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Single Source
Dual Energy

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Maximize Outcome. Minimize Dose.

SOMATOM Definition AS

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With the SOMATOM Definition AS, Siemens has established a scanner that for the first time is capable of adapting to virtually every patient and every clinical question. With its great flexibility, the system has proven to be the right choice when it comes to high-end CT imaging – no matter whether it is set to be used for routine diagnostic imaging, high-end cardiac settings, or to add functional and material information to morphology with Dual Energy or dynamic datasets. Furthermore, the system can be tailored to fit specialized clinical settings like high-end surgery, a two room acute care solution with a Sliding Gantry, a dedicated radio therapy planning scenario with a large bore, or a highly efficient interventional setting with outstanding 3D capabilities. All this comes along with Siemens' unique FAST CARE technology. Outstanding clinical results and more time with your patients: it's simply made to maximize clinical outcomes and patient-centric productivity.

In addition, the system is designed to minimize dose. From the very beginning, one of the most important topics for Siemens CT has been patient safety. In Computed Tomography, patient safety translates primarily into dose reduction. Over the years, Siemens has been highly successful in integrating many innovations into the Siemens scanners that significantly reduce radiation dose in comparison to other systems available on the CT market. Examples for this are the Adaptive Dose Shield or SAFIRE* with the capability to reduce dose by up to 60%. Along with the CARE features like CARE kV – the industry's first automated exam-specific kV setting – the system gives users every means to minimize dose and consequently take best care of their patients' well-being.

*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, homogeneity, low-contrast 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.

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Product Benefits

Single-Click Readiness

Equipped with FAST CARE technology and Single Source Dual Energy, the SOMATOM Definition AS leads to faster and more reliable clinical results.

FAST CARE technology

To give medical professionals more time to take better care of their patients, our new FAST CARE technology accelerates workflow and lowers radiation exposure to previously unseen levels – to help users leverage untapped potential in patient-centric productivity. FAST CARE technology offers comprehensive software packages adjusted to customers' needs and clinical fields.

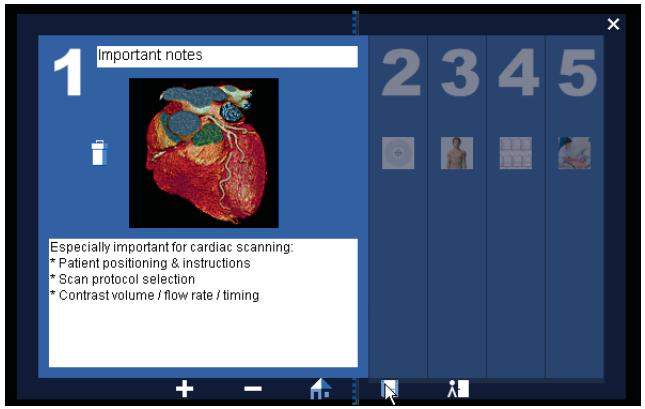
FAST CARE technology – Be FAST

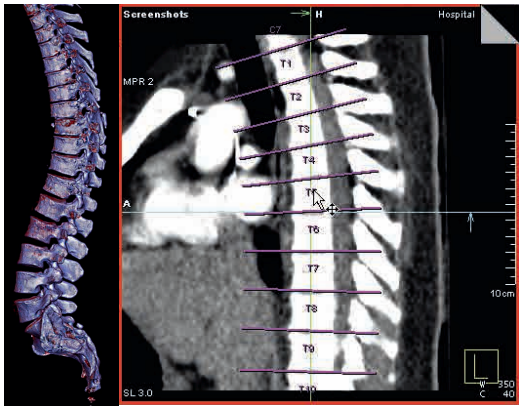
With the Fully Assisting Scanner Technologies (FAST) features, typically time-consuming and complex procedures during the scan process are simplified and automated, not only improving workflow efficiency, but optimizing the overall clinical outcome by creating reproducible results. This makes diagnosis more reliable and reduces patient burden through streamlined examinations. The technology helps the user in every step of the scan procedure – no matter if it is preparation, scanning, or reconstruction.

Efficient scan and recon planning

FAST Planning prepares the scan and recon settings based on the characteristics of the chosen organ. This not only reduces the efforts needed to set up an examination, but makes them highly reproducible and less error-prone. With FAST Adjust, parameters can be simply adjusted or, when in doubt, defined just with the push of a button. The FAST Scan Assistant offers a user-friendly, streamlined interface for adjusting and adapting scan parameters depending on the individual patient.

FAST Cardio Wizard guides the user intuitively through the preparation of cardiac examinations with easy to follow step-by-step explanations.





Anatomically correct spine reconstructions are typically very time consuming procedures, as every spinal vertebrae and disc needs to have its own recon layer depending on its individual position. With FAST Spine, these manual steps can be simplified to just a single click.

Guided routine in cardiac CT

One of the most sophisticated examinations is cardiac CT. The SOMATOM Definition AS provides ideal specifications for cardiac CT with a rotation speed as low as 0.30 s and dedicated scan modes like Adaptive ECG Pulsing or the Adaptive Cardio Sequence. Additionally, FAST CARE technology offers a unique feature to support this particular workflow. The FAST Cardio Wizard uses a step-by-step approach showing how to achieve an optimal cardiac scan, either for training purposes or in a real-life situation, thus helping to set institutional standards and uniform quality.

Focus on the patient, not the system

Unfortunately, complexity can become a source of inefficiency or, even worse, errors. Typical examples are spine exams. With conventional CT scanners, this means a lot of cumbersome, manual preparation steps, which make spine recon especially time-consuming. This is simplified to ideally just a single click with FAST Spine, saving not only valuable time, but making these tasks more reliable. At the end of the day, the SOMATOM Definition AS with FAST CARE technology helps to save highly valuable time, so that it can be spent on diagnosis and the interaction with patients.

Single Source Dual Energy as easy as a spiral scan

Dual energy makes it possible to add functional and material information to morphology. Now the combination of a routine-ready scan mode and enhanced low-kV image quality is available on every SOMATOM Definition AS. This offers new applications and opportunities to expand both the clinical and the research portfolio in everyday practice. And even better, the Dual Energy scan mode is as easy as a spiral scan.

Your Single Source for Right Dose

Equipped with a variety of unique dose protection and reduction features, the SOMATOM Definition AS will lead you to excellent clinical results taking CARE of the right dose.

FAST CARE technology – Take CARE

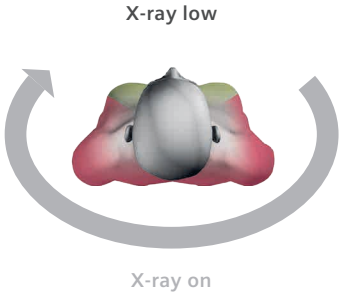
Applying the lowest radiation dose possible is of utmost importance both for users, and, of course, patients. With the Combined Applications to Reduce Exposure (CARE) the SOMATOM Definition AS offers an outstanding dose protection portfolio to achieve highest dose protection and reduce radiation to a level as low as possible. This satisfies the desire for the lowest possible radiation exposure while on the other hand delivering excellent image quality. And all this is fully automated and integrated into the scan process.

Completing the picture for patient-centric imaging with CARE kV

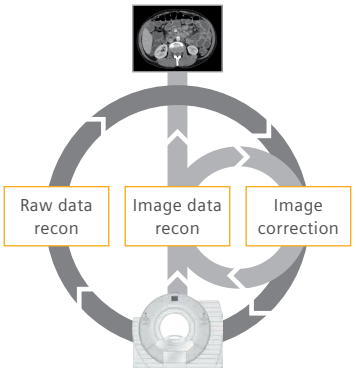
For decades, Siemens has put the patient in the center of the examination, especially with regard to radiation protection. CARE Dose4D™ has proven its qualities for many years with its unique real-time dose modulation that guarantees an unparalleled combination of outstanding image quality at minimum dose for every patient. A new dimension has been added with CARE kV. It automatically sets the appropriate voltage for the examination and adjusts other scan parameters according to the individual patient and selected examination type, thus delivering certainty of having highest dose efficiency in every scan.

Dedicated pediatric imaging with 70 kV protocols

Besides the ability to offer our customers the combination of maximum speed and exceptional image quality with no cooling delays, the STRATON X-ray tube has another unique feature: CARE Child, a dedicated pediatric CT imaging tool which includes 70 kV scan modes and specific CARE Dose4D curves and protocols, comes as a standard feature with every SOMATOM Definition AS. This makes it possible to scan even the most vulnerable patients, if necessary, with a good conscience.



X-CARE reduces the tube current close to zero within a certain range of projections, minimizing direct exposure for highly dose sensitive body regions.



SAFIRE

- More powerful dose reduction than image-based methods
- Well-established image impression
- Superior image quality
- Fast reconstruction in image and raw-data space and improved workflow with variable settings

Organ-sensitive dose protection

Previous attempts at dose reduction were very successful but did not specifically take into consideration highly dose sensitive areas such as women's breasts or the heart. Here, the SOMATOM Definition AS can selectively reduce exposure in sensitive areas with X-CARE. Furthermore, the gantry tilt protects dose sensitive organs like the eyes or the thyroid gland by moving them out of the x-ray beam in sequential or spiral scans. And finally, the Adaptive Dose Shield protects patients from unnecessary spiral over-radiation, which is crucial, for example, in cardiac examinations.

Iterative reconstruction with SAFIRE

Iterative reconstruction can achieve significantly increased image quality with reduced dose. The further integration of raw data beyond the initial reconstruction process, however, posed considerable restrains regarding the computational power available – up to now: with Sinogram Affirmed Iterative Reconstruction – SAFIRE* – Siemens introduced a new and unique approach to iterative reconstruction. Raw data information is utilized to enhance the image quality or reduce dose. This is made possible by a new reconstruction algorithm, as well as an image reconstruction system, delivering the required reconstruction power.

Dose-optimized Dual Energy scan

In order to avoid doubling the dose, both scans of the Dual Energy scan are performed at approximately half the dose utilizing all dose reduction functionalities: e.g. CARE Dose4D, SAFIRE, and Adaptive Dose Shield. The result is a dose-optimized Dual Energy scan that helps to add functional and material information to morphology.

*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 4 to 60% dose reduction when using the SAFIRE reconstruction software: noise, CT numbers, homogeneity, low-contrast 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.

Open for all Patients

The outstanding flexibility of the SOMATOM Definition AS addresses the versatile needs of physicians and patients, thus offering a solution for every clinical demand.

Open for every clinical demand

The SOMATOM Definition AS can be configured and customized to fit virtually any setting. Its full on-site upgradeability from 20- to 128-slice configuration permits specifying the system precisely to the customer's clinical requirements and financial situation. It also gives investment protection and assurance to grow with future demands. With its small footprint and freely selectable air- or water-cooling, it perfectly adapts to every clinical setting, e.g. acute care where a sterile environment is of utmost importance.

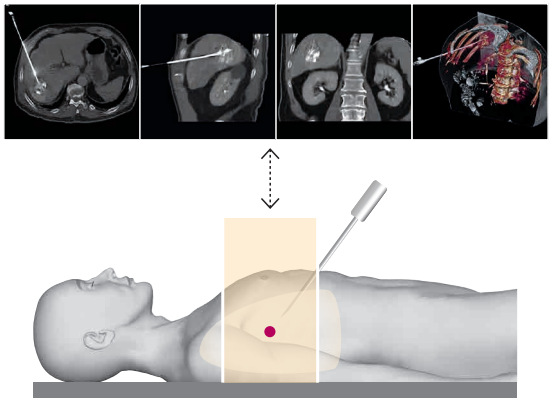
Open for functional imaging

Dynamic imaging has become a new dimension in CT over recent years. With the innovative Adaptive 4D Spiral, the SOMATOM Definition AS offers whole brain perfusion or long-range CTAs. Able to cover up to 42 cm, it overcomes the limitations of a static detector design when imaging whole organs or regions. Furthermore, the system offers Siemens' easy-to-use Dual Energy functionality with different clinical applications. This enables users to answer a wide range of diagnostic challenges and widen the clinical portfolio.

Open for bariatric patients

No one should be excluded because of the limitations of a system. For bariatric patients, patient accommodation and power reserves are the key. Here, the SOMATOM Definition AS offers up to 80 cm bore diameter, 307 kg table load capacity, and a 100 kW power generator. All this results in great image quality, performance, and clinical efficiency.

The SOMATOM Definition AS delivers clinical excellence and opens CT for all patients - regardless of the given conditions.



Adaptive 3D Interventions offers real time 3D during intervention procedures.

The Sliding Gantry solution can serve two rooms with one CT.

Open for intervention

Intervention in CT has established itself in recent years. Over 30% of existing SOMATOM Definition AS customers use the Siemens' unique intervention solution. It puts users in full control in any plane with 3D-guided interventions. Additionally, it delivers a more accurate overview of needle position and surrounding organs during difficult procedures. All this can be done without leaving the patient's side, managing the entire procedure with just the touch of a button with i-Control. With 3D guided guidance for minimally invasive procedures, the system makes interventions more accurate, thus safer and, in the end, more efficient.

Open for radiation therapy

Over recent years, computed tomography has become the preferred choice for virtual simulation. Radiation therapy is evolving towards more precise and more powerful treatment delivery techniques. With the SOMATOM Definition AS, Siemens offers an outstanding versatile large bore that fulfills the needs both of radiation therapy and general diagnostics. With the RT Pro Edition, dedicated features have been developed for high-end radiation therapy planning. On the other hand, the system can serve as a perfect back-up system for radiology if needed.

Open for specialized clinical settings

Nevertheless, there are clinical settings where a regular CT reaches barriers that seem to be insuperable. Not the SOMATOM Definition AS. The system can even be mounted as a Sliding Gantry, offering access to solutions such as two rooms being served with one gantry. Dedicated high-end surgery settings in combination with surgery tables can be realized, opening new paths into completely new directions. It enables high-resolution CT imaging to be utilized during surgical procedures without the need to move the anaesthetized patient.

Added Benefits of *syngo*.via

Regardless of volume or disease, *syngo*.via helps in preparing 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 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 makes possible a rule-out of coronary artery disease in less than a minute.

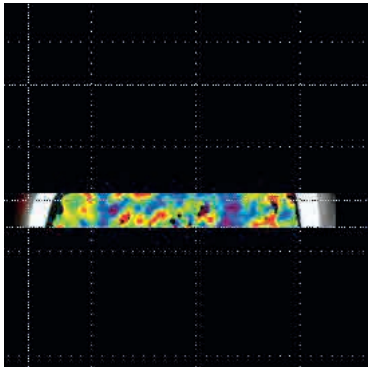
Automated

syngo.via helps physicians 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 pre-processed the images and displays them in the appropriate layout together with the right evaluation tools. Evaluation of the coronary vessels, the functional parameters, and the prepared calcium score can start immediately.

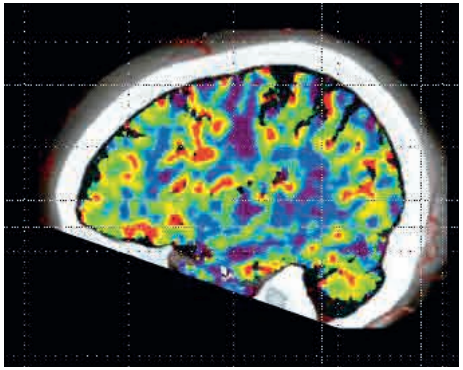
Image networking

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 nature supports a smooth, teamwork-like sharing of tasks, just as it is required in 3D labs and larger radiology departments. Images can be shared among multiple users at once, providing a sound basis for joint pre-procedural planning.

syngo Volume Perfusion CT Neuro



Conventional Perfusion



Adaptive 4D Spiral Perfusion

Fast answers

Using the SOMATOM Definition AS together with the CT Neuro Engine leads to unsurpassed workflow efficiency delivering fast answers to fundamental questions in stroke. These questions in stroke assessment vary: Is it caused by bleeding, what size and location has a possible clot, how big is the infarct and what does the blood flow look like in a dynamic way? The CT Neuro Engine offers a complete diagnostic stroke solution.

High precision and speed

Innovations such as whole brain CT Perfusion, Neuro BestContrast, or Dual Energy applications have dramatically changed the diagnostic approach for reading physicians by enabling new indications and improved times in the examination of patients with acute neurological diseases. In stroke evaluation, “time is brain.” The CT Neuro Engine helps users answer the key questions so they can decide on optimal treatment – with high precision and speed.

* *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 on 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 an operating room or for an emergency case requires customers to provide respective emergency measures in case of non-availability of 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

system:
SOMATOM Definition AS+

collimation:
128 x 0.6 mm

scan time:
5.0 s

scan length:
116 mm

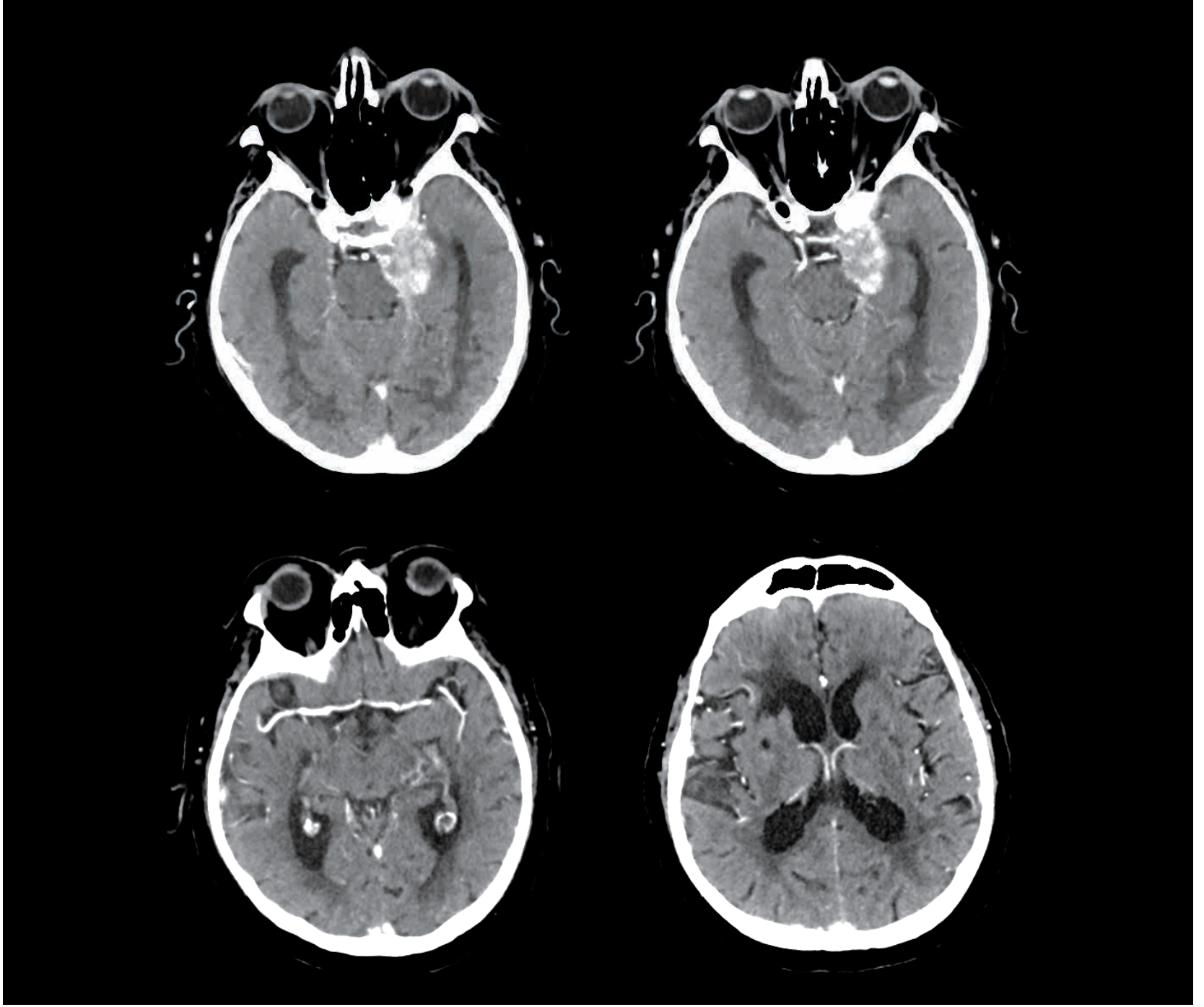
rotation time:
1.0 s

tube settings:
120 kV, 380 eff. mAs

CTDIvol:
54.08 mGy

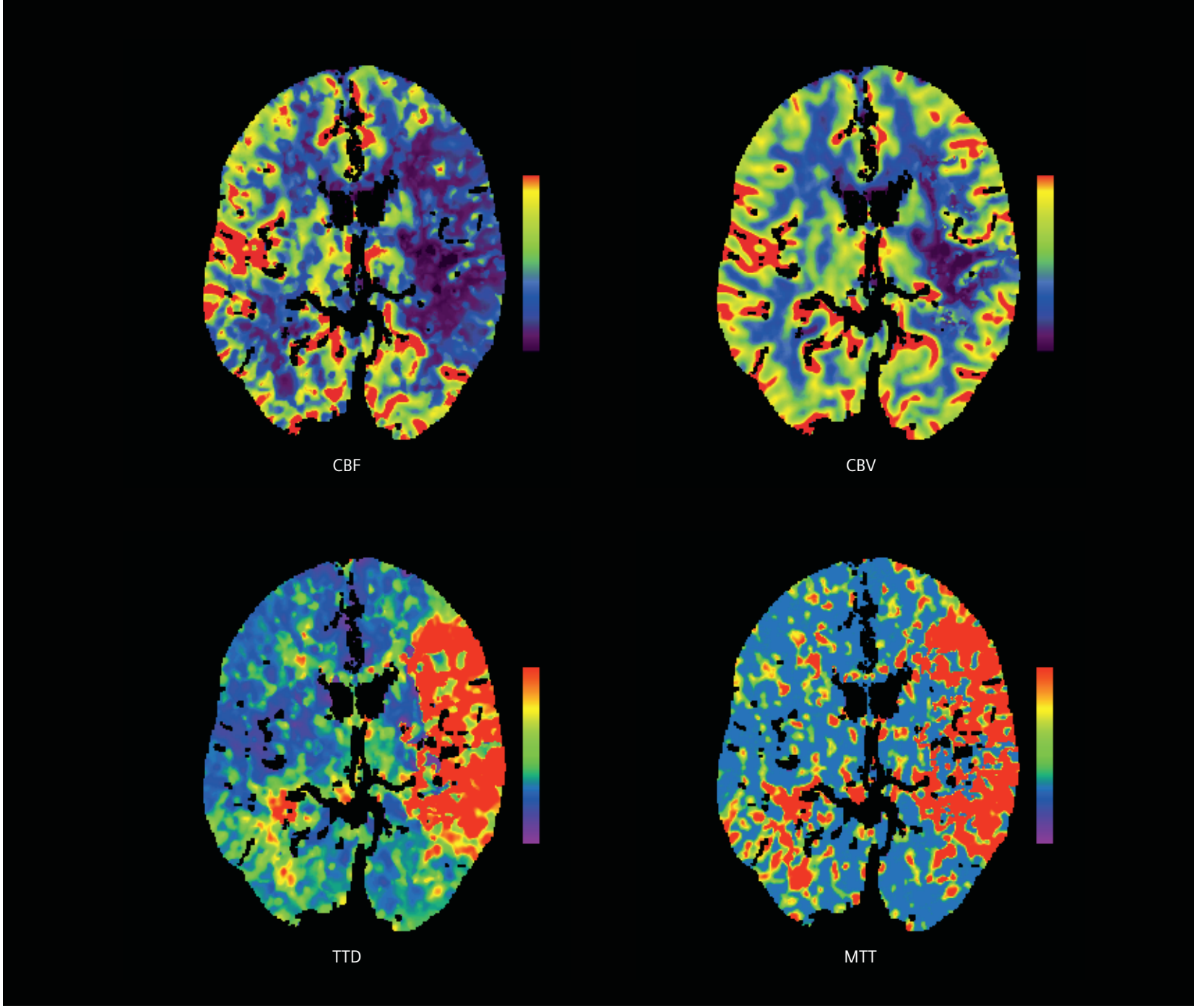
DLP:
916 mGy cm

eff. dose:
1.92 mSv



Cerebral CT –
Contrast enhanced axial images show a suspected meningioma extruding the pons and bilateral lacunar infarctions in the basal ganglia area.

Centre Hospitalier Caremeau, Nimes, France



University of Goettingen, Goettingen, Germany

system:
SOMATOM Definition AS+

collimation:
32 x 1.2 mm

scan time:
45.0 s

scan length:
84 mm

rotation time:
0.6 s

tube settings:
80 kV, 200 eff. mAs

CTDIvol:
218.99 mGy

DLP:
2505 mGy cm

eff. dose:
5.3 mSv

Volume Perfusion CT –
VPCT images show significantly reduced blood flow, along with a prolonged time to drain and a mean transit time with partially reduced blood volume in the left MCA territory.

system:
SOMATOM Definition AS+

collimation:
128 x 0.6 mm

scan time:
3.5 s

scan length:
375.9 mm

rotation time:
0.5 s

tube settings:
100 kV, 90 eff. mAs

CTDIvol:
2.83 mGy

DLP:
116 mGy cm

eff. dose:
2.204 mSv

Sliding Gantry CT –
allows a fast patient triage and emergency management, as for this injured young boy.

Wels KH UNF, Wels, Austria

system:
SOMATOM Definition AS+

collimation:
128 x 0.6 mm

scan time:
7.0 s

scan length:
677 mm

rotation time:
0.5 s

tube settings:
120 kV, 186 eff. mAs

CTDIvol:
12.59 mGy

DLP:
889 mGy cm

eff. dose:
13.34 mSv

Polytrauma CT –
MPR images present multiple costal and spinal fractures with vertebral subluxation, a C2- fracture , and a right-sided pleural effusion with pulmonary atelectasis.

University of Radiology Diagnostic, Salzburg, Austria

system:
SOMATOM Definition AS 64

collimation:
20 x 0.6 mm

scan time:
21.0 s

scan length:
203 mm

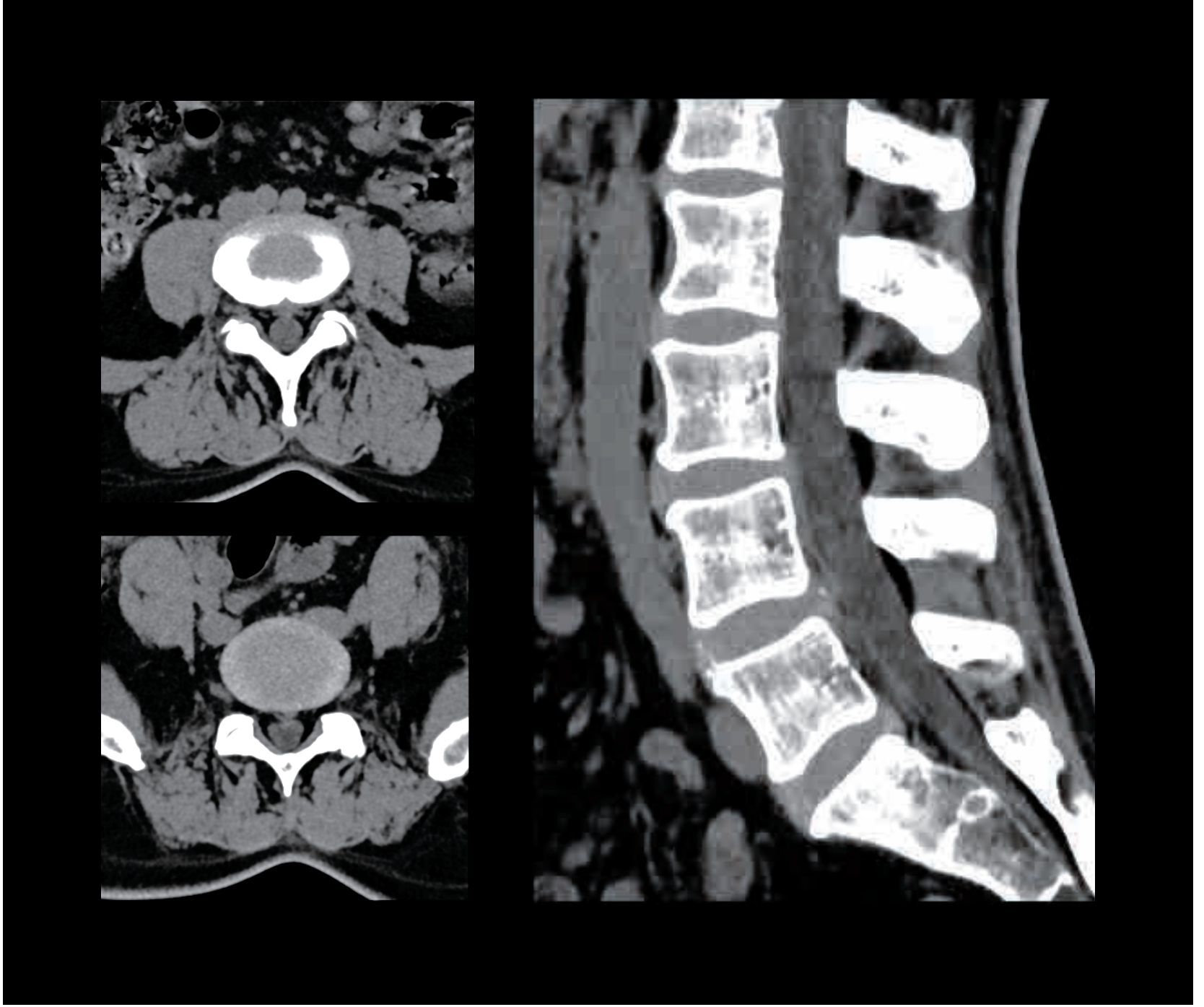
rotation time:
1.0 s

tube settings:
100 kV, 395 eff. mAs

CTDIvol:
18.72 mGy

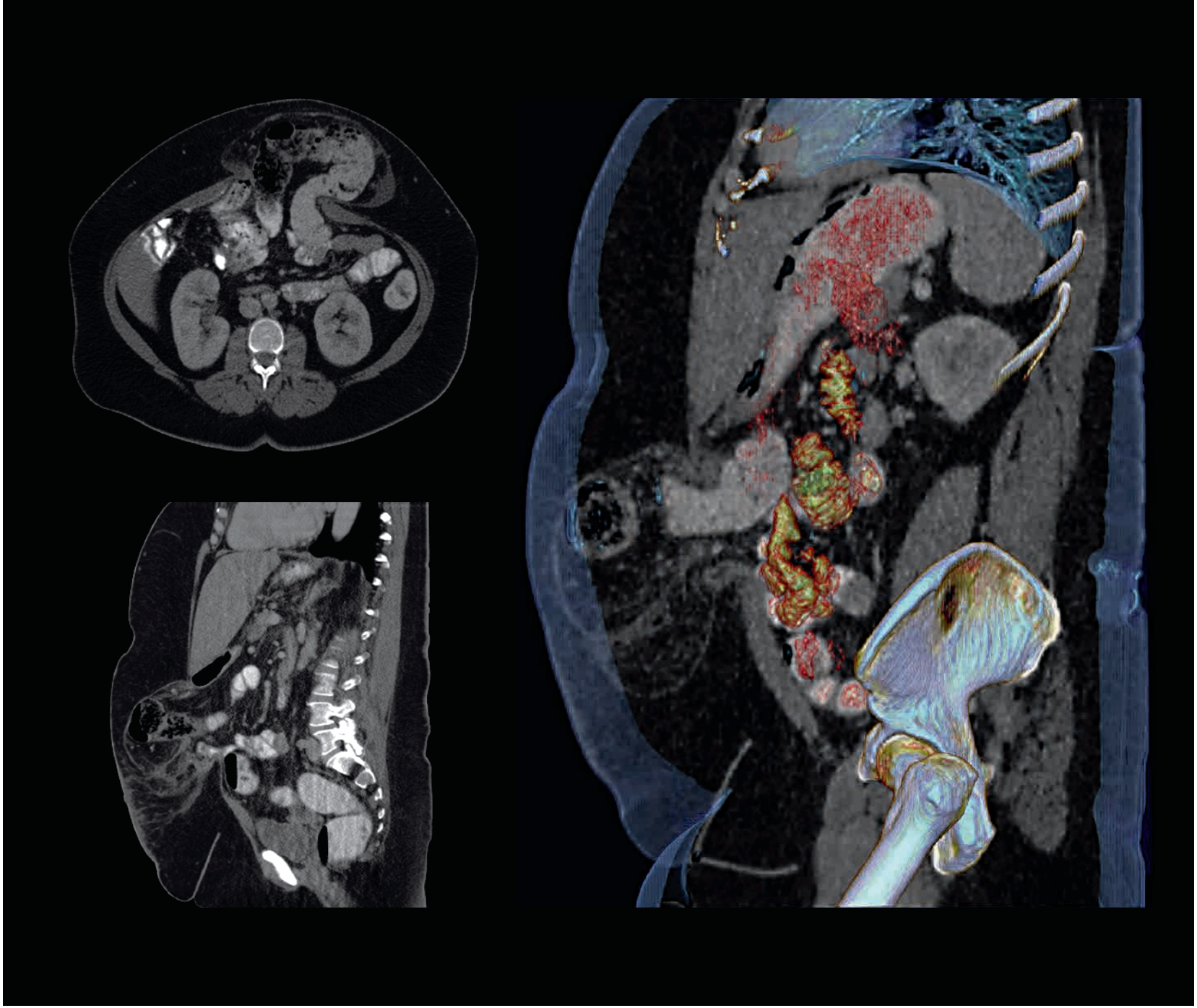
DLP:
398 mGy cm

eff. dose:
5.97 mSv



Spinal CT –
MPR images present a protruded disc with calcification at L4/5 and a bulging disc at L5/S1.

Centre Hospitalier de Vitre, Vitre, France



system:
SOMATOM Definition AS+

collimation:
128 x 0.6 mm

scan time:
9.0 s

scan length:
506 mm

rotation time:
0.5 s

tube settings:
120 kV, 361 eff. mAs

CTDIvol:
23.83 mGy

DLP:
1304 mGy cm

eff. dose:
19.56 mSv

CT for Obesity –
MPR images show an abdominal hernia in an obese patient.

University Erlangen Radiologie, Erlangen, Germany

system:
SOMATOM Definition AS 64

collimation:
64 x 0.6 mm

scan time:
7.0 s

scan length:
118 mm

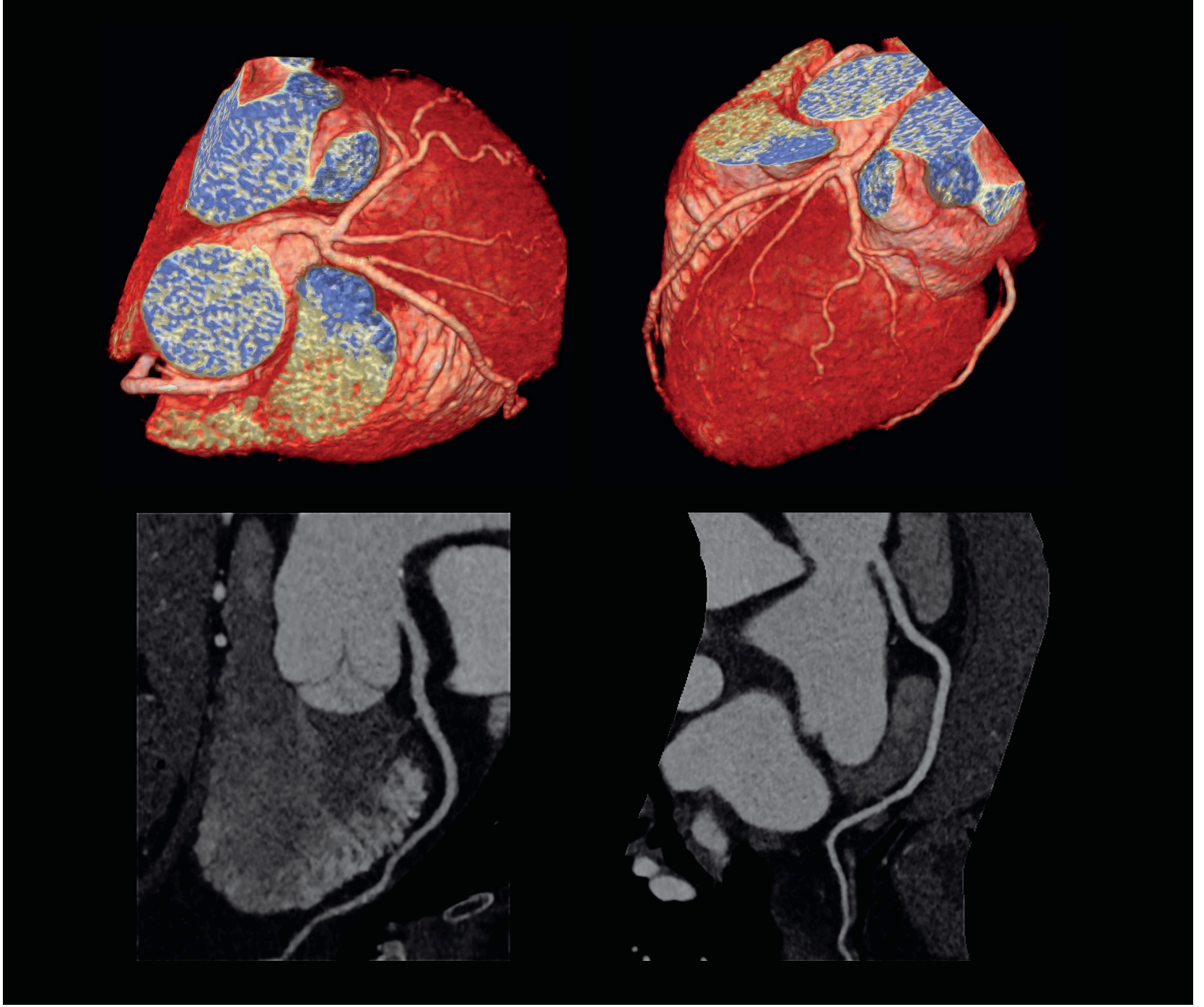
rotation time:
0.42 s

tube settings:
120 kV, 205 eff. mAs

CTDIvol:
13.92 mGy

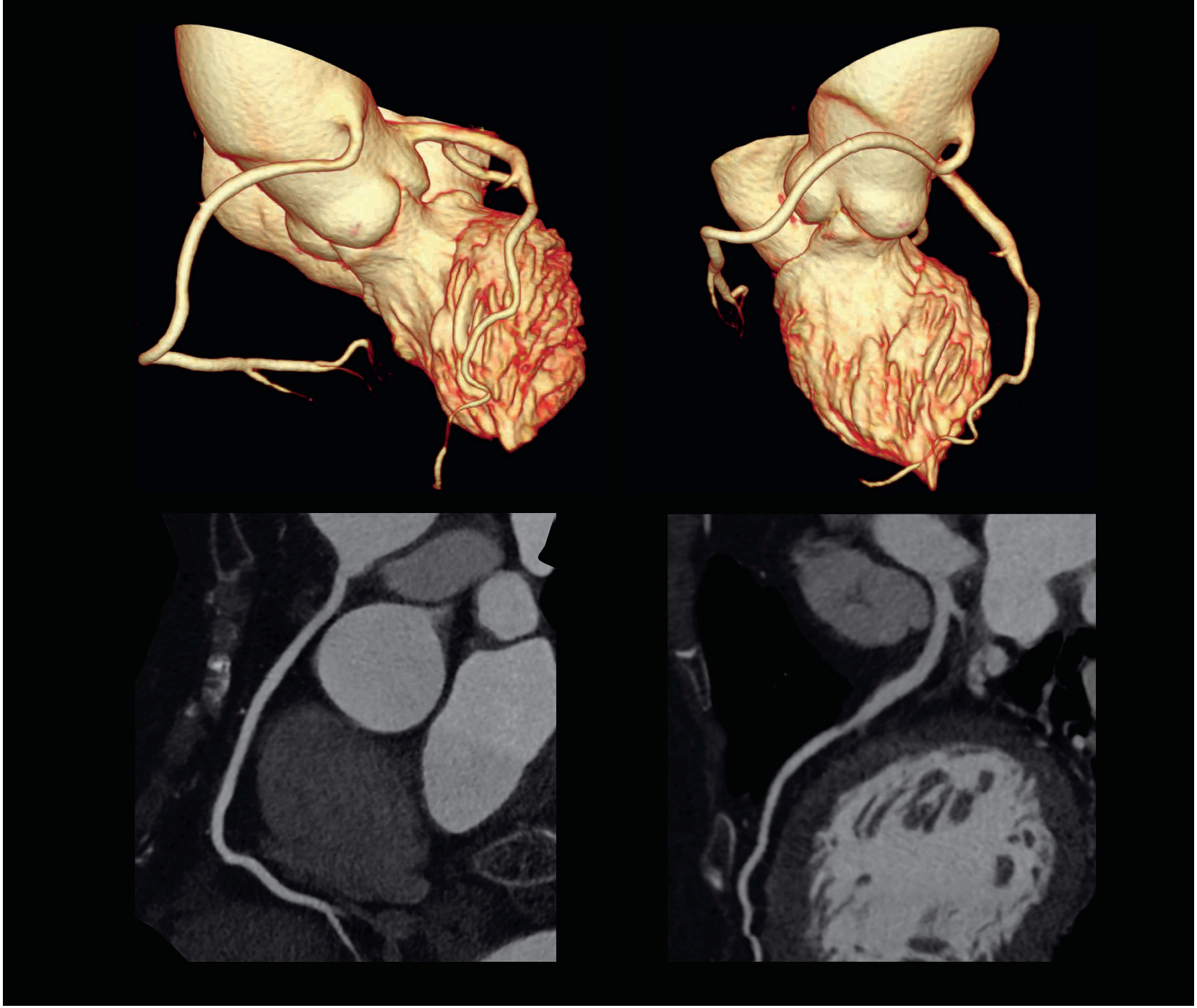
DLP:
166 mGy cm

eff. dose:
2.32 mSv



Cardiac CT –
VRT & Curved MPR images allow the exclusion of a coronary stenosis.

Radiologische Praxis am Diakonissenkrankenhaus, Dresden, Germany



system:
SOMATOM Definition AS+

collimation:
128 x 0.6 mm

scan time:
3.0 s

scan length:
103 mm

rotation time:
0.22 s

tube settings:
100 kV, 123 eff. mAs

CTDIvol:
4.02 mGy

DLP:
42 mGy cm

eff. dose:
0.56 mSv

Cardiac CT –
VRT & Curved MPR images reveal a stenosis in the mid-LAD.

University Erlangen Radiologie, Erlangen, Germany

system:
SOMATOM Definition AS+

collimation:
128 x 0.6 mm

scan time:
0.91 s

scan length:
175 mm

rotation time:
0.3 s

tube settings:
70 kV, 29 eff. mAs

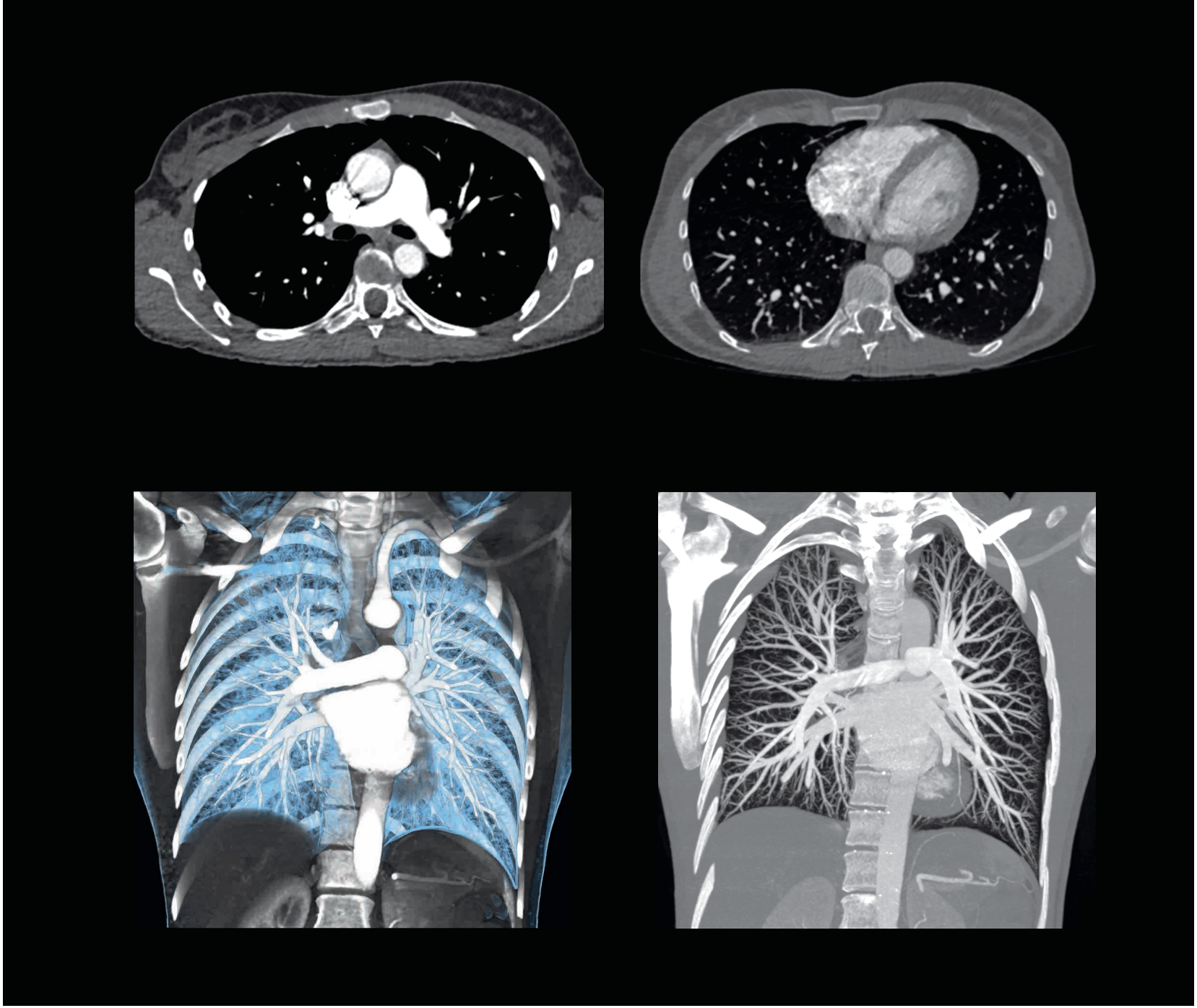
CTDIvol:
0.26 mGy

DLP:
7 mGy cm

eff. dose:
0.23 mSv

CARE kV CT –
Excellently enhanced images, using 70 kV, demonstrate an aortic coarctation in an 8-year-old boy.

TDM Ste-Marie, Osny, France



system:
SOMATOM Definition AS 64

collimation:
64 x 0.6 mm

scan time:
6.02 s

scan length:
277.5 mm

rotation time:
0.5 s

tube settings:
70 kV, 141 eff. mAs

CTDIvol:
1.85 mGy

DLP:
55 mGy cm

eff. dose:
0.77 mSv

CARE kV CT –
Excellently enhanced images, using 70 kV and SAFIRE, allow reliable exclusion of a PE, although only 60 mL contrast was applied.

Department of Diagnostic and Interventional Radiology, Goethe University Frankfurt, Germany

system:
SOMATOM Definition AS 64

collimation:
64 x 0.6 mm

scan time:
41.0 s

scan length:
1558 mm

rotation time:
0.6 s

tube settings:
120 kV, 67 eff. mAs

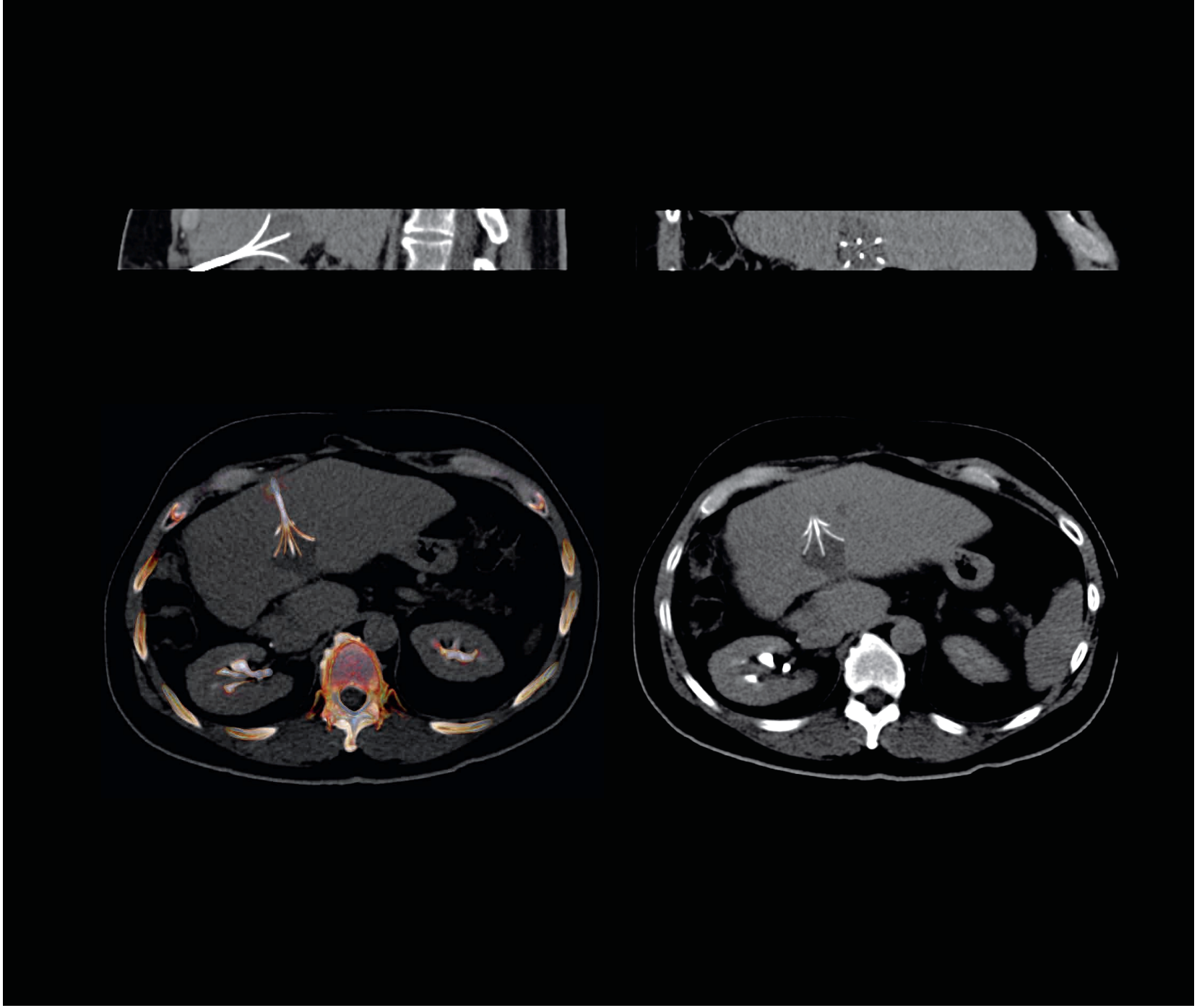
CTDIvol:
5.13 mGy

DLP:
805 mGy cm

eff. dose:
6.359 mSv

Whole Body CTA –
VRT & MIP images show bilateral axillo-fermoral bypasses – patent on the right and occluded on the left. An occlusion of left poplitean artery can also be clearly seen.

RadiologySA, Kent Town, Australia



system:
SOMATOM Definition AS 20

collimation:
16 x 1.2 mm

scan time:
1.0 s

scan length:
31.5 mm

rotation time:
0.5 s

tube settings:
120 kV, 143 eff. mAs

CTDIvol:
10.46 mGy

DLP:
84 mGy cm

eff. dose:
1.26 mSv

3D Interventional CT –
VRT & MPR images demonstrate the RFA needle electrode in three dimensions, as it is accurately positioned into a liver tumor.

University Erlangen Radiologie, Erlangen, Germany

system:
SOMATOM Definition AS+

collimation:
128 x 0.6 mm

scan time:
7.0 s

scan length:
208.5 mm

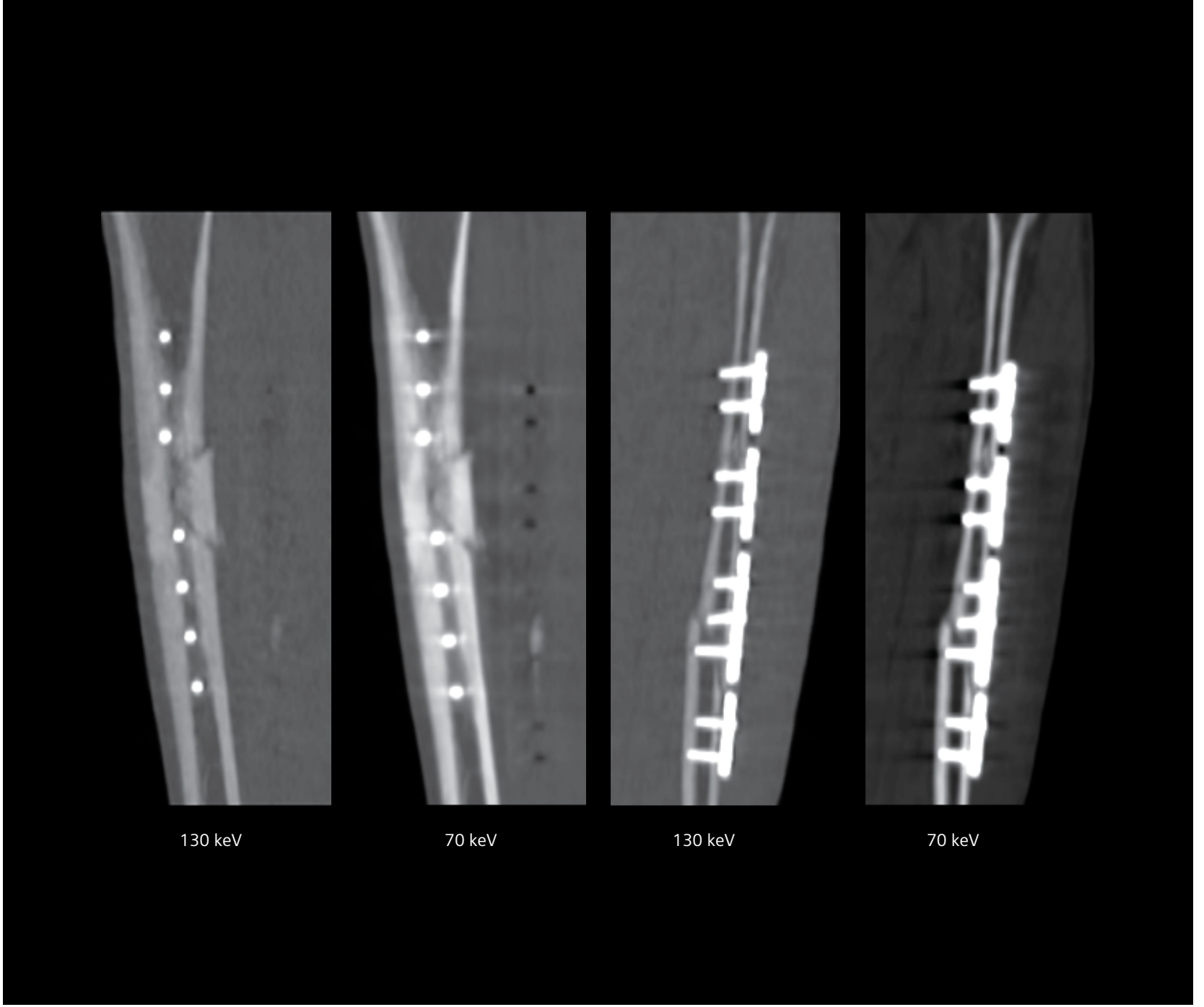
rotation time:
0.5 s

tube settings:
80 kV / Sn 140 kV
40 / 22 eff. mAs

CTDIvol:
0.74 / 2.32 mGy

DLP:
17 / 56 mGy cm

eff. dose:
0.013 / 0.044 mSv



Monoenergetic CT –
in comparison to images at 70 keV, those acquired at 130 keV show a significant reduction of metal artifacts, thus making possible a better evaluation of the fracture.

Nan Xi Shan Hospital, Guilin, P. R. China

system:
SOMATOM Definition AS+

collimation:
128 x 0.6 mm

scan time:
5.0 s

scan length:
220.5 mm

rotation time:
1.0 s

tube settings:
80 kV / Sn 140 kV
178 / 43 eff. mAs

CTDIvol:
3.32 / 4.46 mGy

DLP:
71 / 95 mGy cm

eff. dose:
0.06 / 0.08 mSv

Dual Energy CT –
3D images of hands and feet, of a patient with chronic gout demonstrate extensive tophaceous deposits.

Nan Xi Shan Hospital, Guilin, P.R. China

Core Technology

Unique STRATON X-ray Tube

The unparalleled 0 MHU STRATON X-ray tube offers the combination of maximum speed and exceptional image quality eliminating the need for heat storage capacity at a compact design.

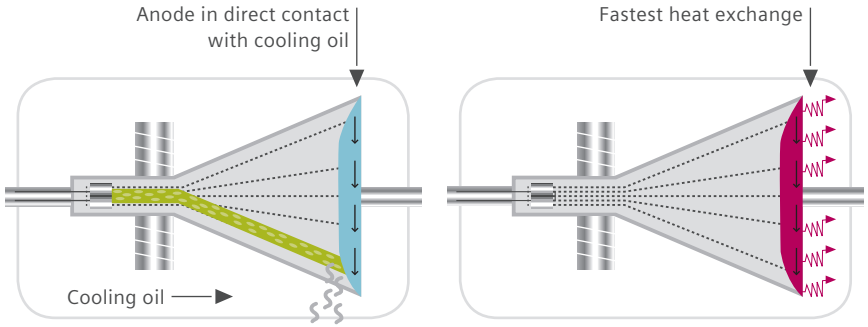
Revolutionary design

The core technology behind the SOMATOM Definition AS' clinical excellence is the highly renowned STRATON™ tube with z-Sharp™. Its revolutionary design based on a direct anode cooling eliminates the need for heat storage and results in an unmatched compact design, thus allowing true temporal resolution of up to 150 ms.

High isotropic resolution of 0.33 m

The STRATON tube provides true isotropic resolution of 0.33 mm at any scan and rotation speed, and at any position within the scan field. This, for instance, allows to significantly reduce motion artifacts of the heart to perform accurate stenosis measurements or stent planning with outstanding precision. It facilitates fast whole body sub-mm imaging at highest pitch revealing outstanding details in long-range vascular studies or polytrauma patients. With its fast pitch of 1.5, a scan range of 2 meters is covered in approximately 10 seconds.

The STRATON tube enables long high-power scans without cooling delays.



STRATON tube design. The backside of the anode can be cooled directly. Therefore, large heat storage capacity is not necessary, which allows for a very compact design.

No cooling delays

The specific construction of the anode plate constitutes an outer wall of the rotating tube housing; it is therefore in direct contact with the cooling oil and can be efficiently cooled. This way, very high power of up to 100 kW and a very high heat dissipation rate of 7.3 MHU/min are achieved. This eliminates the need for heat storage in the anode, which consequently has a heat storage capacity close to zero (0.6 MHU). Thanks to the fast cooling, the system can perform long high-power scans in rapid succession without cooling delays. The STRATON tube completely cools down to its original state within 20 seconds.

Wide spectrum of selectable tube voltages – 70 kV

The STRATON tube offers a spectrum of selectable tube voltages from 70 kV up to 140 kV. With 70 kV, Siemens has introduced a tube voltage for optimized X-ray spectra also in the smallest patients. Low tube voltages are especially beneficial for saving dose in small patients and children who are most sensitive to radiation. It ideally partners with CARE kV, another core technology of the system.

z-Sharp Technology

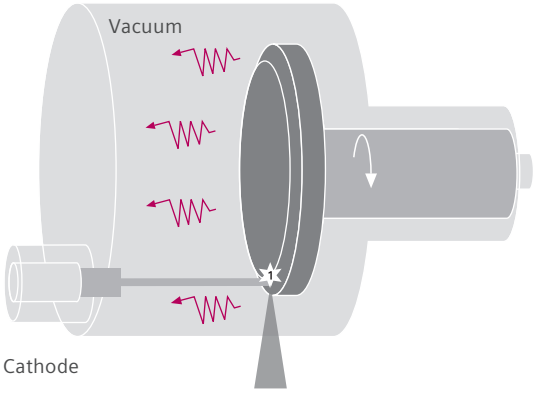
With the STRATON's revolutionary z-Sharp technology, resolution can be significantly increased – getting double the information in half the time and half the dose.

z-Sharp technology

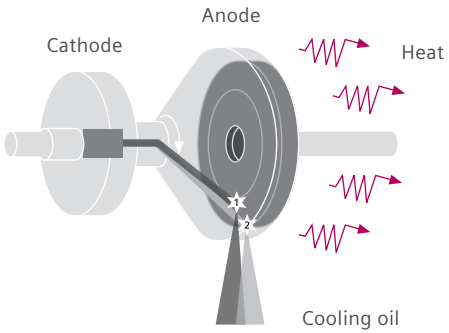
The acquisition of up to 128 slices per rotation with the SOMATOM Definition AS is possible through STRATON X-ray tube's double z-sampling technology (z-Sharp). The tube's electron beam is accurately and rapidly deflected by an electromagnetic field, similar to a cathode-ray tube. Two focal spots are created on the anode plate that alternate precisely 4,640 times per second in the z-direction. This double z-sampling enables two X-ray beams to pass through the body in two different angles, virtually simultaneously.

Double information in half the time and half the dose

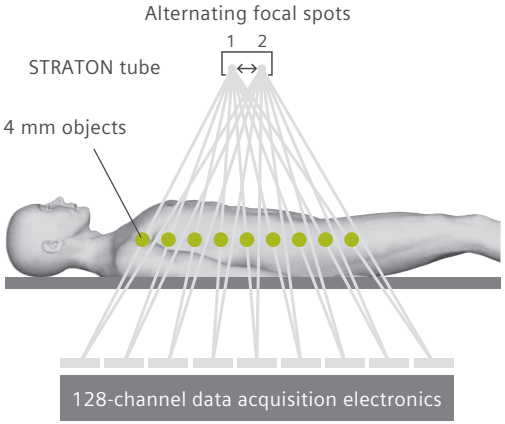
z-Sharp doubles the X-ray projections reaching each detector element. The two overlapping projections result in an oversampling in z-direction. The resulting measurements interleave half a detector slice width, doubling the scan information. Siemens' proprietary, high-speed UFC detector enables a virtually simultaneous readout of two projections for each detector element. Compared to conventional CT acquisition technology, each measurement requires half the time and half the dose.



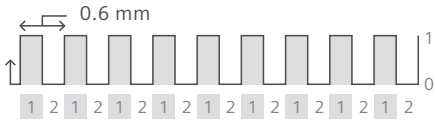
Conventional tube technology.



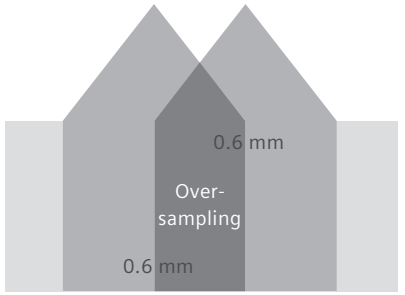
STRATON X-ray tube with
z-Sharp generating two distinct
X-ray projections.



Measured signal per detector element



Resulting resolution



Oversampling

Higher resolution and reduction of artifacts

The simultaneous acquisition leads to twice the number of overlapping slices, which makes possible an increase of longitudinal resolution and reduction of spiral artifacts independent of the selected pitch. Besides being more effective in increasing the resolution in z-direction, this approach is also much more flexible, since it can be utilized in virtually all scan modes. The result is the acquisition of twice the number of slices with less artifacts and higher resolution.

Eliminating windmill-artifacts

Prevention of artifacts by z-Sharp's double z-sampling technology also facilitates neurology examinations. Up to now, windmill-artifacts often occurred in spiral CT examinations of the head, for example in CT angiography examinations for aneurysms, of the neck, and of the thorax. Whithout imposing restrictions to pitch, z-Sharp technology eliminates windmill-artifacts that originate when the X-ray beam penetrates the edges of bones. CTAs of the carotid arteries and the circle of Willis can now be routinely performed at a high pitch.

CARE kV

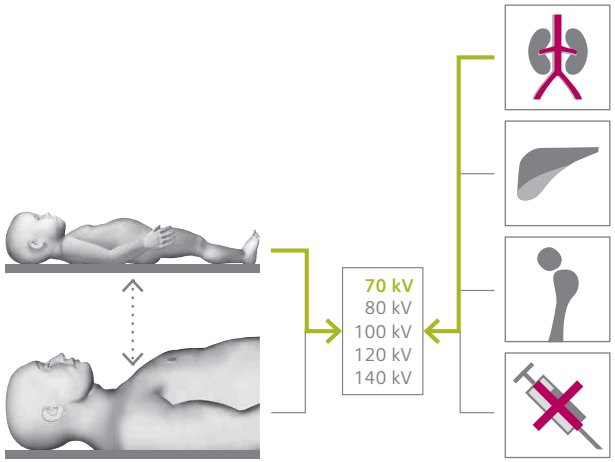
The STRATON tube in combination with FAST CARE technology provides unique features to optimize image quality and reduce dose.

Best clinical results in high-demanding environments

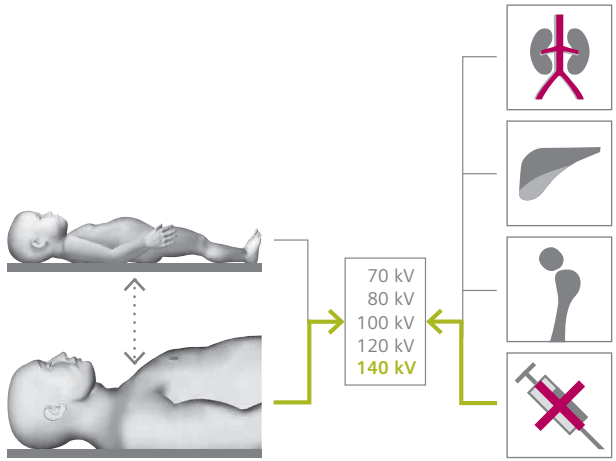
FAST Adjust helps to set the right system parameters like scan time, pitch, or tube current to achieve best clinical results. This is not always easy - especially when working in highly demanding environments such as an emergency department or with bariatric or pediatric patients. With an easy-to-understand and easy-to-use interface, parameters can be simply adjusted or, when in doubt, defined just with the push of a button.

CARE kV for optimized kV setting

Following the scan process, the right kV setting plays an important role in achieving optimal clinical outcome. Changing kV values, however, always comes with the need to adapt all other values according to the respective patient. Up to now, this had to be done manually and required a lot of expertise, so that the full potential for dose reduction often remained untapped. Siemens' unique CARE kV breaks this barrier. It automatically suggests kV and eff. mAs to optimize the contrast-to-noise ratio (CNR) of the image while limiting the applied dose.



Example 1: For a contrast media enhanced vessel examination of a small patient, CARE kV suggests a scan with 70 kV and sets the other values accordingly.



Example 2: For a non-contrast examination of a large patient, CARE kV suggests a scan with 140 kV and sets the other values accordingly.

Automated kV setting for best image quality

The system's proposal is based on the attenuation as measured in the topogram and the user-defined acquisition type (non-contrast, bone, soft tissue, vascular). The main goal is to keep the CNR, the key parameter for image quality, the same. For each patient exam, the topogram and the corresponding attenuation information are used to determine the optimal kV. Even in bariatric patients, CARE kV sets the parameters to make full use of the system's reserves to optimize CNR and acquire the best image quality possible for the patients.

Dedicated pediatric scanner settings

Reducing the tube voltage helps to reduce radiation exposure to patients. While other tubes are limited to a minimum voltage setting of 80 kV, with the STRATON tube the voltage range is extended as low as 70 kV. This helps to further reduce radiation dose to small pediatric or neonate patients. These dedicated pediatric scan modes, bundled with CARE kV and specific pediatric CARE Dose4D curves and protocols, take care of the well-being of our youngest patients. Overall with these features, an additional dose reduction of up to 60% is possible.

Fully customizable

CARE kV is, of course, fully customizable, meaning that users can not only set their individual quality reference mAs, but can also choose the degree of system assistance between none, semi, and full. As the complete SOMATOM Definition AS system, it offers full flexibility to users and adapts to their specific needs and clinical challenges.

Customer Services

A range of innovative service solutions that provide the answers to best support users 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 its 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 enabling system availability with innovative service solutions. Siemens Remote Services, for example, establishes a highly efficient, secure, and certified remote connection between CT systems and 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 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 help customers develop a customized roadmap 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 AS

Maximize Outcome. Minimize Dose.

Single-Click Readiness

FAST CARE technology and Single Source Dual Energy for better results

- Efficient scan and recon planning
- Guided scan and recon procedures
- Single Source Dual Energy as easy as a spiral scan

Your Single Source for Right Dose

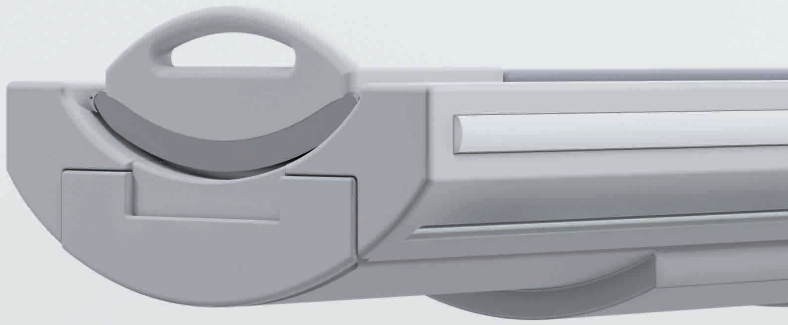
Dose protection and reduction features taking CARE of the right dose

- Automated voltage setting with excellent image quality
- Dedicated pediatric imaging with 70 kV protocols
- Iterative reconstruction with SAFIRE

Open for all Patients

Outstanding flexibility offers a solution for every clinical demand

- Full on-site upgradeability
- Functional imaging with Adaptive 4D Spiral and Dual Energy
- Variety of solutions for different specialized clinical settings




SIEMENS
SOMATOM
Definition AS

Detector	Ultra Fast Ceramic (UFC)
Number of acquired slices	20, 40, 64, 128
Rotation time	up to 0.3 s
Temporal resolution	up to 150 ms
Generator power	80, 100 kW
kV steps	70, 80, 100, 120, 140 kV
Isotropic resolution	0.33 mm
Cross-plane resolution	0.33 mm
Max. pitch	up to 1.5; up to 192 mm/s coverage
Table load	up to 307 kg / 676 lbs
Gantry opening	78 cm (80 cm optional)

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