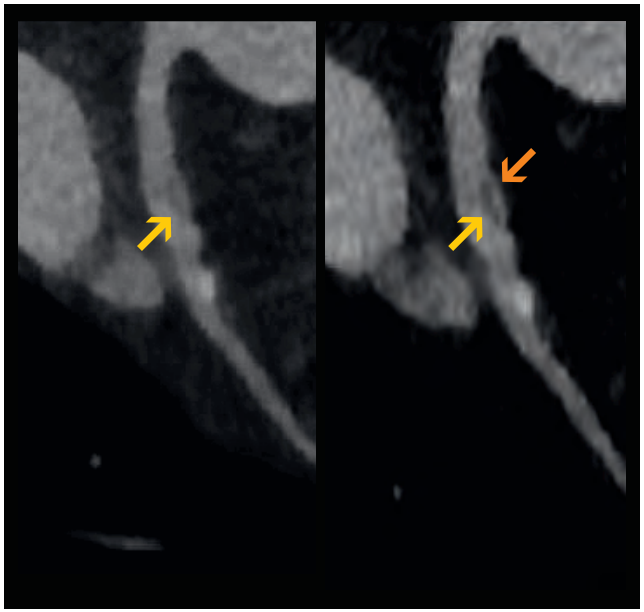
Expand your institution's clinical capabilities by improving contrast media efficiency in low-kV TAVI planning, introducing precise plaque differentiation, and enabling reliable, high-speed, triple rule-out scanning.

Cardiology is one of CT's most challenging fields: Long scan ranges and irregular heart rates meet the need to keep contrast media low, and the dose just right. Covering greater volumes faster, and efficiently optimizing contrast media use, radiation dosage, and tube current, SOMATOM Definition Edge will not only meet, but exceed your expectations in cardiology.

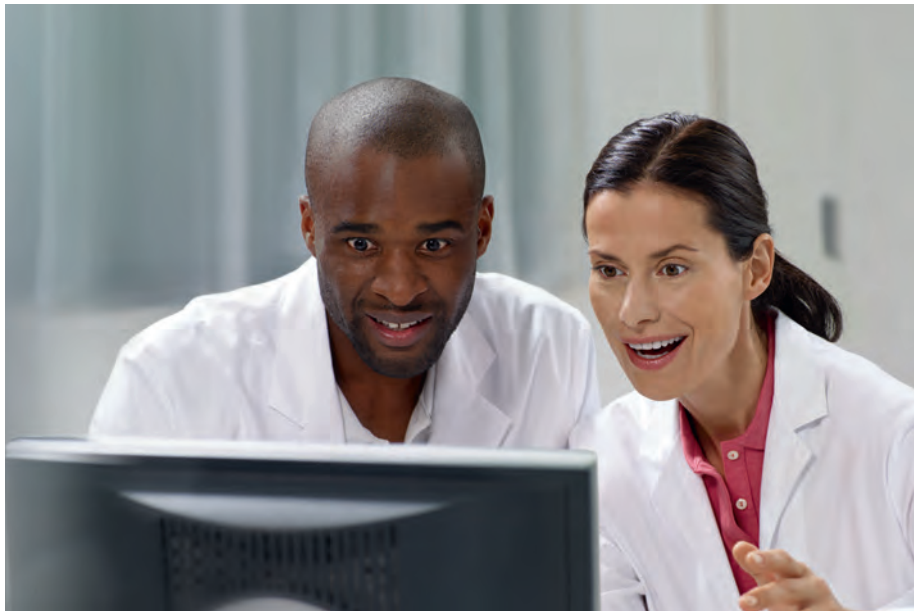
Precise TAVI planning

When a lack of precision can result in underexposed vessels, undiagnostic image quality, and even re-scans, physicians are right to expect new ways of optimizing bolus timing in CT imaging for TAVI planning.

The new SOMATOM Definition Edge allows physicians to freely choose the scan speed for ranges of up to 23 cm/s. With the STRATON tube designed to deliver at voltages as low as 70 kV, the system enables perfect timing along with the bolus, optimizing vessel display with low-kV imaging. In addition, a perfectly-timed bolus helps optimize the amount of contrast media required, effectively allowing users of SOMATOM Definition Edge to exceed expectations not only with regard to absolute precision, but also in terms of exemplary contrast media efficiency.



Comparison between 0.6 (left) and 0.5 mm (right) slices – advanced plaque differentiation with thinner slices showing fabriocalcified plaque (orange arrow) in 0.5 mm slices.



Plaque differentiation

With the majority of acute coronary syndromes resulting from plaque rupture and superimposed thrombosis in the setting of a moderate coronary stenosis, radiologists nowadays expect CT technology to help not only in identifying plaque – but also to differentiate plaque, and to help physicians understand the underlying atherosclerotic plaque characteristics and physiologic parameters. Equipped with the first fully integrated Stellar detector, the new SOMATOM Definition Edge combines high-speed rotation of up to 0.28 s with the precision of 0.5 mm slices.

Enabling institutions to routinely work with more precise clinical images, the system gives you the opportunity to save time and resources. If you expect identifying plaque via CTA to be a difficult interpretative process, learn how to minimize slice blurring and calcium blooming, reduce cross-talk and increase cross-plane resolution to 0.30 mm with the new SOMATOM Definition Edge – and get ready to have your expectations exceeded.

Reliable triple rule-out scanning

In coronary CTA acquisition, higher heart rates and heart rate variation can result in inappropriate data sampling, severe motion artifacts, and often unacceptably high radiation exposure. That's why physicians expect CT technology to include a heart rate adaptive optimization of spatial and temporal resolution to minimize or, ideally, avoid motion artifacts. The new SOMATOM Definition Edge meets and exceeds these expectations: Intelligently combining its 0.28 s rotation and flying focal spot with z-Sharp, the system is able to maintain its outstanding spatial resolution even at a high temporal resolution of 142 ms – across the entire relevant cardiac field of view.

Exceeding expectations in Emergency Medicine

Increase your institution's process efficiency and substantially reduce door-to-image time by introducing excellent emergency care for all patients, and establishing future-ready, high-efficiency workflows.

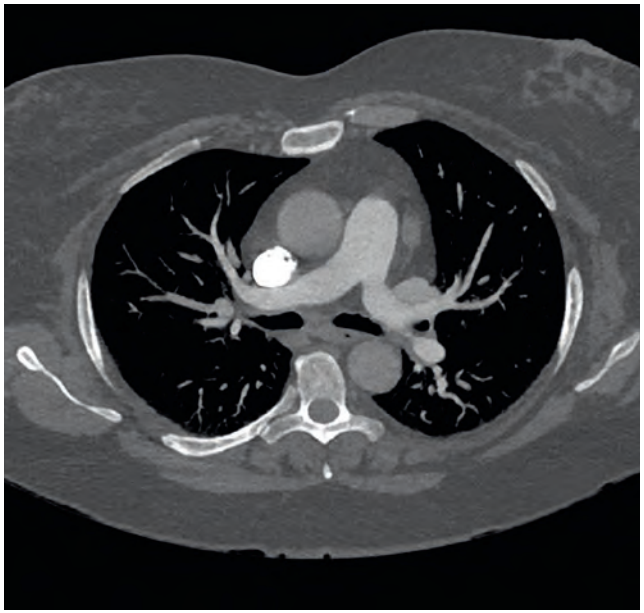
Emergency scanning has to cover the whole range, from pediatric to bariatric patients. When the goal is to provide fast and reliable diagnoses, patient exclusion has to be avoided by all means – a fast and reliable workflow for optimum-quality images for every patient is key. Exceed expectations in emergency medicine with the new SOMATOM Definition Edge.

Pediatric imaging

Challenges in emergency scanning start with the smallest patients: Pediatric patients. Featuring CARE Child – a unique combination of 70 kV imaging with dedicated pediatric protocols – the new SOMATOM Definition Edge helps clinicians decide whether or not to scan the most dose-sensitive cases. With a pitch of up to 1.7, and scan speeds of up to 23 cm/s, the system enables fast pediatric scanning without dose discussions, with no compromise on image quality, and keeps sedation minimized – exceeding expectations.

Bariatric imaging

With more and more patients suffering from obesity, the capacity to deliver sound bariatric imaging is essential. In emergency medicine, having to send patients to other facilities because the on-site imaging devices cannot cope with them is a worst-case scenario. In addition to the technical considerations, these patients usually suffer from short breath, and are often unable to hold a certain position for a very long time. They also have the highest X-ray attenuation, which places a high demand on a scanner's detector technology. In short, healthcare providers risk generating bad or even non-diagnostic images when they examine bariatric patients.



Even obese patients (in this case 143 kg) can be scanned at full rotation of 0.28s and a pitch of 1.7 for mimized breath-hold.

The new SOMATOM Definition Edge, with its large bore of 78 cm and a patient load capacity of up to 307 kg, has been designed to overcome these challenges and avoid excluding these patients. An acquisition speed of 23 cm/s minimizes breath-hold times and with its unique combination of the renowned STRATON tube, power reserves of up to 100 kW and 800 mA, and the Stellar detector – which was specifically developed to handle very low X-ray signals – the new SOMATOM Definition Edge offers the ideal imaging chain to diagnose large patients.

Be FAST. Take CARE.

When every second counts, efficient routine workflows have to be in place. Operators should not have to worry about setting scan parameters or preparing reconstructions, but should be spending their time with the person at the center of it all – the patient. Here, FAST CARE technology makes time-consuming and complex procedures faster and more intuitive. FAST Spine enables the accurate and automatically aligned preparation of spine recons with just a single click. FAST 3D Align enables the automated alignment of FOV, adjustments and reconstructions of standard views. Scanning becomes more reproducible and less prone to errors.

Reducing metal artifacts

In addition to time constraints and complicated preparations, emergency care imaging often suffers from metal artifacts diluting image quality. If patients are uncooperative or unconscious, clarification about whether or not metal implants are present is often not possible. The resulting metal artifacts can obstruct relevant anatomies or pathologies for the diagnoses, and potentially lead to incorrect treatment decisions. The new SOMATOM Definition Edge offers an innovative solution: iterative Metal Artifact Reduction (iMAR) combines fast recon-struction speed with easy workflow integration – and is guaranteed to exceed expectations for your clinical routine in the ER.

Exceeding expectations in Oncology

Optimize your patient outcomes by introducing early tumor identification, fast, easy, and reliable therapy response assessment, and improved, low-dose therapy control.

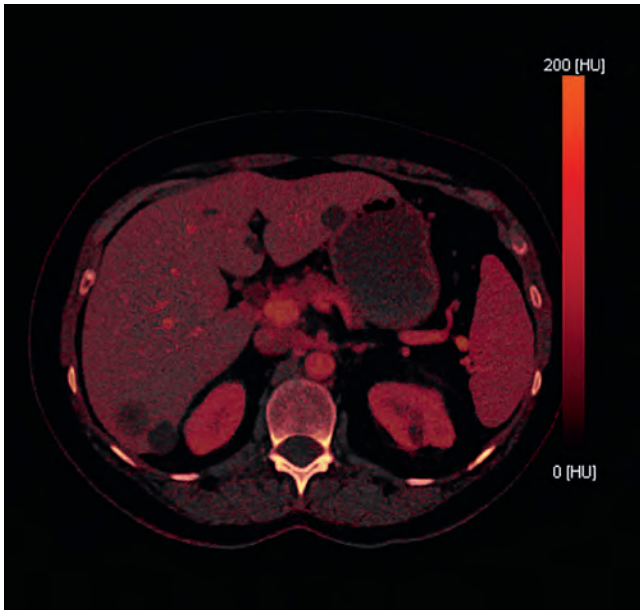
Computed tomography is an important imaging tool in routine clinical oncology, especially for CT-guided interventions, follow-up scans during treatment procedures, and control scans. And the more that technological innovation helps to increase reliability and dose-efficiency, the greater its role will become for preventive care as well: Exceeding expectations with the new SOMATOM Definition Edge.

Early detection and sustainable therapy

The key to successful treatment in oncology is identifying and characterizing tumors at a very early stage. Consequently, one of the most debated topics in oncology today is CT-based preventive care, i.e. low-dose lung imaging for early tumor detection. The Stellar detector, in combi-nation with high-end iterative reconstruction tools like SAFIRE and ADMIRE, enables scans with diagnostic image quality at dose levels that seemed unthinkable only a few years ago. The new SOMATOM Definition Edge delivers on what you would expect of routine oncology imaging – and exceeds expecta-tions by preparing your clinical portfolio for the future.

Reliable therapy response assessment

Tumor detection is one thing – deciding on the appropriate treatment and assessing therapy success is another. After all, whether the tumor is treated with minimally invasive procedures, with surgery, or with new personalized medicine, physicians need to see whether or not the tumor has been completely removed, if it is still vital, and how it is responding to expensive therapeutic drugs. Traditionally, monitoring the disease in this phase was rather extensive, and often required multiple CT scans, e.g. combining images with and without contrast media.



TwinBeam Dual Energy acquires body imaging at two different energy levels in a single scan. The characters of the multiple hepatic lesions can be clearly differentiated using Liver VNC.

The new SOMATOM Definition Edge with TwinBeam Dual Energy can do it all in one scan – and deliver diagnostic information beyond what is expected of CT imaging. The scan mode enables the reconstruction of a virtual non-contrast image, and allows for the precise quantification of iodine uptake in the tumor. As a result, both diagnostic quality and confidence are improved and stabilized, and tumor evaluation can be carried out faster, easier, and more reliably than ever before – exceeding expectations.

Low-dose therapy control for all patients

Following up on therapy success usually takes a significant amount of time requiring several additional examinations. As consecutive scans can lead to high dose accumulations over time, not only do dose reduction and treatment quality become essential, but so too does patient satisfaction. When inefficiencies eventually result in lower revenue or higher costs, institutions are well advised to look for a system that combines innovative clinical capabilities, patient focus, and outstanding efficiency. A system that exceeds the expectations of both patients and professionals – exceeding expectations.

Added benefits of *syngo*.via

Regardless of volume or disease, *syngo*.via helps prepare cases, eases interdisciplinary collaboration, and helps generate a faster and more reliable diagnosis.

syngo®.via for sustainable care

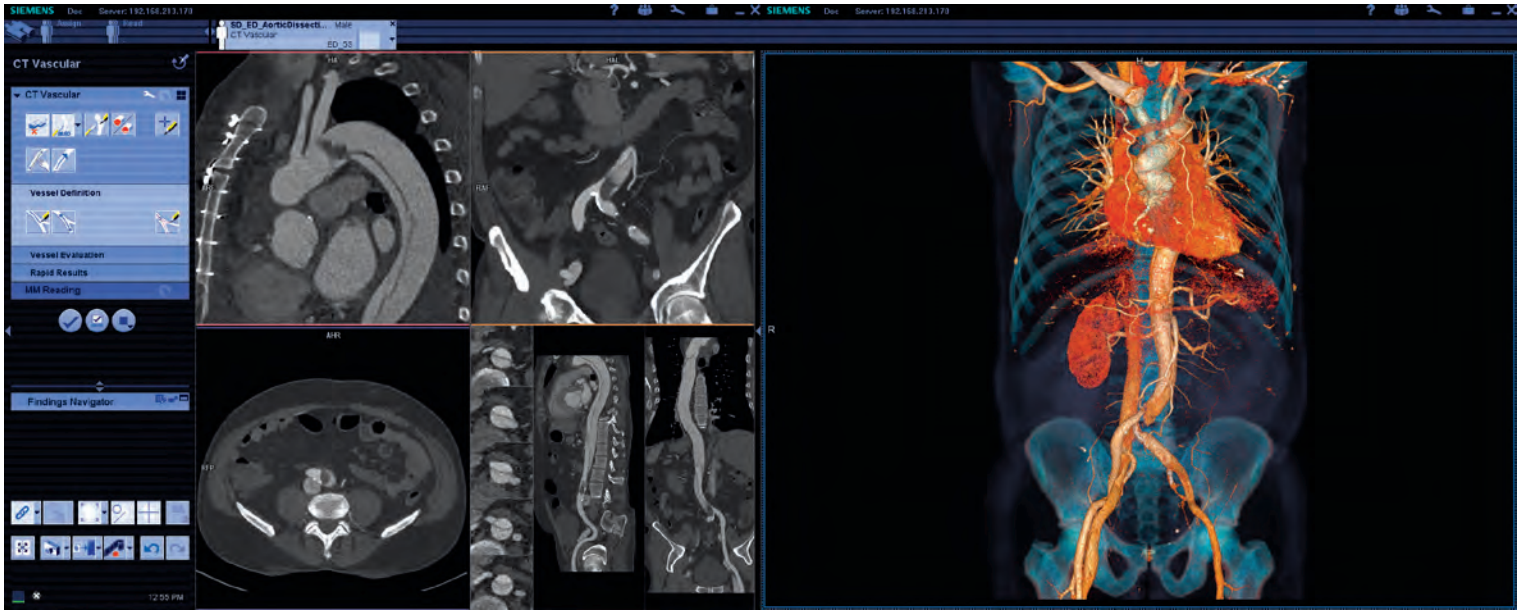
As the number of chronic disease patients rises, the demand for high-quality, efficient care is increasing. *syngo*.via* is Siemens' state-of-the-art imaging software, creating an exciting experience in terms of efficiency and ease of use. *syngo*.via can help foster sustainable care by equipping physicians with workflows and applications for evaluating images from multiple modalities. In the case of cardiovascular CT, it enables a rule-out of coronary artery disease in less than a minute.

Automatic case preparation

syngo.via helps the physician to analyze the individual case, prepares images, suggests an optimized workflow, and offers guidance when needed. For example, when a cardiac case is opened, the automated case preparation has already preprocessed the images and displays them in the appropriate layout together with suitable evaluation tools. Evaluation of the coronary vessels, the functional parameters, and the prepared calcium score can start immediately.

Image networking

syngo.via speeds up the way users connect and share information with clinical partners and patients – even on the go.** *syngo*.via's client server-based design supports a smooth, teamwork-like sharing of tasks, as is required in 3-D labs and larger radiology departments. Images can be shared among multiple users at once, providing a sound basis for joint preprocedural planning.



As soon as the case is opened, it is ready for review which allows, for instance, a quick assessment of an aortic dissection.

Fast decisions in acute care

CT is the modality of choice when it comes to diagnostic imaging in acute care situations – whether it is for a triple rule-out in patients with acute chest pain, for stroke assessment, or for the evaluation of polytrauma and acute abdominal pain. The CT Acute Care Engine provides clinical functionality that delivers decisive results for all of these challenging indications. Thanks to automatic preprocessing, the case is ready for reading as soon as it is opened.

When every second counts

The software within the CT Acute Care Engine isolates the heart, provides the angiography-like display, and also uses the radiologist's preferred reading layout. For the assessment of intra- and extra-cranial vasculature, the CT Acute Care Engine provides fully automatic pre-processing of data, including automatic bone removal. Above all, speed and dependability add confidence for critical decisions made against the clock.

Zero-click vessel assessment

The CT Acute Care Engine facilitates the assessment of the aorta and general vessels by providing a vessel-only view when the case is opened. The combination with the automatic side-by-side layouts, e.g. for displaying both carotid arteries, helps to better assess and evaluate complex lesions. In addition, the CT Cardiovascular Engine, CT Neuro Engine, and CT Oncology Engine offer an impressive range of advanced applications tailored to many different clinical needs.

* *syngo*.via can be used as a stand-alone device or together with a variety of *syngo*.via-based software options which are medical devices in their own rights. These products are pending regulatory clearance in some countries and therefore not yet commercially available in all countries. Usage of *syngo*.via in operating rooms or for an emergency case requires customers to provide appropriate emergency measures in case of non-availability of the system or network.

** Prerequisites include: Internet connection to clinical network, DICOM compliance, meeting of minimum hardware requirements, and adherence to local data security regulations.

Clinical Images

Collimation:
128 x 0.6 mm

Spatial resolution:
0.30 mm

Scan time:
6.0 s

Scan length:
146 mm

Rotation time:
0.28 s

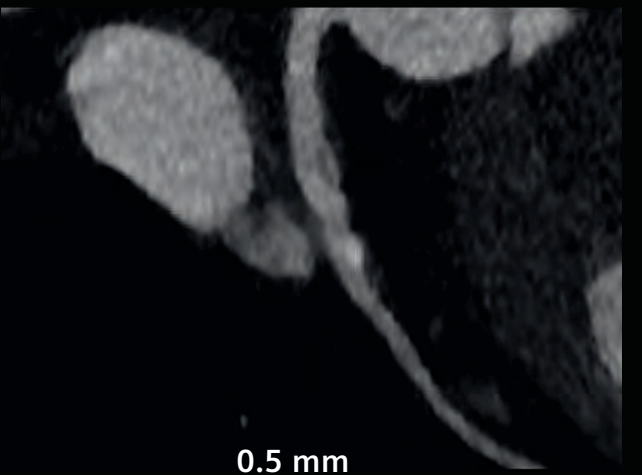
Tube settings:
80 kV, 75 mAs

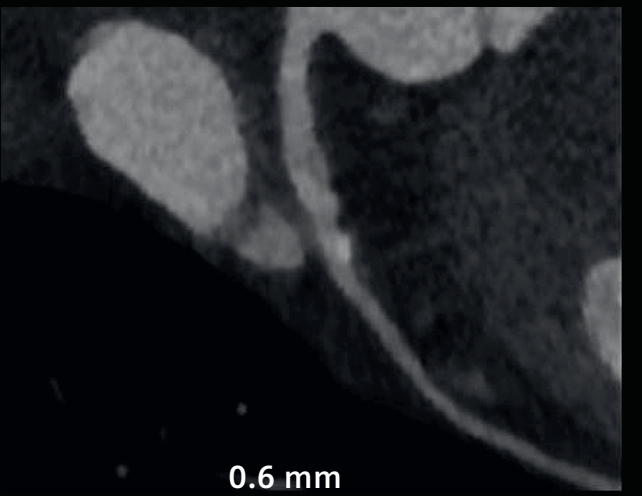
CTDIvol:
4.38 mGy

DLP:
72.65 mGy cm

Eff. dose:
1.0 mSv

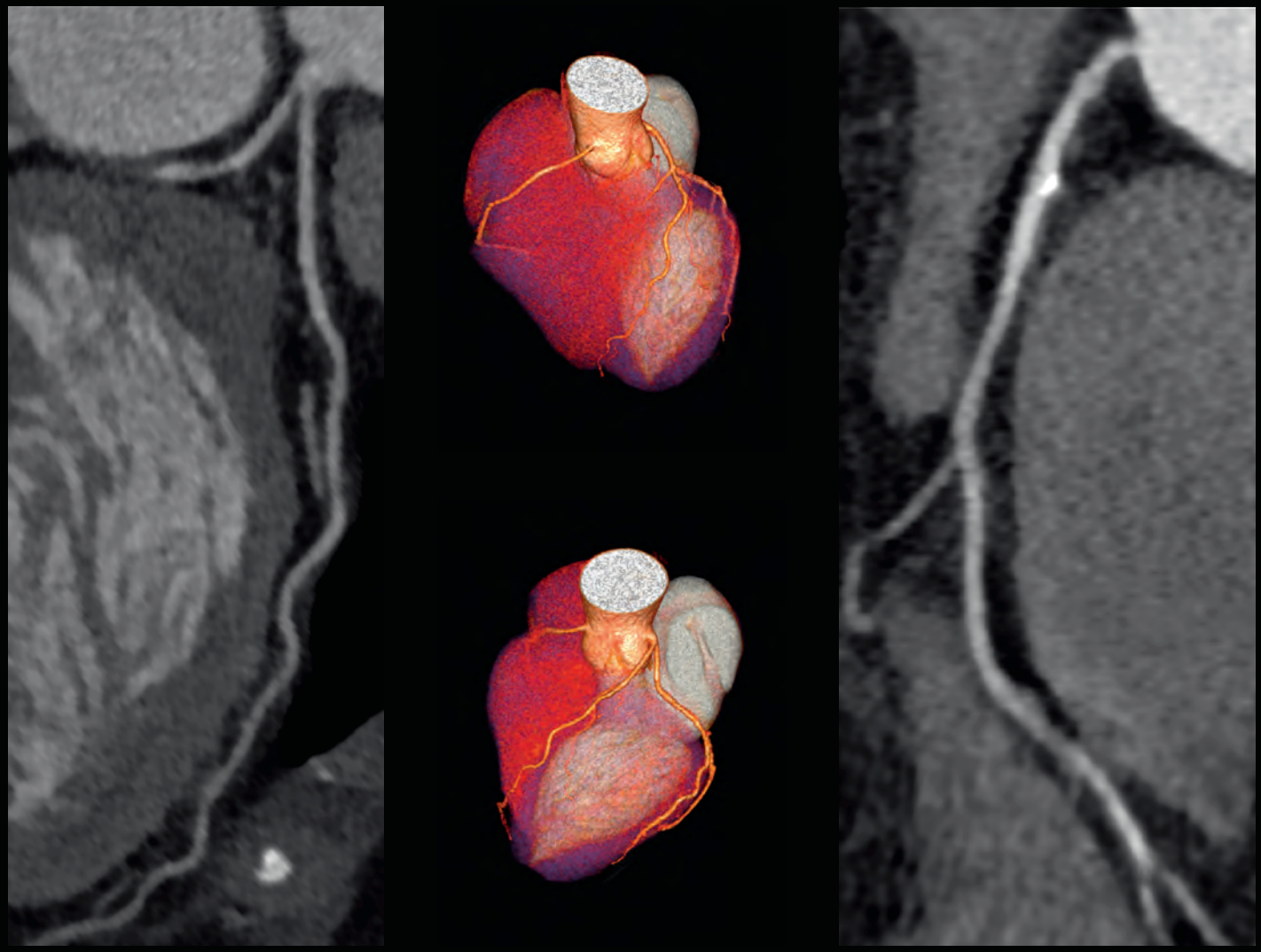
Heart rate:
67 bpm





Soft and fibrocalcified plaques in the LAD –
Routinely high rotation speed, combined with Edge technology and 0.5 mm slices, delivers additional diagnostic information for more precise plaque differentiation.

Courtesy of CIMOP Bizet, Paris, France



Collimation:
128 x 0.6 mm

Spatial resolution:
0.30 mm

Scan time:
3.7 s

Scan length:
137 mm

Rotation time:
0.28 s

Tube settings:
100 kV, 98 mAs

CTDIvol:
11.39 mGy

DLP:
179 mGy cm

Eff. dose:
2.5 mSv

Heart rate:
81 bpm

Coronary plaque imaging at higher heart rate –
A rotation speed of 0.28 s and a temporal resolution of 142 ms provide excellent image quality in cardiac imaging even for higher heart rates of more than 80 bpm.

Courtesy of CIMOP Bizet, Paris, France

Collimation:
128 x 0.6 mm

Spatial resolution:
0.30 mm

Scan time:
2.5 s

Scan length:
580 mm

Rotation time:
0.28 s

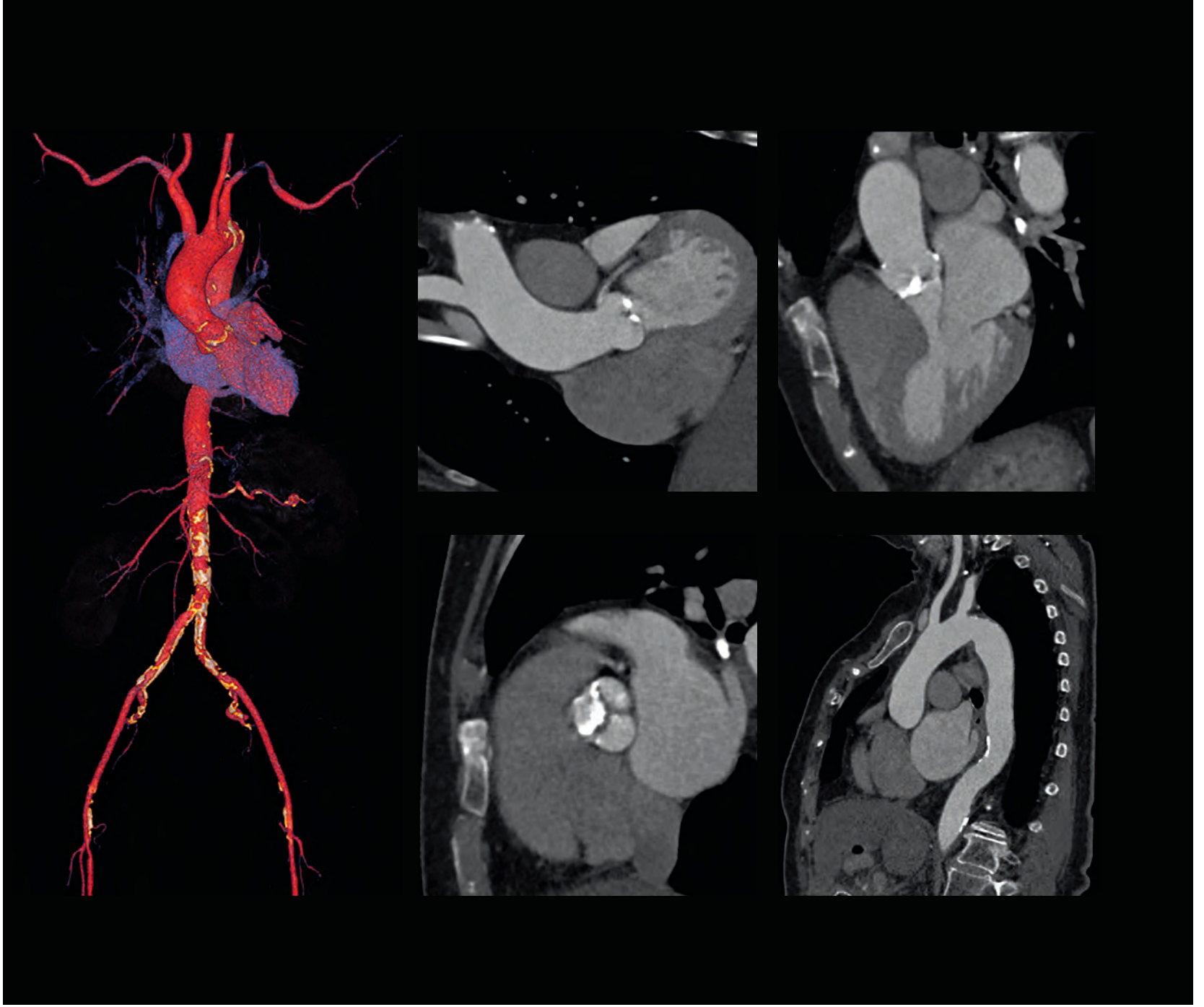
Tube settings:
100 kV, 70 mAs

CTDIvol:
2.77 mGy

DLP:
172 mGy cm

Eff. dose:
2.49 mSv

Heart rate:
77 bpm



TAVI planning –
An acquisition speed of up to 23 cm/s (pitch 1.7) boosts contrast media efficiency and shortens scan times substantially in pre-procedural TAVI/TAVR planning.

Courtesy of LMU Großhadern, Munich, Germany

Collimation:
128 x 0.6 mm

Spatial resolution:
0.30 mm

Scan time:
9.0 s

Scan length:
640 mm

Rotation time:
0.5 s

Tube settings:
70 kV, 192 eff. mAs

CTDIvol:
2.22 mGy

DLP:
147 mGy cm

Eff. dose:
2.2 mSv

Aortic CTA –
CARE kV automatically sets the right kV for reproducible image quality and enhanced contrast with low kV imaging and reduced dose. In this case using 70 kV.

Courtesy of Linköping University Hospital, Linköping, Sweden

Collimation:
128 x 0.6 mm

Spatial resolution:
0.30 mm

Scan time:
7.6 s

Scan length:
161 mm

Rotation time:
0.28 s

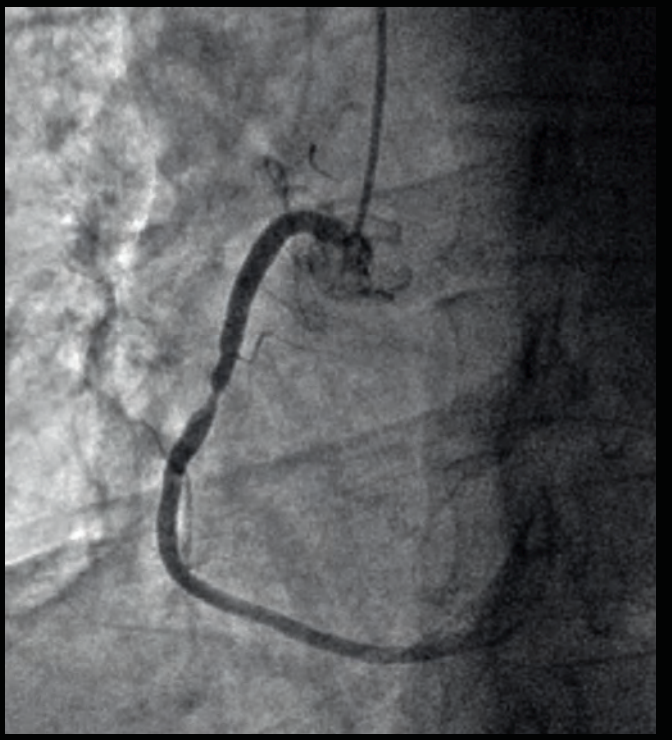
Tube settings:
80 kV, 129 eff. mAs

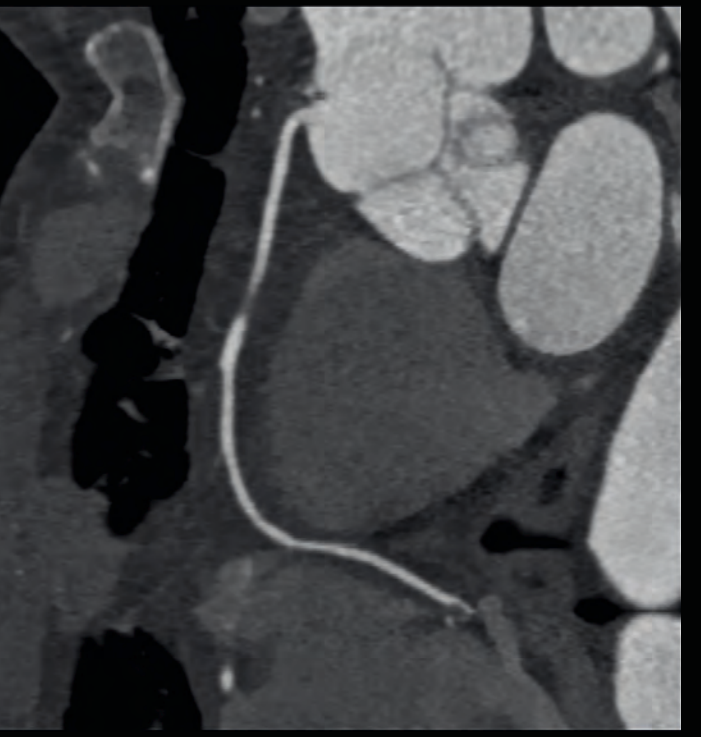
CTDIvol:
7.37 mGy

DLP:
133 mGy cm

Eff. dose:
1.862 mSv

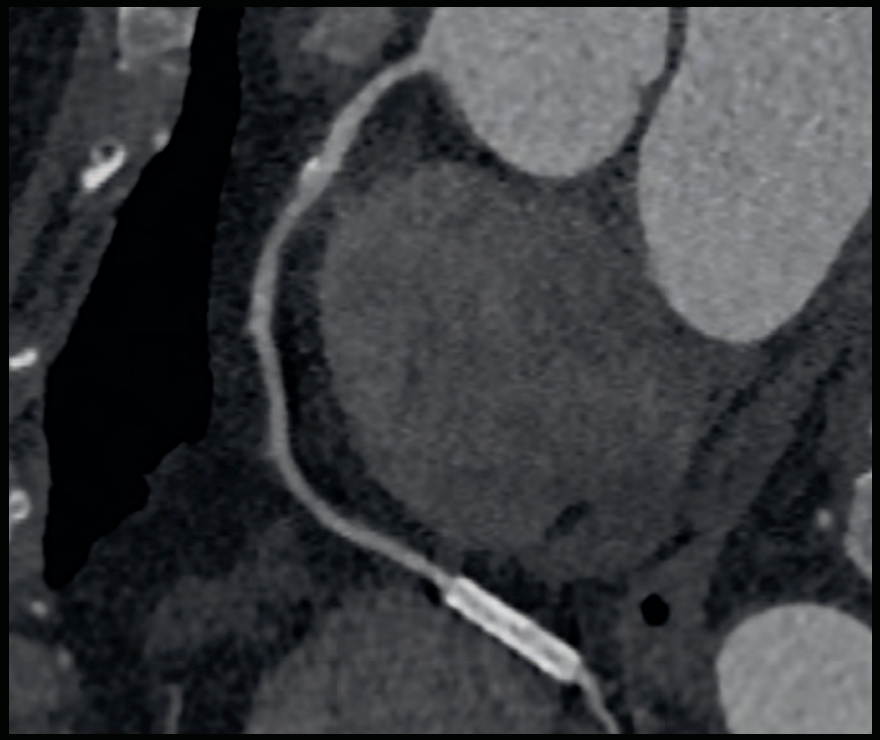
Heart rate:
61-70 bpm

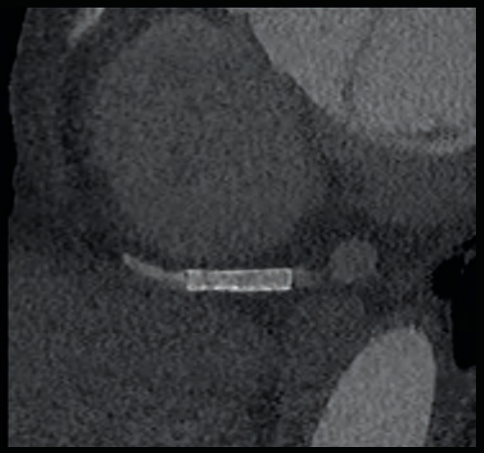


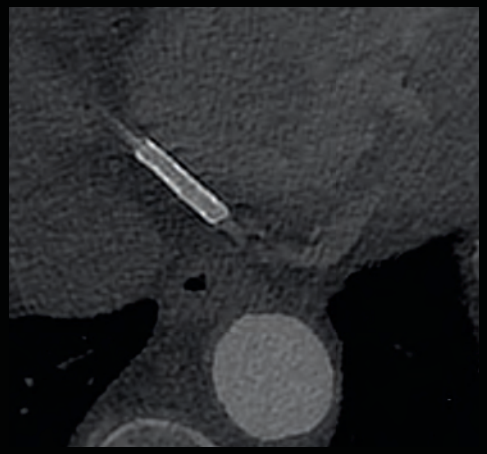


Stenosis in the RCA –
High temporal resolution (142 ms) in combination with Stellar detector delivers diagnostic image quality comparable to an angiographic image.

Courtesy of CIMOP Bizet, Paris, France







Collimation:
128 x 0.6 mm

Spatial resolution:
0.30 mm

Scan time:
5.0 s

Scan length:
154 mm

Rotation time:
0.28 s

Tube settings:
100 kV, 100 eff. mAs

CTDIvol:
13.12 mGy

DLP:
228 mGy cm

Eff. dose:
3.19 mSv

Heart rate:
70 bpm

Calcified plaque and stent in the RCA –
High rotation speed of 0.28 s enables visualization and stent evaluation even in the fastest moving part of the heart. In this case, a small stent in the RCA shows no signs of occlusion.

Courtesy of CIMOP Bizet, Paris, France

Collimation:
128 x 0.6 mm

Scan time:
5.0 s

Scan length:
156 mm

Rotation time:
0.28 s

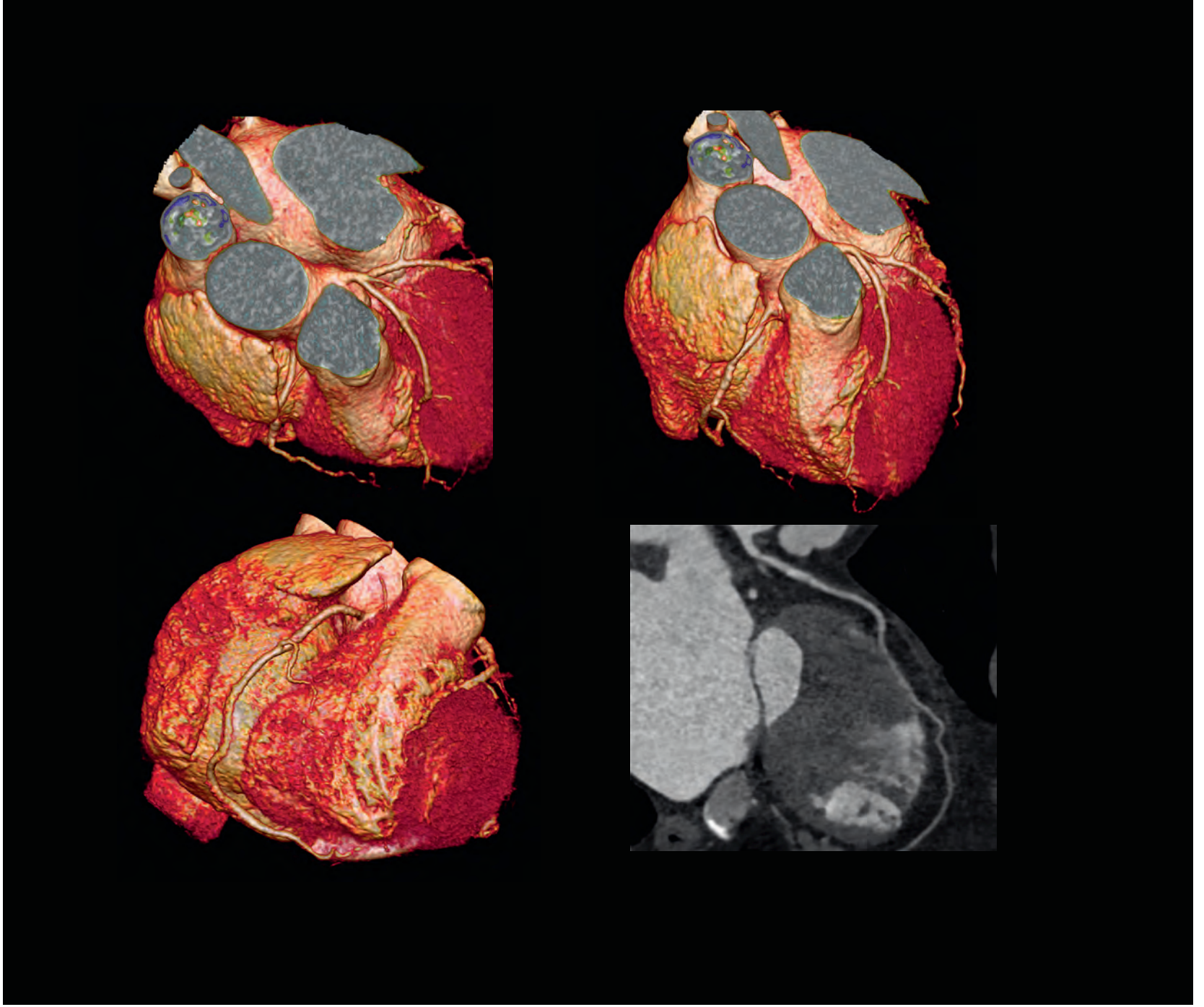
Tube settings:
80 kV, 129 eff. mAs

CTDIvol:
8.55 mGy

DLP:
149 mGy cm

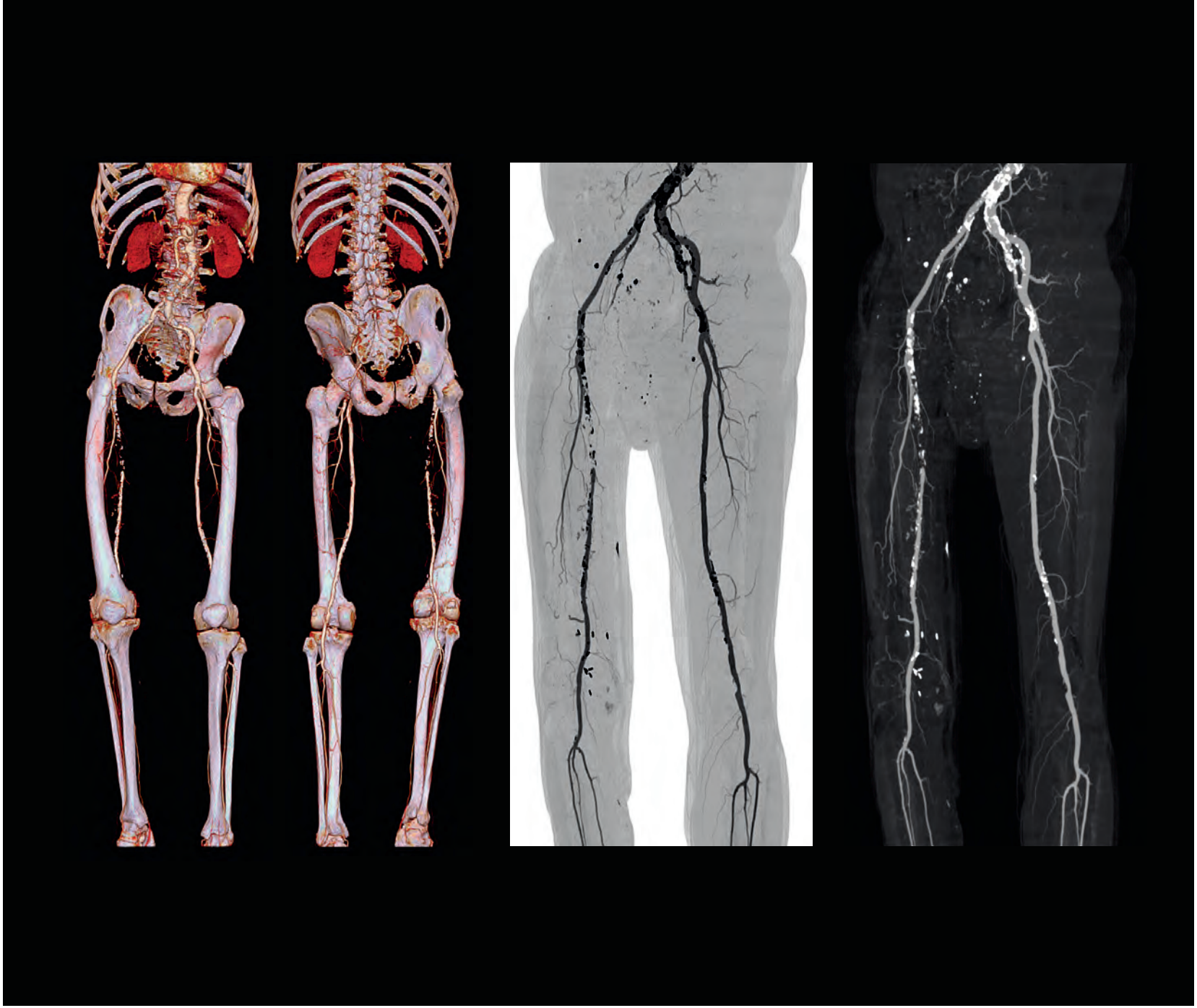
Eff. dose:
2.08 mSv

Heart rate:
59-104 bpm



Myocardial bridge in the LAD –
Higher temporal and spatial resolution result in excellent image quality at lower dose, even with arrhythmia at 59 – 104 bpm.

Courtesy of LMU Großhadern, Munich, Germany



Collimation:
128 x 0.6 mm

Spatial resolution:
0.30 mm

Scan time:
39.0 s

Scan length:
1221 mm

Rotation time:
1.0 s

Tube settings:
80 kV, 191 eff. mAs

CTDIvol:
3.55 mGy

DLP:
446 mGy cm

Eff. dose:
2.5 mSv

Angio run off –
Long-range acquisition at low kV shows great vascular details at very low dose.

Courtesy of CIMOP Bizet, Paris, France

Collimation:
128 x 0.6 mm

Spatial resolution:
0.30 mm

Scan time:
0.6 s

Scan length:
133 mm

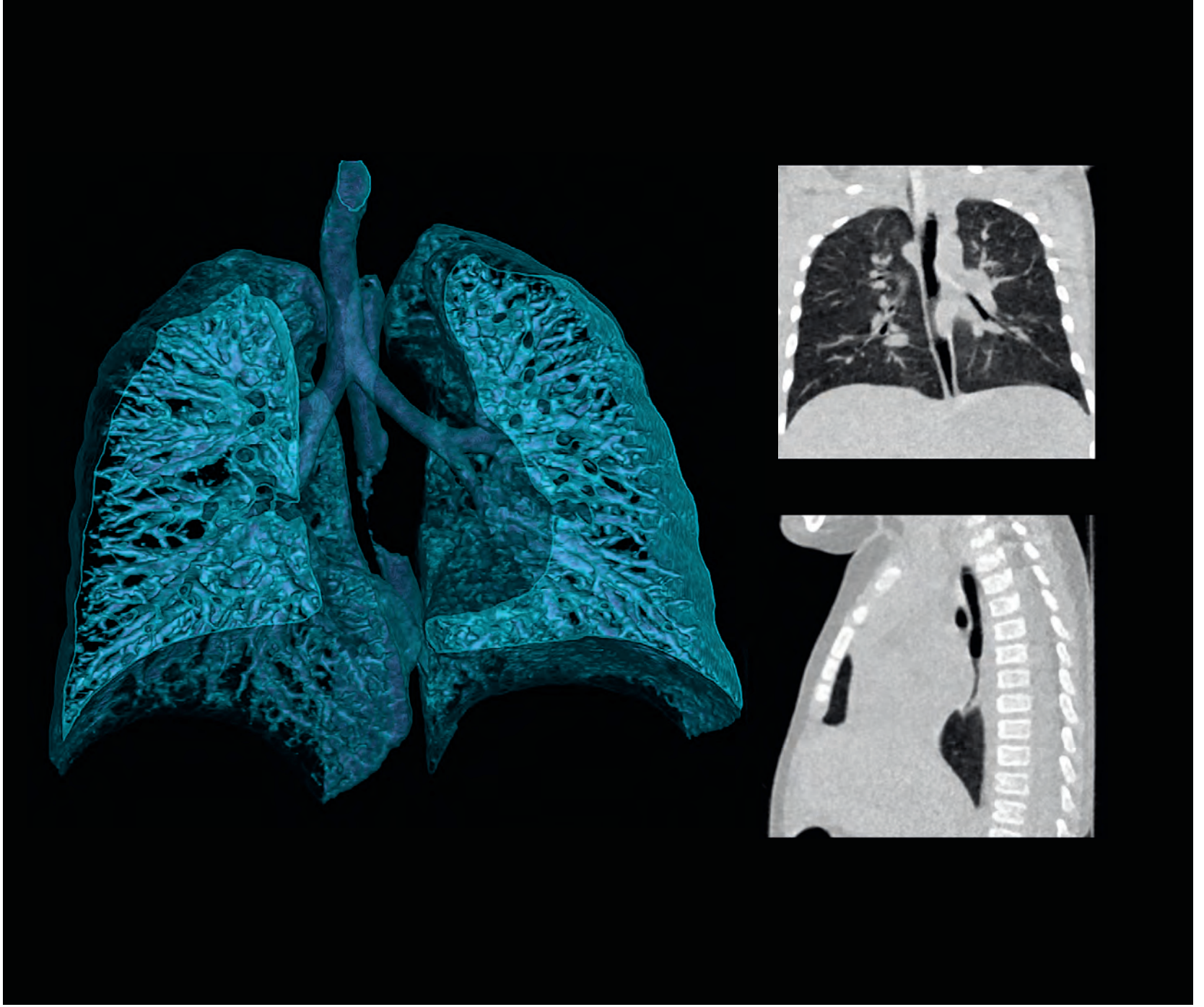
Rotation time:
0.28 s

Tube settings:
100 kV, 4 mAs

CTDIvol:
0.14 mGy

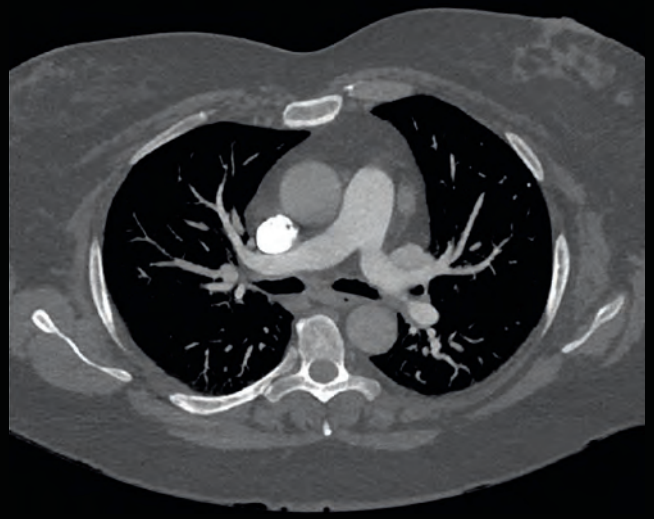
DLP:
2 mGy cm

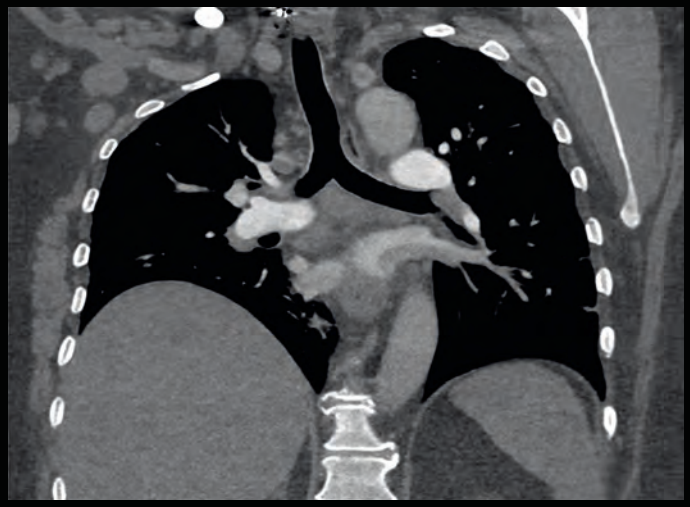
Eff. dose:
0.17 mSv

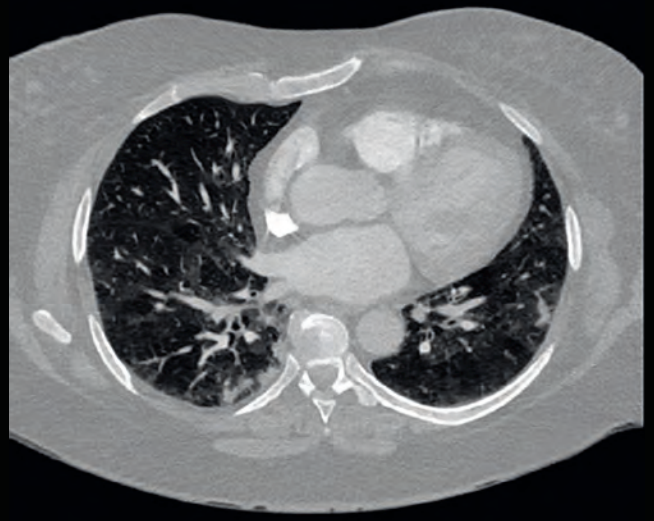


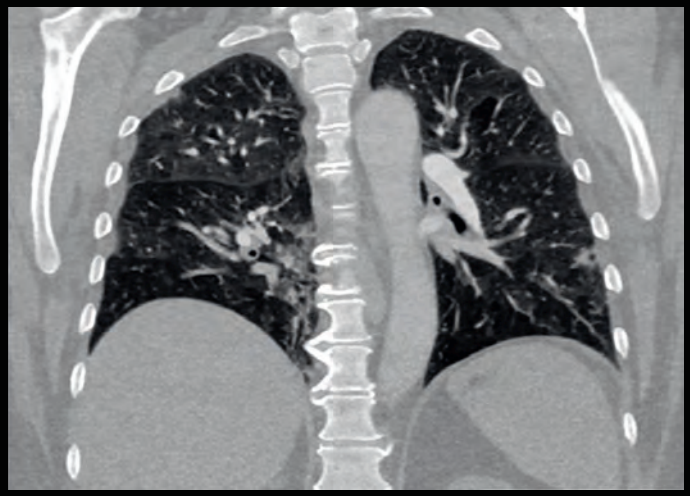
Emergency care for pediatric patients –
The faster pitch (of 1.7) and higher rotation time (of 0.28 s) allow acquisition of diagnostic information at an ultra low dose (DLP 2 mGy cm) in challenging cases, such as this 9-month-old baby with esophagus stenosis. In this case, even without sedation.

Courtesy of Linköping University Hospital, Linköping, Sweden









Courtesy of Olmsted Medical Center,Rochester, USA

Collimation:
128 x 0.6 mm

Spatial resolution:
0.30 mm

Scan time:
1.11 s

Scan length:
252 mm

Rotation time:
0.28 s

Tube settings:
120 kV, 130 eff. mAs

CTDIvol:
8.83 mGy

DLP:
260 mGy cm

Eff. dose:
3.64 mSv

Body weight:
143 kg

Emergency care for obese patients –
The outstanding tube and generator power and faster scan speeds (up to 23 cm/s) guarantee an optimal image quality even in challenging cases, such as for obese patients.

Collimation:
128 x 0.6 mm

Scan time:
12.0 s

Scan length:
170 mm

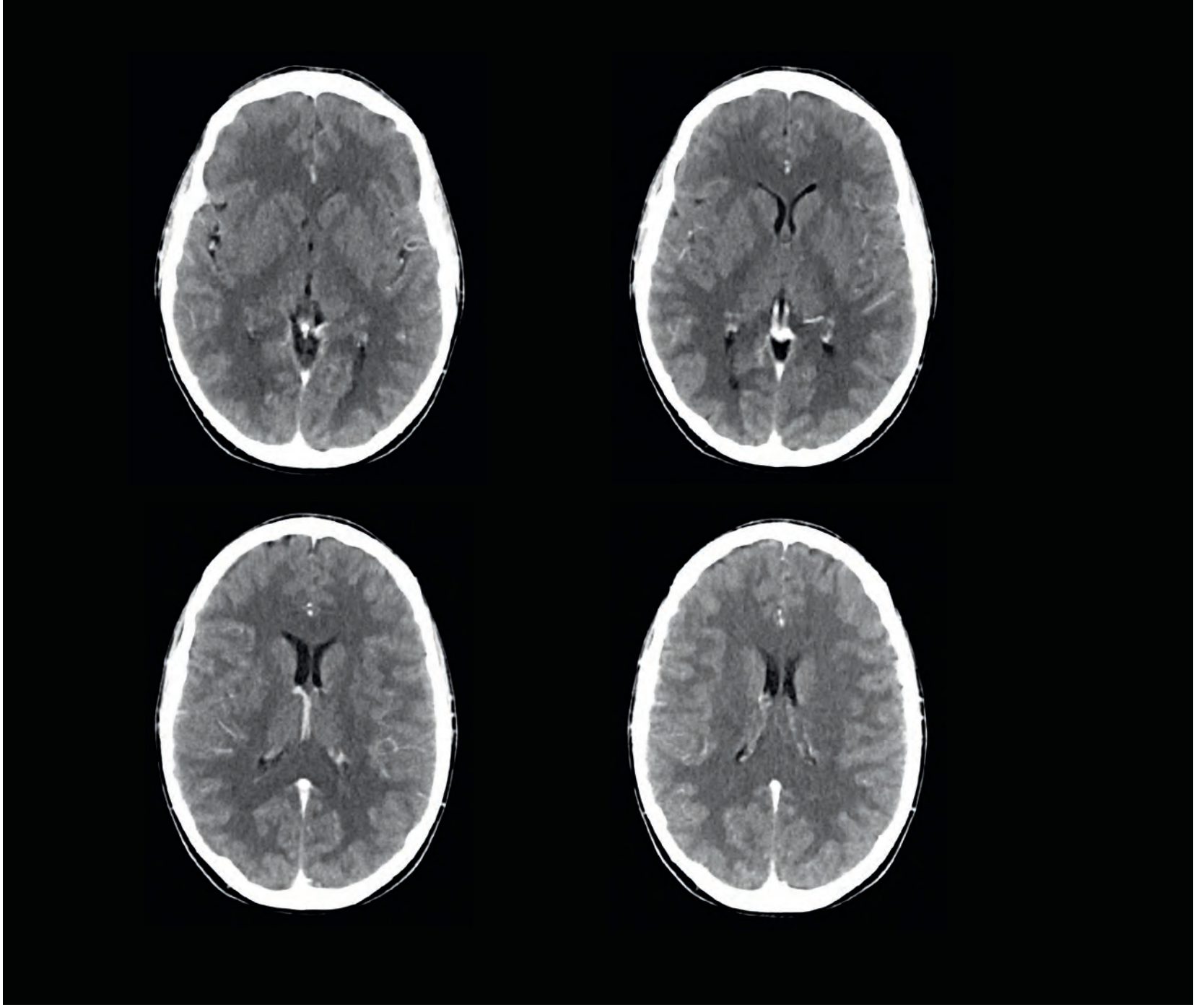
Rotation time:
1.0 s

Tube settings:
100 kV, 422 eff. mAs

CTDIvol:
40.92 mGy

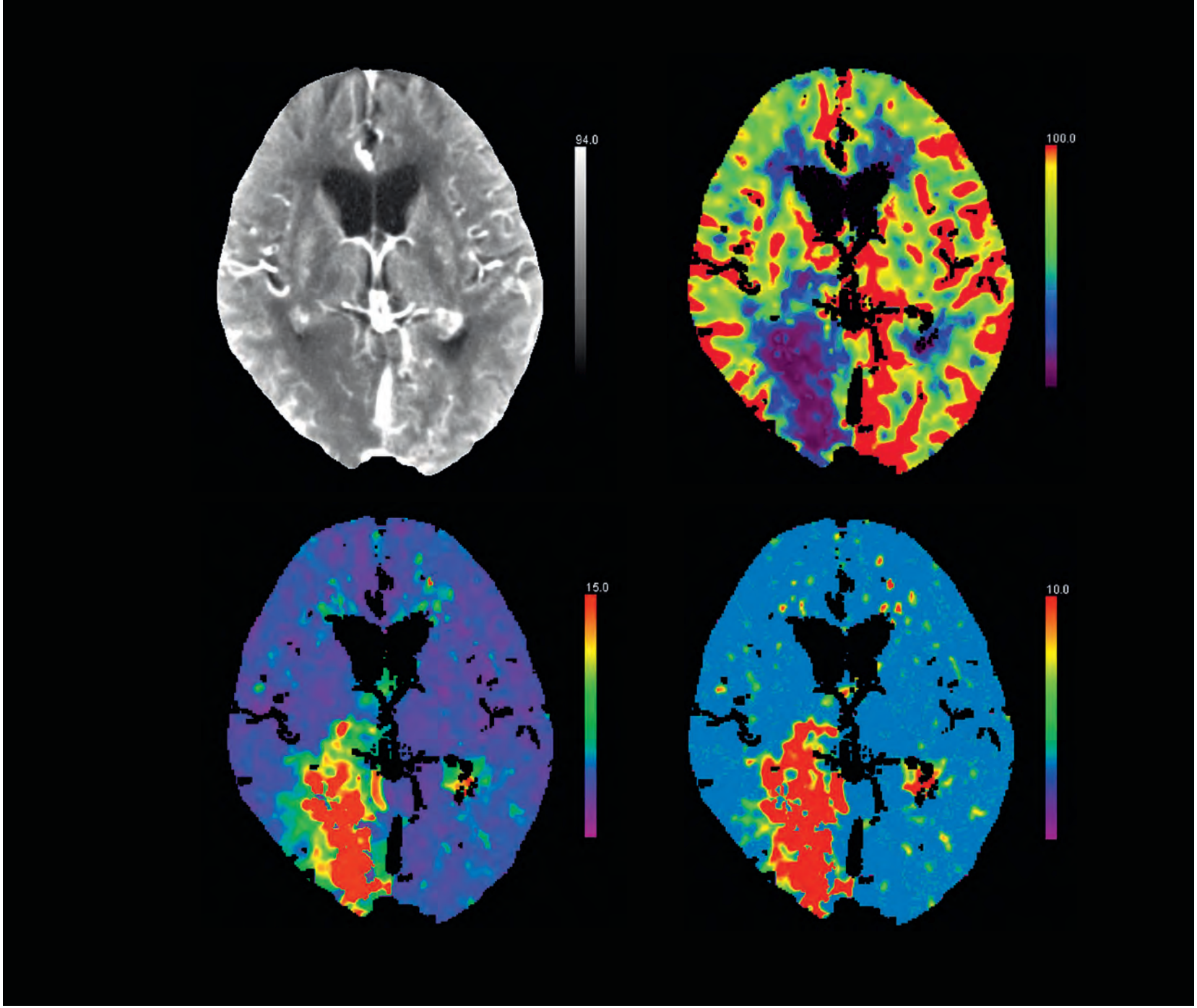
DLP:
706 mGy cm

Eff. dose:
1.48 mSv



Cerebrum –
ADMIRE, the latest generation of iterative reconstruction, greatly enhances image quality while reducing radiation dose. In this cerebral examination, great grey-white matter differentiation was achieved using a reduced radiation dose in combination with ADMIRE.

Courtesy of CIMOP Bizet, Paris, France



Courtesy of LMU Großhadern, Munich, Germany

Collimation:
32 x 1.2 mm

Spatial resolution:
0.30 mm

Scan time:
44.0 s

Scan length:
90 mm

Rotation time:
0.5 s

Tube settings:
80 kV, 200 eff. mAs

CTDIvol:
237.49 mGy

DLP:
2,800 mGy cm

Eff. dose:
5.88 mSv

Comprehensive stroke assessment –
The Adaptive 4D Spiral brings perfusion scanning to a new level. Being able to evaluate perfusion deficits in a very short time, and effortlessly acquire a scan range beyond the detector coverage, greatly improves stroke assessment and workflow.

Collimation:
16 x 0.3 mm

Spatial resolution:
0.30 mm

Scan time:
12 s

Scan length:
49 mm

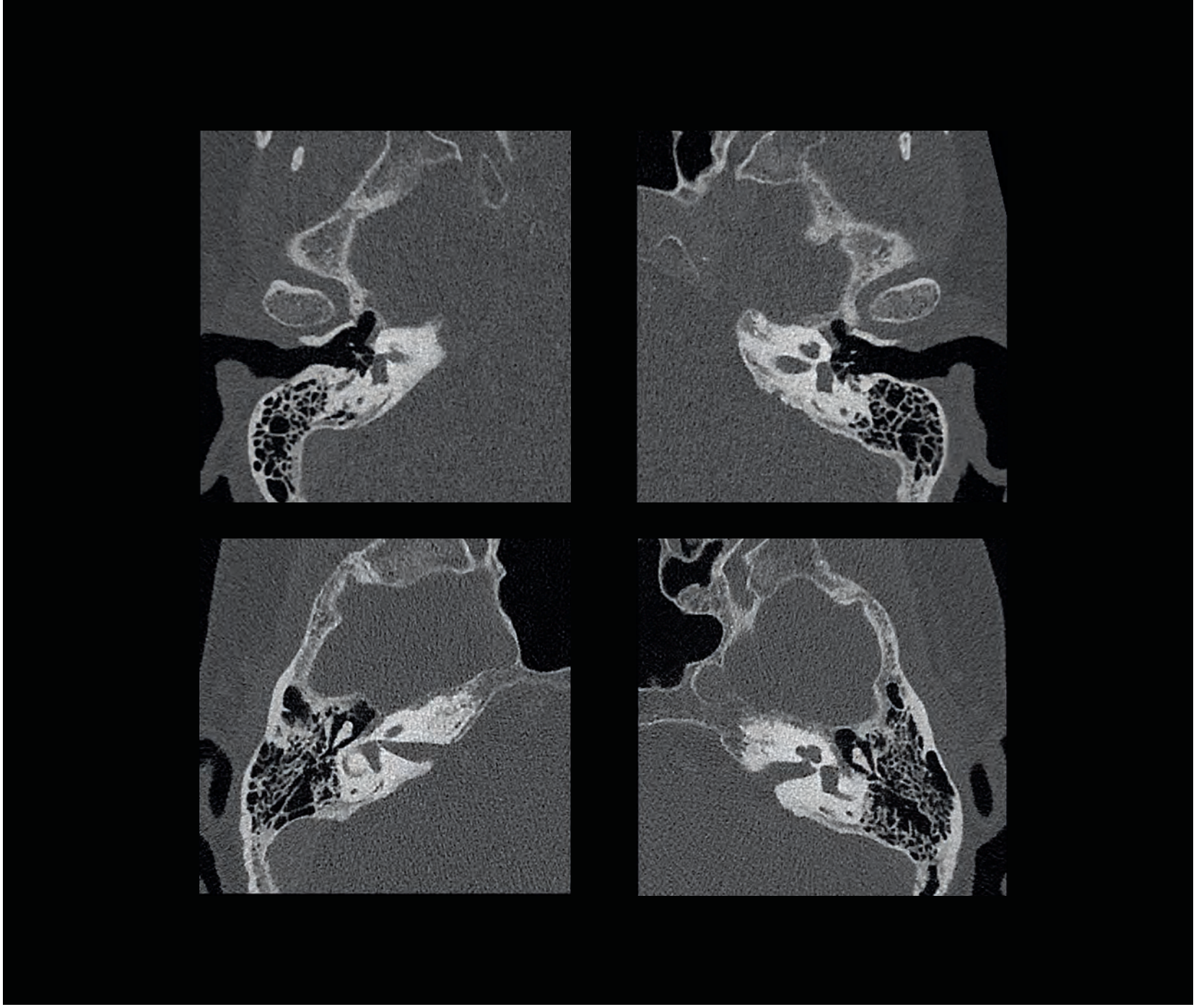
Rotation time:
1.0 s

Tube settings:
120 kV, 121 mAs

CTDIvol:
27.08 mGy

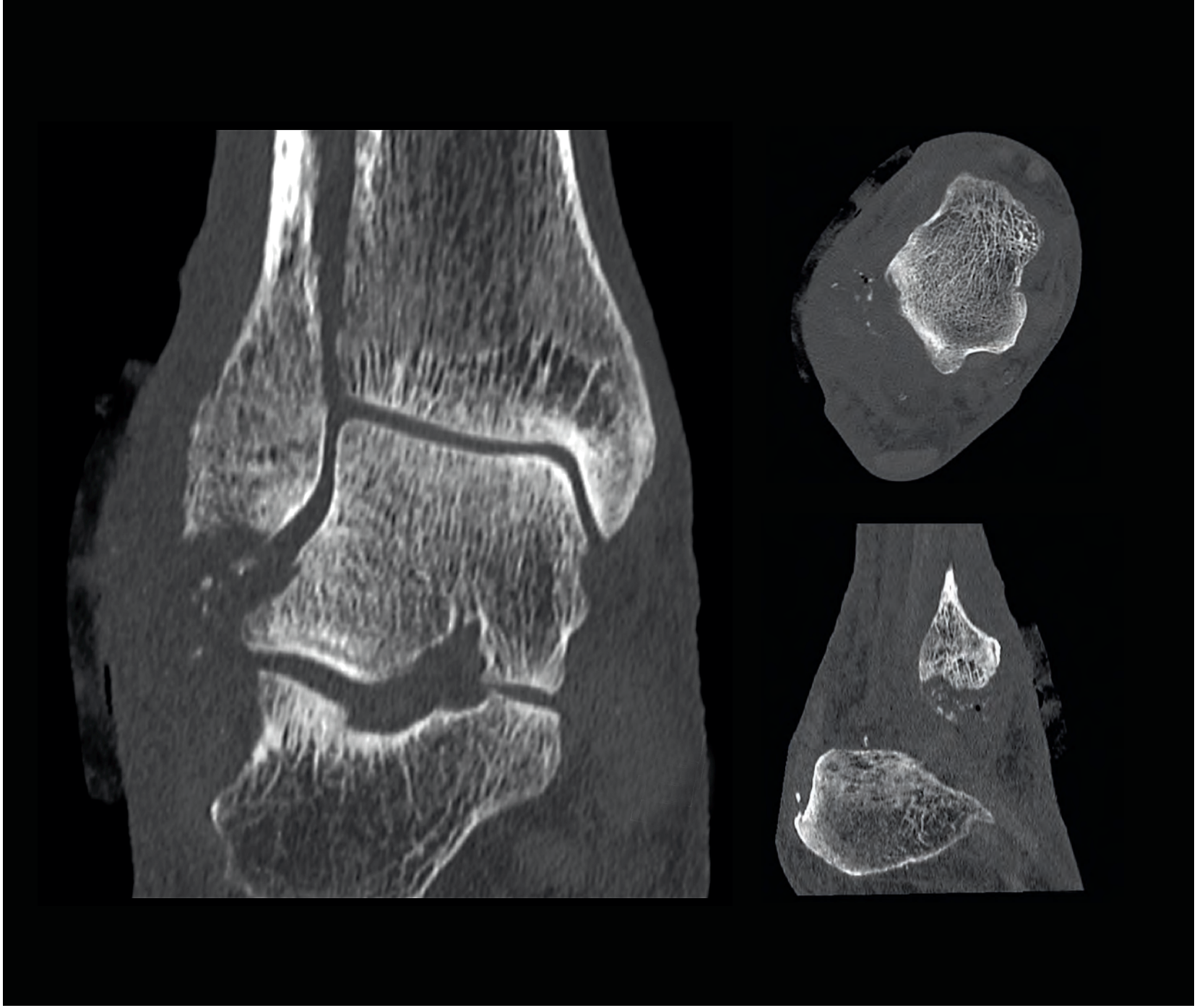
DLP:
148 mGy cm

Eff. dose:
0.46 mSv



Inner ear imaging –
Higher spatial resolution enables z-UHR-like image quality in less time and with less dose.

Courtesy of CIMOP Bizet, Paris, France



Collimation:
16 x 0.3 mm

Spatial resolution:
0.30 mm

Scan time:
52.0 s

Scan length:
209 mm

Rotation time:
1.0 s

Tube settings:
120 kV, 232 mAs

CTDIvol:
21.89 mGy

DLP:
454 mGy cm

Eff. dose:
0.36 mSv

Lateral ankle joint fracture –
In trauma cases, higher spatial resolution shows even very fine structures like on this fibula bone splintering.

Courtesy of CIMOP Bizet, Paris, France

Collimation:
64 x 0.6 mm

Scan time:
44 s

Scan length:
1,534 mm

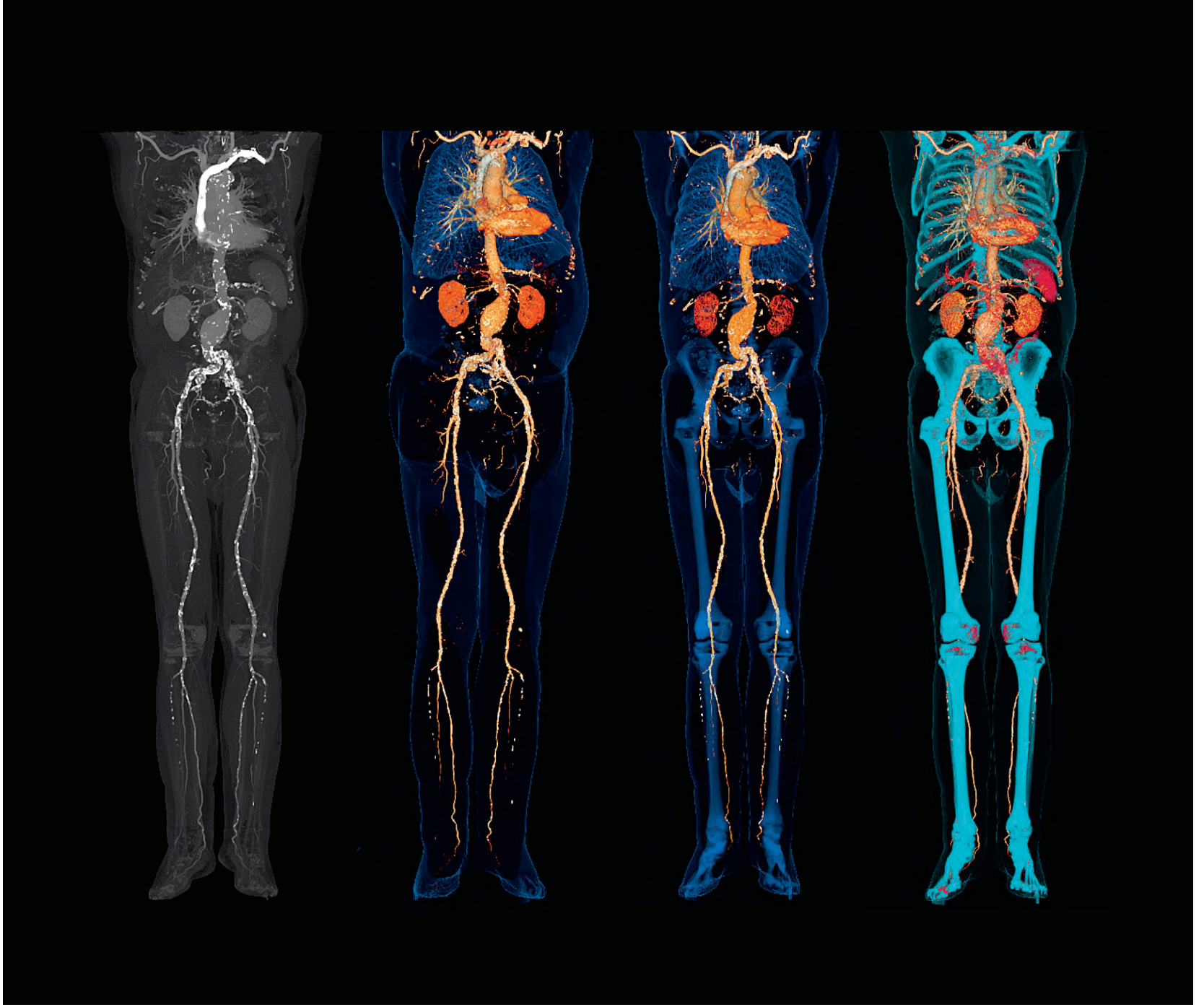
Rotation time:
0.33 s

Tube settings:
AuSn 120 kV, 301 eff. mAs

CTDIvol:
6.44 mGy

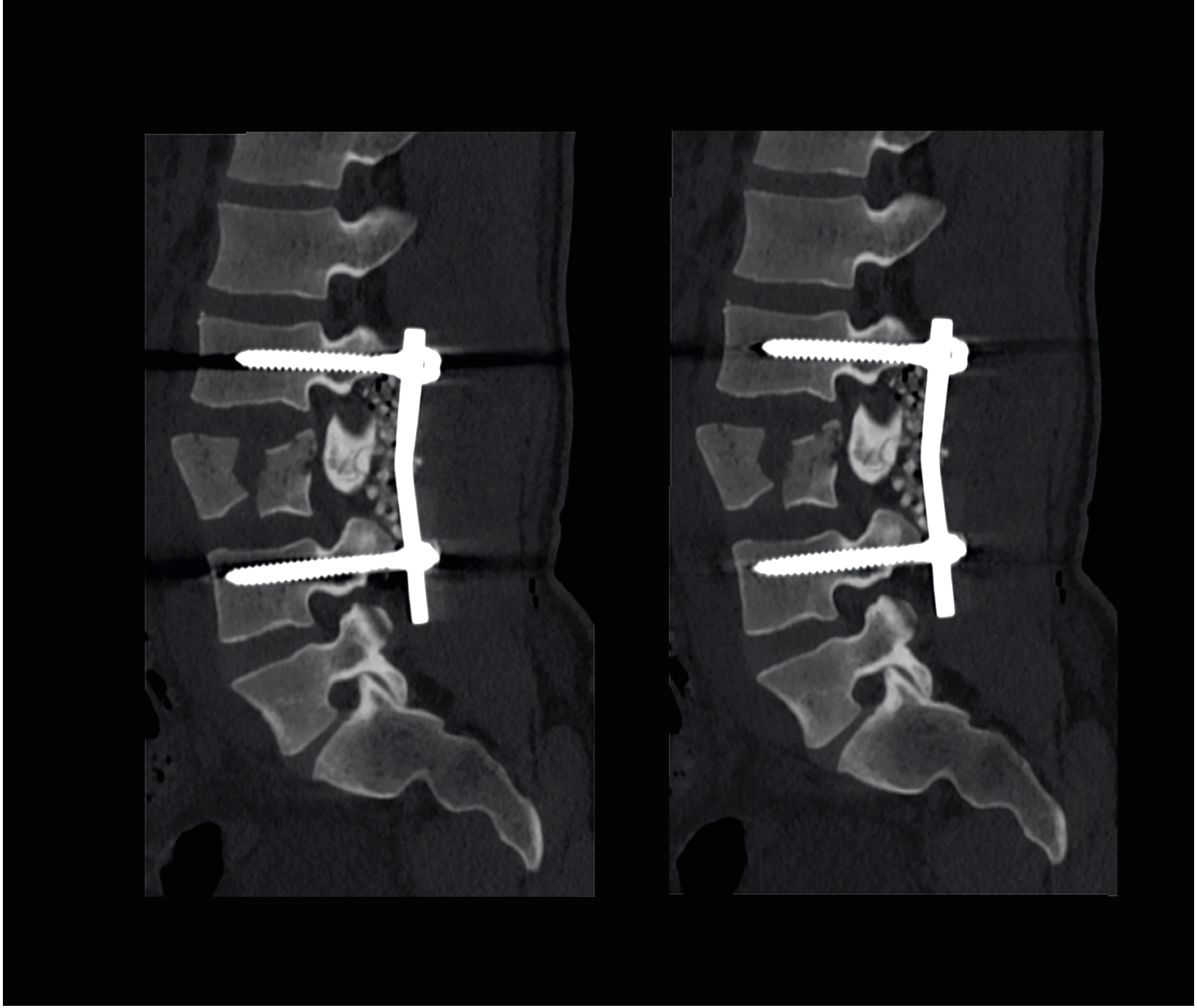
DLP:
1,007.8 mGy cm
140 ml Imeron 350

Eff. dose:
8 mSv



Infra-renal abdominal aortic aneurysm (AAA) –
TwinBeam Dual Energy acquires a whole body CTA at two different enegry levels in a single scan. Such a large dataset can be converted into three dimensional visualizations very conveniently and easily using automatic bone removal.

Courtesy of University Erlangen Radiologie, Erlangen, Germany



Collimation:
128 x 0.6 mm

Spatial resolution:
0.30 mm

Scan time:
7.0 s

Scan length:
260 mm

Rotation time:
1.0 s

Tube settings:
120 kV, 206 mAs

CTDIvol:
13.90 mGy

DLP:
392.2 mGy cm

Eff. dose:
5.9 mSv

Follow-up on spinal fixation – iMAR applies iterative corrections to reduce metal artifacts effectively. It can be routinely applied in follow-up imaging, such as spinal fixation, to visualize the location of the screws and the structures of the spine.

Courtesy of Luzerner Kantonsspital, Lucerne, Switzerland

Collimation:
128 x 0.6 mm

Scan time:
9.5 s

Scan length:
449 mm

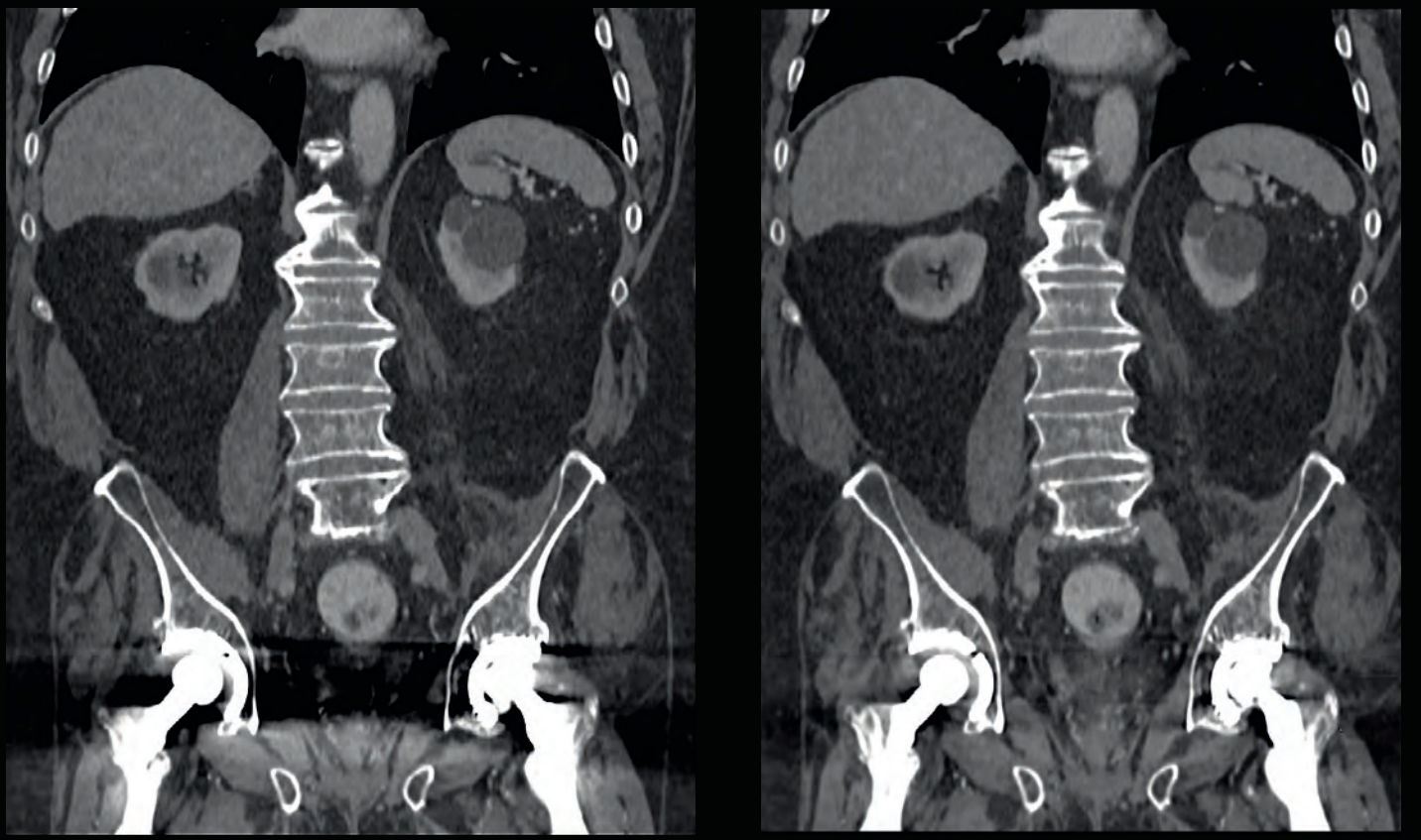
Rotation time:
0.5 s

Tube settings:
100 kV, 372 eff. mAs

CTDIvol:
14.7 mGy

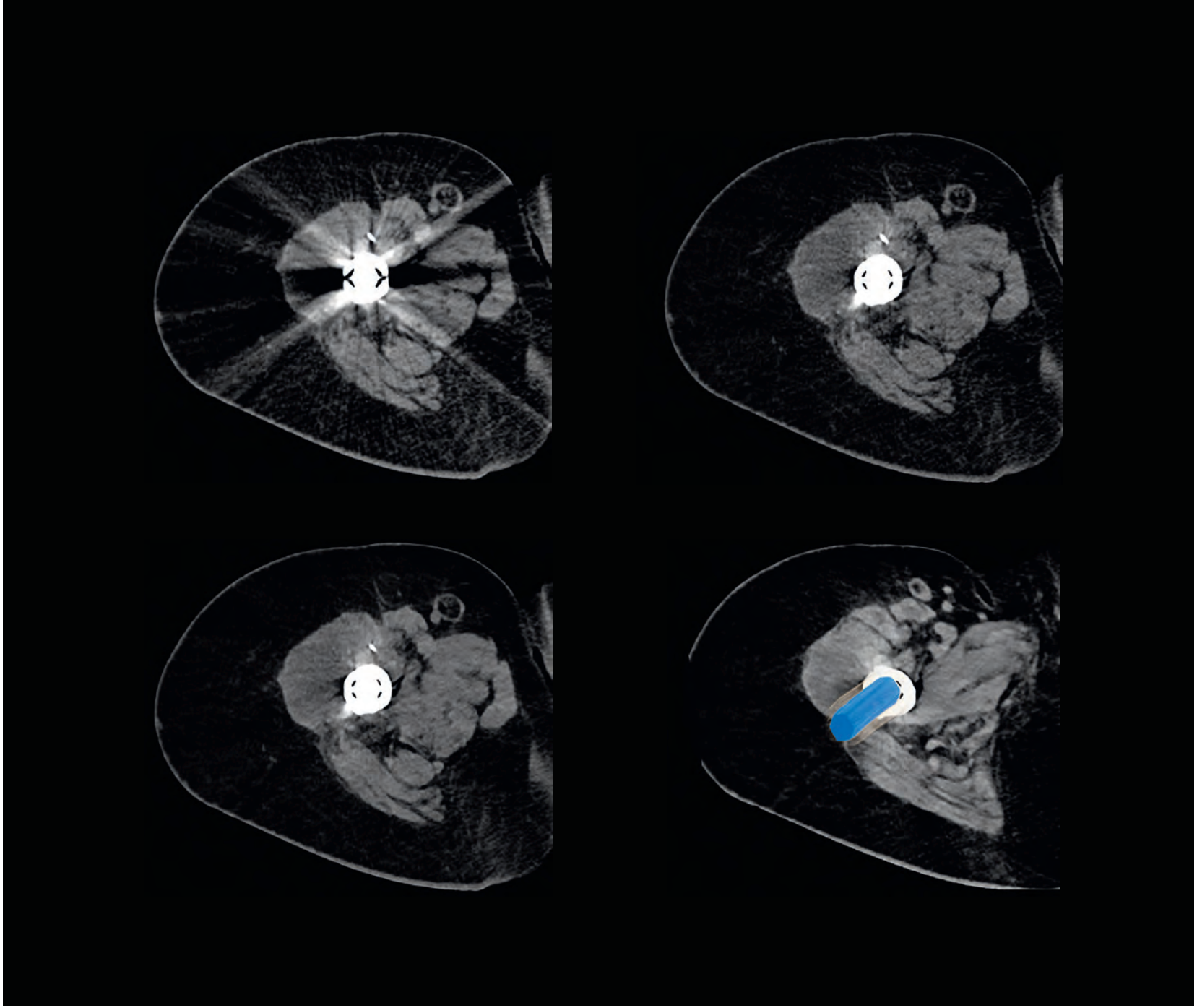
DLP:
682.4 mGy cm

Eff. dose:
10.2 mSv



Pelvic imaging with bilateral hip prostheses –
iMAR technology can also be applied in challenging cases, such as pelvic imaging with bilateral hip prostheses, to enhance diagnostic confidence.

Courtesy of Lucerne Kantonsspital, Lucerne, Switzerland



Collimation:
128 x 0.6 mm

Spatial resolution:
0.30 mm

Scan time:
4.4 s

Scan length:
147 mm

Rotation time:
0.5 s

Tube settings:
120 kV, 157 mAs

CTDIvol:
10.61 mGy

DLP:
173.3mGy cm

Eff. dose:
2.6 mSv

Pre-biopsy imaging of a small tumor adjacent to a tibial metal implant –
iMAR technology can even be applied in very difficult cases, such as a small tumor adjacent to a tibial metal fixation, to provide clear guidance for biopsy.

Courtesy of University Hospital Basel, Basel, Switzerland

Collimation:
128 x 0.6 mm

Spatial resolution:
0.30 s

Scan time:
1.86 s

Scan length:
300 mm

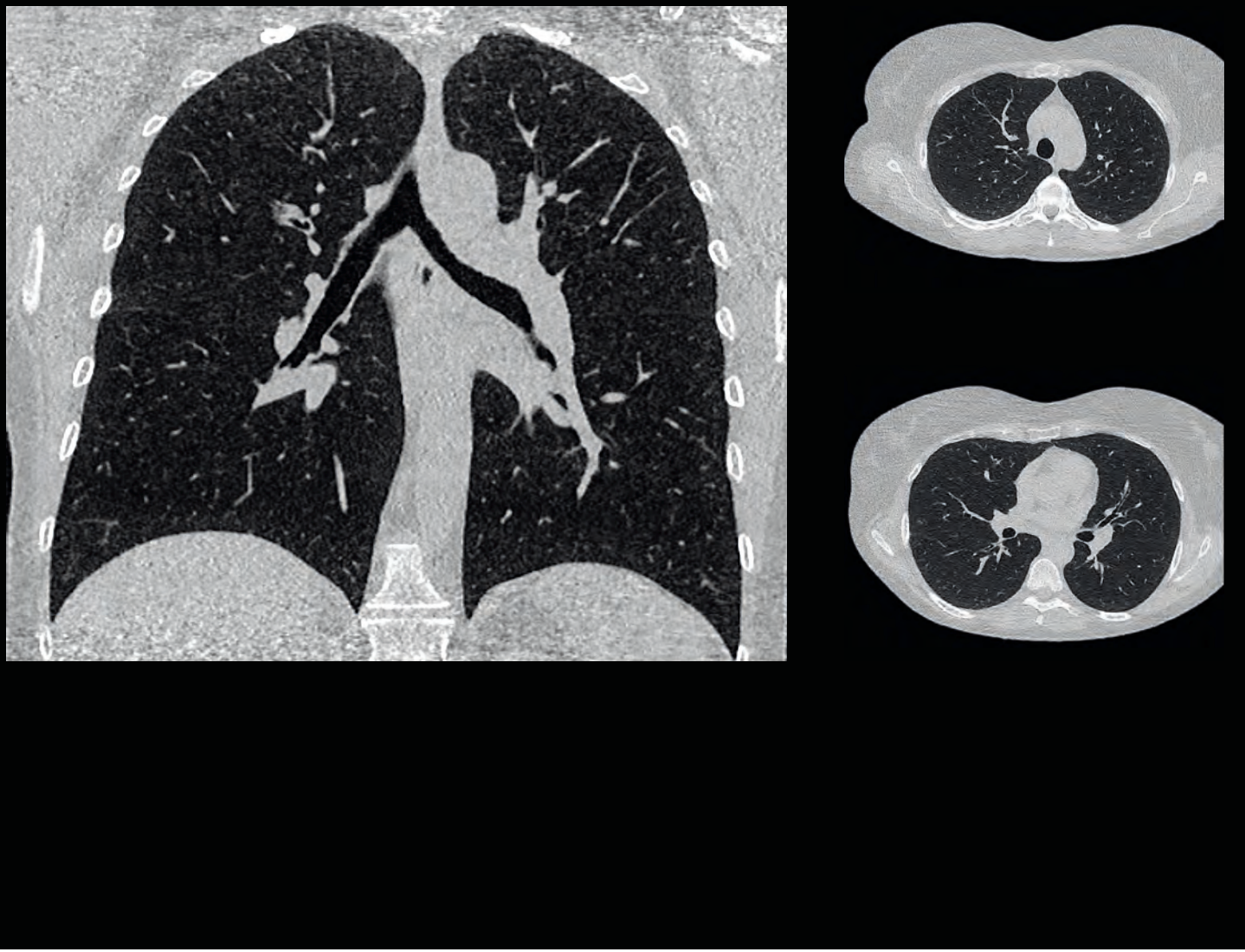
Rotation time:
0.28 s

Tube settings:
100 kV, 10 eff. mAs

CTDIvol:
0.39 mGy

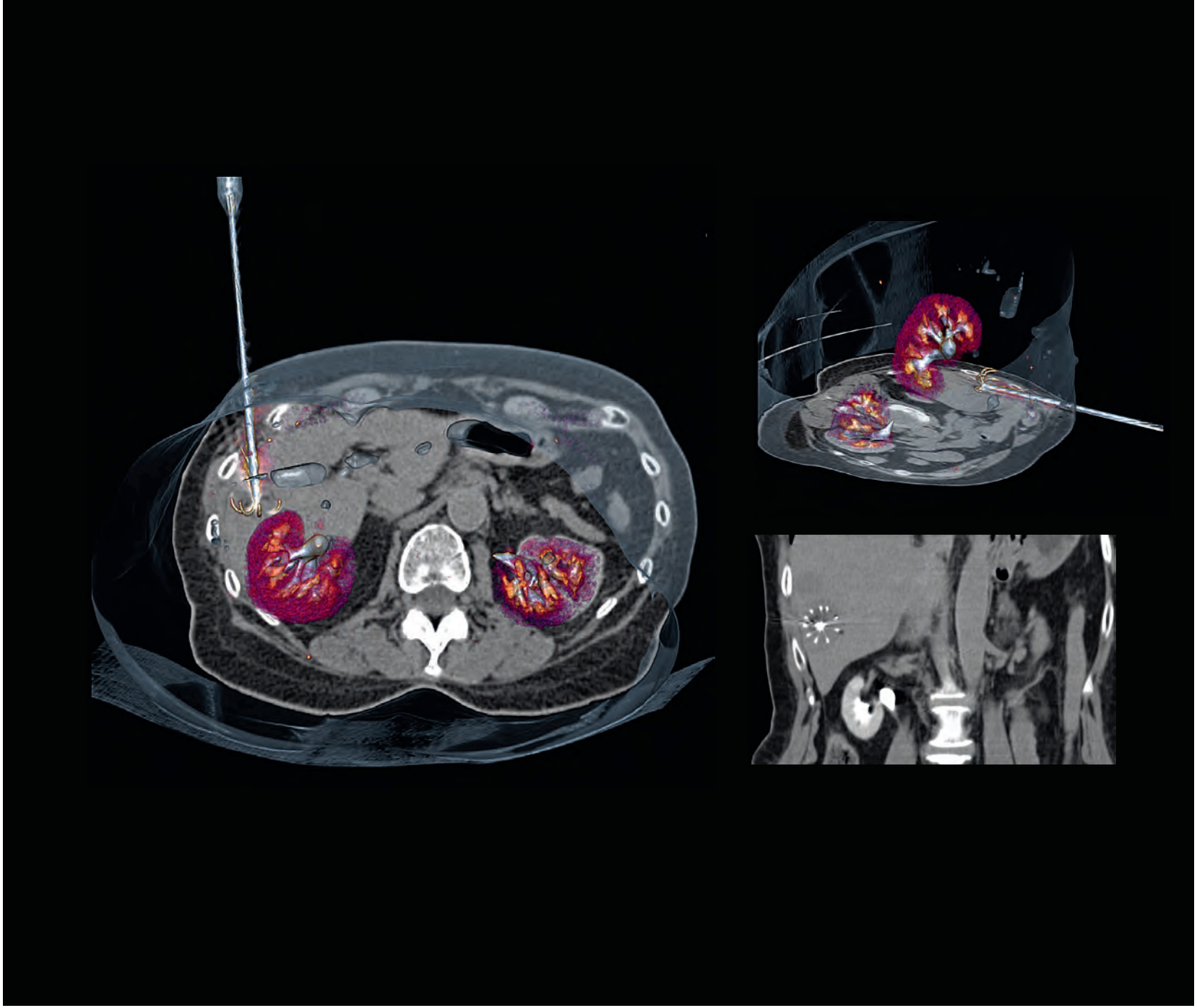
DLP:
15 mGy cm

Eff. dose:
0.21 mSv



Rule-out of pulmonary diseases – The Stellar detector, in combination with high-end iterative reconstruction algorithms, such as SAFIRE and ADMIRE, facilitates the ruling out of pulmonary disease at an early stage using ultra low doses.

Courtesy of CIMOP Bizet, Paris, France



Collimation:
128 x 0.6 mm

Scan time:
3.0 s

Scan length:
179 mm

Rotation time:
0.5 s

Tube settings:
80 kV, 150 eff. mAs

Intervention of hepatic metastasis –
Adaptive 3D Intervention Suite enables high-end interventional procedures with near to real-time coronal, sagittal, and oblique image guidance. In this case, a tumor ablation.

Courtesy of LMU Großhadern, Munich, Germany

Collimation:
64 x 0.6 mm

Scan length:
650 mm

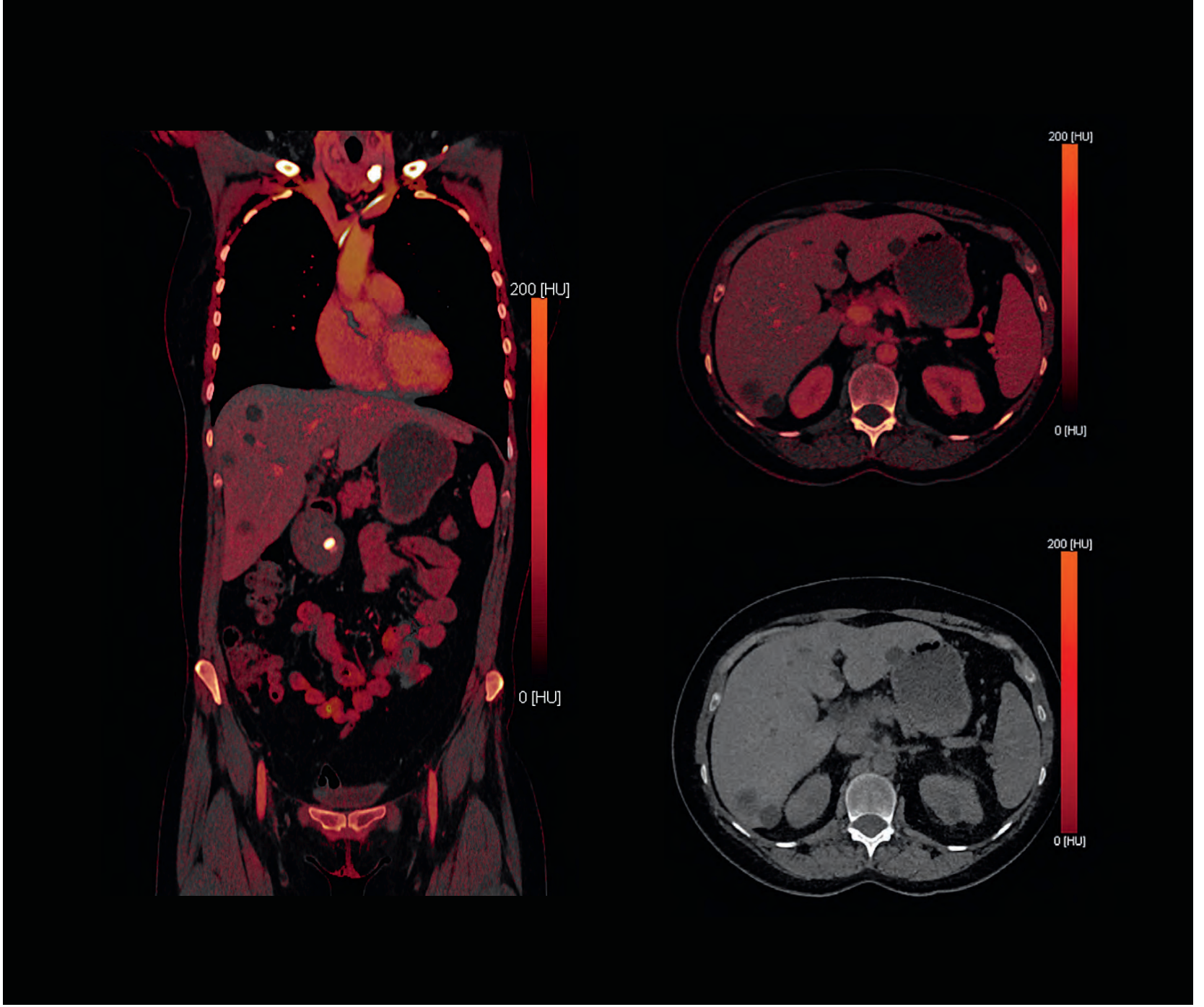
Rotation time:
0.33 s

Tube settings:
AuSn 120 kV, 355 mAs

CTDIvol:
7.6 mGy

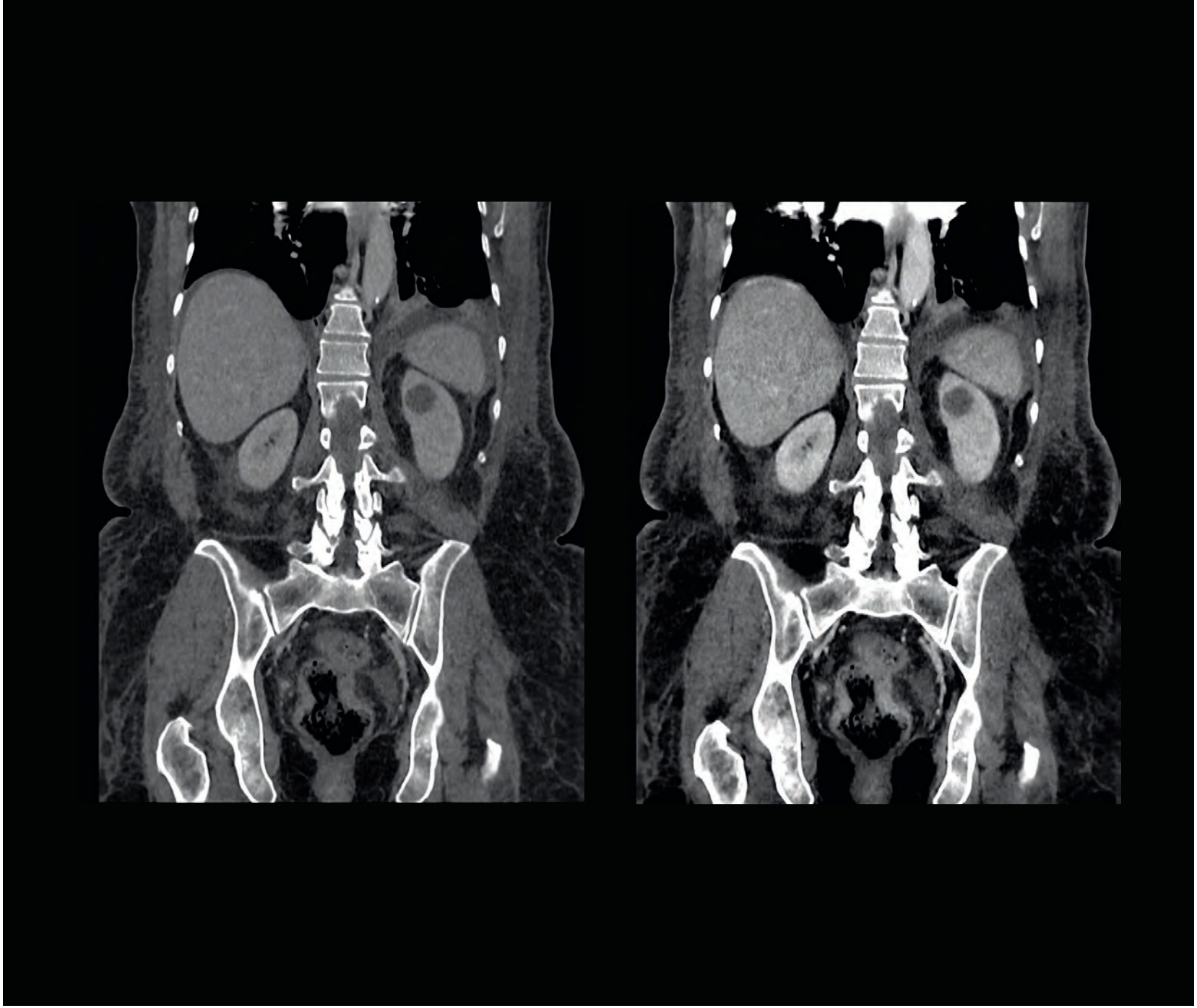
DLP:
508 mGy cm

Eff. dose:
7.6 mSv



Differential diagnosis of multiple hepatic lesions – TwinBeam Dual Energy acquires body imaging at two different energy levels in a single scan. The characters of the multiple hepatic lesions can be clearly differentiated using Liver VNC.

Courtesy of University Hospital Basel, Basel, Switzerland



Collimation:
64 x 0.6 mm

Scan time:
13.2 s

Scan length:
468 mm

Rotation time:
0.33 s

Tube settings:
AuSn 120 kV, 467 eff. mAs

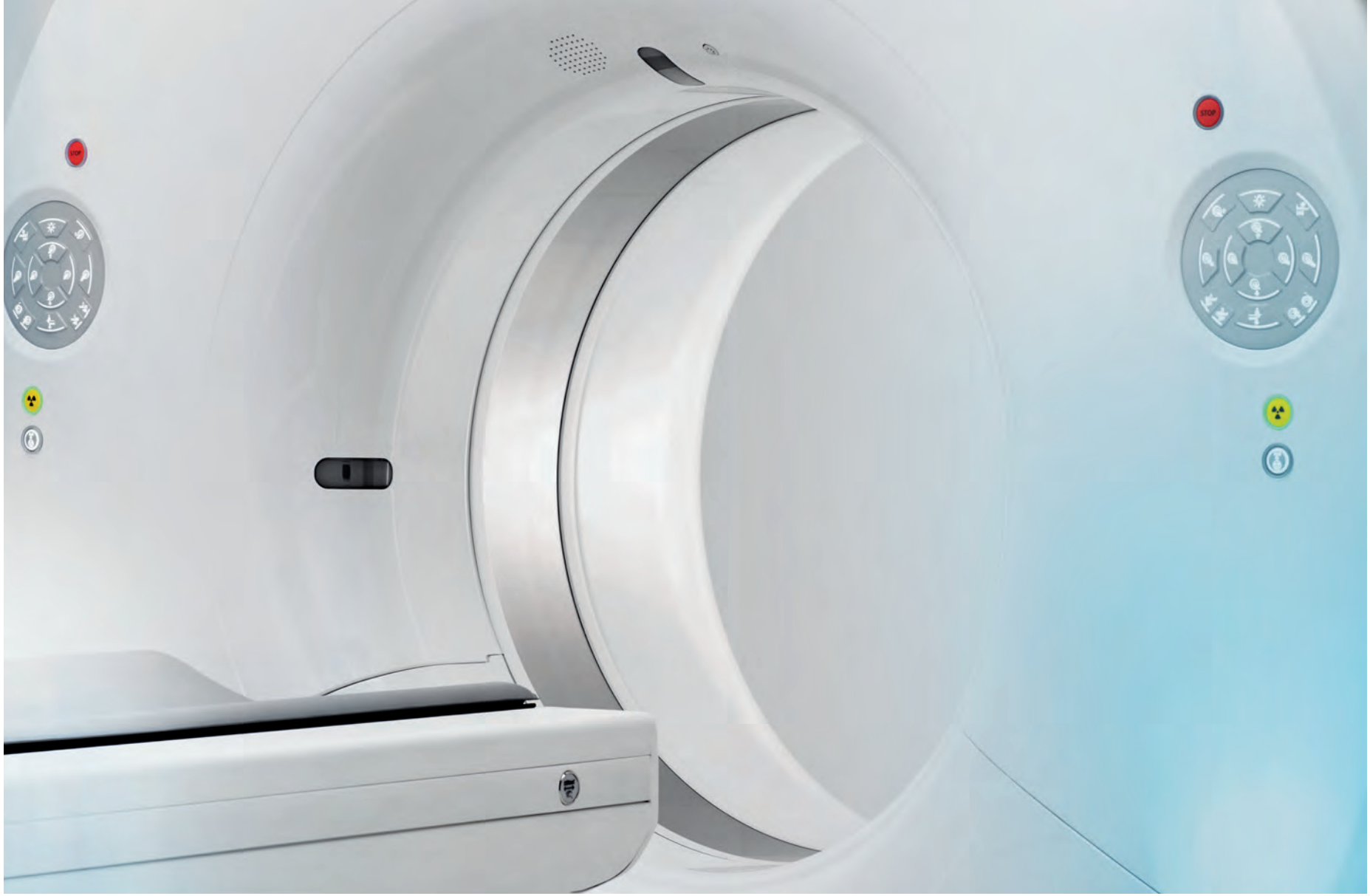
CTDIvol:
10.00 mGy

DLP:
486.3 mGy cm

Eff. dose:
7.3 mSv

Kidney cyst –
TwinBeam Dual Energy with monoenergetic imaging enhances the image contrast at lower keV settings, thus providing confidence in differential diagnosis.

Courtesy of University Hospital Basel, Basel, Switzerland



Core Technologies

Exceeding expectations with the Stellar detector

The new SOMATOM Definition Edge with the Stellar detector introduces lower signal, lower voltage, and lower dose scanning – without compromising image quality and diagnostic reliability.

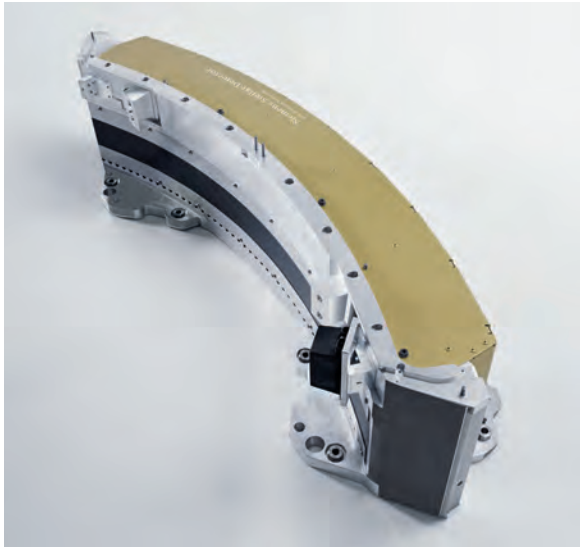
Innovation, integration, and a "stellar" performance

The Stellar detector introduces the next generation of detector technology, succeeding gas and solid-state technology. As a pioneer of high-end nanotechnology, Siemens was the first to miniaturize the electronic components on the detector elements. For the first time, a healthcare provider was able to fully integrate the detector directly into the photodiode. This industry-first, full electronic integration will exceed expectations with a "stellar" performance.

Less "problematic", more "perfect"

With conventional detector technology, CT specialists are used to electronic noise and cross-talk, which often compromises image quality and diagnostic value. Based on the full electronic integration of the Stellar detector, Siemens' exclusive TrueSignal technology significantly reduces noise and cross-talk. Intrinsic slice blurring between neighboring detector rows is avoided, and individual slice profiles are generated with much greater precision. In combination with Edge technology, an almost-perfect model of the focal spot and detector is capable of generating a slice thickness of 0.5 mm, sufficient in everyday clinical routine for virtually all cases.

The Stellar detector places SOMATOM Definition Edge in a class of its own with a routine spatial resolution of up to 0.30 mm, allowing visualizations of very fine structures or lesions.



The STRATON tube and the newly designed gantry enable high spatial resolution even at an acquisition speed of up to 23 cm/s. This takes motion out of the equation.

High spatial resolution, excellent signal-to-noise ratio

Conventional CT compensates for slice blurring, noise, and cross-talk by increasing the dose. The TrueSignal technology of the Stellar detector exceeds expectations by offering a new solution to this challenge: Instead of increasing the dose, it makes more efficient use of the initially available quants per voxel. High spatial resolution and a high signal-to-noise ratio (SNR) are reliable indicators of excellent image quality. In addition, the Stellar detector, provides a homogeneous slice profile with the same spatial resolution and SNR in the entire field of view (FoV), which is essential for consistently high image quality.

More efficiency, more range, more patients

At high signal levels, image noise is more or less the same across different CT technologies. However, when the signal is lowered – either by high attenuations from obese or broad-shouldered patients, or by reducing the applied mA – the impact of TrueSignal technology increases, as the detector can make better use of the measured signal. Fully integrated, the Stellar detector will also benefit your patient outcomes with an extended dynamic range (HiDynamics) as there is no need to switch bandwidth. This means that the detector's sensitivity for visualizing finer structures, especially for low-kV datasets, is substantially increased.

Scan to learn more about the new Stellar detector.

www.siemens.com/edge-stellar

Exceeding expectations with TwinBeam Dual Energy

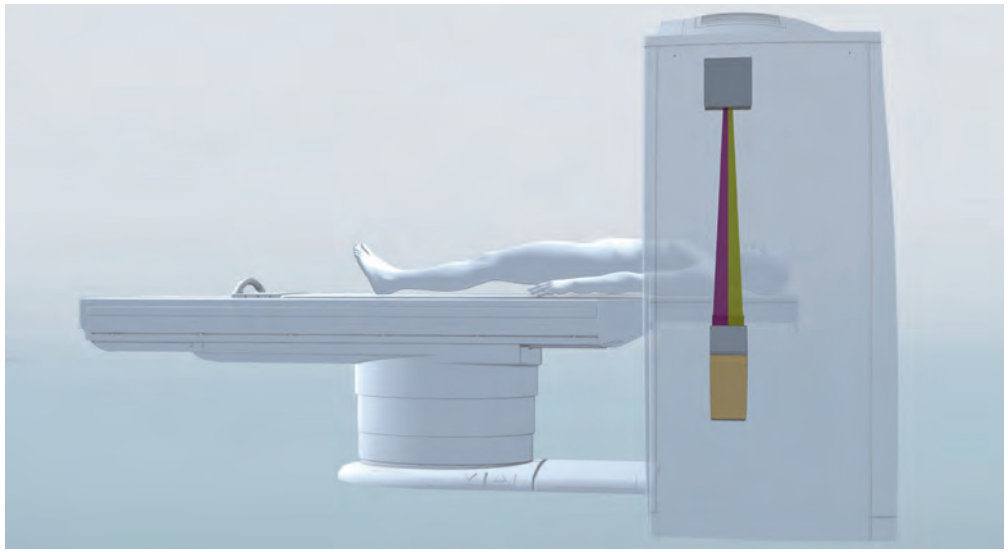
The new SOMATOM Definition Edge offers greater versatility than any other Single Source CT system, by introducing dose-efficient, comprehensive Dual Energy capabilities for virtually all patients.

The new benchmark in Single Source Dual Energy

To bring the benefits of Dual Energy to more patients, Siemens introduced Single Source Dual Energy with the Dual Spiral approach. The new SOMATOM Definition Edge now expands the Dual Energy portfolio even further, introducing the new TwinBeam Dual Energy™ technology. This innovative Dual Energy approach allows for the simultaneous acquisition of high and low-kV datasets in a single CT scan, enabling high-contrast dynamic applications.

How it works

Siemens TwinBeam Dual Energy is routinely applicable for virtually all patients without compromising the image quality or radiation dose. To create two X-ray spectra simultaneously from one tube, the STRATON® tube assembly system generates a prefiltered X-ray beam, creating two different X-ray spectra – a high- and a low-energy spectrum – before it reaches the patient. Due to the additional filtration, this acquisition technique requires sufficient tube power reserves, which are readily available on Siemens CT scanners with the STRATON tube.



With TwinBeam Dual Energy, the X-ray beam is split up into a high- and low-energy spectrum enabling high-contrast dynamic applications.

Expanding your clinical routine

A large variety of *syngo*.via Dual Energy applications are now available for cases acquired with Single Source Dual Energy. Image acquisition is possible for all rotation times (up to 0.28 seconds), for the full field of view of 50 cm, and with the full number of projections for both spectra. In terms of detection, the simultaneously acquired low- and high-energy data can be reconstructed separately and examined independently. Alternatively, a composite reconstruction is available (disregarding spectral differences) to give a single-energy image dataset with excellent diagnostic image quality.

Routine ready workflow

TwinBeam Dual Energy in combination with FAST DE Results paves the way for Dual Energy in clinical routine. As part of an advanced workflow, FAST DE Results generates Dual Energy datasets at the acquisition workplace, and the results are sent directly to the reading environment for a straightforward Dual Energy workflow with advanced diagnostic information. This is enabled through the reconstruction of monoenergetic images at different keV levels, as mixed, optimum contrast and virtual non-contrast (VNC) images without additional interaction.

Major clinical benefits

Additional major clinical benefits include, for example, evaluations of pulmonary embolisms using *syngo*.CT DE Lung Analysis. This application provides immediate diagnostic information such as the location of the affected vessel and details of the perfusion defect in the parenchyma. TwinBeam Dual Energy together with *syngo*.CT DE Direct Angio is designed to perform high dynamic/arterial phase Dual Energy scans, offering you a bone-free view of the vascular system.

Exceeding expectations with the Right Dose

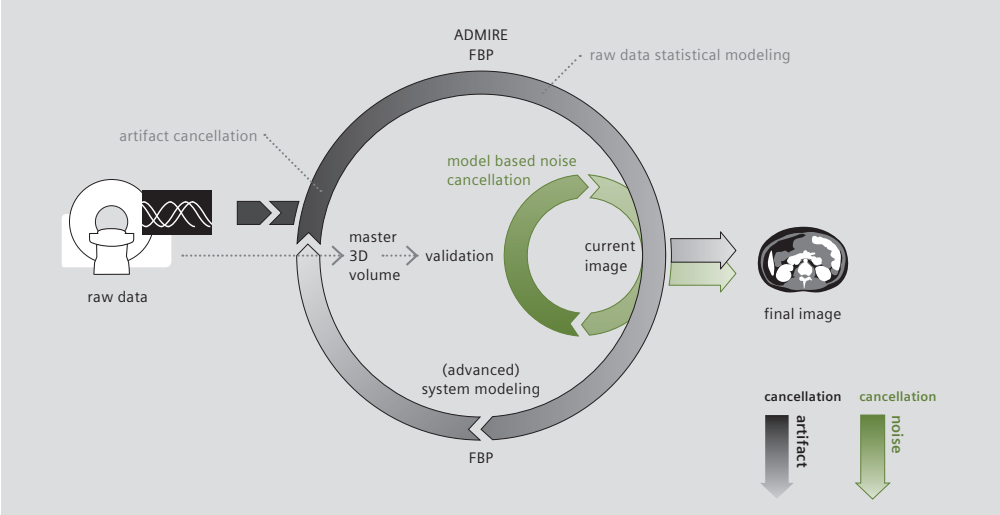
The new SOMATOM Definition Edge helps you achieve the ideal balance between radiation dose and image quality – providing sound and sustainable results while guaranteeing maximum patient safety.

Above all, ALARA

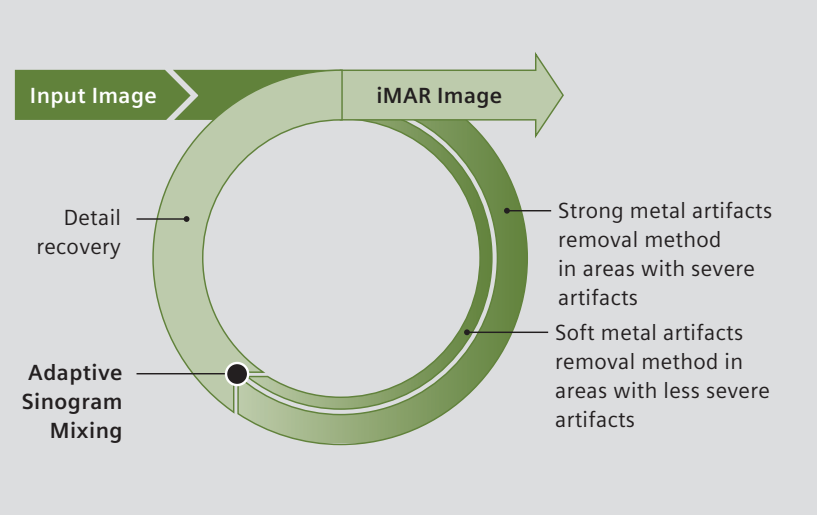
Medical imaging is based on two essential pillars: Sound and sustainable clinical results, and the best possible patient safety. When it comes to applying radiation, ALARA – As Low As Reasonably Achievable – is the overarching principle. Innovation leader Siemens has been at the forefront of radiation reduction for decades – scans at sub-mSv doses have found their way into clinical routine. However, no single dose level fits everyone. Every clinical question and every single patient requires individual, meticulous dose management. Siemens has pioneered this principle and continues to drive innovation with its CARE Right and Right Dose programs and philosophy.

Perfect CARE for all patients

Siemens' comprehensive CARE – Combined Applications to Reduce Exposure – portfolio offers innovative and unique dose reduction features. CARE kV, for example, is the industry's first tool that automatically determines the appropriate kV and scan parameter settings to help deliver the right dose for a particular scan, and with user-defined image quality. In combination with the STRATON tube and Siemens' Sinogram Affirmed Iterative Reconstruction (SAFIRE)*, CARE offers low-kV imaging down to 70 kV, enhanced contrast media for advanced diagnostic information, and enables dose savings of up to 60%*.



ADMIRE – Advanced Modeled Iterative Reconstruction



iMAR - iterative Metal Artifacts Reduction

Enhancing everything: ADMIRE

With the new ADMIRE** – Siemens' Advanced Modeled Iterative Reconstruction – you can smoothly integrate exceptionally low doses and excellent image quality into your daily routine. ADMIRE clinical images provide higher resolution at organ borders and improved delineation of edges, e.g. to better localize lesions. Thick slices are now reconstructed at a more natural image impression, even from ultra-low-dose scans. Iteratively reconstructed low-dose datasets can now easily be stored in PACS or on film – ADMIRE gives clinicians access to enhanced image quality with a natural image impression, and all clinical applications, while utilizing the full dose reduction potential offered by iterative reconstruction.

Easy to adapt: Adaptive Dose Shield

The Adaptive Dose Shield eliminates over-radiation pre- and post-spiral to the patient. By dynamically moving shields into place on the X-ray tube, it blocks clinically irrelevant doses – not only for dedicated applications, but for every single spiral acquisition. The Adaptive Dose Shield dynamically opens at the beginning of a spiral range and then dynamically closes at the end, effortlessly avoiding exposure of tissue that will never be part of the reconstructed images, resulting in significant dose reductions without affecting image quality.

iMAR – iterative Metal Artifacts Reduction

iMAR improves diagnostic confidence by reducing metal artifacts – even in challenging cases like dental fillings, spine implants, and pacemakers. iMAR is based on Adaptive Sinogram Mixing. It combines a strong metal artifact removal method in areas with severe artifacts with a soft correction in areas with less-severe artifacts. The result is outstanding image quality without the metal artifacts and with the valuable information.

*In clinical practice, the use of SAFIRE 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. The following test method was used to determine a 54 to 60% dose reduction when using the SAFIRE reconstruction software. Noise, CT numbers, homogenity, low-contast resolution, and high contrast resolution were assessed in a Gammex 438 phantom. Low dose data reconstructed with SAFIRE showed the same image quality compared to full dose data based on this test. Data on file.

**In clinical practice, the use of ADMIRE 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.

Customer Services

A range of innovative service solutions provide the answers to best support our customers in raising quality and productivity in healthcare.

Maintainable healthcare

Providing economically viable healthcare means efficiently and productively delivering the highest quality care possible. This is why Siemens works closely with our customers, offering experience and innovative solutions to increase uptime, improve performance, and optimize workflow for maintainable healthcare. This means raised quality, better productivity, and greater cost-effectiveness.

Increased availability with System Services

Peak performances and higher uptime are achieved by proactively ensuring system availability with innovative service solutions. Siemens Remote Service, for example, establish a highly efficient, secure and certified remote connection between CT systems and the Siemens' service organization for remote monitoring and remote fixing in order to maximize availability and performance.

Proactive maintenance

With the Siemens Guardian Program™ including TubeGuard, potential tube downtime can be predicted ahead of time. This allows healthcare institutions to schedule maintenance without impairing regular patient hours for higher system efficiency.

Improved operation with User Services

Personalized education and training are the key to more expertise, greater efficiency, and higher productivity of the system operators. In addition, dedicated consultancy services facilitate the further improvement of system usage. Optimize CARE CT, for example, is a comprehensive program to help customers reduce radiation in CT scanning. The program provides expert insights, methods, and tools that assist customers in developing a customized road map towards improving their CT dose.

Optimized utilization with Management Services

Increased workflow optimization and better productivity through process optimization and consulting help improve efficiency, system utilization, and return on investment. Utilization Management Consulting combines quantitative data from the Utilization Management report with technical experience and radiological workflow management. Customers can then learn about their strengths and improvement potential across all professional groups.

SOMATOM Definition Edge

"Exceeding expectations" VS. "Accepting the average"

Second best is not an option.

Exceeding expectations in Cardiology

- Precise plaque differentiation
- Contrast media-efficient TAVI planning
- Reliable, high-speed triple rule-out scanning

Exceeding expectations in Emergency Medicine

- Excellent emergency stroke care for all patients
- Future-ready, high-efficiency workflow
- Reduced door-to-image time

Exceeding expectations in Oncology

- Early tumor identification
- Efficient therapy response assessment
- Improved, low-dose therapy control


SIEMENS
SOMATOM
Definition Edge

Detector	Stellar detector
Number of acquired slices	128
Number of reconstructed slices	384
Spatial resolution	0.30 mm
Rotation time	up to 0.28 s
Temporal resolution	up to 142 ms
Generator power	up to 100 kW
kV steps	70, 80, 100, 120, 140 kV
Max. scan speed	up to 23 cm/s
Table load	up to 307 kg / 676 lbs
Gantry opening	78 cm


SIEMENS
SOMATOM
Definition Edge

On account of certain regional limitations of sales rights and service availability, we cannot guarantee that all products included in this brochure are available through the Siemens sales organization worldwide. Availability and packaging may vary by country and is subject to change without prior notice. Some/All of the features and products described herein may not be available in the United States.

The information in this document contains general technical descriptions of specifications and options as well as standard and optional features which do not always have to be present in individual cases.

Siemens reserves the right to modify the design, packaging, specifications, and options described herein without prior notice. Please contact your local Siemens sales representative for the most current information.

Note: Any technical data contained in this document may vary within defined tolerances. Original images always lose a certain amount of detail when reproduced.

syngo.via can be used as a stand-alone device or together with a variety of *syngo*.via-based software options, which are medical devices in their own rights.

Usage of *syngo*.via for an emergency case requires customer to provide respective emergency measures in case of non-availability of system or network.

Siemens Healthcare Headquarters
Siemens Healthcare GmbH
Henkestr. 127
91052 Erlangen
Germany
Phone: +49 9131 84 0
siemens.com/healthcare

Order no. A91CT-00452-13C2-7600 | CC CT 2862 07160.5 |

siemens.com/healthcare