

A medical professional in blue scrubs and a surgical cap is operating a Siemens Artis with PURE interventional radiology system. The system includes a large monitor displaying angiographic images and a control panel with various buttons and a joystick. The professional is holding a catheter or similar device. The Siemens logo is visible in the top left corner.

SIEMENS

Artis
With PURE®

Artis with
PURE®



www.siemens.com/interventional-radiology

Smart solutions for routine and advanced angiography procedures

Siemens' broad portfolio for interventional radiology

Answers for life.

A comprehensive portfolio and complete range of applications

for the full scope of procedures
performed by interventional radiologists

The field of interventional radiology is growing.

It is rapidly becoming an integral part of the patient treatment scheme in more and more clinical situations, helping to fight the most threatening diseases, prolonging patients' lives and improving their quality of life.

From routine interventional procedures to new innovative endovascular and percutaneous treatments – efficient imaging techniques are a necessary base for them all.

Siemens offers the most extensive system portfolio to support your specific needs in the angio suite: from fluoroscopy to various types of acquisition – all with excellent image quality and low dose, utilizing industry leading technology.

A broad scope of dedicated innovative applications and workflows are available to support your needs – from the everyday procedures to the most challenging ones.

Not all features shown in this brochure are necessarily standard and available in all countries.





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Artis with PURE[®]

Adding smooth to smart.

In angiography, many physicians do not get to experience the full capabilities of their modern interventional systems as both procedures and system interaction get increasingly complex. The new PURE[®] platform for Artis zee, Artis Q, and Artis Q.zen is changing this now: Adding smooth use to Siemens' smart technologies.

Increase your process efficiency in the angio suite, enable all your staff members to get the full potential of the system, and enhance your patient treatment outcomes – with an angio system that combines better ease of use, integrated expert therapy guidance, and tools providing better diagnostic information.

For a PURE[®] experience in angiography.



Smooth interaction

Save time during procedures. Fewer steps. More efficiency.

Smart performance

Expand your capabilities. More confidence. Better outcomes.



Experience PURE[®]
Scan this code
or visit
[www.siemens.com/
artis-with-pure](http://www.siemens.com/artis-with-pure)

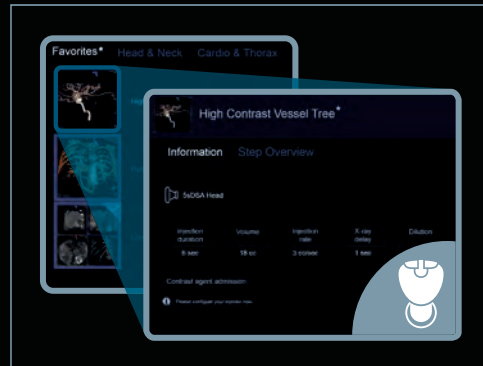
Some highlights of the PURE® platform:



syngo DynaCT SMART

Reduce metal artifacts to see the unseen

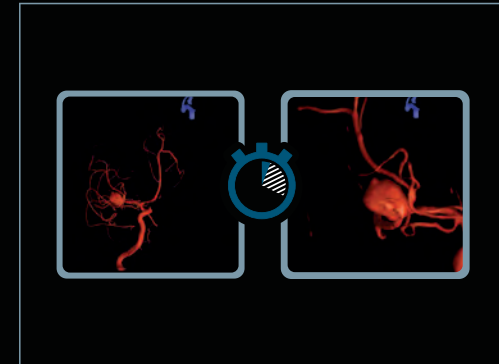
Important diagnostic information can be obscured by metal artifacts. Reduce these artifacts with *syngo*® DynaCT SMART. This helps you increase diagnostic confidence and increases the chance for visualizing complications such as bleedings close to metallic objects.



3D Wizard

Simplify 3D imaging with expert guidance

Choosing an optimal 3D protocol is not always easy. The 3D Wizard provides step-by-step expert guidance to achieve the desired imaging results. Increase your confidence when using 3D and get the full benefits from your system.



QuickZoom

Focus and zoom at tableside with just one click

Interacting with 3D volumes at tableside can be cumbersome. QuickZoom helps you save time and speed up your workflow. Click into your region of interest, and QuickZoom centers and zooms automatically, and even provides high-resolution refinement of your 3D volume.



syngo 2D/3D Fusion

Save 99% dose when integrating pre-op volumes for live image guidance*

Pre-op CT, MR, or PET data is often available, but remains unused in the angio suite. With *syngo* 2D/3D Fusion, only two fluoro projections are required to easily fuse 3D volumes from other imaging modalities for live image guidance. Expand your capabilities while saving radiation dose and contrast media.

* This measurement was performed with an Alderson phantom using fluoroscopy with 10 images per 2D projection and a low-dose 6s DCT body program. Results in actual clinical practice may vary.

Tools for your everyday procedures



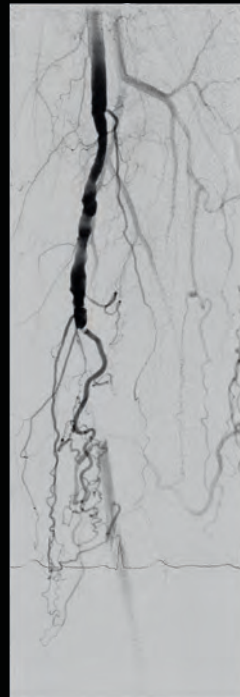


Low-dose Acquisition

- Dedicated low-dose acquisition protocols saving up to 67% of the dose*
- Outstanding DSA image quality utilizing 0.3 mm micro-focus and 2K resolution
- Up to five magnification formats
- Selectable frame rates independent of organ program, changeable at tableside
- CLEARmatch: next generation real-time pixel shift for movement compensation



Get excellent image quality at a third of the dose*



Artis Q low-dose DSA image of lower extremity using 287 nGy per frame (detector entrance dose)

Courtesy of Hanover Medical School, Germany

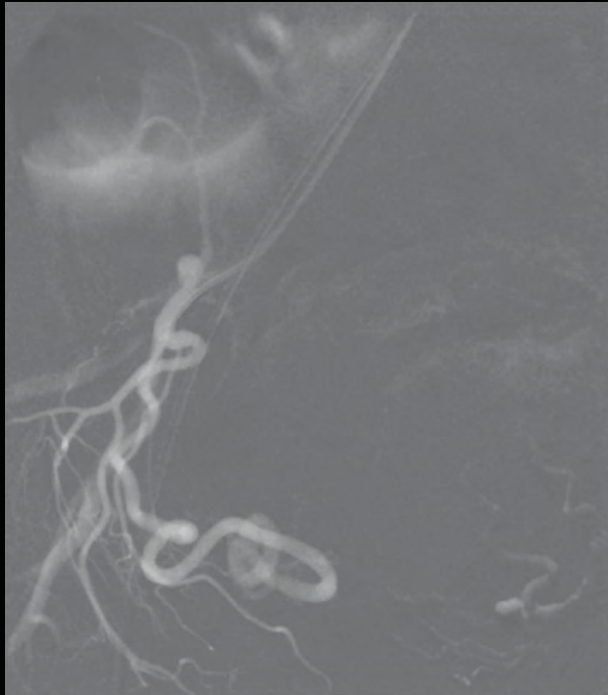


Artis zee low-dose DSA image of the iliac arteries using 360 nGy per frame (detector entrance dose)

Courtesy of St. James Hospital, Dublin, Ireland

*Compared to standard system settings.

Vessel map for precise catheter navigation



Roadmap image of the right uterine artery for catheter guidance during uterine artery embolization procedure

Courtesy of St. James Hospital, Dublin, Ireland

Roadmap and DSA Roadmap

- DSA Roadmap: Increase image quality and save contrast and X-ray dose by using a DSA image as vessel map
- Individual windowing of vessel map and devices
- CLEARmatch: next generation real-time pixel shift for movement compensation
- CLEARmap: a set of features to support an easy and efficient Roadmap workflow including: starting Roadmap DSA with the press of a button, zoom and pan during Roadmap mode, and more

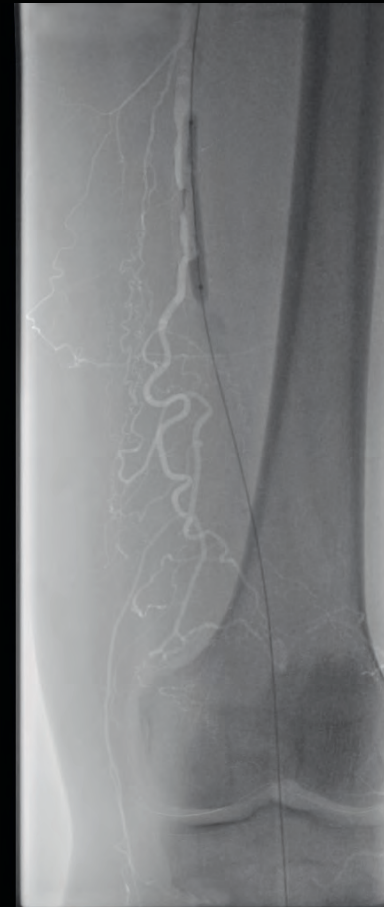


Overlay Reference

- Save dose and contrast agent by overlaying existing DSA images to guide your intervention
- See the vessel map in relation to anatomical landmarks
- Fade in and out the overlay image according to personal preference
- Easily select your preferred overlay mode at tableside: Roadmap, Roadmap DSA or Overlay Reference



Easily monitor device location.
No additional contrast needed.

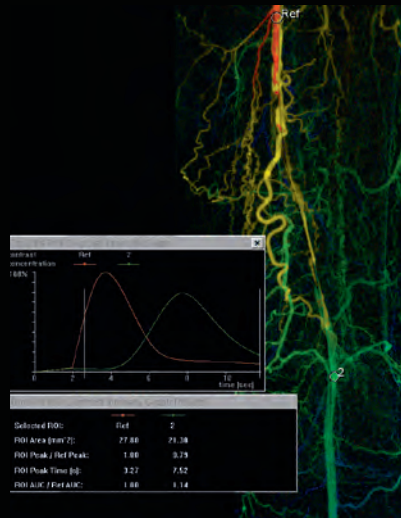


Overlay of vessel map from a DSA reference image on live fluoroscopy for accurate positioning during balloon angioplasty

Courtesy of Jena University Hospital, Germany

Understand the flow – quantify results

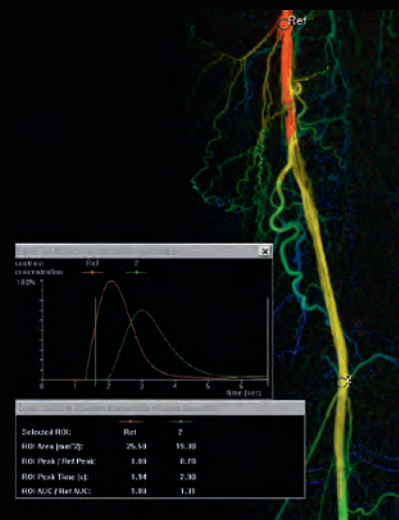
Pre-angioplasty



Flow analysis using syngo iFlow performed on a DSA run before angioplasty

Courtesy of Jena University Hospital, Germany

Post-angioplasty



Flow analysis using syngo iFlow performed on a DSA run after angioplasty.
Shorter time difference between peak times in the two regions of interest indicates an improved flow following angioplasty.

syngo iFlow

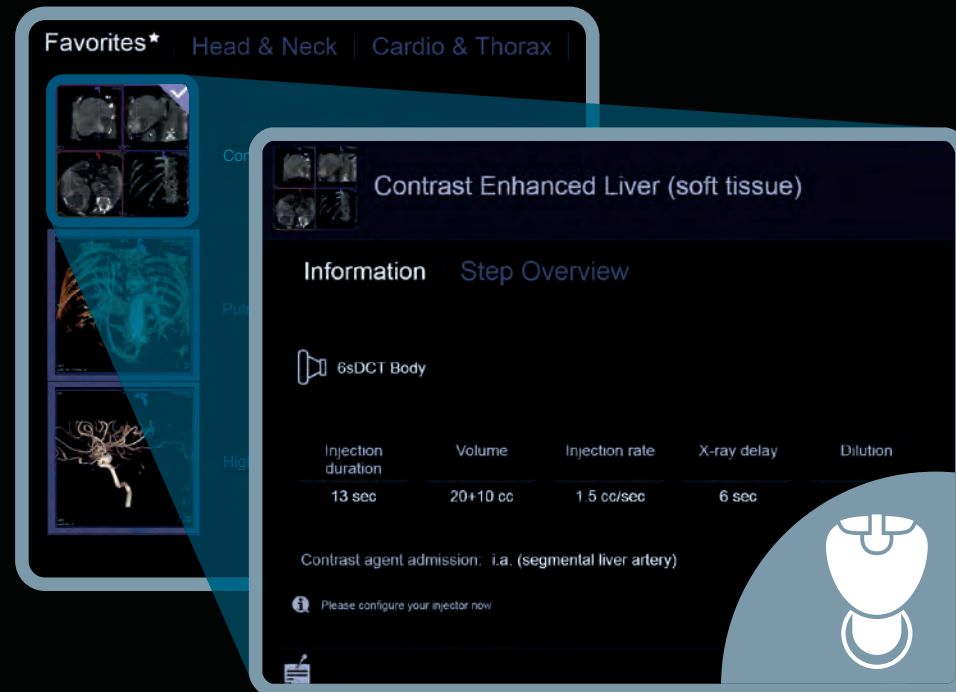
- Easily visualize flow characteristics and identify the regions with blood flow anomalies
- Analyze and understand flow at specific points of interest along the vessel tree
- Demonstrate changes in flow post-intervention and quantify level of post-procedural improvement
- Get additional information to support decision-making during the intervention
- syngo iFlow also works with previously acquired DSA scenes – no need for a dedicated acquisition

3D Wizard

- Choose the desired image result from a pool of possible cases and let the system guide you through the 3D scan
- Provides all required parameters for a 3D scan at the time you need them
- Supports definition and establishment of clinical and departmental standards (e.g. for clinical studies, quality assurance, etc.)

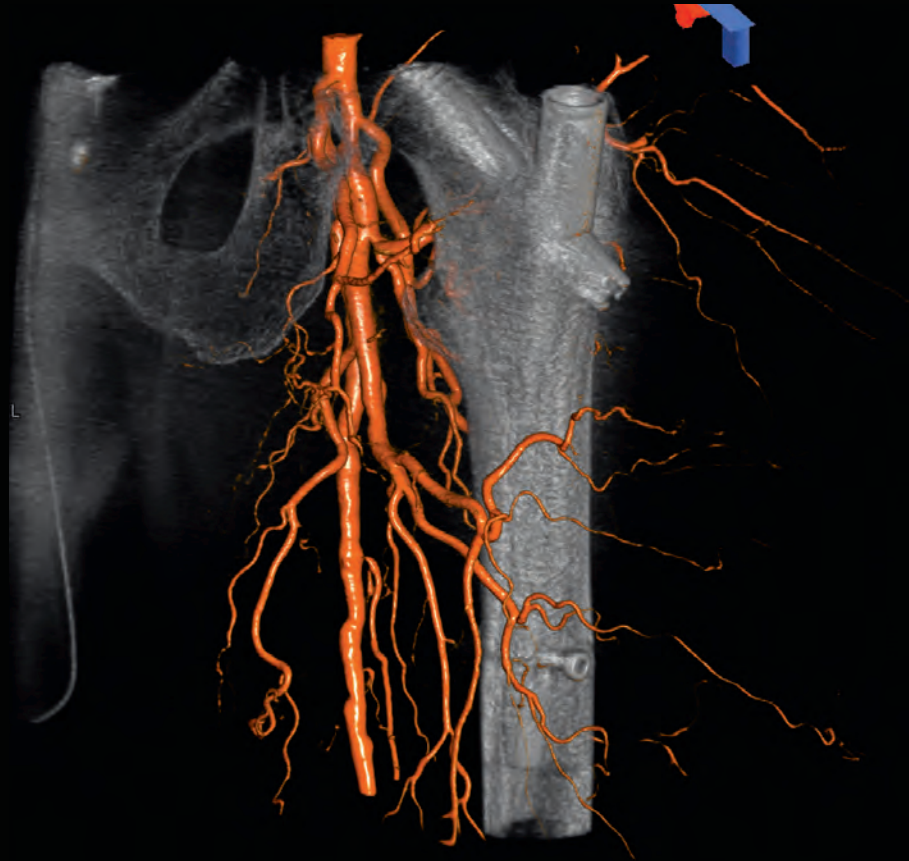


Simplify 3D imaging with expert guidance



On-screen display of the 3D Wizard for easy selection of the relevant 3D protocol

High-contrast 3D acquisition and visualization



A *syngo* Dyna3D subtracted scan visualized in *syngo* DualVolume mode, to inspect the vessel anatomy from all directions, despite the presence of a metal hip implant

Courtesy of Onze Lieve Vrouwe Gasthuis (OLVG), Amsterdam, the Netherlands

syngo Dyna3D

- Automatic reconstruction with user defined presets
- Full 3D control from tableside
- Real-time update of 3D view with C-arm movements
- Subtracted scans for optimal visualization of the stent, graft or coils in relation to the contrast-filled vessels – with *syngo* DualVolume
- Simply select your desired 3D imaging result using the 3D Wizard and let the system guide you through the acquisition step by step, including recommended injection parameters and acquisition delays

Artis with
PURE®

Tools for your most challenging interventions





syngo Toolbox and syngo 3D Roadmap

- Overlay of marked anatomical landmarks or points of interest from the 3D information onto live fluoroscopy
- One-click generation of anatomical outlines
- Allows for better orientation during catheter navigation through complex vessel anatomy
- Changes in C-arm angulation, SID, zoom and table movement are automatically updated in real time
- Efficient tools to support a high patient throughput: Bookmarks allow to plan the procedure in advance, save and later recall the procedure planning data easily when needed. Parallel patient processing allows the independent use of the post-processing applications in the control room, while maintaining full workplace functionality in the exam room, even for datasets of different patients.



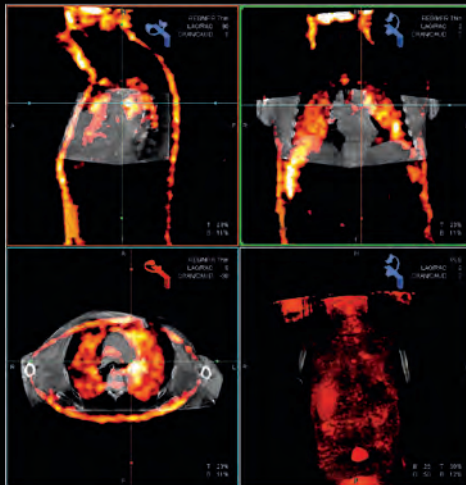
Insights from 3D data sets shown on 2D live images



Overlay of the vessel outlines and perpendicularity ring on live fluoroscopy during an endovascular aneurysm repair, to easily identify the optimal working projection for accurate device deployment

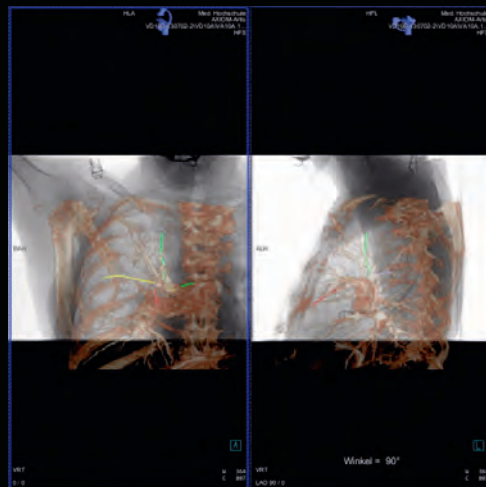
Courtesy of Onze-Lieve-Vrouw Hospital, Aalst, Belgium

Multimodality information – integrated into your workflow



syngo 3D/3D Fusion of PET images with
syngo DynaCT images

Courtesy of Völklingen Hospital, Germany



Making use of existing pre-procedural syngo DynaCT
information using syngo 2D/3D Fusion

Courtesy of Hanover Medical School, Germany

syngo Fusion Package

- Integrate the unique information of MRI, CT or PET•CT into your angio image using syngo Fusion Package
- Make the most of available pre-procedural information and avoid radiation dose and contrast injections of repeating 3D scans
- Overlay information from other modalities using syngo 3D Roadmap or utilize applications like syngo Toolbox with existing three-dimensional datasets
- Select between syngo 3D/3D Fusion, or syngo 2D/3D Fusion for easy multimodality integration, which does not require an intra-procedural 3D scan
- syngo Fusion Package enables multimodality integration without leaving the tableside

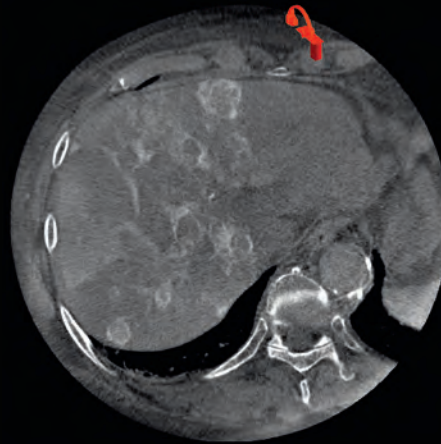


syngo DynaCT

- Provides most updated 3D soft-tissue information directly in the angio suite for planning, monitoring of interventions, and confirmation of treatment results
- Differentiation of 10 HU in 5 mm slice thickness or 5 HU in 10 mm slice thickness
- 200 degree rotational angiography for reconstruction of the complete volume
- Reconstructed volume of 24 cm x 18.5 cm (9.4" x 7.3")
- Visualization as MPR, MIP, or VRT
- Simply select your desired 3D imaging result using the 3D Wizard and let the system guide you through the acquisition step by step, including recommended injection parameters and acquisition delays

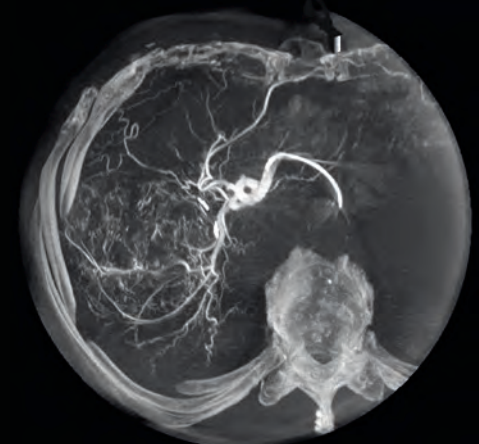
Artis with
PURE[®]

Soft-tissue imaging in the angio suite



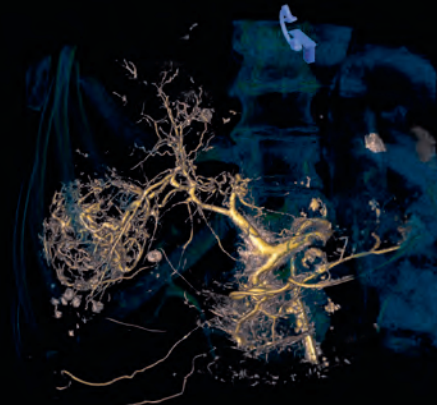
Multiplanar Reconstruction (MPR) for assessment of lesion (acquired with Artis zee)

Courtesy of Osaka City University Hospital, Japan



Maximum Intensity Projection (MIP) for assessment of tumor feeders (acquired with Artis Q)

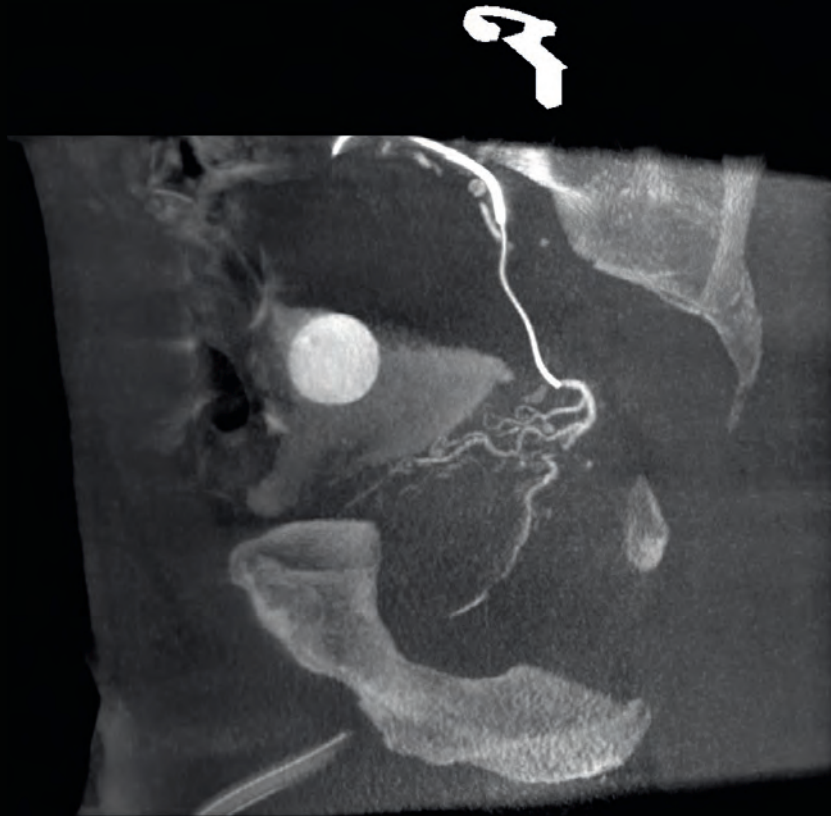
Courtesy of Hanover Medical School, Germany



Volume Rendering Technique (VRT) for 360° assessment of region of interest (acquired with Artis Q)

Courtesy of Hanover Medical School, Germany

Dedicated dose-saving *syngo* DynaCT protocols



syngo DynaCT Body CARE protocol used for Prostate Artery Embolization (acquired with Artis zee)

Courtesy of Hopital Europeen Georges Pompidou (HEGP), Paris, France

syngo DynaCT with low-dose

- Perform *syngo* 3D/3D Fusion at lower dose using a dedicated Low-dose *syngo* DynaCT protocol, with up to 72% less dose
- Confirm catheter position in dose-sensitive regions with *syngo* DynaCT Body CARE – a dedicated soft-tissue imaging protocol with 30% less dose and shorter acquisition time

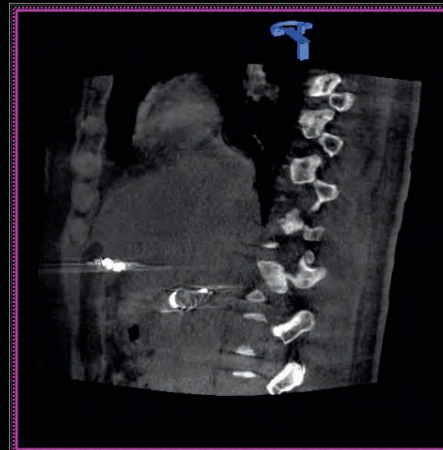
syngo DynaCT SMART

- Reduce artifacts from dense objects using the dedicated syngo DynaCT SMART volume reconstruction
- Make relevant aspects in soft tissue visible even close to e.g. coil packages or glue for sounder decision-making during interventions

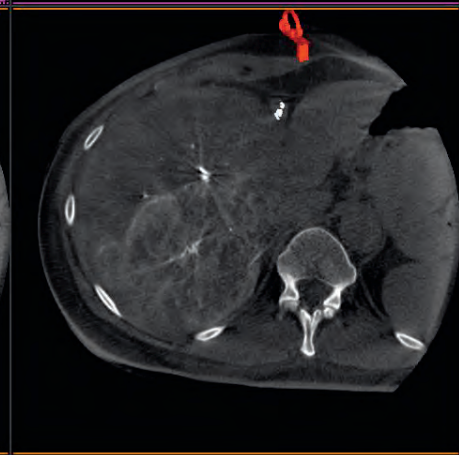
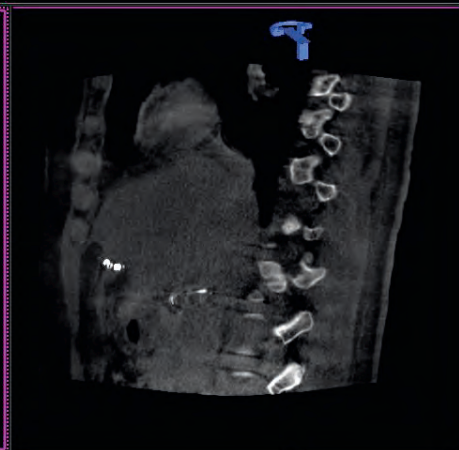


Reduce metal artifacts to see the unseen

Without syngo DynaCT SMART



With syngo DynaCT SMART



syngo DynaCT after SIRT preparation showing streak artifacts from several coils (left two images) and successful reduction of artifacts after syngo DynaCT SMART secondary reconstruction (right two images)

Courtesy of Barmherzige Brüder Hospital, Munich, Germany

A new level of detail in the angio suite



Multiplanar Reconstruction (MPR) of a syngo DynaCT Micro acquisition taken during a wrist Arthrography procedure

Courtesy of Hanover Medical School, Germany

syngo DynaCT Micro

- syngo DynaCT Micro provides 40% more resolution to enhance the smallest details and up to 68% less dose due to reduced field of view
- Improved spatial resolution compared to CT to better visualize small structures like stents, cochlear implants or cartilage structures
- Expand the scope of your lab by accommodating additional procedures and diagnostic studies in e.g. musculoskeletal or ENT field

syngo DynaCT 360* and *syngo* DynaCT Large Volume*

- Get extended *syngo* DynaCT coverage with these Artis zeego unique acquisition protocols:
 - a 35 cm x 24 cm (13.8" x 9.4") volume in only 6 seconds using *syngo* DynaCT 360
 - a 45 cm x 18.5 cm (17.7" x 7.3") volume using *syngo* DynaCT Large Volume
- Obtain the complete axial view of the entire abdomen, also on obese patients
- Demonstrate the accurate skin entry point for needle procedures

The complete picture.
In one scan.



syngo DynaCT 360 acquired following an intravenous injection for evaluating the patency of the portal vein before a TIPS procedure

Courtesy of Jena University Hospital, Germany

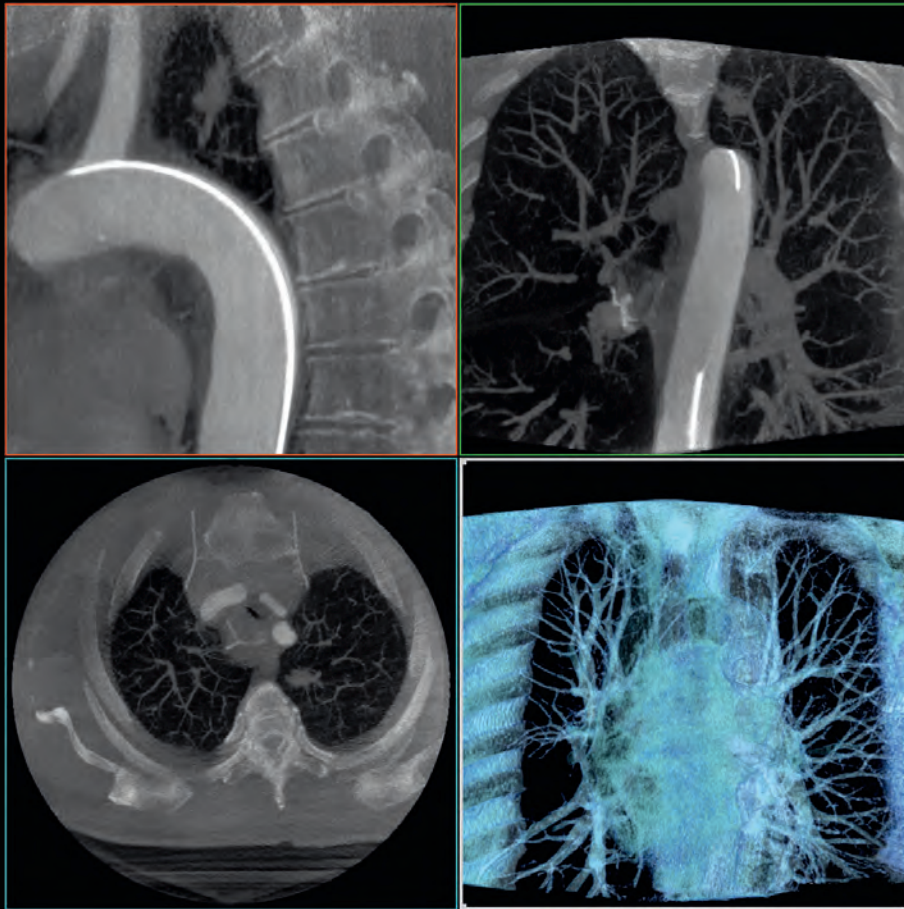


syngo DynaCT Large Volume with detector in portrait mode to demonstrate the complete liver and abdomen in coronal view, during a chemoembolization procedure

Courtesy of University Hospital of Frankfurt/Main, Germany

*Available exclusively with Artis zeego.

The fastest 3D scan on the market – 3 seconds



Reconstruction of pulmonary vessel tree following a syngo Dyna3D HighSpeed acquisition

Courtesy of University Hospital of Frankfurt/Main, Germany

syngo Dyna3D HighSpeed*

- This Artis zeego exclusive protocol enables the shortest acquisition time available – 3 seconds only – for high contrast 3D images
- This means:
 - less contrast material used
 - fewer motion artifacts with moving organs
 - shorter breath-hold for your patient
- Most useful for lung imaging, for example: demonstrating lung tumors, stenoses or AVMs

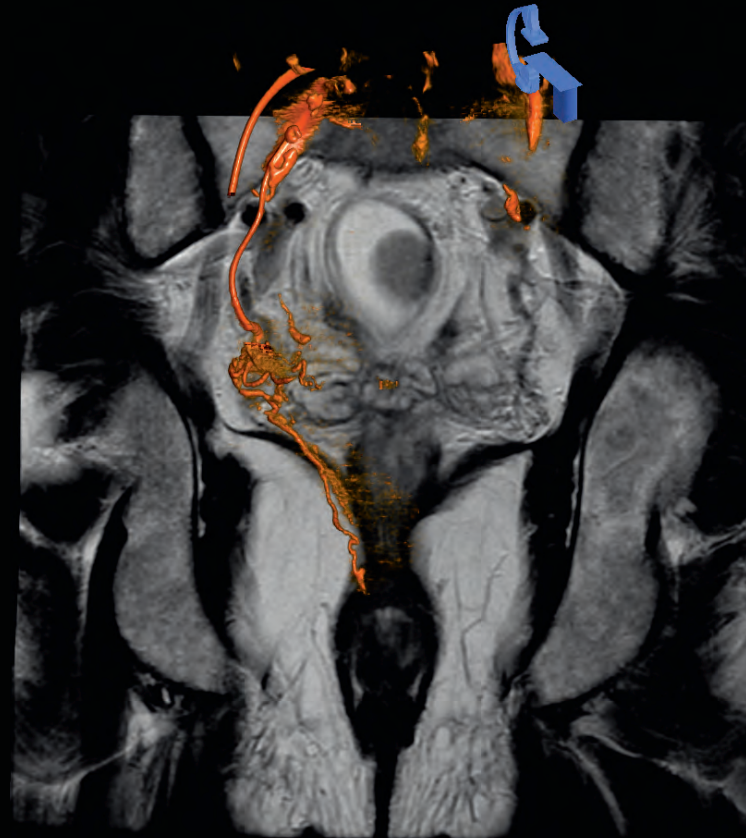
*Available exclusively with Artis zeego.

syngo DualVolume

- Clearly differentiate between different types of objects by using distinctive visualization presets
- Visualize two high-contrast datasets to demonstrate the contrast-filled vessels in relation to implanted devices such as stents, grafts or coils
- Visualize one high- and one low-contrast dataset in one volume to carefully study vessels in relation to surrounding soft tissue
- Individual visualization parameters can be applied to each volume
- “DSA Layout”: intelligently preprocessed visualization combining three volumes: fill run visualized as cross-sectional MPR images, as well as mask run and subtracted run visualized as a DualVolume in VRT



Merge and manipulate two volumes for optimal visualization

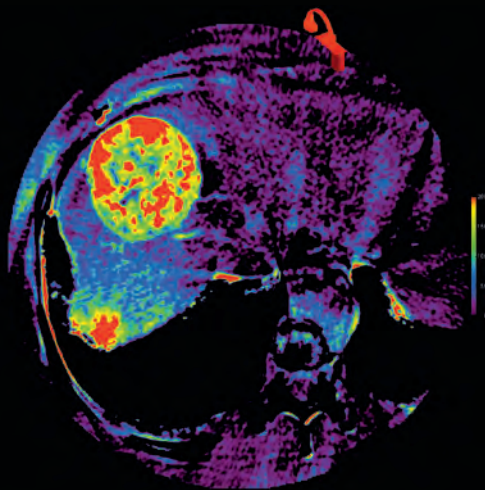


syngo DualVolume visualization demonstrating vascular anatomy in relation to soft tissue in order to assess tumor feeders and avoid non-target embolization during prostate artery embolization

Courtesy of Hopital Europeen Georges Pompidou (HEGP), Paris, France

Evaluate perfusion for personalized therapy

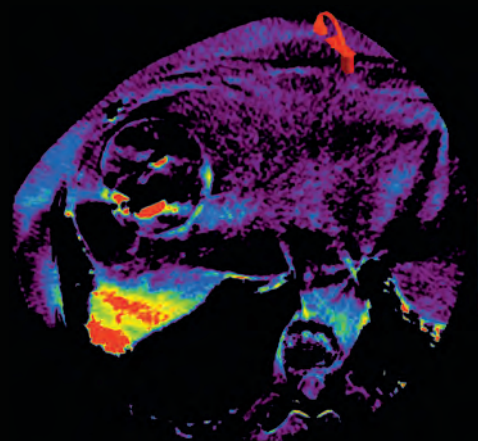
Pre-embolization



Hypervascularized hepatocellular carcinoma with heterogeneous contrast enhancement before transarterial chemoembolization

Courtesy of Hacettepe University, Ankara, Turkey

Post-embolization



Perfusion of the tumor is almost completely blocked as a result of complete embolization of the arterial tumor feeders

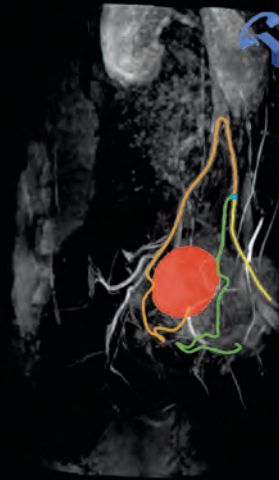
syngo DynaPBV Body

- Check distribution of blood in lesions and surrounding tissue by obtaining cross-sectional blood volume information in your lab
- Perform qualitative measurement of blood volume in order to assess changes in perfusion caused by e.g. tumor embolization
- Presets available for:
 - pre-/post-therapy comparison
 - dual-volume representation of blood volume map together with anatomic information from the mask run
- Supports identification of the optimal endpoint during embolization
- Potential to identify non-responders directly in the angio suite

syngo Embolization Guidance

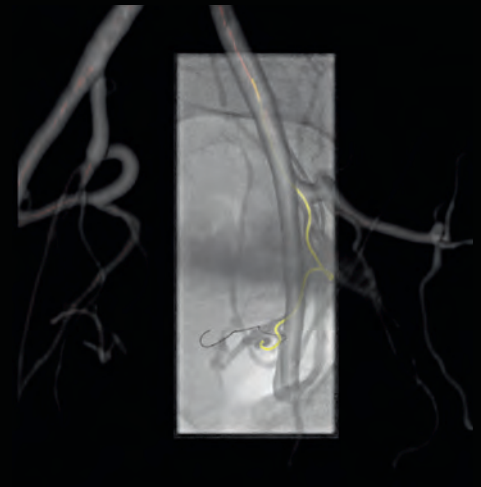
- Simple planning and guidance for catheter-based interventions
- Automatic path computation from the tip of a diagnostic catheter to the tiny vessels feeding a lesion
- Easy lesion segmentation incl. automatic tumor volume calculation
- Planning can be done on *syngo* DynaCT as well as CT, PET•CT or MR volumes
- Overlay of planning data onto live fluoroscopy with *syngo* 3D Roadmap

Immediate catheter positioning.
Effective tumor treatment.



Segmentation of uterine myoma and tumor feeders performed on an MRA dataset

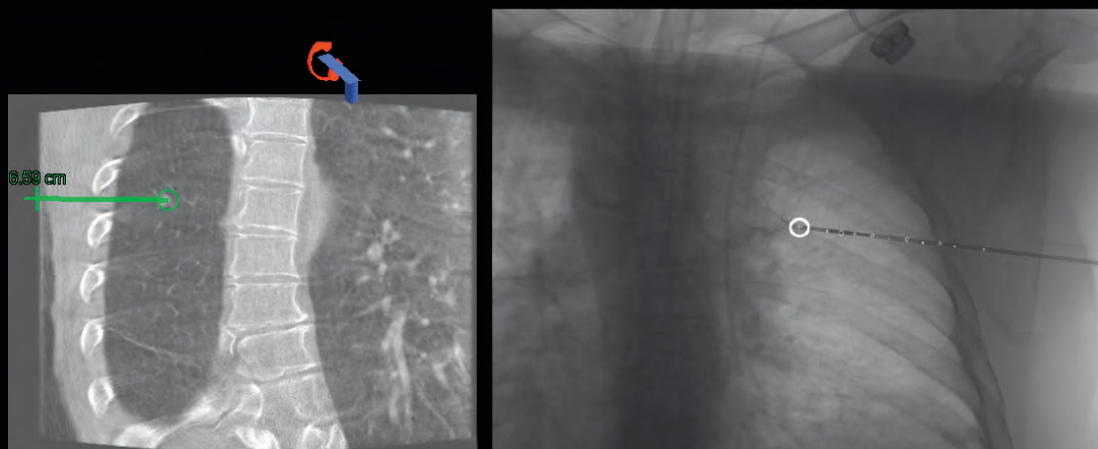
Courtesy of University Hospital of Frankfurt/Main, Germany



Overlay of *syngo* 3D Roadmap and segmented feeders onto collimated live fluoroscopy during a uterine fibroid embolization

Courtesy of University Hospital Magdeburg, Germany

Live and integrated needle guidance



Needle path planning and overlay on live fluoroscopy, for a radiofrequency ablation of a lung tumor



Unique integrated cross-hair laser light visualizes skin-entry point and allows for radiation-free needle advancement for easy needle positioning

syngo Needle Guidance

- Increase safety, confidence and accuracy of needle procedures using a dedicated planning and guidance application
- Planning can be done on *syngo* DynaCT as well as CT, PET-CT or MR volumes
- Control scans are automatically registered with the planning scan
- Free up your CT by facilitating needle procedures in the interventional suite
- Get better access in obese patients and complex needle procedures
- Unique integrated cross-hair laser light visualizes skin-entry point and allows for radiation-free needle advancement
- Allows for simultaneous planning and overlay of multiple puncture paths

Artis with
PURE[®]

Artis family of imaging solutions

Versatile systems for all types of interventional radiology

The Artis family includes four product lines of interventional imaging systems: Artis one, Artis zee, Artis Q, and Artis Q.zen. They feature the complete portfolio for radiology, including a floor-, ceiling-mounted, or biplane system and even a highly flexible multi-axis system with robotic technology: Artis zeego.

The versatile portfolio from Siemens offers the right solution for virtually all needs in interventional radiology keeping in mind the essentials, such as flexibility in working position and high level of control from the sterile area.



Artis one

Artis zee

Artis Q

Artis Q.zen

Artis with
PURE®

Floor-mounted	Ceiling-mounted	Biplane	zeego*	Multi-Purpose*	Detectors	X-ray Tube
					 midsize detector	MEGALIX Cat Plus
					 small detector  large detector	
					 small detector  large detector (HDR)	GIGALIX
					 midsize detector (crystalline silicon)	

*Only available with large detector.

Interventional cardiology

Interventional radiology

Surgery

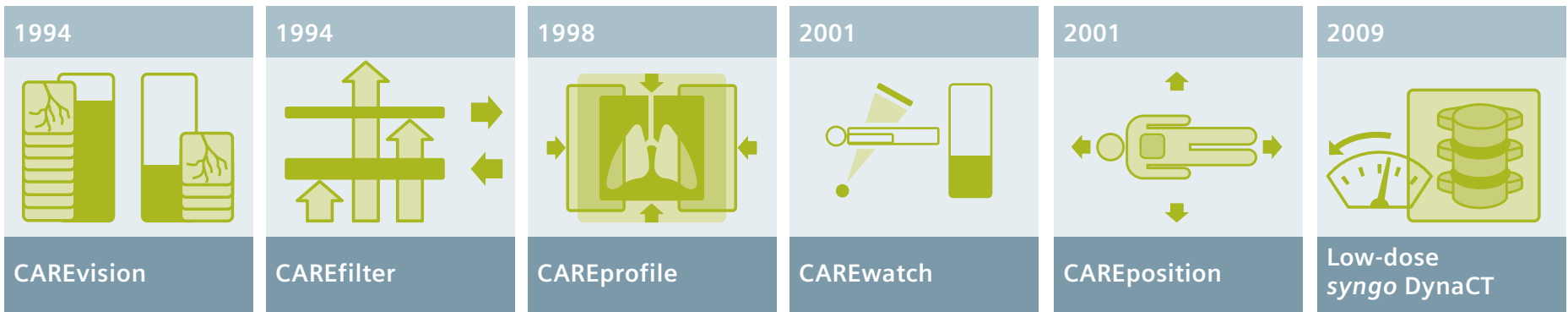
CARE+CLEAR

CARE+CLEAR is our comprehensive portfolio of image-quality and dose-saving tools. It provides our customers with their preferred image quality at the lowest possible dose, supporting confident decisions in diagnosis and treatment as well as increasing the safety of both patients and clinical staff.

The CARE package helps reduce radiation for the operator and patient.

The CLEAR package offers a comprehensive range of applications to enhance image quality.

CARE+CLEAR is standard with all Artis systems.



More than 20 years of Siemens innovations to reduce, monitor, and report dose in angiography

CARE features

- **CAREvision:** Dose reduction by adapting the pulses per second
- **CAREfilter:** Minimized patient entrance dose* with nearly no impact on image quality
- **CAREprofile:** Radiation-free adjustment of collimation and semitransparent filter
- **CAREposition:** Patient positioning without additional fluoroscopy while moving the table or C-arm
- **Low-dose Acquisition:** Get the image quality you need, at a much lower dose
- **Low-dose syngo DynaCT:** 3D imaging at the lowest possible dose
- **CAREguard:** Effective patient entrance dose* control during procedures
- **CAREwatch:** Making dose visible
- **CAREmonitor:** Real-time patient entrance dose* monitoring
- **CAREreport:** Comprehensive reporting for easier dose management
- **CARE Analytics:** Improved dose monitoring and increased transparency

CLEAR features

- **CLEARpulse:** Improved image quality by shortening the pulse length
- **CLEARcontrol:** Optimized image brightness in areas with high density differences
- **CLEARview:** Dose-adaptive noise reduction to enhance image quality of low-dose images
- **CLEARmotion:** Excellent image quality without motion artifacts
- **CLEARvessel:** Enhanced visibility of vessel edges and smooth background
- **CLEARmatch:** Intelligent real-time pixel-shifting for compensation of patient movements in DSA and Roadmap
- **CLEARmap:** Fast and easy access to enhanced image quality in Roadmap



*Patient entrance dose = Air kerma; Patient entrance dose rate = Air kerma rate.

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In the interest of complying with legal requirements concerning the environmental compatibility of our products (protection of natural resources and waste conservation), we recycle certain components. Using the same extensive quality assurance measures as for factory-new components, we guarantee the quality of these recycled components.

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www.siemens.com/medical-accessories

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