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siemens.com/CT-for-RT

Start the RT challenge with an advantage

with the new SOMATOM Definition AS Open – RT Pro edition

With the introduction of the Definition AS Open, Siemens delivered a remarkably versatile large bore CT that fulfills both radiation therapy and diagnostic needs.

Each year since its inception, the Definition AS Open has seen increased performance levels and the addition of advanced features that further enrich its capabilities. Siemens continues on this trajectory of development by introducing the new SOMATOM Definition AS Open – RT Pro edition.

With its strong performance specifications, the new SOMATOM Definition AS Open – RT Pro edition is a powerful imaging platform that delivers high-quality images and intuitive tools to provide a sound basis for the treatment techniques of today and tomorrow. Siemens' new metal artifact reduction technique, iMAR, and the latest Extended Field of View algorithm, HD FoV Pro, simplify even the most complex cases. With Motion Management Pro, you are equipped to tackle the challenge of tumor motion, thanks to a broad range of advanced 4DCT tools.

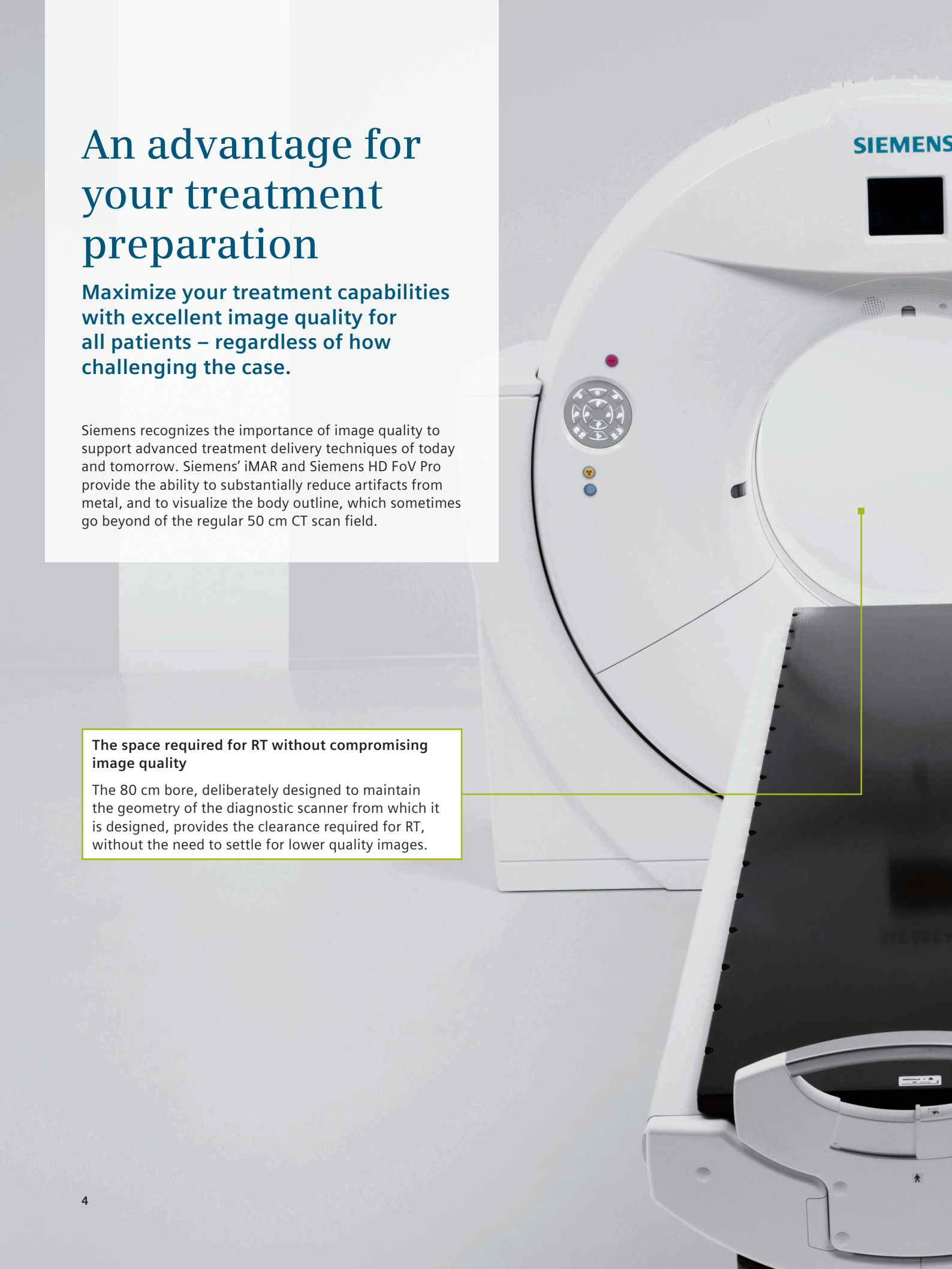
Additionally, Siemens' new *syngo*.via RT Image Suite provides an ideal complement to the new SOMATOM Definition AS Open – RT Pro edition. This dedicated viewing and contouring application aids clinicians in devising and assessing treatment strategies, and enables users to capitalize on the advanced capabilities of their Siemens imaging equipment. By connecting a wide range of imaging data to provide a comprehensive view for each patient, *syngo*.via RT Image Suite enables you to leverage efficiently modern imaging capabilities in your RT environment.


120 kV
500 mA
30.0
-200.0
John Doe
STOP

An advantage for your treatment preparation

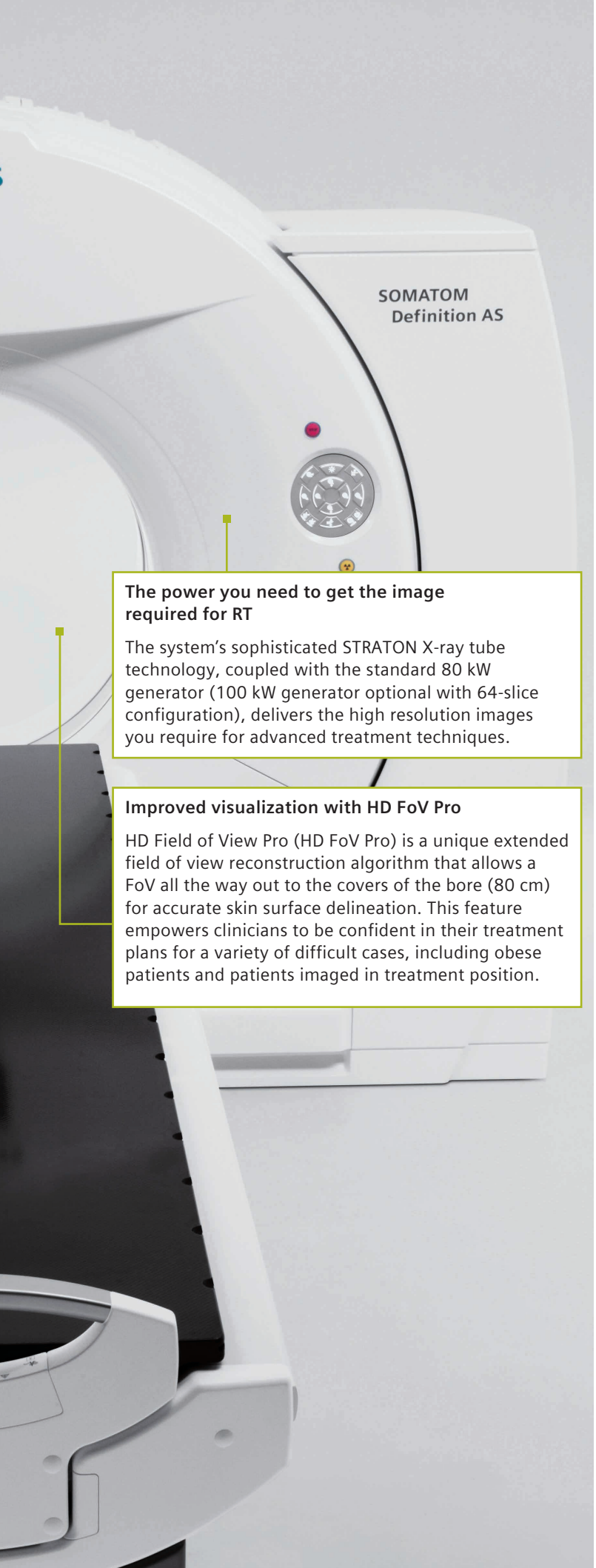
Maximize your treatment capabilities with excellent image quality for all patients – regardless of how challenging the case.

Siemens recognizes the importance of image quality to support advanced treatment delivery techniques of today and tomorrow. Siemens' iMAR and Siemens HD FoV Pro provide the ability to substantially reduce artifacts from metal, and to visualize the body outline, which sometimes go beyond of the regular 50 cm CT scan field.



The space required for RT without compromising image quality

The 80 cm bore, deliberately designed to maintain the geometry of the diagnostic scanner from which it is designed, provides the clearance required for RT, without the need to settle for lower quality images.

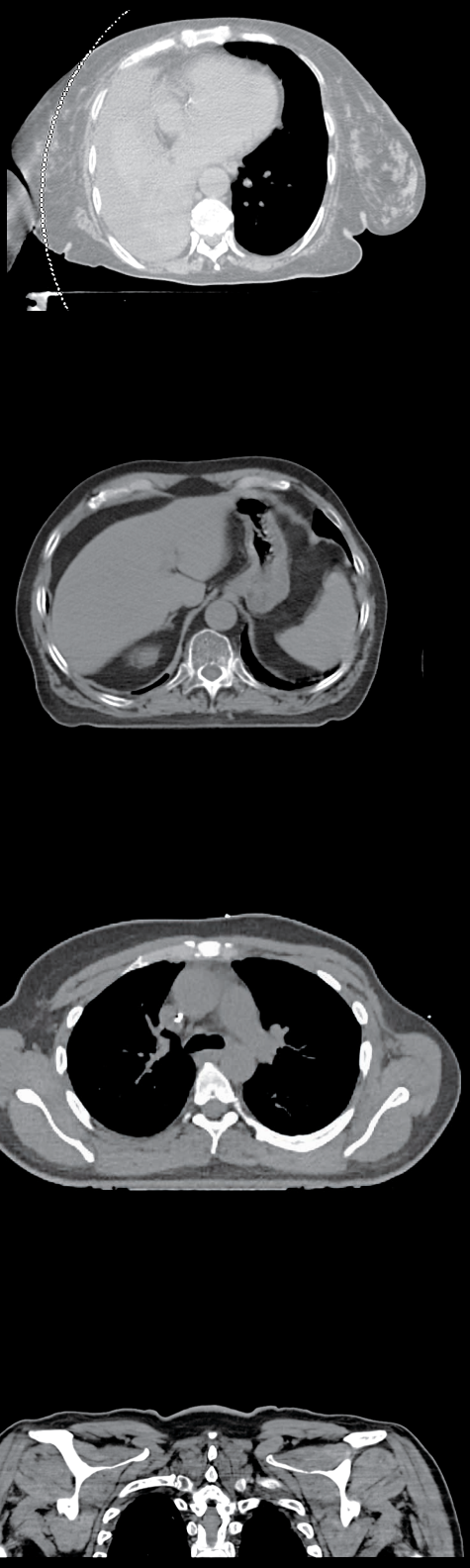


The power you need to get the image required for RT

The system's sophisticated STRATON X-ray tube technology, coupled with the standard 80 kW generator (100 kW generator optional with 64-slice configuration), delivers the high resolution images you require for advanced treatment techniques.

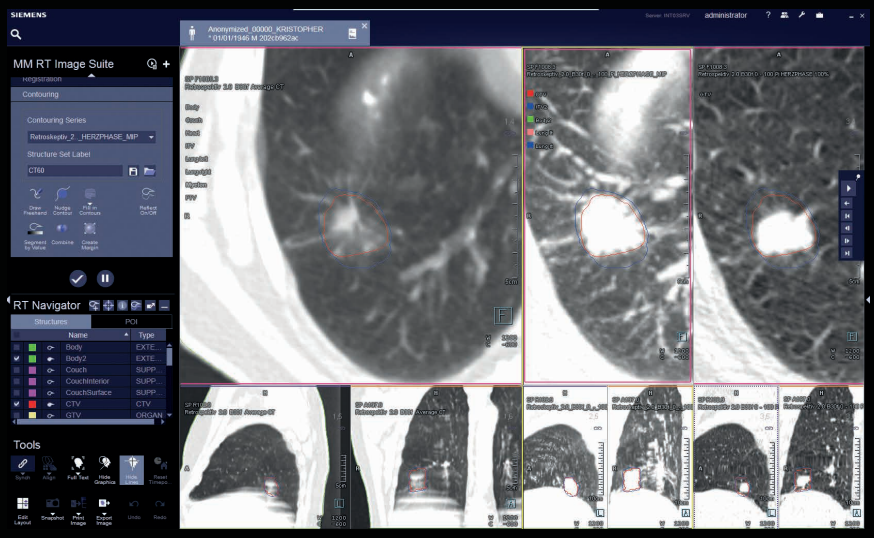
Improved visualization with HD FoV Pro

HD Field of View Pro (HD FoV Pro) is a unique extended field of view reconstruction algorithm that allows a FoV all the way out to the covers of the bore (80 cm) for accurate skin surface delineation. This feature empowers clinicians to be confident in their treatment plans for a variety of difficult cases, including obese patients and patients imaged in treatment position.



Example of scan acquisitions going beyond the regular 50cm, using HD FoV Pro.
Courtesy of Radiologische Allianz, Hamburg, Germany


SIEMENS
300
-2000.0
0.0°
John Doe



Example of tumor motion management contouring workflow showing simultaneous visualization of 4D cine datasets, Average CT and t-MIP on RT Image Suite*. Courtesy of Radiologische Allianz, Hamburg, Germany.

A comprehensive motion management solution

With the SOMATOM Definition AS Open – RT Pro edition's 4DCT solution, major disruptions to the normal respiratory cycle (coughs or gasps, for example) can be easily deleted or ignored when reviewing the respiratory wave form on the CT console. For smaller irregularities (small gasps, for example), our intelligent Auto Wave Edit software identifies and removes these disturbances in the breathing curve, saving time and eliminating the need to re-scan.

The SOMATOM Definition AS Open – RT Pro edition is compatible with a number of respiratory gating devices, including the Anzai* belt and the Varian RPM* and RGSC* devices. The online mode available with Varian's RGSC improves your 4D workflow, thanks to the complete integration of the breathing curve signal at the CT console.

4D tools available directly at the console:

- Prospective and retrospective acquisition modes
- AverageCT, tMIP, tminIP
- Fast reconstruction speed (up to 40 images/sec)
- Compatibility with iterative reconstruction (SAFIRE*) and iMAR*
- Auto Wave Edit feature
- Phase-based, time-based, and amplitude-based reconstruction modes

Save time with an easy-to-use and robust contouring tool

syngo.via RT Image Suite* provides flexible tools to help simplify the contouring process:

- Display multiple image series as well as a cine loop of the 4DCT scan to allow concurrent use of all relevant images
- Perform semi-automatic contour propagation over the different breathing phases
- Modify a planning CT contour with the parallel contouring feature, which reflects the contour of a given series onto the other series

* Optional

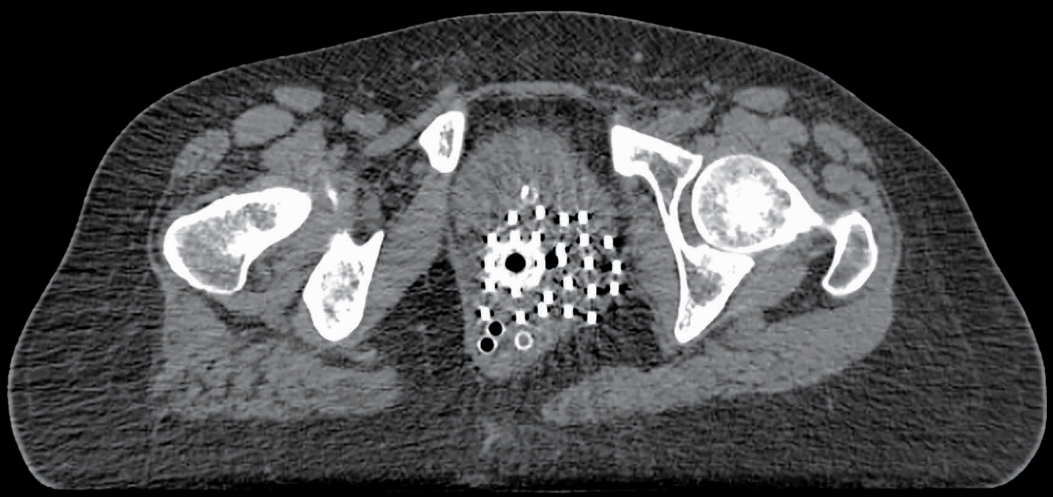
Precise reduction of metal artifacts

With iMAR*, Siemens delivers metal artifact reduction capabilities on a completely new level. The algorithm combines three advanced approaches: beam hardening correction, normalized sinogram inpainting, and frequency split. Whether the artifacts are caused by dental fillings, screws, prostheses, or pacemakers, iMAR helps to recover anatomy otherwise masked by significant artifacts.

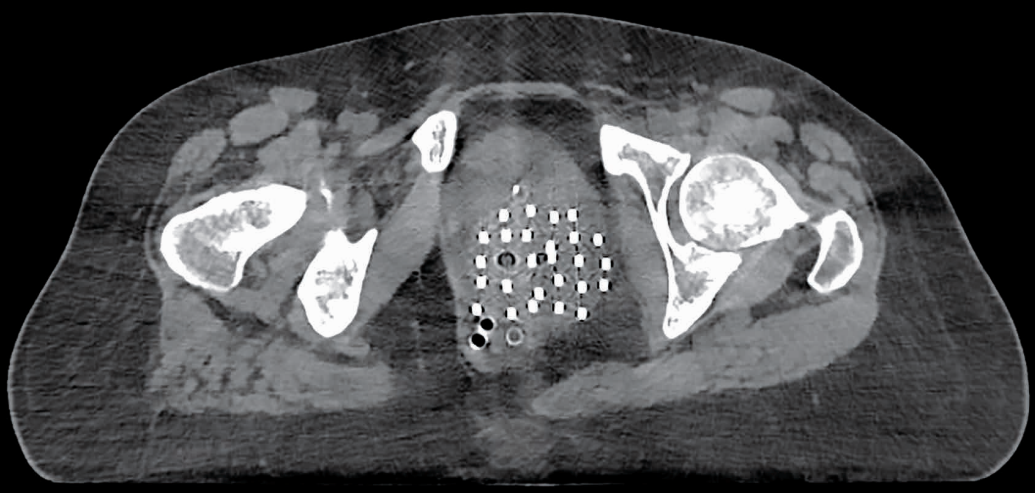
iMAR can be used in conjunction with:

- 4DCT acquisitions
- Dual energy acquisitions
- HD FoV Pro
- Iterative reconstruction (SAFIRE)
- Extended HU scale

Visualization of needles in the case of brachytherapy treatment for cervical cancer



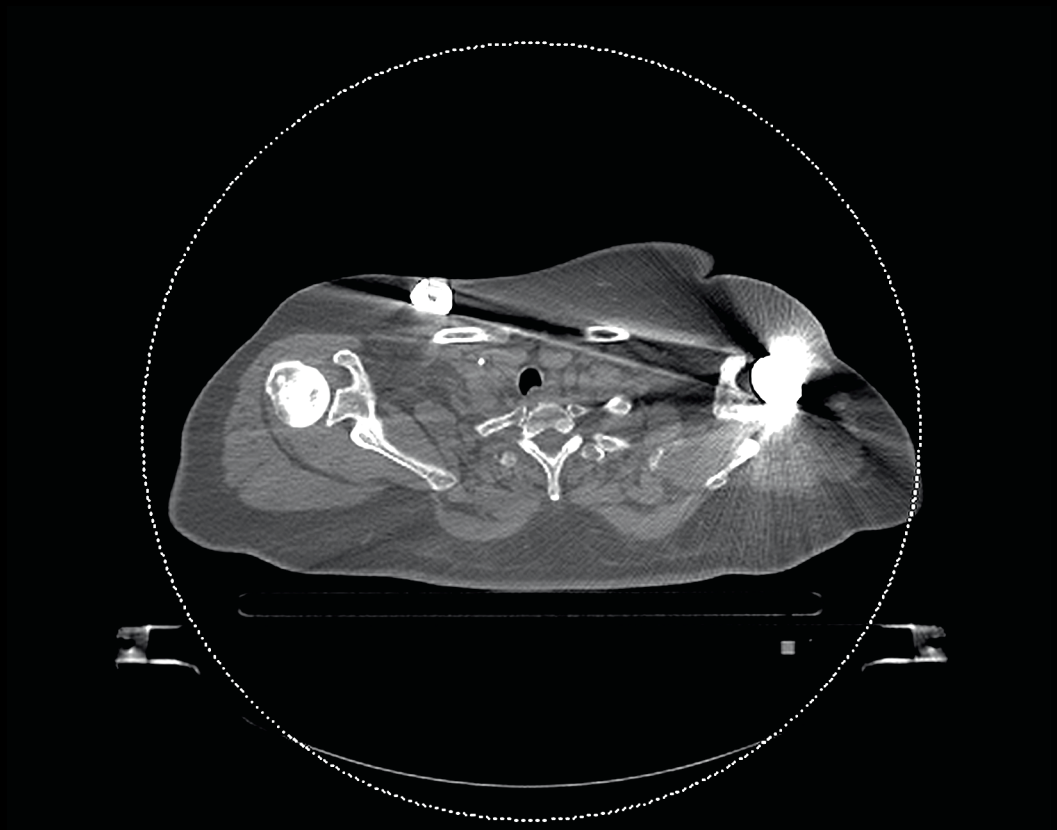
No IMAR



IMAR

Courstesy of Rigshospitalet / Copenhagen, Denmark

Reduction of artifacts of a metallic implant in bariatric patient

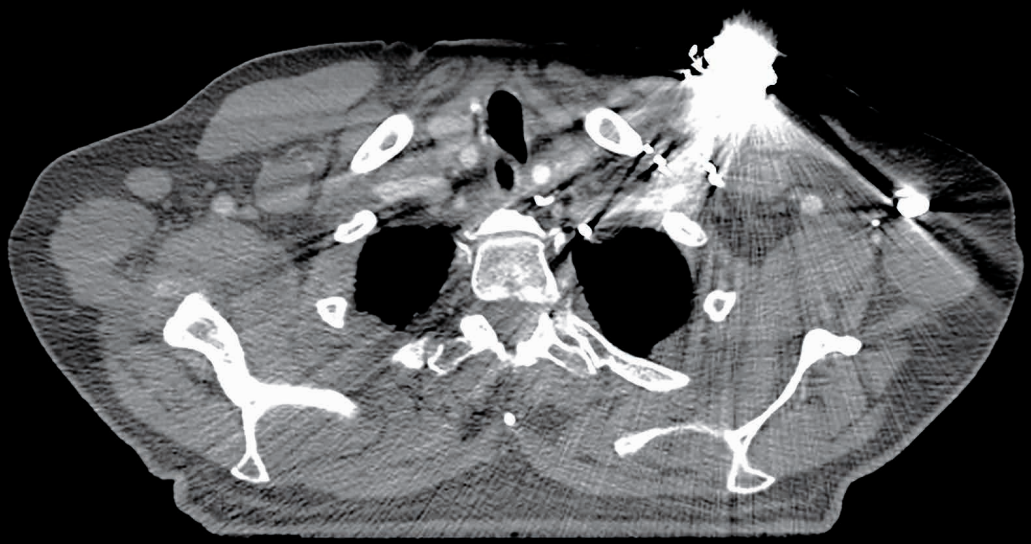


No IMAR

IMAR

Courstesy of Rigshospitalet / Copenhagen, Denmark

Thoracic scan with pacemaker



No IMAR

IMAR

"iMAR provides information for contouring in areas where otherwise I would have to guess, for example near dental fillings or prosthetic hips."*

Anne Kiil Berthelsen, Radiologist, Rigshospitalet, Copenhagen, Denmark

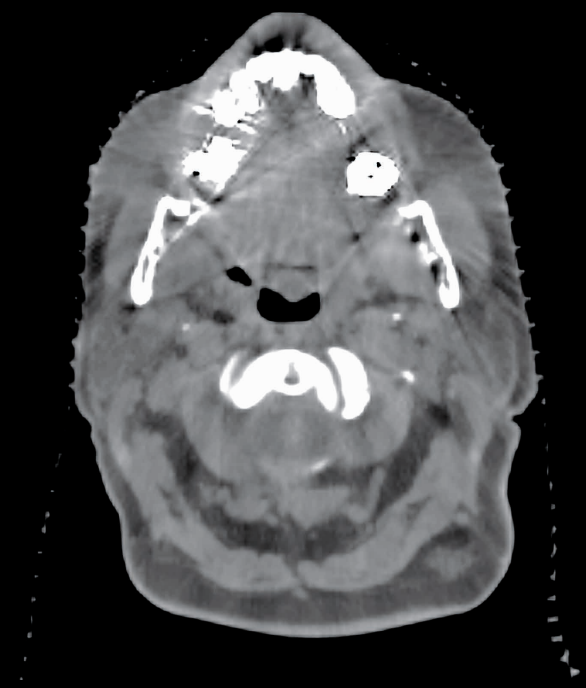
* Optional

Courstesy of Rigshospitalet / Copenhagen, Denmark

The statements by Siemens' customers described herein are based on results that were achieved in the customer's unique setting. Since there is no "typical" hospital and many variables exist (e.g. hospital size, case mix, level of IT adoption) there can be no guarantee that other customers will achieve the same results.

Head and Neck case with dental fillings

No IMAR



IMAR

* Optional

Courstesy of Rigshospitalet / Copenhagen, Denmark

An advantage for your investment

Secure your investment in your CT simulator with an upgradeable system that has the capacity to grow with you as your clinical needs evolve.

Leverage your ability to be more accurate with 64 slices*

Radiation Therapy is evolving towards more precise and more powerful treatment delivery techniques and you want to be sure that your CT supports you there as well.

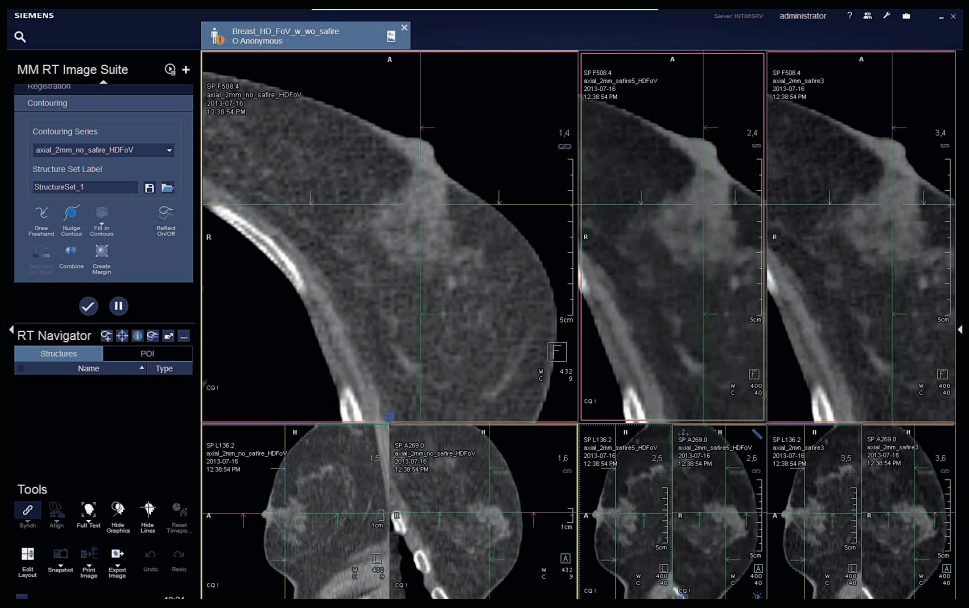
The unique **STRATON X-ray tube** embedded in the new SOMATOM Definition AS Open – RT Pro edition utilizes an electron beam that creates two precise focal spots alternating 4,608 times per second, called **z-Sharp technology**. This doubles the X-ray projections at each detector element. The corresponding detector electronics enable a virtually simultaneous readout of two projections for each detector element, resulting in a full two-slice acquisition per detector row.
The two projections are overlapping, what results in an oversampling in z-direction. The resulting measurements interleave half a detector slice width, **doubling the scan information without a corresponding increase in dose.** This provides scan speed independent visualization of 0.33 mm isotropic voxels and a corresponding minimization of spiral artifacts at any position within the scan field.

The **highest isotropic resolution** of the 64-slice configuration **prepares you optimally for SRS and SBRT.**

Reduce noise in your image to a minimum level with SAFIRE*

With SAFIRE– Sinogram Affirmed Iterative Reconstruction – Siemens introduced the first raw data-based iterative reconstruction algorithm. The optimization process used by SAFIRE allows for a substantial reduction of image noise, which can be particularly valuable for cases requiring 4D scans, and cases of obese patients. In reducing image noise, SAFIRE enables clinicians to be more confident in their contouring, and ultimately in their treatment plans.

* Optional



With *syngo*.via RT Image Suite*, you can visualize images on up to 4 panels simultaneously, thereby enabling to contour on the best image offered by new reconstructions such as SAFIRE. Example showing the display of different SAFIRE strength reconstructions.

Courtesy of Radiologische Allianz, Hamburg, Germany

"With lower noise level and sharper borders, the discrimination of borders of a region of interest from OAR and perceived ease of facility of delineation of organs are improved in IR scans."*

* Iterative Reconstruction

Source: "Turn down the noise – a blinded evaluation of iterative image reconstruction in radiation therapy computed tomography simluation" Nhu-tram A. Nguyen MDCM, Guy Charron MSc, Danis Blais MSc, David Roberge MD. Published in Practical Radiation Oncology (2015).


SIEMENS

Broaden your application spectrum with Dual Energy*

Improve soft tissue contrast

With the new SOMATOM Definition AS Open – RT Pro edition, you can now access the world of Dual Energy on your large bore CT.

The images acquired with two photon spectra can be manipulated for various purposes, such as reducing artifacts or better characterizing different tissue. Lower energy monoenergetic images, derived from dual energy information, may deliver an increase in soft tissue contrast, improving your ability to delineate soft tissue structures (the prostate, for example).

With FAST DE results*, you can automatically generate monoenergetic datasets at the control console for a straightforward and easy-to-use workflow.

Expand your clinical capabilities with FAST CARE Technology

Ready for diagnostic purposes and shared-use

In radiology, workflow and dose are common issues. The new SOMATOM Definition AS Open – RT Pro edition, thanks to Siemens' FAST CARE Technology, accelerates workflow and lowers radiation exposure to previously unseen levels – helping to leverage untapped potential in patient-centric productivity.

FAST – Fully Assisting Scanner Technologies – make time-consuming and complex procedures faster as well as more intuitive. Thus, they make scanning more reproducible and less prone to errors.

CARE – Combined Applications to Reduce Exposure – help to deliver excellent image quality at the right dose. Being highly integrated in the workflow, they additionally contribute to optimizing productivity.

Develop therapy monitoring and follow-up with Adaptive 4D Spiral*

Facilitates volume perfusion CT studies

An increasing number of publications are reporting a correlation between contrast enhancement parameters and histological measurements of angiogenesis validating the use of perfusion CT as a marker of angiogenesis.

Thanks to the Adaptive 4D spiral*, which moves the table smoothly back and forth multiple times to cover a larger scan range, the new SOMATOM Definition AS Open – RT Pro edition is perfectly suited to support CT perfusion studies with up to 9 cm coverage[1].

As *syngo*.via RT Image Suite* uniquely accepts a wide range of imaging data, including perfusion, it is the ideal platform to visualize all available patient data and monitor their therapy.

Drive progress with the Interventional Suite*

Ideal to implant gold markers

As healthcare systems around the globe are under cost pressure, image-guided minimally invasive procedures might be the solution for reducing costly invasive surgeries. In RT, in the case of a patient with liver metastases, for example, gold fiducial markers can be implanted percutaneously under computed tomography (CT) guidance in the healthy liver tissue surrounding the liver metastasis for verification of target localization and patient repositioning before dose delivery. Increase your targeting accuracy and experience the full benefit of 3D CT image guidance.

- Increase process efficiency by gaining full in-room control over table movement and scanner software at the tableside with i-Control*
- Enhance patient outcome thanks to precise positioning even in the most complex anatomies with the Adaptive 3D intervention Suite*
- Improve clinical capabilities for spinal injections by providing 2D CT guidance with the Basic Intervention Package*

[1] 9 cm maximum coverage with 64-slice system.
8 cm maximum coverage with 20-slice system.

* Optional

An advantage for your operations

Improve your process efficiency through an advanced solution that will ease your everyday workload – from the acquisition procedures to multi-modality imaging, patient positioning and connectivity to OIS.

Streamline your workflow with the all-in-one workplace

Direct access to modern reconstruction modes and assess 4D datasets while the patient is still on the table.

The new Definition AS Open – RT Pro edition grants you access to the latest technologies such as Dual Energy* with FAST DE Results* directly at the acquisition workstation. Additionally, streamline your 4D workflow with RGSC Online mode and assess 4D images directly while the patient is still on the table using the *syngo* TrueD – 4D viewer.*

Speed up planning – with *syngo* VSim@AWP*, easy-to-use simulation and segmentation tools

The Virtual Simulation application *syngo* VSim@AWP* provides Sim tools right at the acquisition console. Drop an isocenter or reference point and drive your lasers in a matter of seconds. Tools such as contouring and segmentation, structure delineation, and production of high-quality DRRs, MPRs and surface shaded displays are also available.

Simplify contrast media injection with CARE Contrast*

Synchronizing CT scan and contrast media injection is a very well know challenge in CT. The new SOMATOM Definition AS Open – RT Pro edition thanks to CARE CONTRAST* allows to define and manage contrast protocols on the scanner console and combine scan and contrast protocols.

Siemens and Varian partnership

The combination of Siemens' imaging excellence and Varian's powerful delivery systems expands the possibilities for image guided radiotherapy and radiosurgery.

Powerful portfolio

We offer a comprehensive and complementary product portfolio – combining state-of-the art imaging and precise and powerful radiotherapy. Benefit from compatible motion management solutions, streamlined scheduling of scans in Varian's Oncology Information System and smooth image transfer to Varian's Treatment Planning System.

Smooth purchasing experience

We collaborate closely to streamline and facilitate your acquisition process. Both teams are trained and knowledgeable on the entire portfolio to sufficiently address your needs. We provide innovative financing solutions that enable you to acquire and deploy technologies to grow your clinical practice.[1]

Smooth integration in your RT department

TG-66 compliance

Our TG66-compliant tables help provide accurate patient positioning and reduce the potential for error in your treatment plan.

High level of flexibility

The new SOMATOM Definition AS Open – RT Pro edition offers a high level of flexibility. With a small footprint of only 18 m^2 (59 ft^2) and a compact system design that needs only 24 m^2 (78 ft^2), it even fits into a very small CT suite. And as the scanner can be cooled by either air or water*, it easily integrates into your existing infrastructure.

System reliability – through powerful service

Our comprehensive service offering comprises real-time monitoring, preventive maintenance, hardware and software services as well as application support and training – to enable optimized system availability, performance, and workflow efficiency.

- Siemens Remote Services (SRS*) – our IT service infrastructure that links your CT directly to our service experts
- Guardian Program™* – pro-active real-time monitoring for your CT, scanning for deviations from current norms
- Guardian Program incl. TubeGuard* – predicts the majority of all potential CT tube failures, for planned downtimes
- Virus Protection* – helps protect your CT from every known type of virus, worm or Trojan horse
- Remote Application Support – expert support for your CT applications

[1] Siemens Financial Services is not available in all regions and certain conditions apply. Please consult your local sales representative.

* Optional

Empower your decisions with *syngo*.via RT Image Suite*

syngo.via RT Image Suite* helps Radiation Oncologists to devise and assess routine and complex treatment strategies.

By connecting all existing imaging data to provide a comprehensive view, *syngo*.via RT Image Suites' flexible, intuitive design supports even the most complex cases.

Efficient 3D and 4D image assessment, precise contouring and streamlined collaboration among physicians will help advance quality and efficiency in the field of radiation therapy substantially.

Transforming imaging information into imaging intelligence, *syngo*.via RT Image Suite* allows RT specialists to look closer at what they need to see today – enabling them to see further into the future of individualized therapy.

syngo.via – Get the full picture

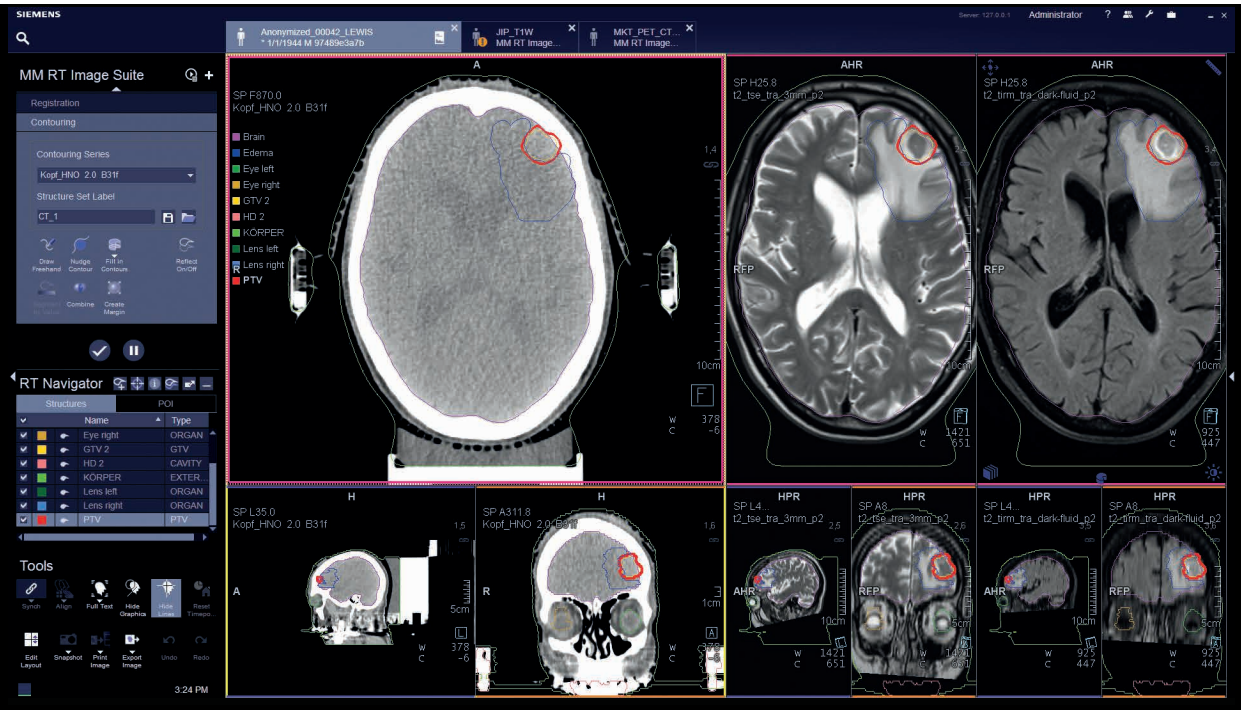
syngo.via is the Siemens software platform spanning all medical modalities. Thanks to *syngo*.via's modular licensing model, you can expand *syngo*.via to meet your needs, for example with Computed Tomography specific oncology applications* or application bundles* (i.e. "engines"). These applications allow departments to combine the powerful capabilities of *syngo*.via RT Image Suite with *syngo*.via oncology applications to support diagnostic, treatment preparation, response assessment and follow-up needs.

Client-server architecture

syngo.via is based on a client-server architecture allowing thin clients to be installed on PCs that meet the hardware and software requirements.

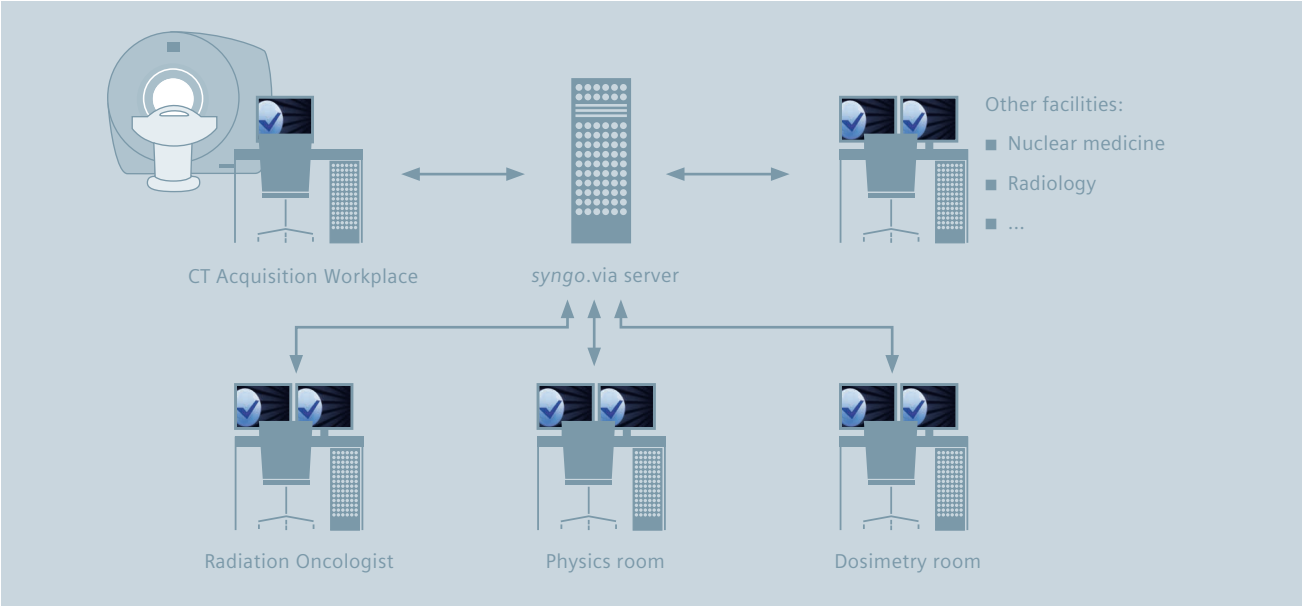
The client software is downloaded from the *syngo*.via server and needs to be installed on each client computer. The installation of the client software is the responsibility of the IT administrator.

The installation of the client software requires administrative rights on the client computer. The client software can be installed and updated using the standard Microsoft Windows installer.

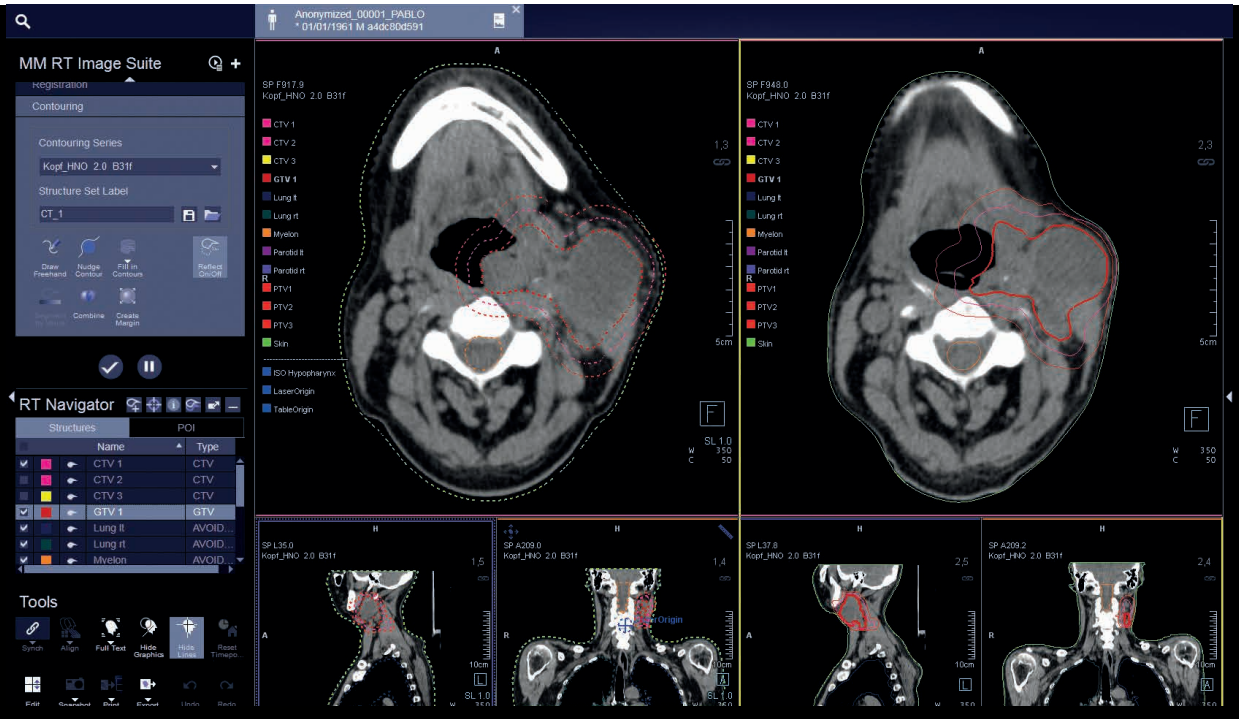


syngo.via RT Image Suite supports a broad range of image formats on up to 4 panels to enable more precise contouring. Example of CT and MR images of a brain tumor. Courtesy of Radiologische Allianz, Hamburg, Germany

Example of an integration of *syngo*.via RT Image Suite* in a Radiotherapy department



Through its DICOM and HL7 connectivity, *syngo*.via and *syngo*.via RT Image Suite can integrate smoothly into a variety of environments.** This graphic aims at highlighting how *syngo*.via and *syngo*.via RT Image Suite can potentially be deployed; it does not represent all possible deployments.



syngo.via RT Image Suite supports contour warping for efficient re-planning. Example of a head and neck case.
Courtesy of Radiologische Allianz, Hamburg, Germany

* Optional

** Please refer to Siemens DICOM conformance statement for additional details.

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