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Leading Innovation >>>

Clinical Image Gallery

Next Generation – Volume 1



ONE
Aquilion[™]

Adaptive Diagnostics
Clinical Solutions



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United Kingdom

After long experience with the first generation, a next generation Aquilion ONE™ was recently installed in our department. Four years ago we were excited by the new applications offered by the 16 cm detector coverage, the decrease in dose and the excellent image quality. With the new Aquilion ONE we are at the latest hardware level, the image quality has improved again and the patient doses were reduced once more. The new software comes with Adaptive Diagnosis offering us the best solutions for a wide variety of clinical questions. For example, when scanning metal hip implants SEMAR reduces artifacts caused by metal so that we easily can diagnose the surrounding areas. Variable Helical Pitch combines fast and low pitch in one continuous scan, simplifying scan procedures, reducing contrast media and shortening scan times. With ^{SURE}Subtraction™ Lung we can visualize for example the effect of lung emboli in detail which can affect treatment. With the new Aquilion ONE we have state-of-the-art technology to offer our patients the best possible care.

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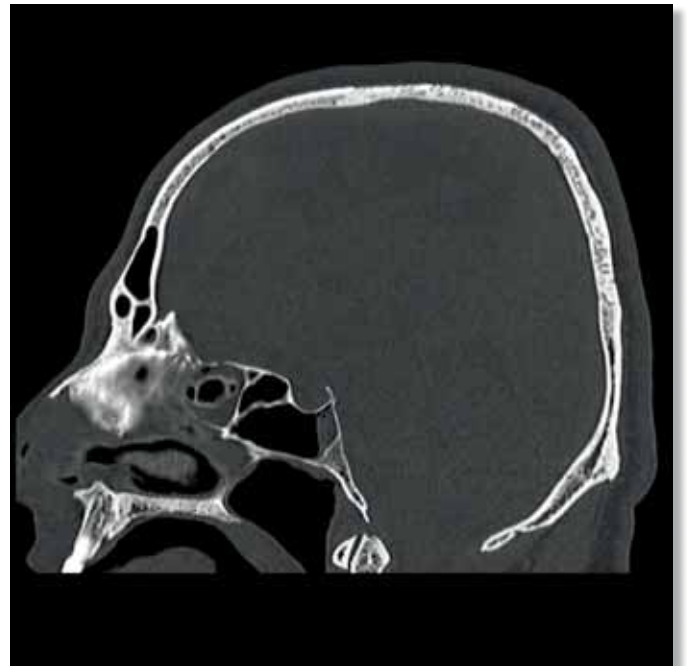
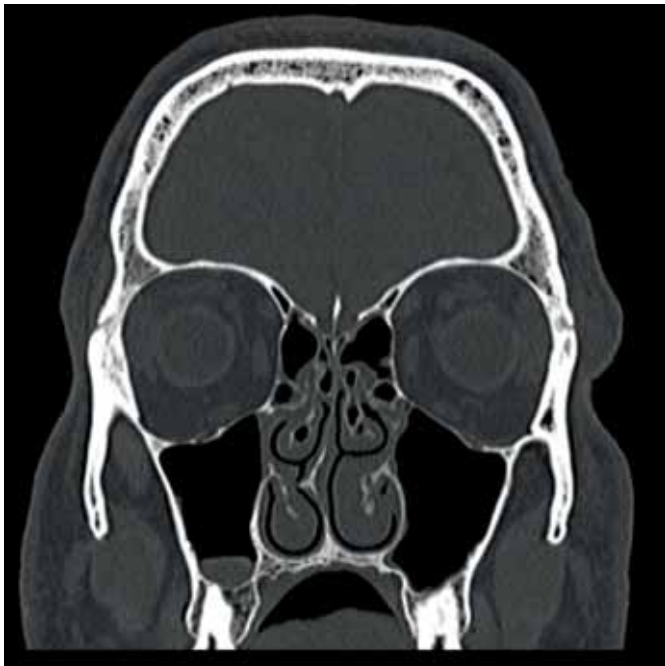
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WARNING: Any reference to x-ray exposure, intravenous contrast dosage, and other medication is intended as a reference guideline only. The guidelines in this document do not substitute for the judgment of a healthcare provider. Each scan requires medical judgment by the healthcare provider about exposing the patient to ionizing radiation.
Use the As Low As Reasonably Achievable radiation dose principle to balance factors such as the patient's condition, size and age; region to be imaged; and diagnostic task.

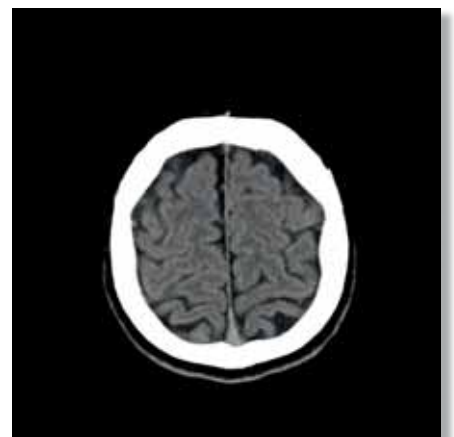
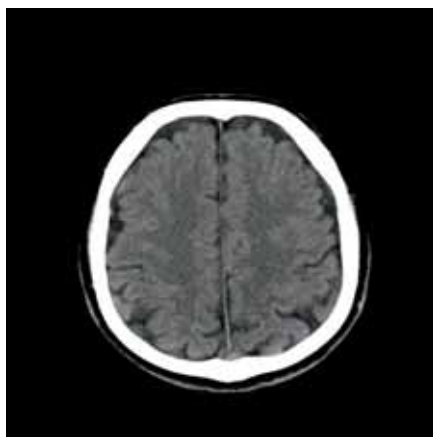
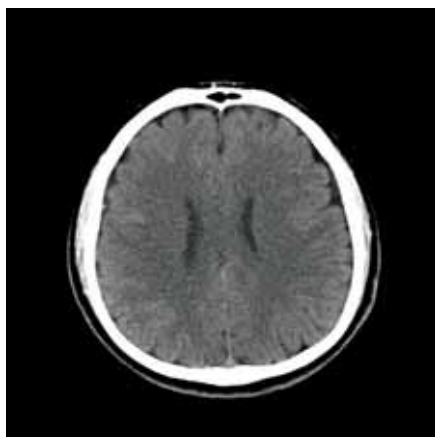
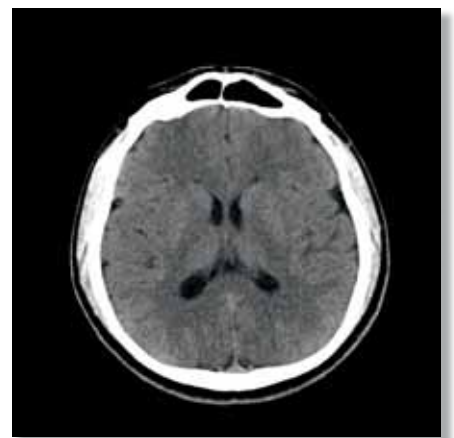
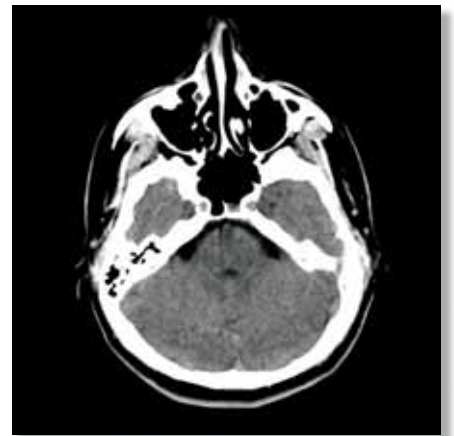
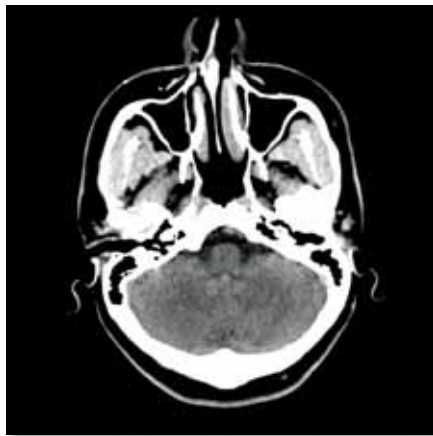
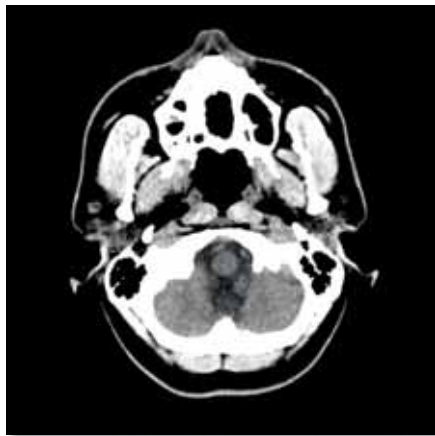
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Brain

A native brain scan of a 32-year-old trauma patient was performed with multiple wide volumes of 80 x 0.5 mm. The wide volume scan mode provides an excellent white/gray matter differentiation, while 3D reconstructions and MPR images are of high quality.

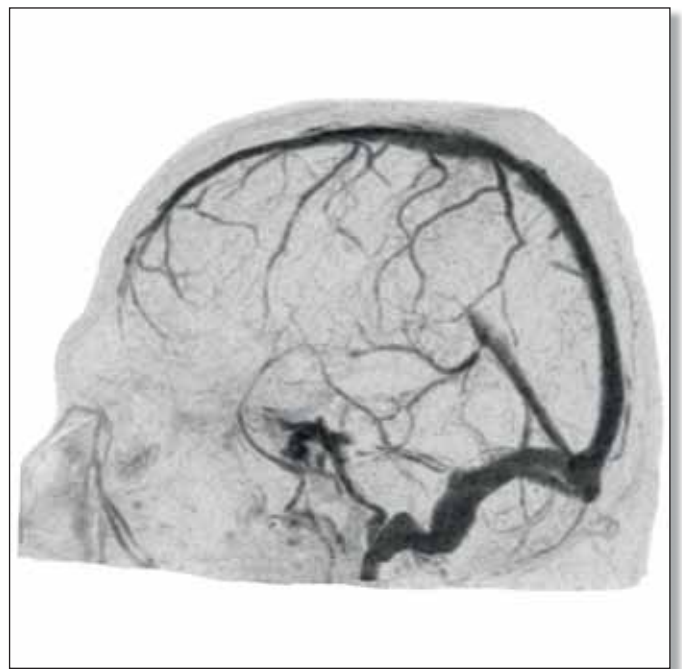
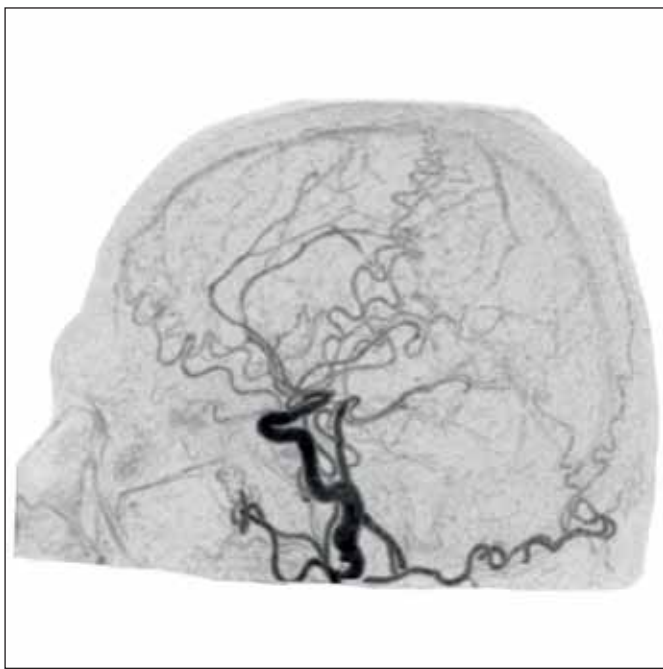
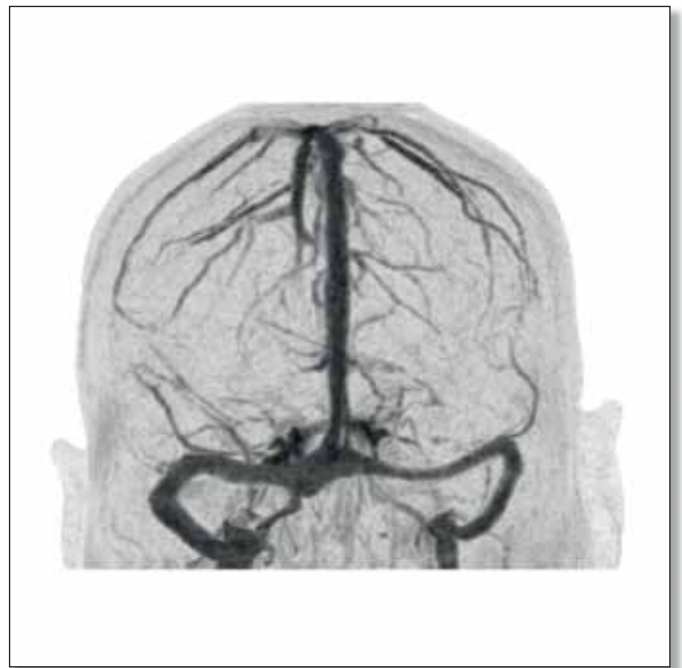
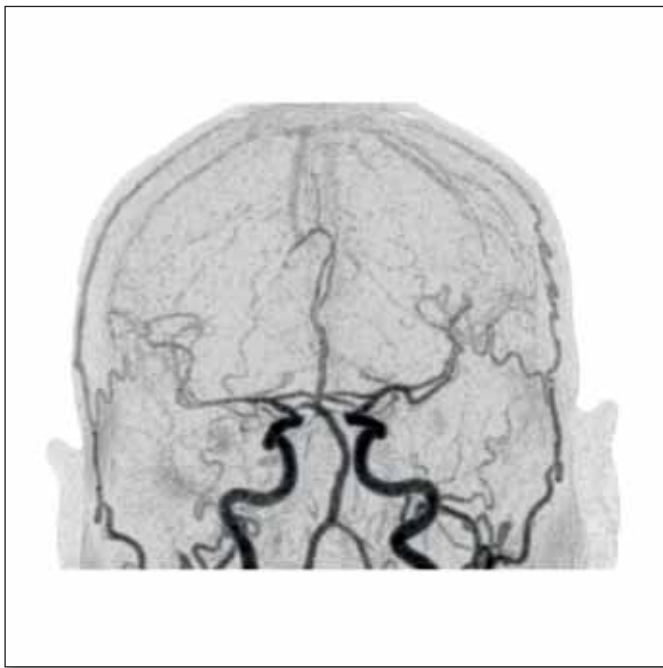


Scan Mode	Collimation	Pitch	kVp	mAs	Rotation Time (s)	Scan Range (mm)	Dose Reduction	CTDIvol (mGy)	DLP (mGy-cm)	Effective Dose (mSv)	k
Wide-Volume	0.5 mm x 80	/	120	250	1	151	AIDR 3D Standard	55.0	1034.3	2.17	0.0021

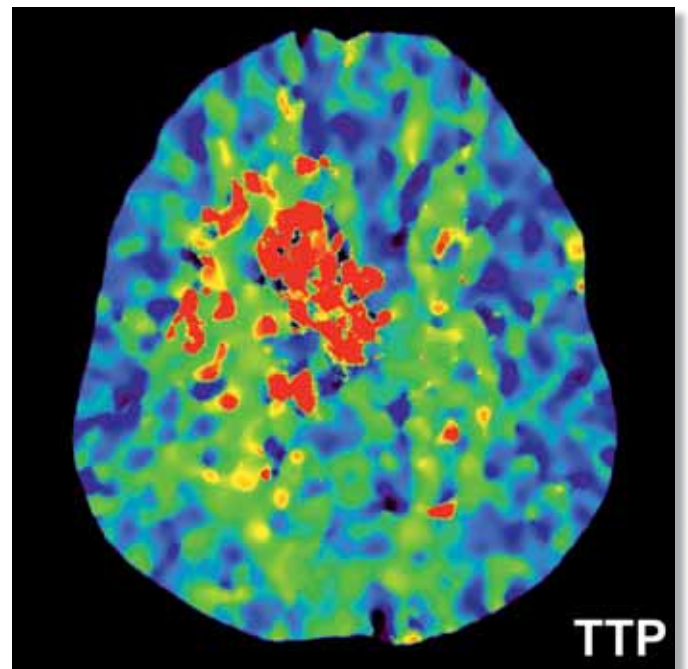
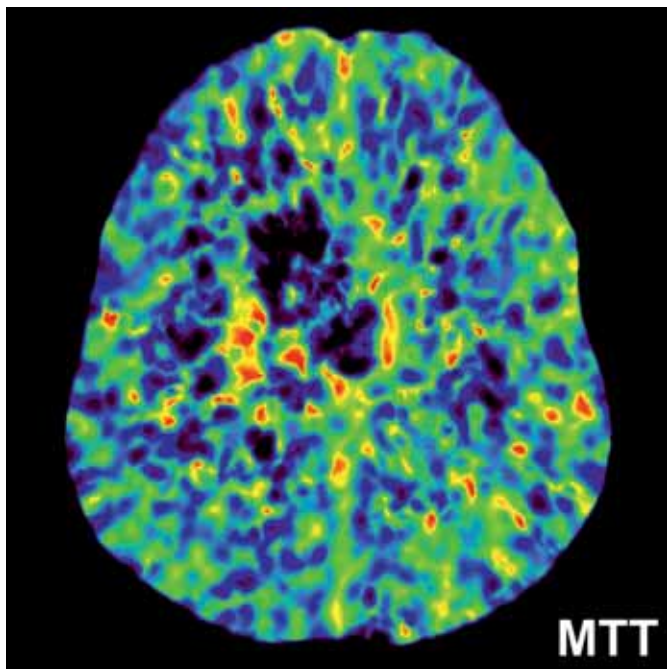
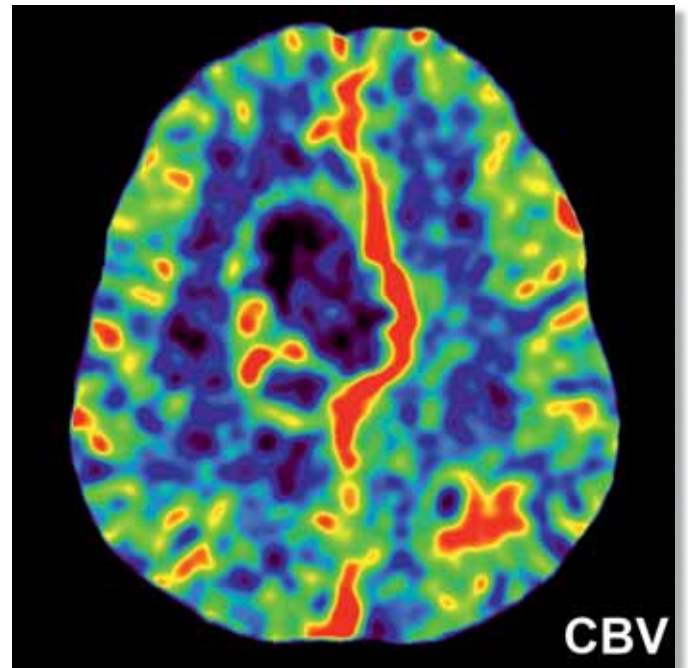
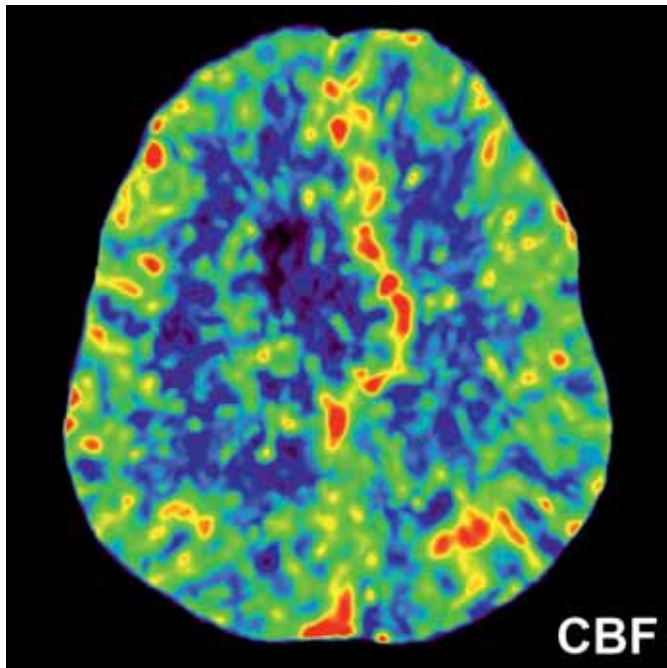


Brain Perfusion

This dynamic volume scan of the brain was acquired of a 58-year-old male with a known brain tumor. Whereas the angiogram shows vascular structures in detail, the automatically calculated perfusion maps show an intracerebral space-occupying lesion with increased CBV in the peripheral zones and decreased CBV in the central region. This indicates a high grade central necrotic neoplastic mass, such as glioblastoma multiforma.



Scan Mode	Collimation	Pitch	kVp	mAs	Rotation Time (s)	Scan Range (mm)	Dose Reduction	CTDIvol (mGy)	DLP (mGy-cm)	Effective Dose (mSv)	k
Dynamic Volume	0.5 mm x 320	/	80	SURE ^{EXPOSURE} ™ 3D Standard	0.35	160	AIDR 3D Standard	137.47	2199.6	4.62	0.0021



Facial Fracture

Multiple fractures of the facial bones are shown in this scan of a 29-year-old male. This scan was acquired in only one rotation of 0.5 seconds allowing the clinician to make an instant diagnosis in a trauma situation where time is critical.

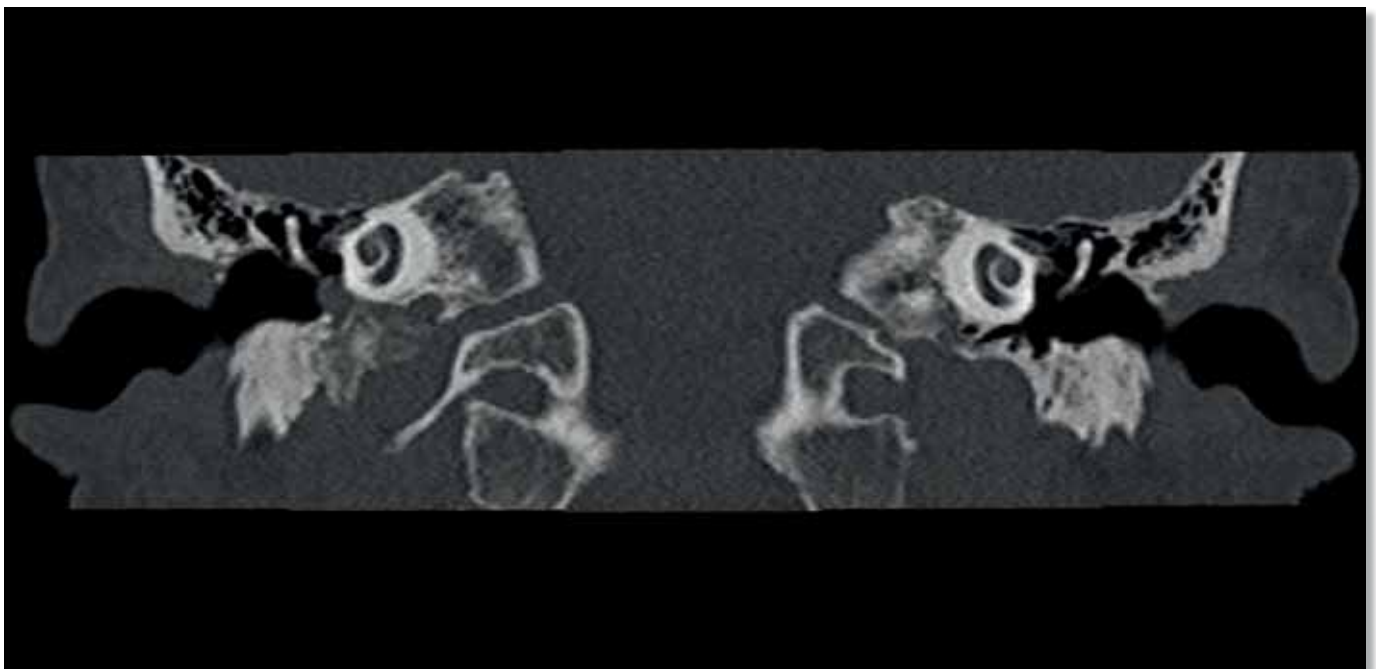
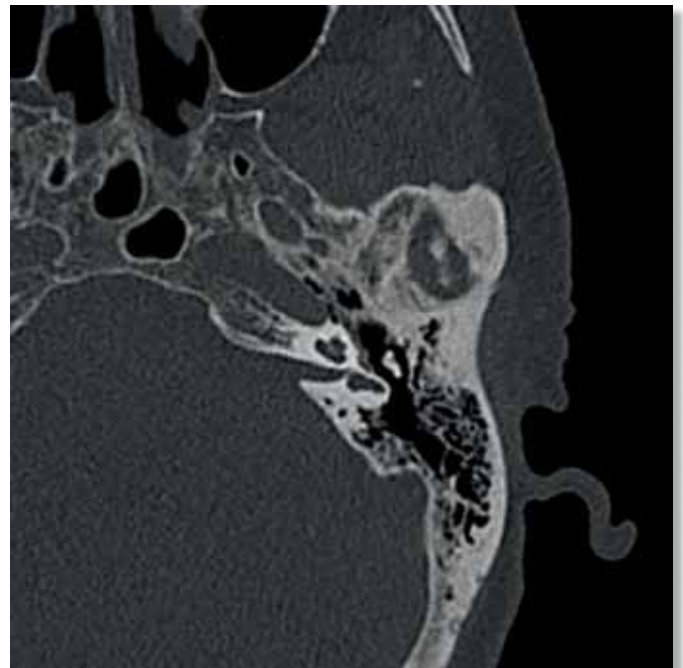
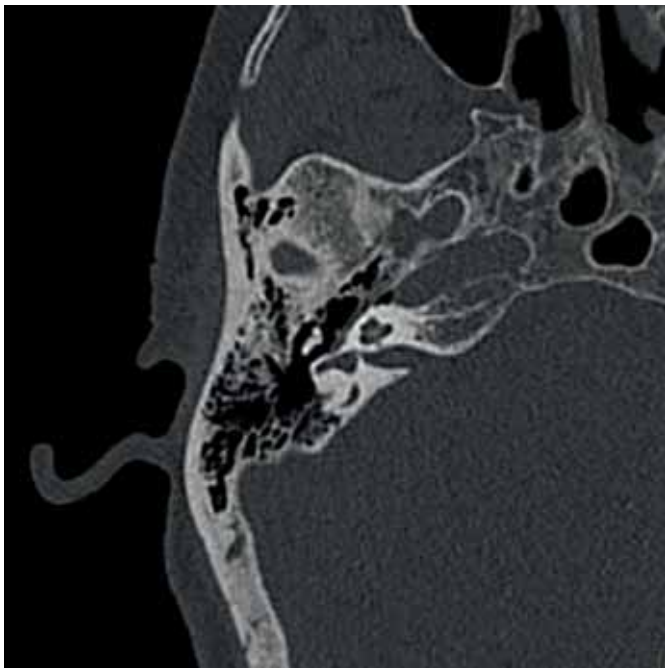
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Volume	0.5 mm x 80	/	100	25	0.5	140	AIDR 3D Standard	2.9	40.9	0.086	0.0021



Inner Ear

This scan of the inner ear is acquired in just one rotation of 0.5 seconds. With a slice thickness of only 0.5 mm, a very high spatial resolution is reached which results in this detailed image of the inner ear.

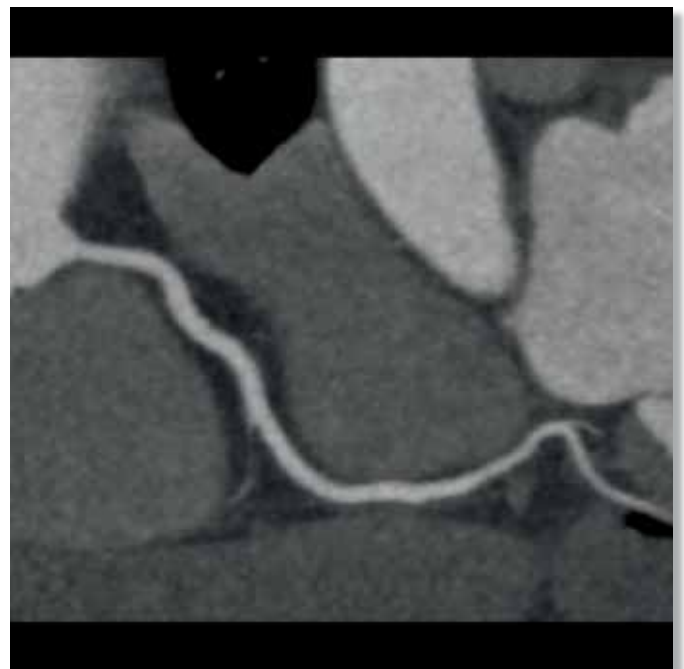
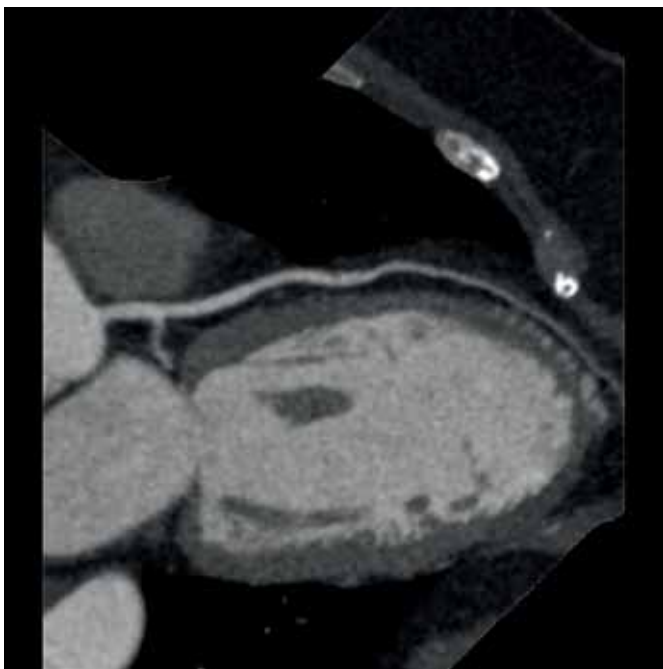
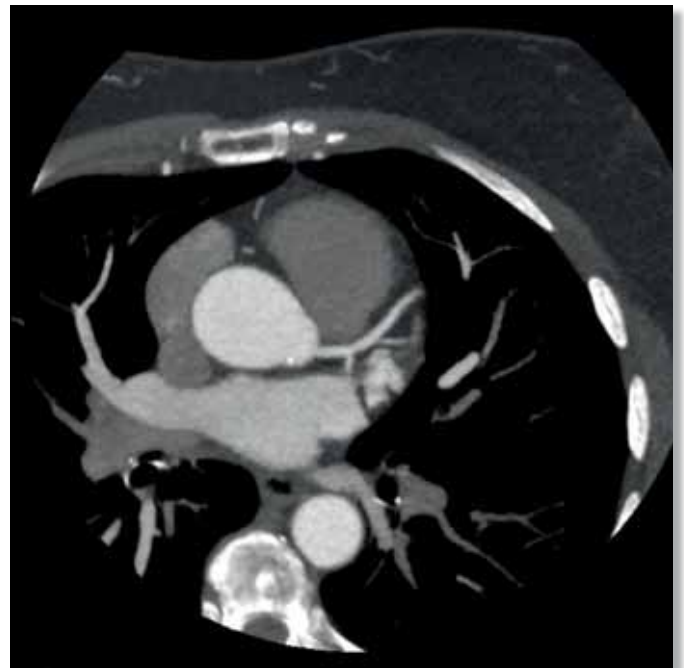
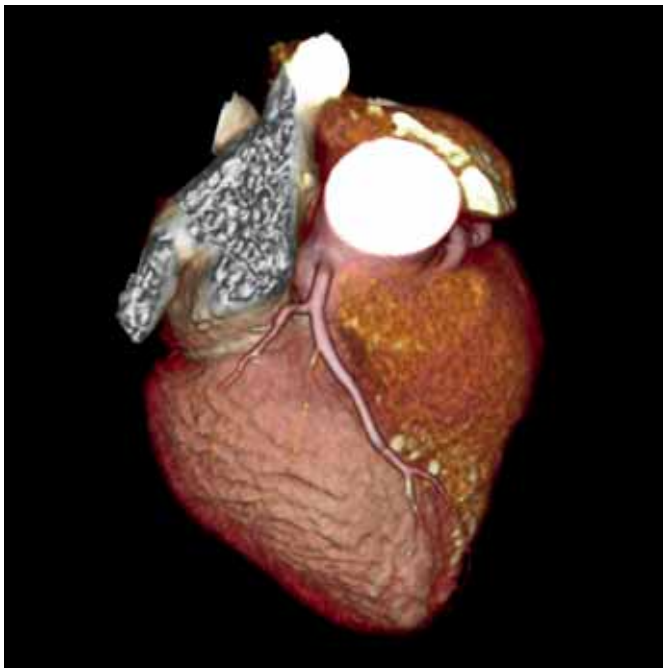
Scan Mode	Collimation	Pitch	kVp	mAs	Rotation Time (s)	Scan Range (mm)	Dose Reduction	CTDIvol (mGy)	DLP (mGy-cm)	Effective Dose (mSv)	k
Volume	0.5 mm x 80	/	120	100	0.5	40	AIDR 3D Standard	21.1	84.5	0.18	0.0021



Cardiac

A 55-year-old female patient presented with atypical chest pain. A cardiac CT scan was made to rule out coronary artery disease. In a single 0.35 second rotation scan the end-diastolic phase of the heartbeats was acquired in a 12 cm volume scan, resulting in a motion-free and high resolution image.

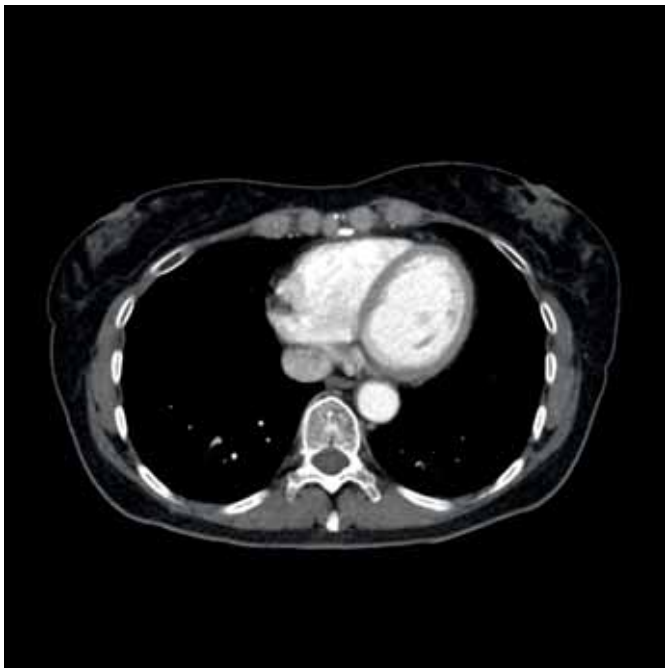
Scan Mode	Collimation	Pitch	kVp	mAs	Rotation Time (s)	Scan Range (mm)	Dose Reduction	CTDIvol (mGy)	DLP (mGy-cm)	Effective Dose (mSv)	k
Volume	0.5 mm x 320	/	100	^{SURE} Exposure 3D Standard	0.35	100	AIDR 3D Standard	4.9	58.7	0.82	0.014



Thorax

This oncology follow-up scan reconstructed with hybrid filter shows low contrast soft tissue and high contrast sharp lungs within one reconstruction. Together with the integration of AIDR 3D into ^{SURE}Exposure 3D the scan is automatically made with the lowest dose possible.

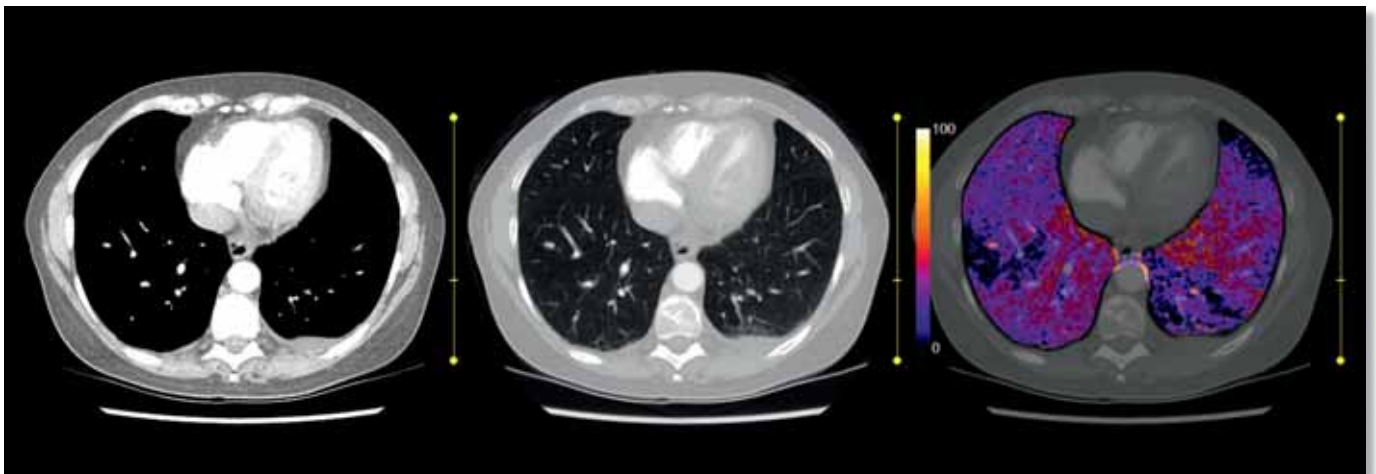
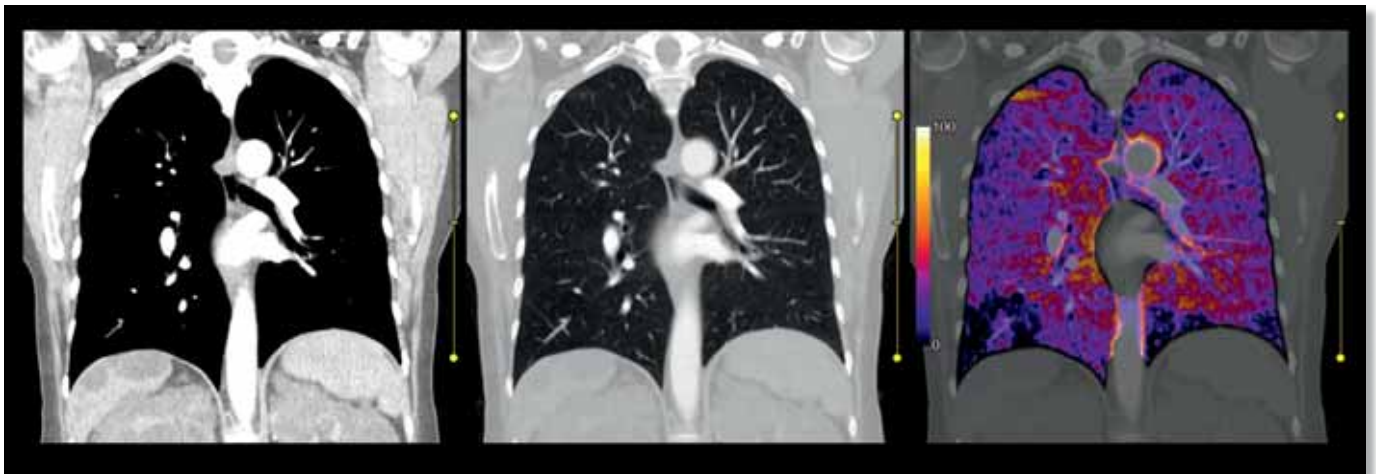
Scan Mode	Collimation	Pitch	kVp	mAs	Rotation Time (s)	Scan Range (mm)	Dose Reduction	CTDIvol (mGy)	DLP (mGy-cm)	Effective Dose (mSv)	k
Helical	0.5 mm x 80	0.812	120	^{SURE} Exposure 3D Standard	0.35	447	AIDR 3D Standard	3.1	144.2	2.02	0.014



Lung Subtraction 1

A 51-year-old female was scanned with the ^{SURE}Subtraction Lung protocol to follow up on known pulmonary embolisms. The color-coded iodine maps show the effect pulmonary embolisms have on iodine perfusion. In addition the prognostic value is increased by this dose-neutral technique.

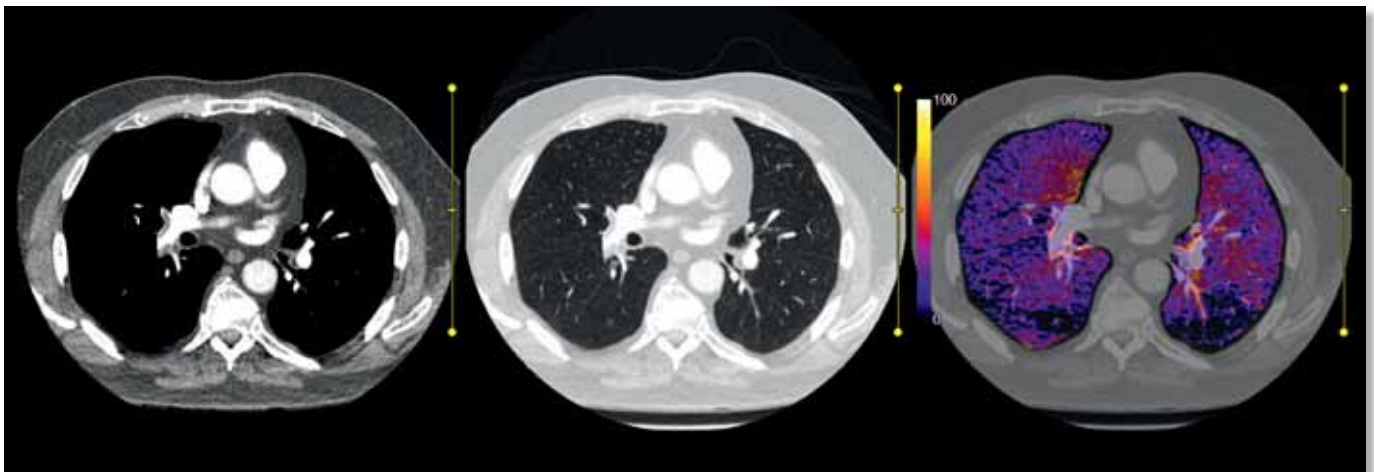
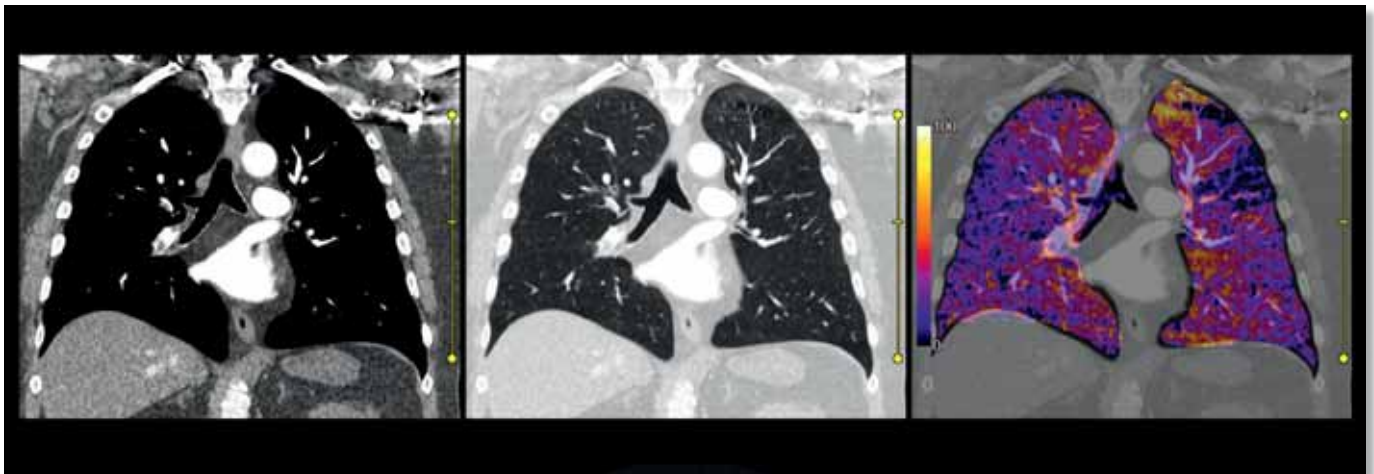
Scan Mode	Collimation	Pitch	kVp	mAs	Rotation Time (s)	Scan Range (mm)	Dose Reduction	CTDIvol (mGy)	DLP (mGy-cm)	Effective Dose (mSv)	k
Helical	0.5 mm x 80	0.821	100	^{SURE} Exposure 3D Standard	0.35	312	AIDR 3D Standard	1.40	47.80	0.67	0.014
Helical	0.5 mm x 80	0.821	100	^{SURE} Exposure 3D Standard	0.35	312	AIDR 3D Standard	2.20	76.30	1.07	0.014



Lung Subtraction 2

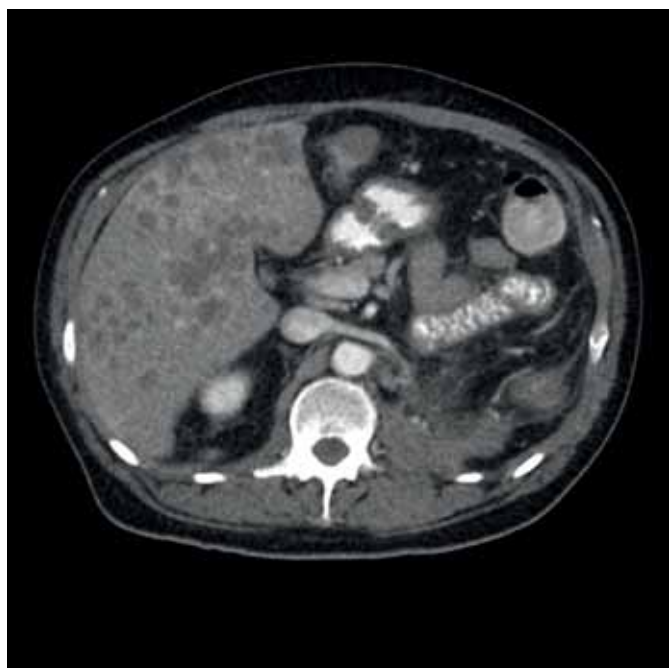
This 72-year-old male presented with a suspicion for pulmonary embolisms. A CT scan was made using the dose-neutral ^{SURE}Subtraction Lung protocol. Lung embolisms were found on the right and left side. The color-coded iodine maps clearly show perfusion defects due to the embolisms.

Scan Mode	Collimation	Pitch	kVp	mAs	Rotation Time (s)	Scan Range (mm)	Dose Reduction	CTDIvol (mGy)	DLP (mGy-cm)	Effective Dose (mSv)	k
Helical	0.5 mm x 80	0.821	100	^{SURE} Exposure 3D Standard	0.35	316	AIDR 3D Standard	4.5	156	2.18	0.014
Helical	0.5 mm x 80	0.821	100	^{SURE} Exposure 3D Standard	0.35	316	AIDR 3D Standard	7.9	276.9	3.88	0.014



Thorax Abdomen Pelvis 1

Multiple liver lesions are shown in this TAP scan of a 48-year-old patient. With the excellent low contrast performance all structures in the abdomen are well visible.



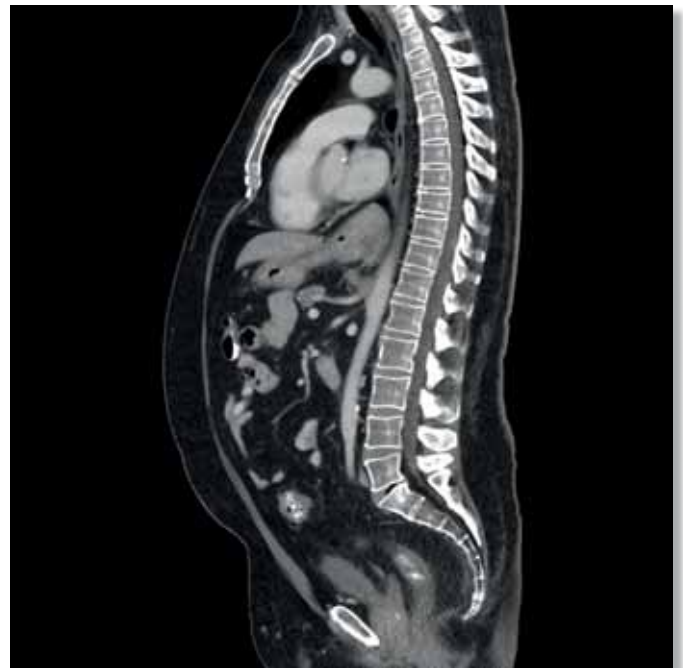
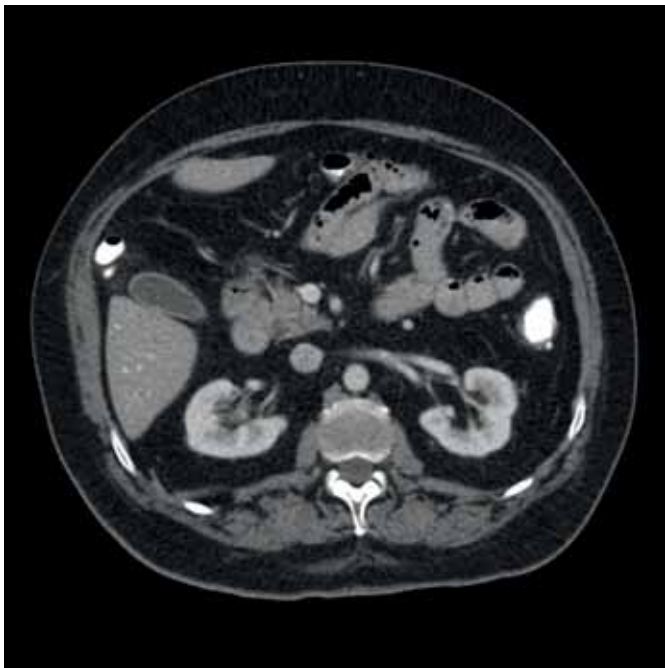
Scan Mode	Collimation	Pitch	kVp	mAs	Rotation Time (s)	Scan Range (mm)	Dose Reduction	CTDIvol (mGy)	DLP (mGy-cm)	Effective Dose (mSv)	k
Helical	0.5 mm x 80	0.812	100	^{SURE} Exposure 3D Standard	0.35	612	AIDR 3D Standard	5.5	364.3	5.28	0.0145



Thorax Abdomen Pelvis 2

A thorax, abdomen and pelvis scan was required of this 60-year-old male patient following up on treatment. Using a fast rotation time of 0.35 seconds for routine scans gives motion-free images. Both low contrast soft tissue and high contrast sharp lungs are reconstructed with one hybrid filter for fast diagnosis and efficient workflow.

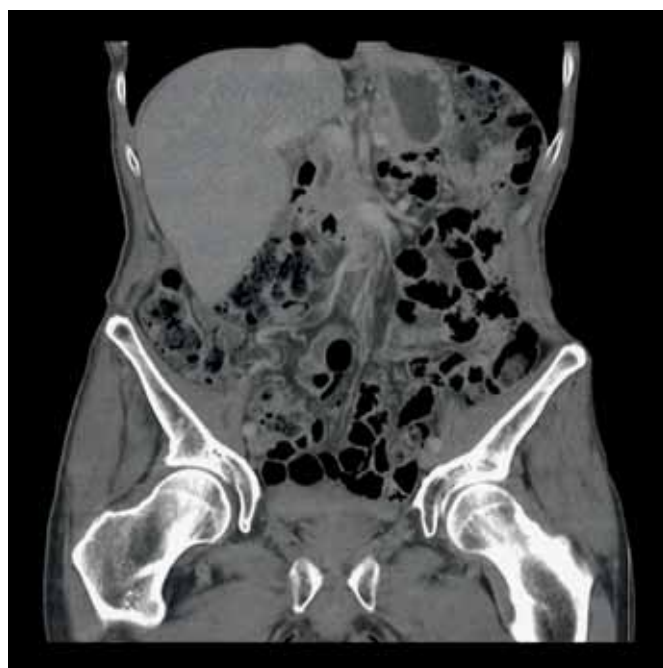
Scan Mode	Collimation	Pitch	kVp	mAs	Rotation Time (s)	Scan Range (mm)	Dose Reduction	CTDIvol (mGy)	DLP (mGy-cm)	Effective Dose (mSv)	k
Helical	0.5 mm x 80	0.812	100	^{SURE} Exposure 3D Standard	0.35	645	AIDR 3D Standard	5.64	396.04	5.74	0.0145



Abdomen

This urogram made of a 72-year-old female shows hydronephrosis and clearly visible stenosis of the left side ureter. The superb low contrast resolution in the venous phase shows the different abdominal structures in high detail.

Scan Mode	Collimation	Pitch	kVp	mAs	Rotation Time (s)	Scan Range (mm)	Dose Reduction	CTDIvol (mGy)	DLP (mGy-cm)	Effective Dose (mSv)	k
Helical	0.5 mm x 80	0.821	120	^{SURE} Exposure 3D Standard	0.35	408	AIDR 3D Standard	4.8	210.6	3.16	0.015

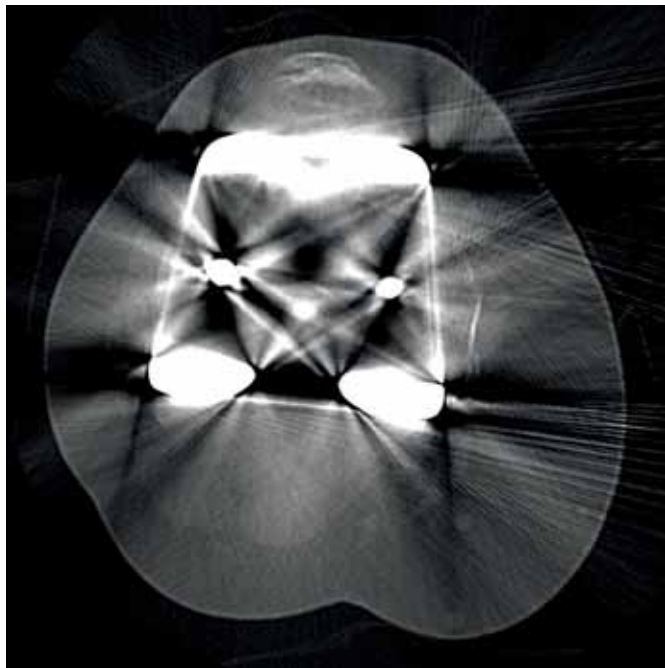


SEMAR Knee

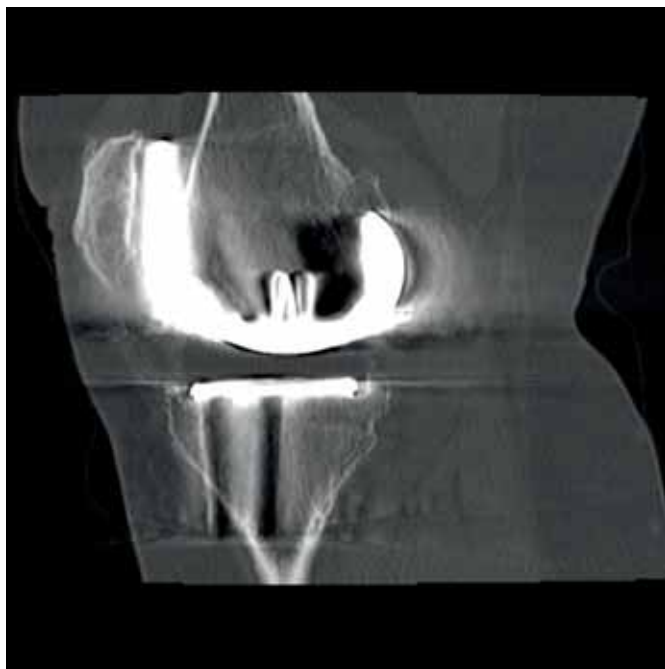
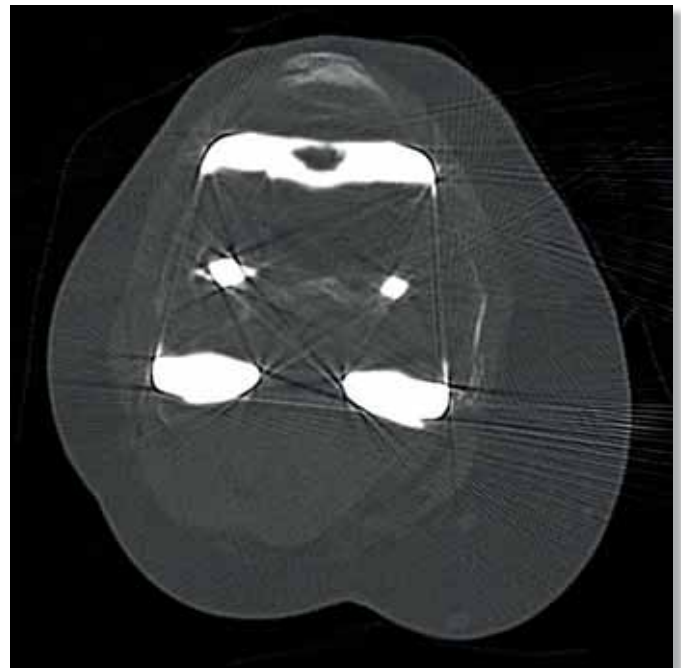
A 67-year-old female patient with total knee prosthesis was sent for follow-up CT. The 128 mm volume scan was made in a single rotation using a low dose AIDR 3D scan protocol. Reconstruction was done with Single Energy Metal Artifact Reduction (SEMAR). This technique reduces metal artifacts extremely, while the knee and surrounding tissue can be diagnosed with improved accuracy.

Scan Mode	Collimation	Pitch	kVp	mAs	Rotation Time (s)	Scan Range (mm)	Dose Reduction	CTDIvol (mGy)	DLP (mGy-cm)	Effective Dose (mSv)	k
Volume	0.5 mm x 256	/	120	82	0.5	128	AIDR 3D Standard	7.50	95.9	0.077	0.0008

Original Image



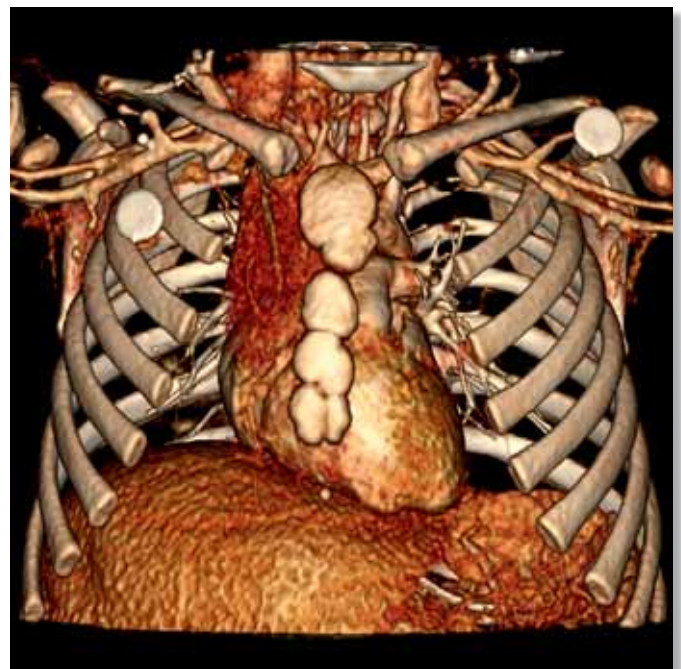
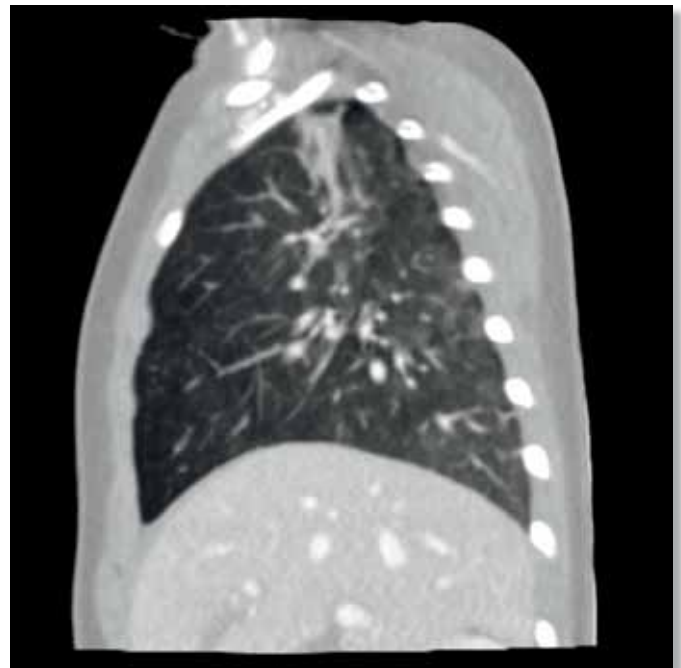
SEMAR Image



Pediatric

A CT scan of the thorax was performed in this 2-day-old child after reanimation. Sedation of the child was not needed as the whole thorax was scanned in one single rotation of 16 cm without table movement. Integration of AIDR 3D into automatic exposure control ensured the lowest possible dose.

Scan Mode	Collimation	Pitch	kVp	mAs	Rotation Time (s)	Scan Range (mm)	Dose Reduction	CTDIvol (mGy)	DLP (mGy-cm)	Effective Dose (mSv)	k
Volume	0.5 mm x 320	/	100	^{SURE} Exposure 3D Standard	0.35	160	AIDR 3D Standard	1.50	23.90	0.35	0.0145





TOSHIBA MEDICAL SYSTEMS EUROPE

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