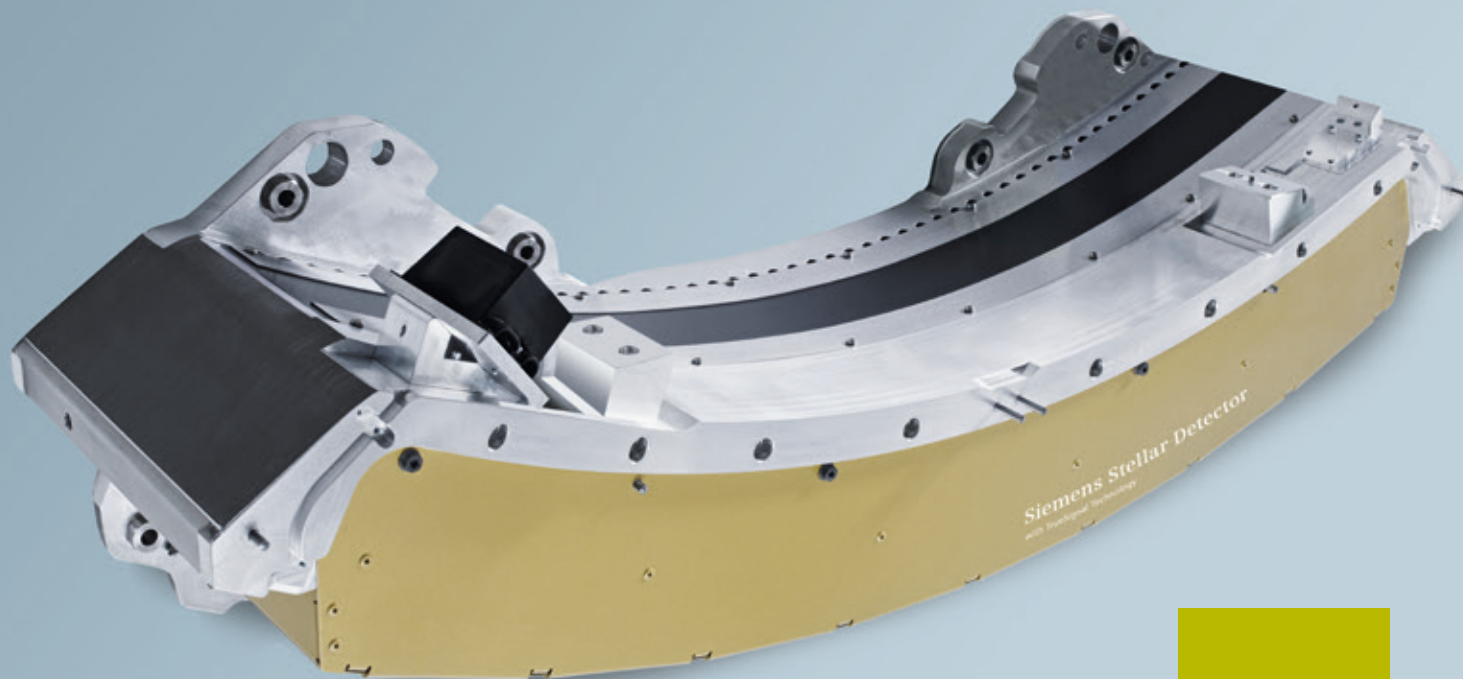


SIEMENS



New

www.siemens.com/somatom-definition-as

SOMATOM Definition AS

Stellar ready

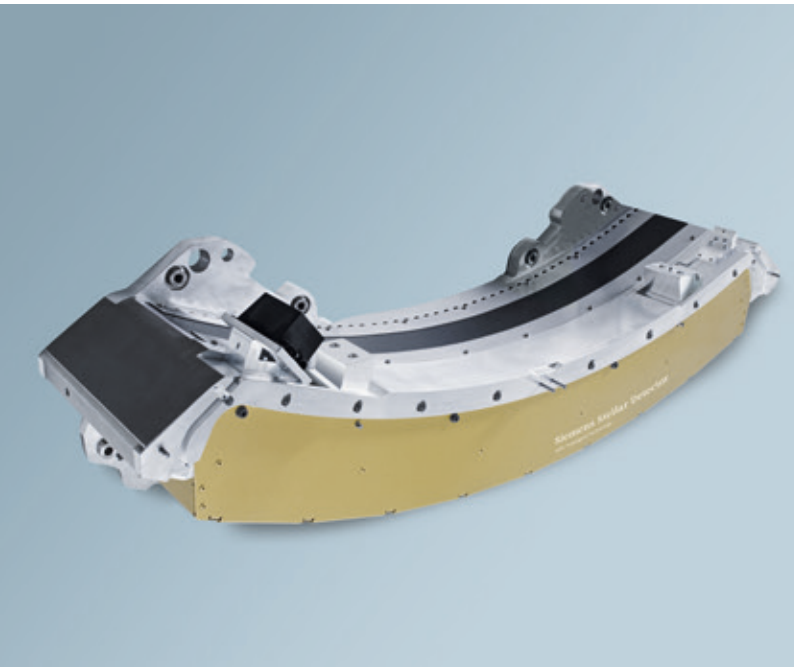
SOMATOM Definition AS

Stellar ready

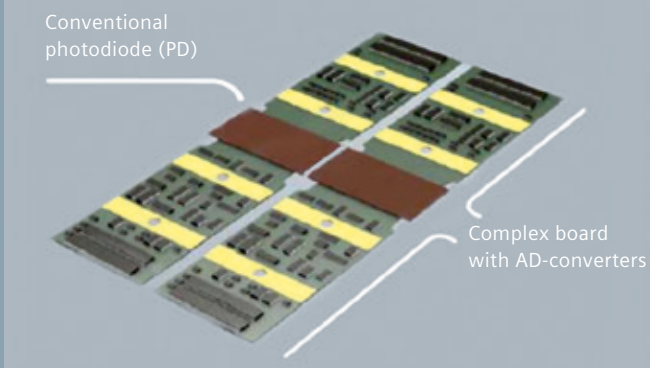
The new SOMATOM Definition AS Stellar ready now offers the full flexibility to upgrade to a SOMATOM Definition AS with Stellar detector. The system is also designed to be able to rotate with 0.28 s and enables a scan speed of up to 23 cm/s.

The Stellar detector: The first fully integrated detector

With the Stellar detector, Siemens is pioneering the first fully integrated CT detector. This enables a processing of the digitized signal without any losses while the electronic noise produced by the detector is reduced (TrueSignal technology). In combination with Edge technology, the Stellar detector delivers a sharper slice profile with a thickness of 0.5 mm, resulting in a routine spatial resolution of up to 0.3 mm. Additionally, HiDynamics extends the dynamic range up to 102 dB, which eliminates the need to modify amplification and avoids detector saturation. Therefore systems with the Stellar detector can measure smaller signals over a wider dynamic range, which reduces the noise and enhances the CT image quality.

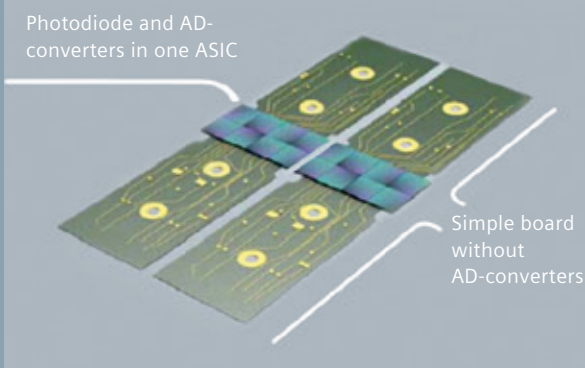


A Solid-state detector



On solid-state detectors, a separate electronic board with analog digital converters is necessary (Fig. A).

B Stellar detector



In the Stellar detector, these components are completely integrated with the photodiode eliminating the need for these additional electronic components (Fig. B).

In the Stellar detector, Siemens has replaced all the boards and electronic components previously present on the detector module (Fig. A & B). The Stellar detector combines the photodiode and the ADC for the first time in one application-specific integrated circuit (ASIC), thus reducing impairment of the signal. The result is a digitized signal with reduced electronic noise in the detected image (see measurements below).

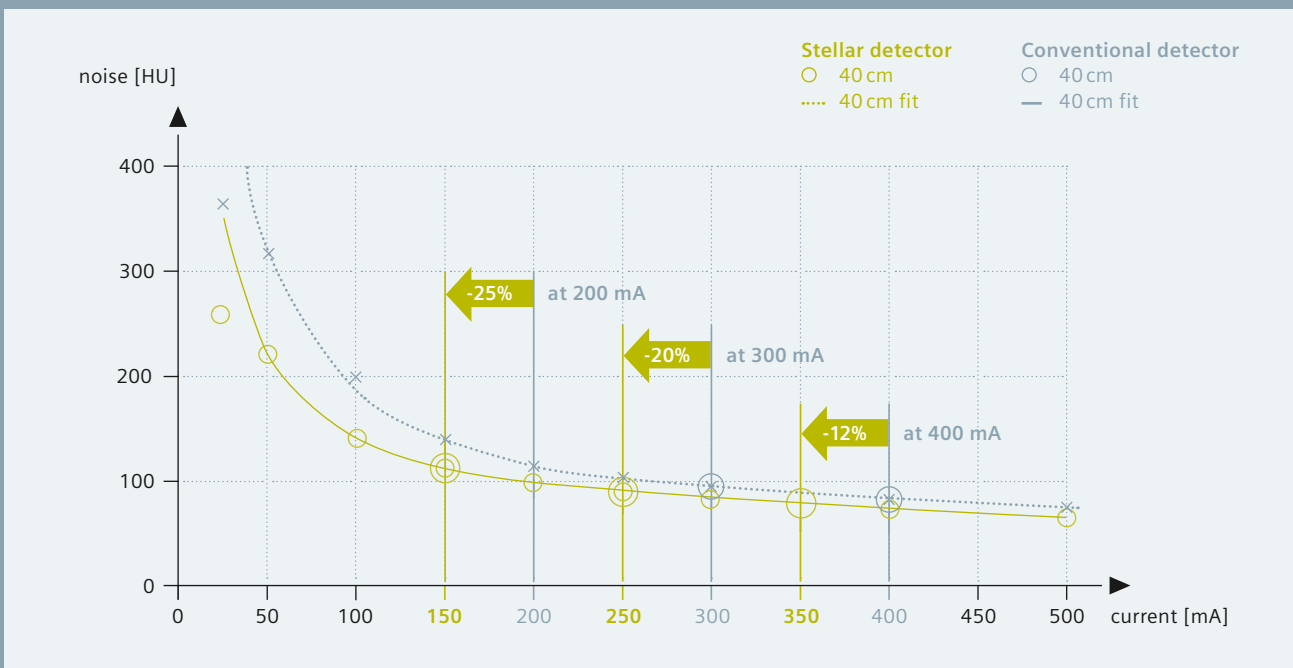


Image noise is measured in a 40 cm water phantom for various mAs settings. When the mAs decreases, image noise increases. With the new Stellar detector, image noise increases more slowly when the

mAs is reduced compared to a conventional detector. The same noise level can now be achieved with 25% lower mAs at an image noise level of 100 HU in a 40 cm water phantom.

Clinical results with Stellar detector: Oncology



with conventional detector: 5.26 mGy



with Stellar detector: 2.69 mGy

**with conventional
detector:**

tube settings:
100 kV, 133 mAs

DLP:
251 mGy cm

CTDIvol:
5.26 mGy

eff. dose:
3.76 mSv

with Stellar detector:

tube settings:
100 kV, 68 mAs

DLP:
131 mGy cm

CTDIvol:
2.69 mGy

eff. dose:
1.96 mSv

Courtesy of Sodra Vallgatan
Helsingborg, Malmö, Sweden

Oncology imaging

Tumor follow-up control scan.
Stellar detector enables dose
savings without compromising
image quality.

Clinical results with Stellar detector: Cardiology

collimation:
128 x 0.6 mm

spatial resolution:
0.30 mm

scan time:
5 s

scan length:
156 mm

rotation time:
0.28 s

tube settings:
80 kV, 129 eff. mAs

DLP:
149 mGy cm

CTDIvol:
8.55 mGy

heart rate:
61–70 bpm

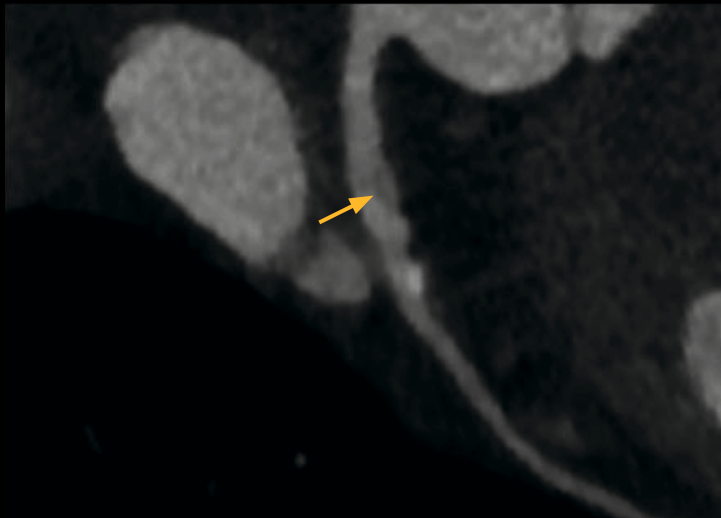
eff. dose:
1.86 mSv

Courtesy of CIMOP Bizet,
Paris, France



Cardiac CT

Stenosis evaluation with excellent image quality. Higher rotation speed in combination with Stellar detector delivers higher temporal resolution with reduced dose.



Conventional 0.6 mm slice thickness



Stellar detector with 0.5 mm slice thickness

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
DLP:
 72.7 mGy cm
CTDIvol:
 4.38 mGy
heart rate:
 67 bpm
eff. dose:
 1.0 mSv

Courtesy of CIMOP Bizet,
Paris, France

Plaque analysis
 Differentiation of type of plaque.
 Edge technology improves
 spatial resolution with 0.5 mm
 slices for higher diagnostic
 confidence.
 Yellow arrow: soft plaque
 Orange arrow: fibrocalcified
 plaque

Clinical results with Stellar detector: Cardio-vascular

collimation:
128 x 0.6 mm

spatial resolution:
0.30 mm

scan time:
2.8 s

scan length:
654 mm

rotation time:
0.28 s

tube settings:
100 kV, 67 eff. mAs

DLP:
185 mGy cm

CTDIvol:
2.65 mGy

heart rate:
68 bpm

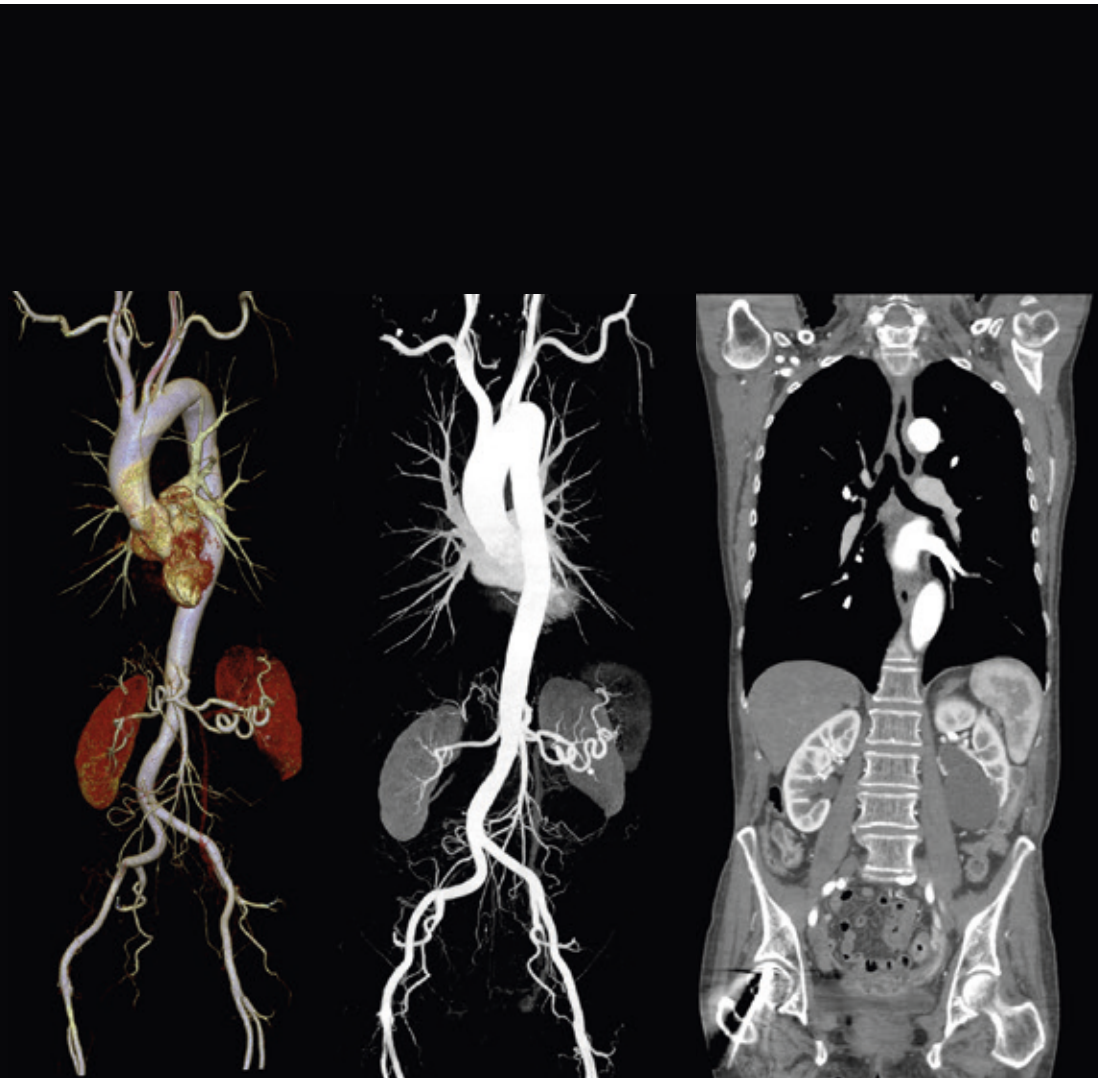
eff. dose:
2.68 mSv

Courtesy of LMU Grosshadern,
Munich, Germany



TAVI/TAVR planning

Planning scan with excellent image quality. Combination of high temporal resolution and fast acquisition of 23 cm/s enables visualizing the entire range.



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
DLP:
 147 mGy cm
CTDIvol:
 2.22 mGy
eff. dose:
 2.2 mSv

Courtesy of Linköping
 University Hospital,
 Linköping, Sweden

Aortic imaging

Control scan of aortic and
 peripheral vessels with only
 60 mL contrast media.
 TrueSignal technology and
 HiDynamics enable low kV
 imaging with excellent
 homogeneous contrast display.

Clinical results with Stellar detector: Thoracic imaging

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

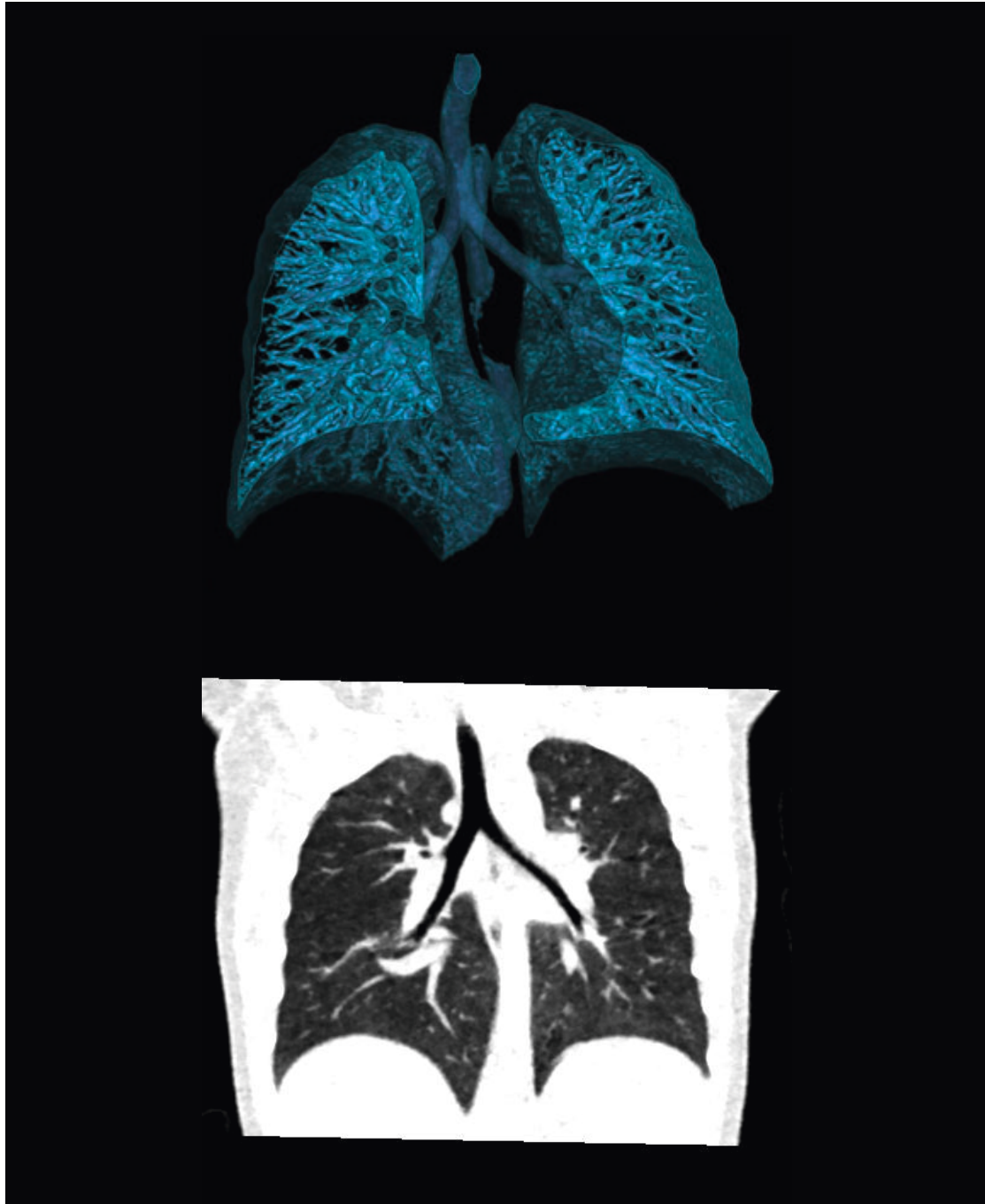
tube settings:
100 kV, 4 eff. mAs

DLP:
2 mGy cm

CTDIvol:
0.14 mGy

eff. dose:
0.17 mSv

Courtesy of Linköping
University Hospital,
Linköping, Sweden



Pediatric scan without sedation

Rule out of esophagus (AE) stenosis due to aspiration in 9-month-old baby. Possible by combining outstandingly fast image acquisition of 23 cm/s with unparalleled dose efficiency using TrueSignal technology.



collimation:
128 x 0.6 mm

spatial resolution:
0.30 mm

scan time:
1.86 s

scan length:
300 mm

rotation time:
0.28 s

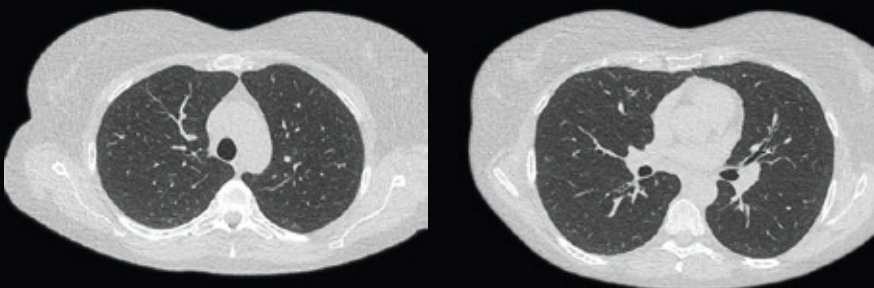
tube settings:
100 kV, 10 eff. mAs

DLP:
15 mGy cm

CTDIvol:
0.39 mGy

eff. dose:
0.21 mSv

Courtesy of CIMOP Bizet,
Paris, France



Low dose lung imaging
Rule out of pulmonary disease
in early stage. SAFIRE* and
TrueSignal technology enable
excellent diagnostic image
quality, even with a dose of only
0.21 mSv.

* 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.

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