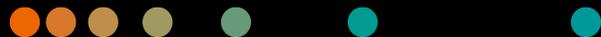


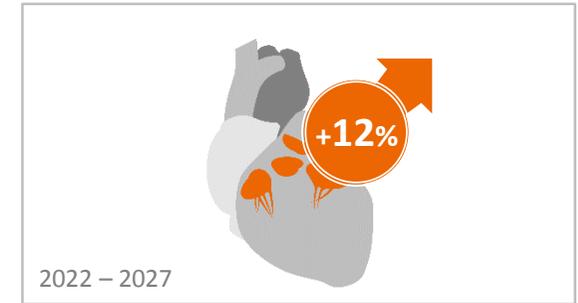
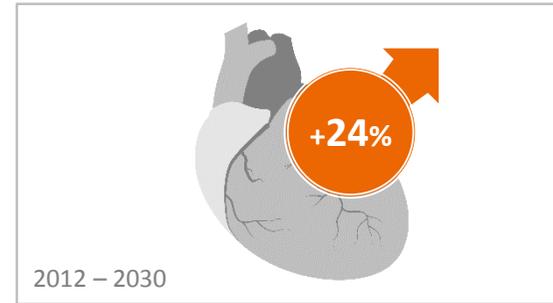
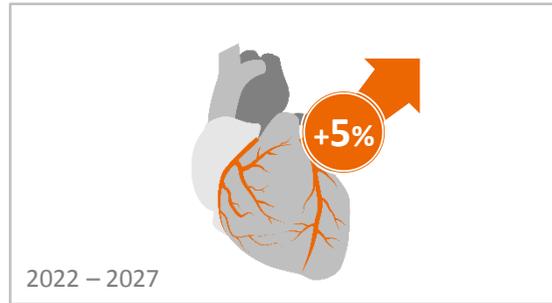
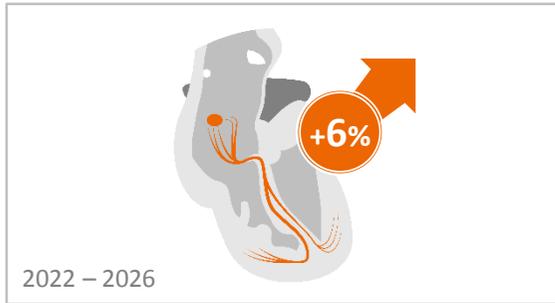
Artis zee with PURE[®]

in Cardiovascular Care

April 2, 2025



Cardiovascular Care – Growth driven by Innovation – Our key imperatives in clinical focus segments



The Outperformer

Arrhythmias

~1,315,000 ablation procedures
~1,400,000 device implantations

Key imperatives

- Advanced visualization and multimodality therapy guidance
- Reduction of procedure duration and radiation dose

▶ Shape technology and partner ecosystem

The Growing Giant

Coronary Artery Disease

~5,300,000 PCI procedures
~7,600,000 diagnostic procedures

- Efficient patient workflows
- Point-of-care decision support
- Multimodality integration for complex procedures

▶ Industrialize care delivery

The Giant's Sister

Heart Failure

~64 million cases of HF prevalence

- Process management and care coordination
- Data management and decision support

▶ Manage health beyond the cath lab

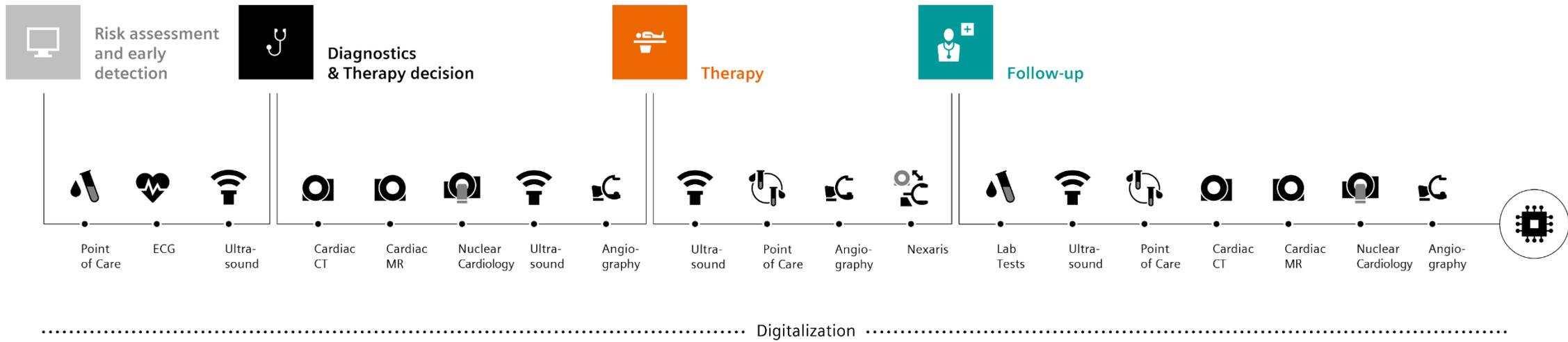
The Rising Star

Structural Heart Disease

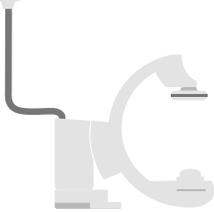
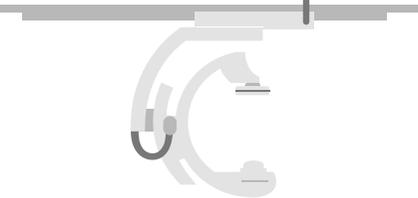
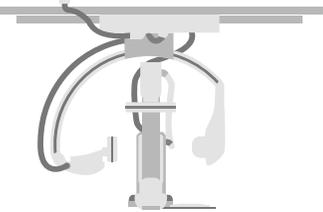
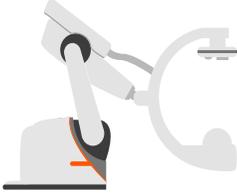
~350,000 TAVR, TMR & LAAC procedures

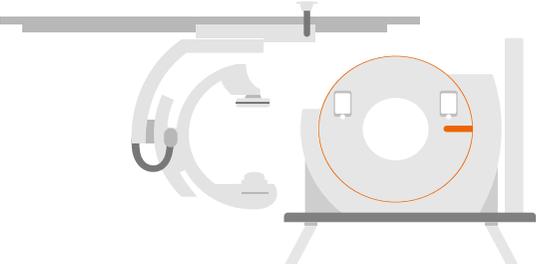
- Real-time multimodality integration at high innovation pace
- Automated therapy guidance to improve outcomes

▶ Innovate multi-modality workflows



Siemens Healthineers leading interventional imaging portfolio for CVC

Angiography solutions	Mobile	Floor-mounted	Ceiling-mounted	Biplane	Robotics
					

Nexaris Therapy Suite	Combined solutions
	



Artis zee with PURE®

Tackle every challenge

01

Hardware overview

Biplane
Ceiling-mounted
Floor-mounted

03

Broaden your procedure mix

Integration
Broad procedural use

02

**Deliver excellent
image quality**

PURE®
CARE+CLEAR
MEGALIX & AEC

04

**Invest with
confidence**

Evolve program
Scientific evidence

Artis zee with PURE® Tackle every challenge



Artis zee with PURE®
Biplane system



Artis zee with PURE®
Ceiling-mounted system



Artis zee with PURE®
Floor-mounted system

Artis zee with PURE[®]

Biplane system

- ✓ Full resolution (200°) syngo DynaCT
- ✓ StraightView: Imaging in any C-arm position
- ✓ Positioning flexibility for various needs
- ✓ Simultaneous 2k acquisition in both planes
- ✓ Second working position for free head-side access



Artis zee with PURE[®]

Ceiling-mounted system

- ✓ Full coverage from head-to toe w/o moving patient
- ✓ Full resolution (200°) syngo DynaCT at left, right, head-side)
- ✓ Plus all angles between for ideal patient access
- ✓ “InFocus” keeps projection during gantry rotation
- ✓ “IsoTilt” keeps projection during Trendelenburg tilting



Artis zee with PURE[®]

Floor-mounted system

- ✓ Complete coverage from head-to-toe
- ✓ Positioning flexibility with 6 positions (MULTISPACE.F)
- ✓ *syngo* Dyna3D and *syngo* DynaCT in head-side position
- ✓ Saves construction cost
- ✓ Fits into small room (25m²)



Flexible configurability with Artis zee with PURE[®]



Detector

Table

Display

Hemodynamics integration

Advanced applications

Flexible configurability with Artis zee with PURE[®]

Different display options

55" Artis Large Display

- Up to 26 different image sources

19" Color Display

- Up to 8 Displays

Small or large detector

20 x 20 (as20)

- Compact design for steep angulations
- Variety of zoom sizes: 25, 20, 16, 10 cm

30 x 40 (as40HDR)

- 16 bit
- Large field of view
- High resolution 2k matrix



Different table options

Standard Table

- Different Table tops
- Up to 250 kg patient weight

Table with stepping

- Motorized longitudinal stepping and PERISTEPPING
- Up to 200 kg patient weight

Table with tilt

- Head-down/head-up tilt options and servo operation, prepared PERISTEPPING
- Up to 200 kg patient weight

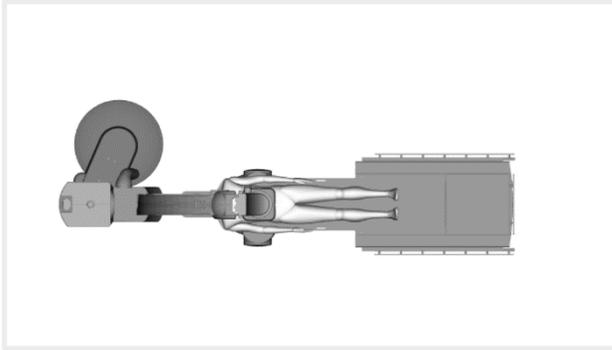
OR Table

- Table with tilt and cradle function
- Up to 200 kg patient weight

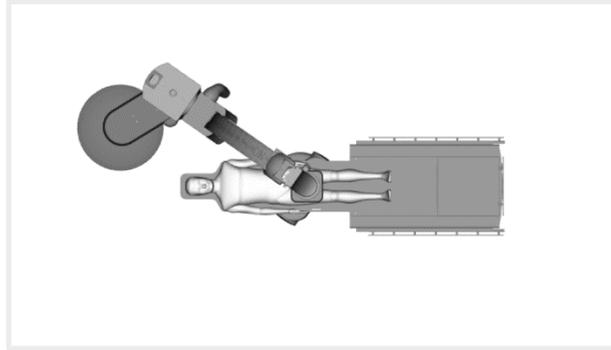
Positioning flexibility to fit various procedure needs

Artis zee floor

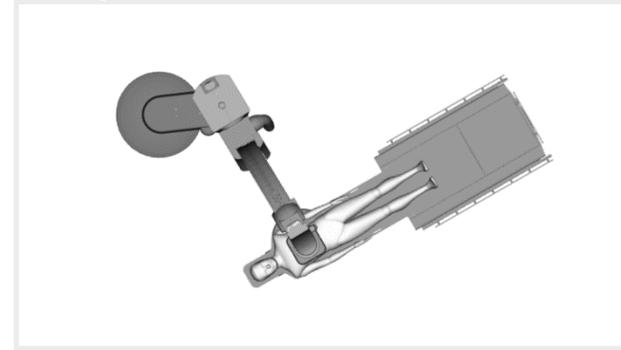
Headside position /
PCI position



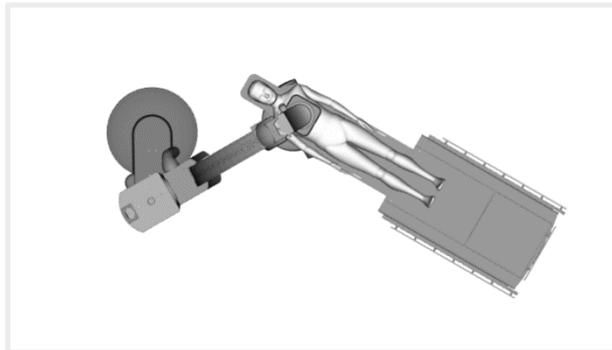
Leftside position/
Abdominal position



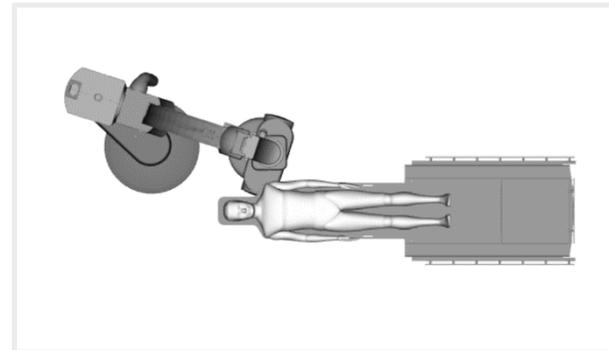
Leftside table rotated position/
TAVI position



Rightside table rotated position/
Position for device implantation



Transferposition



Positioning flexibility to fit various procedure needs

Artis zee ceiling

Head position

allowing steep cran/caud angulations



Right-side position

for device implantation free access to left shoulder



Left side position

e.g. for standard peripheral procedures



Park position is allowing unrestricted access to patient in emergency situation and for patient transport



Dedicated for complex cardiology procedures

Artis zee biplane

- Left-side working position enables head-to-toe coverage and unrestricted access to the head of the patient
- Two small detectors for highest temporal resolution with up to 60 f/s in pediatric cardiology
- Mixed detectors for more coverage in frontal plane for 3D imaging of structural and congenital heart diseases and EP
- Right-side imaging position in single plane allows unrestricted access to the left side of the patient



01

Hardware overview

Biplane
Ceiling-mounted
Floor-mounted

03

Broaden your procedure mix

Integration
Broad procedural use

02

**Deliver excellent
image quality**

PURE®
CARE+CLEAR
MEGALIX & AEC

04

**Invest with
confidence**

Evolve program
Scientific evidence



Artis with
PURE

Artis with PURE[®]

Adding smooth to smart

- Save time during procedures
- Fewer steps
- More efficiency

**Smooth
interaction**



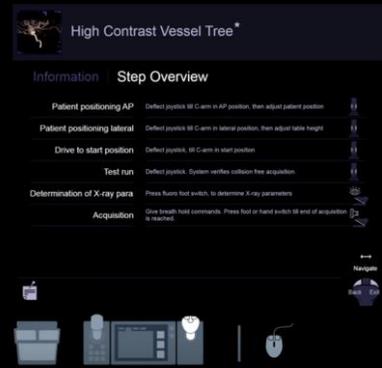
**Smart
performance**

- Expand your capabilities
- More confidence

Artis with PURE[®] Highlight features

3D Wizard

Simplyfy 3D imaging with expert guidance



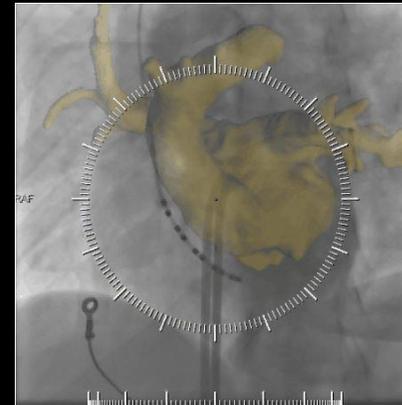
QuickZoom

Focus and zoom at tablesite with just one click



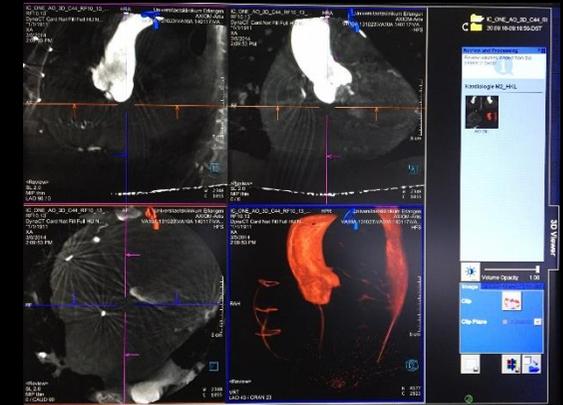
syngo 2D/3D Fusion

Save 99% dose when integrating pre-op volumes for live image guidance ¹⁾



Parallel Patient Processing

Share system capabilities between exam and control rooms



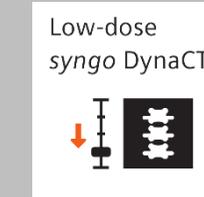
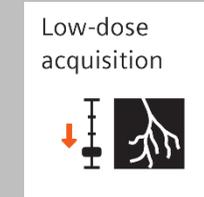
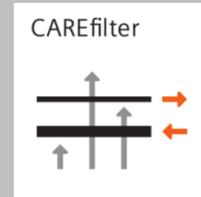
¹⁾ This measurement was performed with an Alderson phantom using Fluoroscopy with 10 images per 2D projection and a low-dose 6s DCT Body program. Results in actual clinical practice may vary.

Courtesy of LKH Medical University of Innsbruck, Austria

CARE+CLEAR

Combined Applications to Reduce Exposure

Dose saving



Dose monitoring



Dose reporting



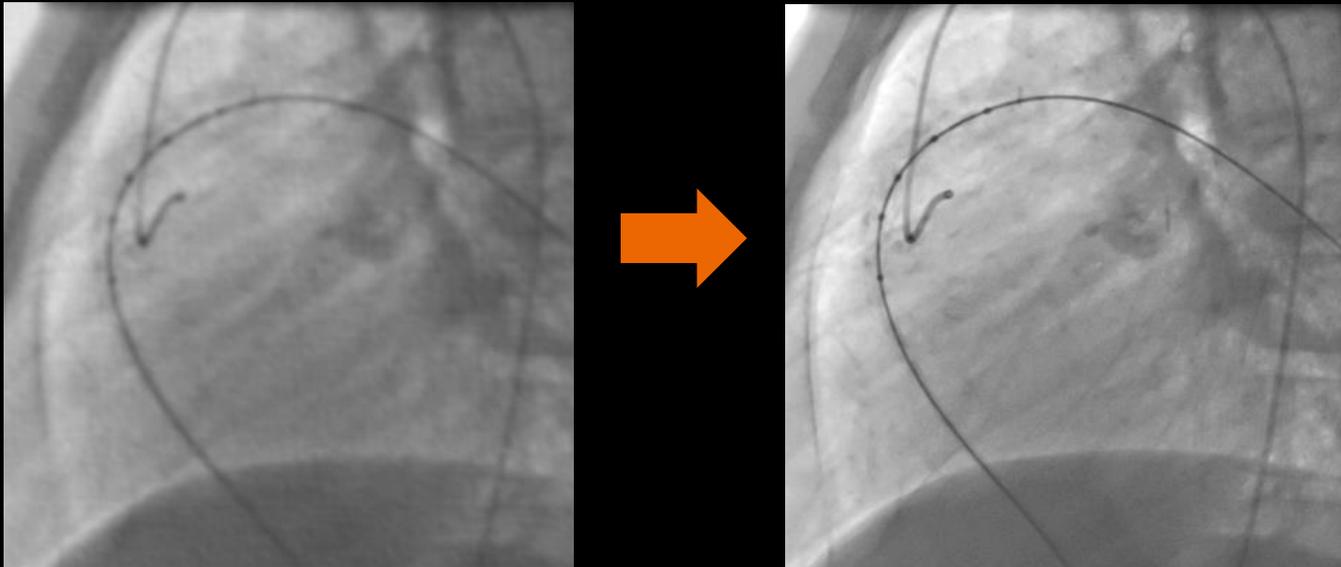
Our philosophy to deliver better care at the lowest reasonable dose.

CLEAR MAX – The evolution of a success story



¹⁾ Available for Artis Q/Artis Q.zen

²⁾ Available for VD12

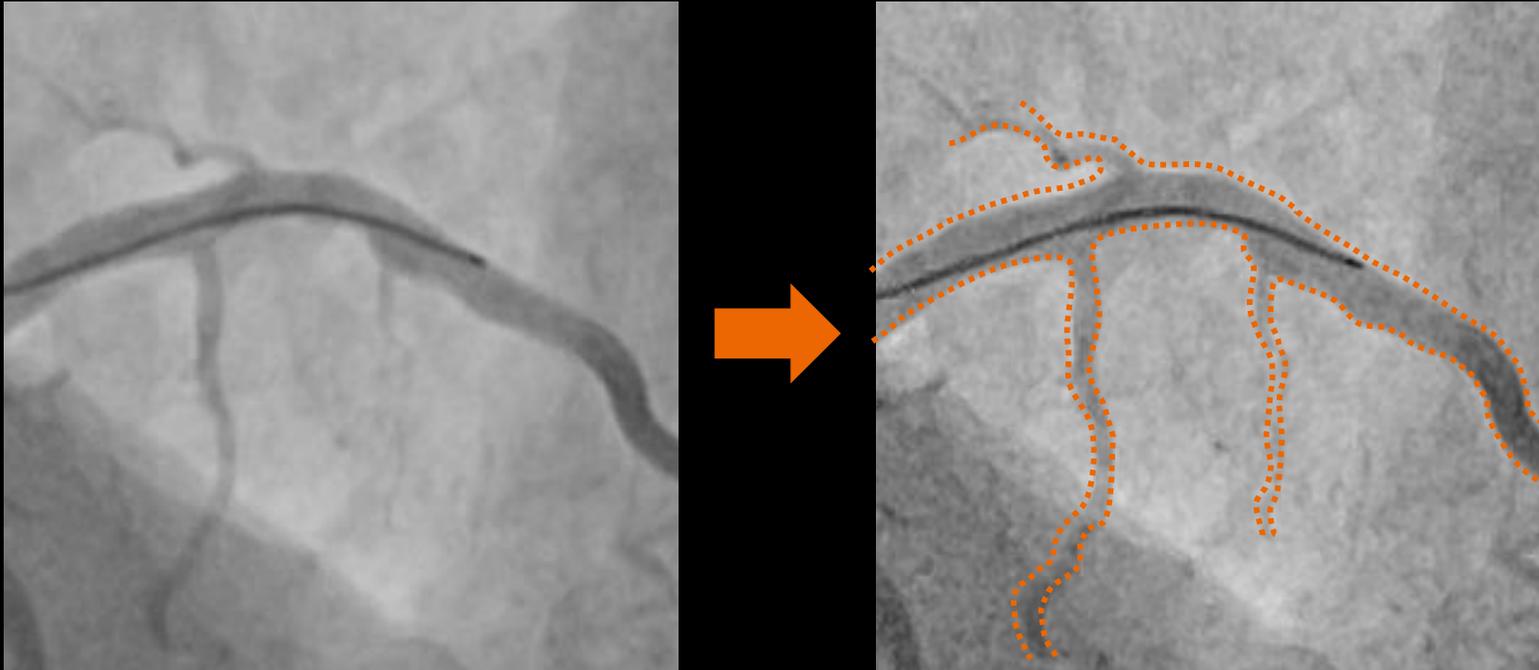


CLEARview



Enhanced image quality in low-dose

- Enhances overall image quality, especially when using low-dose imaging protocols
- Dose-adaptive noise reduction

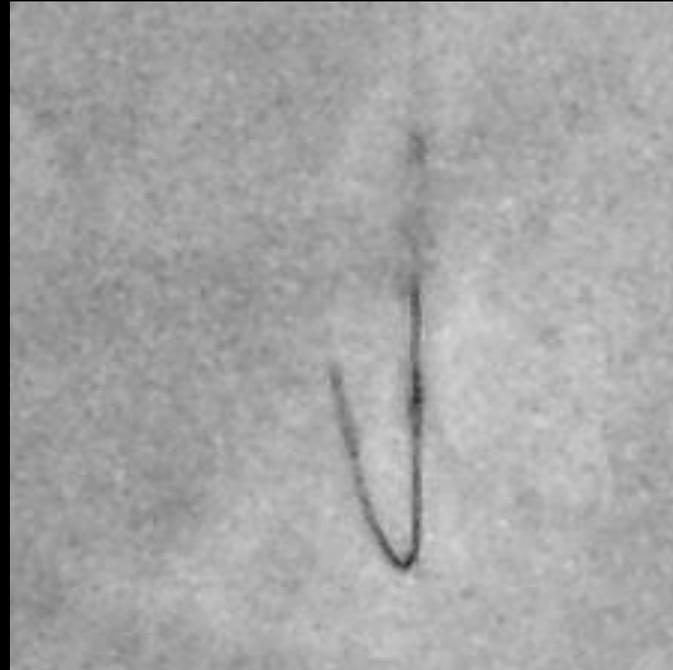
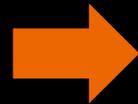


CLEARvessel



CLEARvessel provides sharp vessel edges

- Automatic detection of vessel edges
- Enhanced contrast and visibility of vessel edges without increasing the noise



CLEARmotion



**CLEARmotion provides
efficient motion
artifact compensation**

- Automatic detection of small structures
- Efficient compensation of motion artifacts
- Optimal visualization of small vessels and guidewires in the beating heart



CLEARchoice

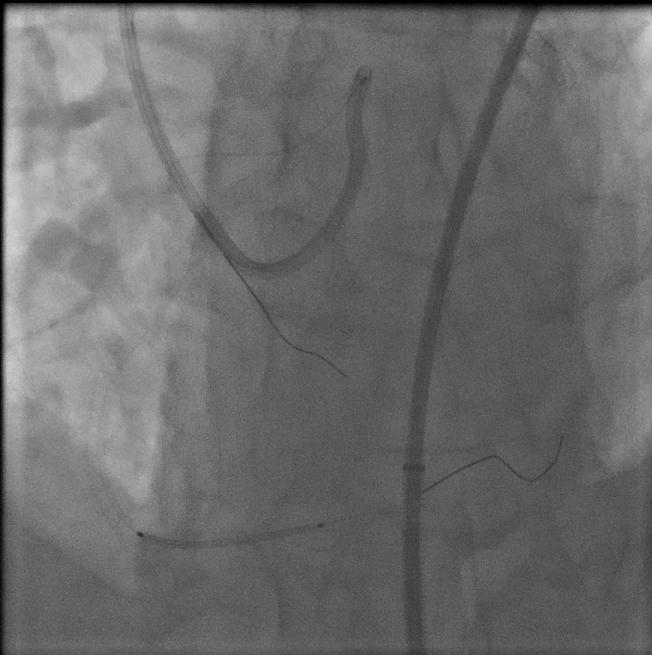


**CLEARchoice provides
customized image
quality**

- Customized image quality to your individual preferences
- Preferred image quality selection during application

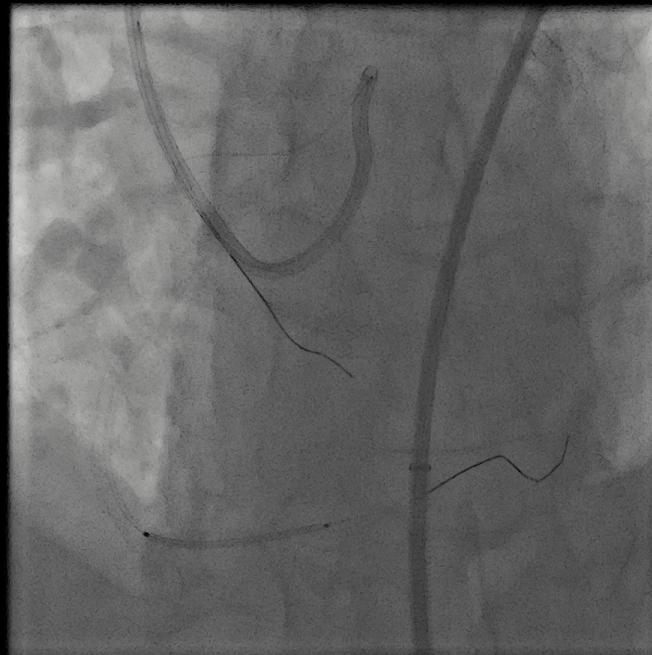
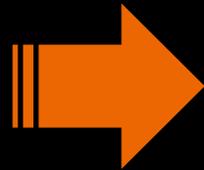
CLEAR MAX – The evolution of a success story

CLEAR MAX asymmetric edge enhancement improves contrast and sharpness of devices e.g. stents and catheter in fluoroscopy at the same dose level.*

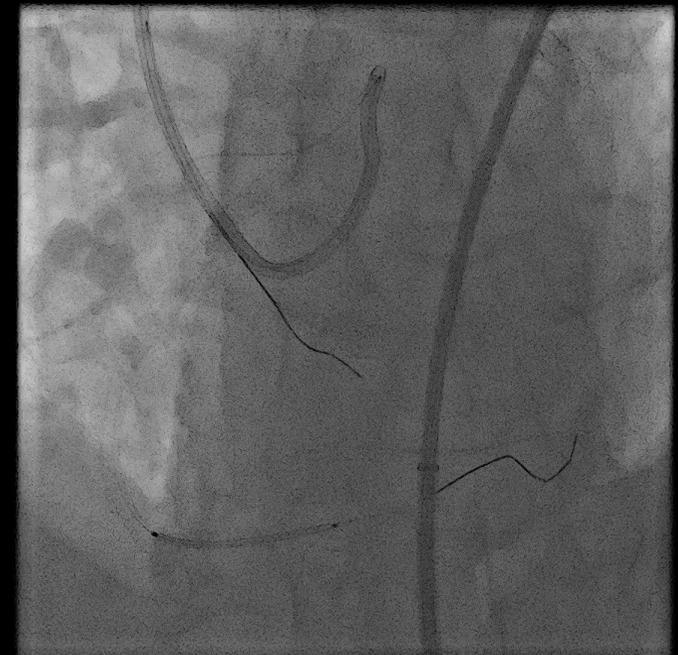


Conventional edge enhancement

Before **CLEAR MAX** (VD11)

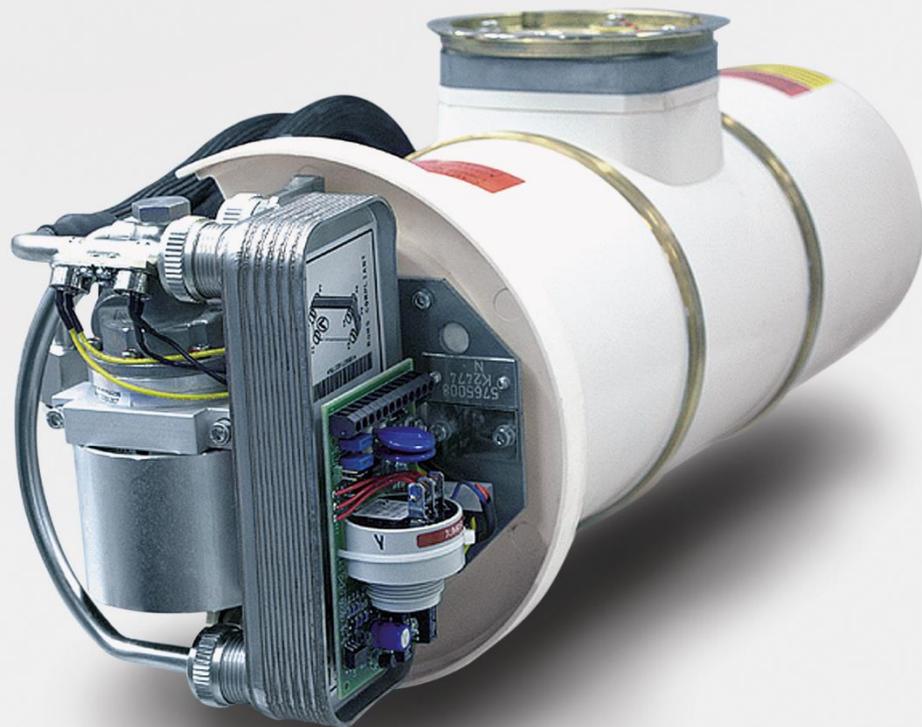


Light **asymmetric** edge enhancement



Medium **asymmetric** edge enhancement

With **CLEAR MAX** (VD12)



MEGALIX AEC

MEGALIX Cat Plus angiography X-ray tube with flat emitter technology

Technology for optimal image quality ...

7.000+

Artis zee
Installations

**sharp
images**

and high image
contrast

0.4

min focal
spot size



250 mA

max fluoro
current

the first angiography
X-ray tube with
**flat-emitter
technology**

Get sharper images independent of direction with flat emitter technology

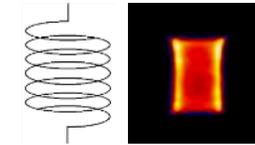
The innovative flat emitter technology optimizes focal spot area

- Small focal spot size (0.4)¹⁾
- The almost quadratic shape improves spatial resolution in all directions

-43%

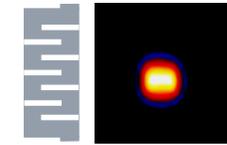


Conventional filament



Conventional Filament Emitter

Flat emitter technology



Flat Emitter



¹ as20 detector. When compared to previous MEGALIX Cat and on foci with flat emitter



“With the Artis zee, image quality is truly outstanding. It’s improved again significantly. The radiation dose is also considerably lower.”

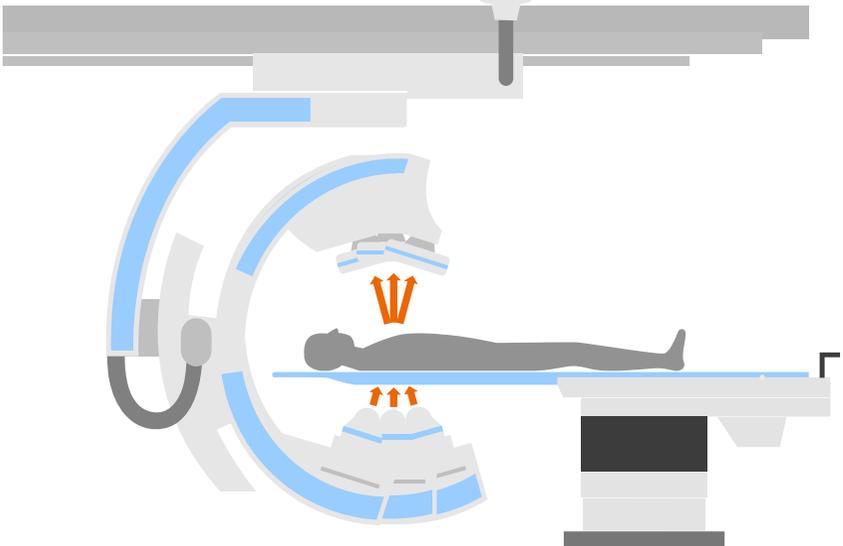
Prof. Matthias Pauschinger, MD
Medical Director of Cardiology
Nuremberg General Hospital, Germany

Interview with
Prof. Pauschinger, MD
on Artis zee with PURE



Angulation-dependent AEC

The key to optimal image quality and lowest reasonable dose



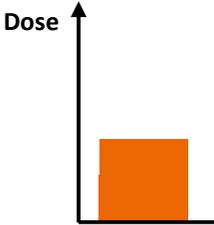
Siemens

5 variable parameters **automatically** adjustable

Parameter adaption

		-	+
	kV	[bar]	[bar]
	mA	[bar]	[bar]
	ms	[bar]	[bar]
variable	Focal spot	[orange bar]	[orange bar]
	Filtration	[orange bar]	[orange bar]

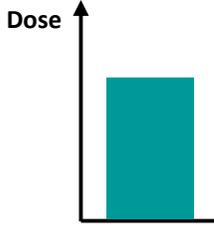
Effect on dose



Other vendors

Only 3 variable parameters **manually** adjustable

		-	+
	kV	[bar]	[bar]
	mA	[bar]	[bar]
	ms	[bar]	[bar]
fixed*	Focal spot	[teal bar]	[teal bar]
	Filtration	[teal bar]	[teal bar]

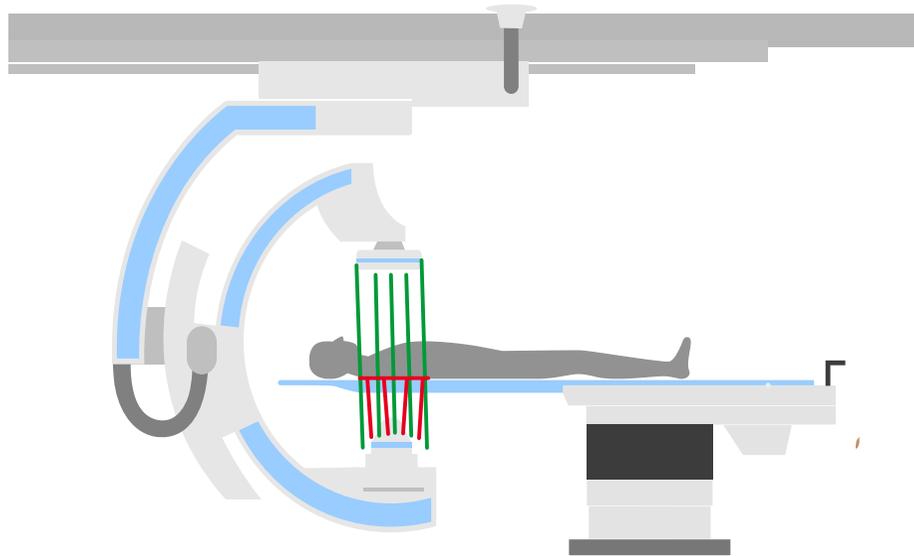


*within selected organ program

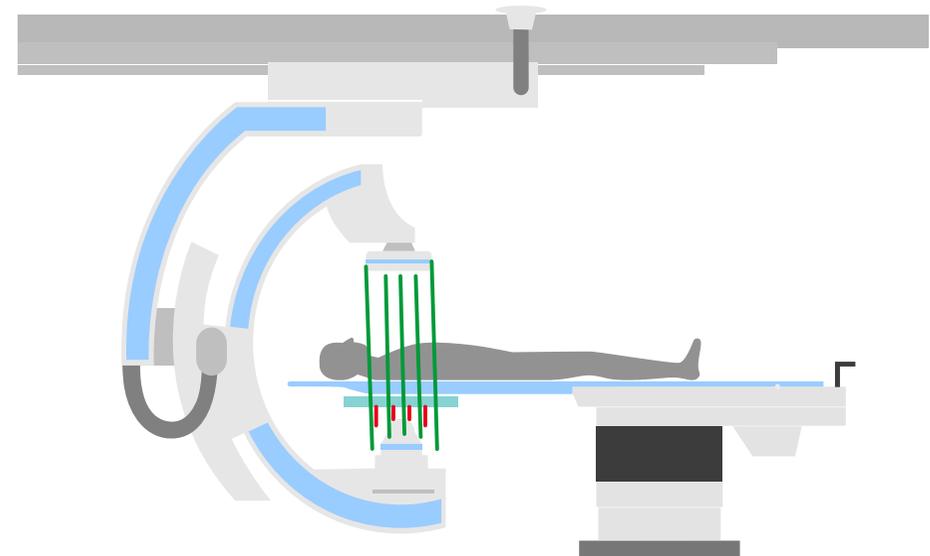
Angulation-dependent filtration

The more copper filtration, the less patient dose

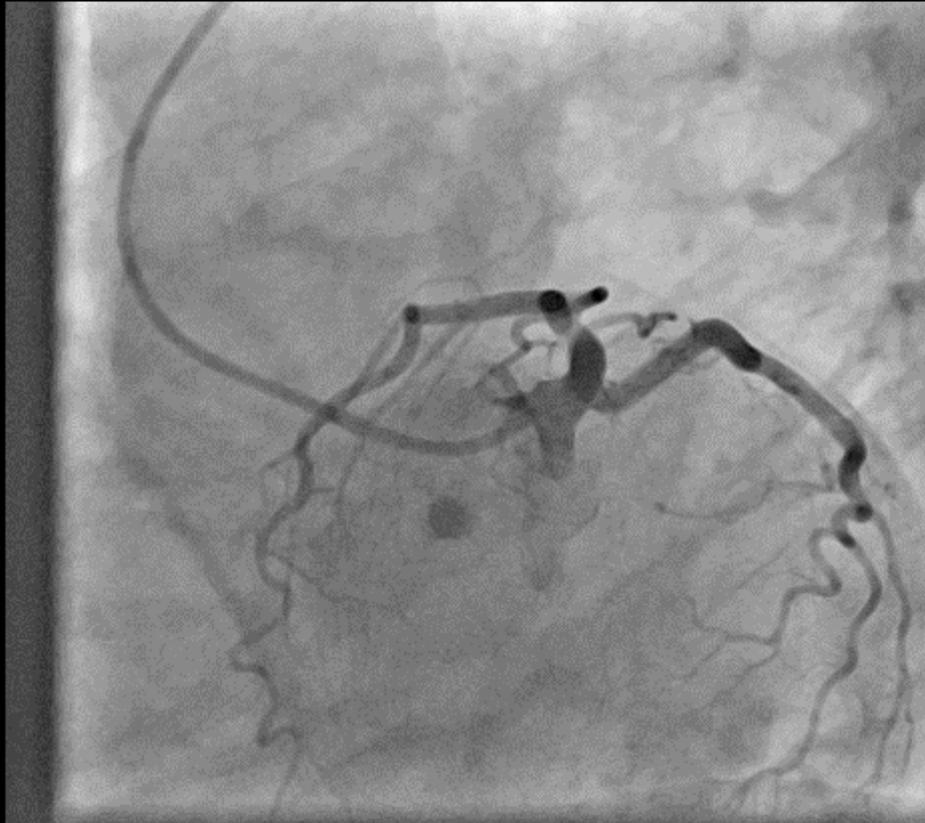
Without copper filtration



With copper filtration



Increasing image quality while minimizing patient dose



Spider-View

LAO: 47° / CAUD: 28°

Patient height: 1.61 m

Patient weight: 46 kg

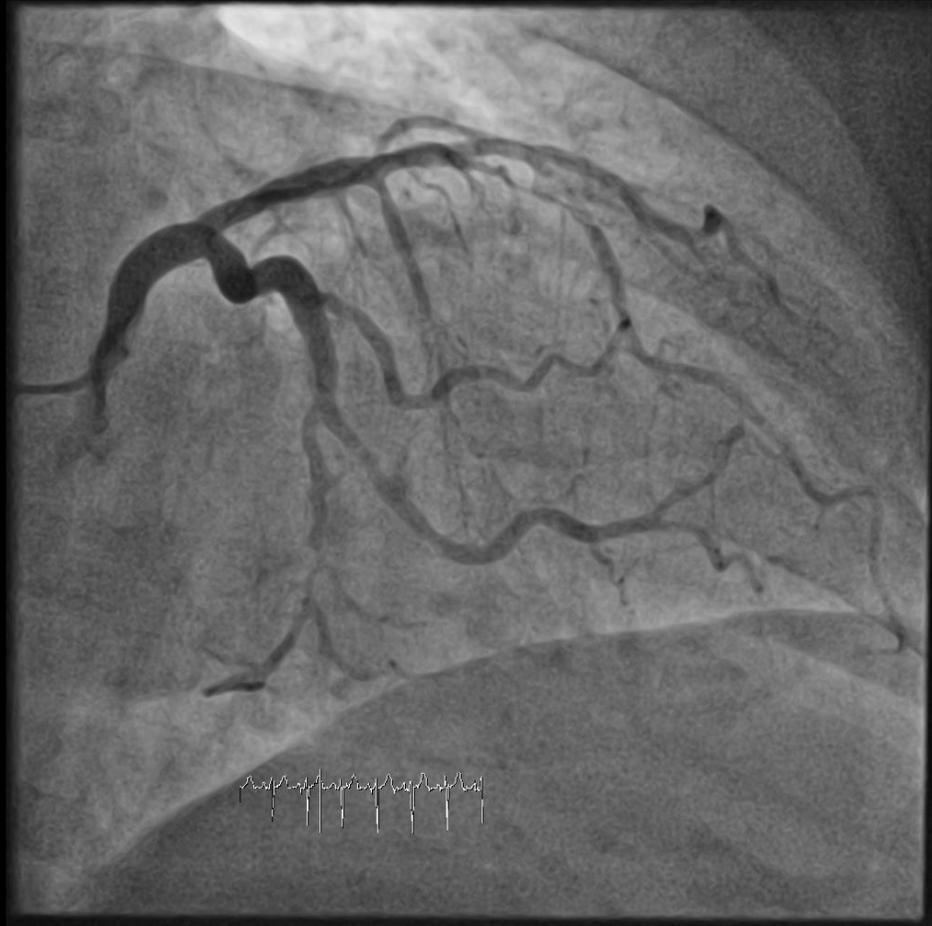
DAP: 1,27 $\mu\text{Gym}^2/\text{f}$

Typical values for spider view

DAP: 6 – 18 $\mu\text{Gym}^2/\text{f}$

Detector dose: 180 nGy/f

Clear images and low dose even in patients with high BMI



Low dose acquisition

LAO: 1° / CAUD: 31°

Patient height: 163 cm

Patient weight: 100 kg

BMI: 38

DAP: 1,59 $\mu\text{Gy}^2/\text{f}$

Typical values for PCI

DAP: 1 – 3 $\mu\text{Gy}^2/\text{f}$

Detector dose: 180 nGy/f

See even fine vessels in low dose fluoroscopy scenes



Store Fluoro

LAO: 1° / CAUD: 31°

Patient height: 161 cm

Patient weight: 67 kg

DAP: 0,92 $\mu\text{Gym}^2/\text{f}$

Typical values for PCI

DAP: 1 – 3 $\mu\text{Gym}^2/\text{f}$

Detector dose: 180 nGy/f

01

Hardware overview

Biplane
Ceiling-mounted
Floor-mounted

03

Broaden your procedure mix

Integration
Broad procedural use

02

**Deliver excellent
image quality**

PURE®
CARE+CLEAR
MEGALIX & AEC

04

**Invest with
confidence**

Evolve program
Scientific evidence

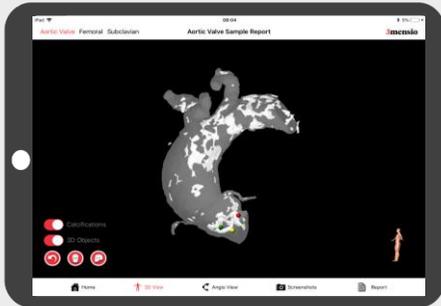


Integration

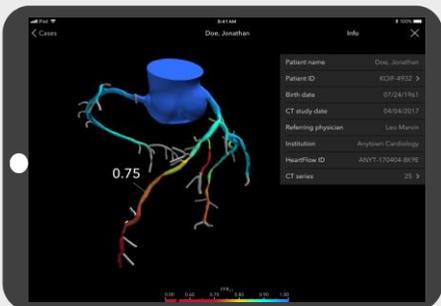
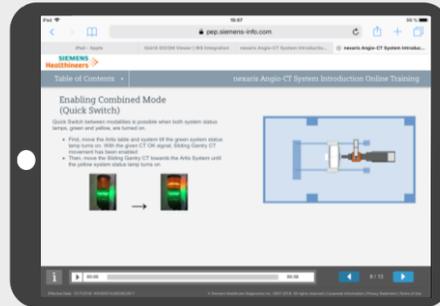
What if you could bring your iPad to the intervention?

... and access your favorite Apps ...

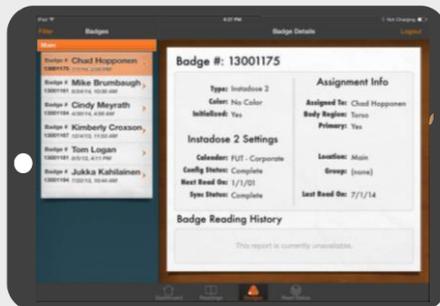
3mensio Report App allows you to interactively view reports for pre-operative sizing and planning



PEPconnect, your smarter connection to knowledge in digitalizing healthcare

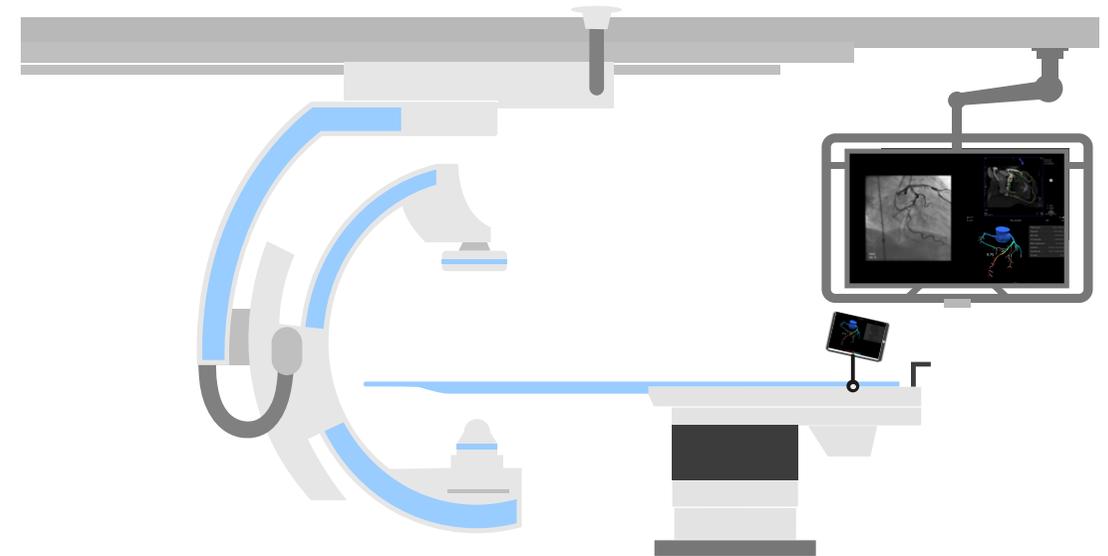


The **HeartFlow** mobile app is a convenient way for clinicians to review their patients' completed HeartFlow FFRCT Analyses.

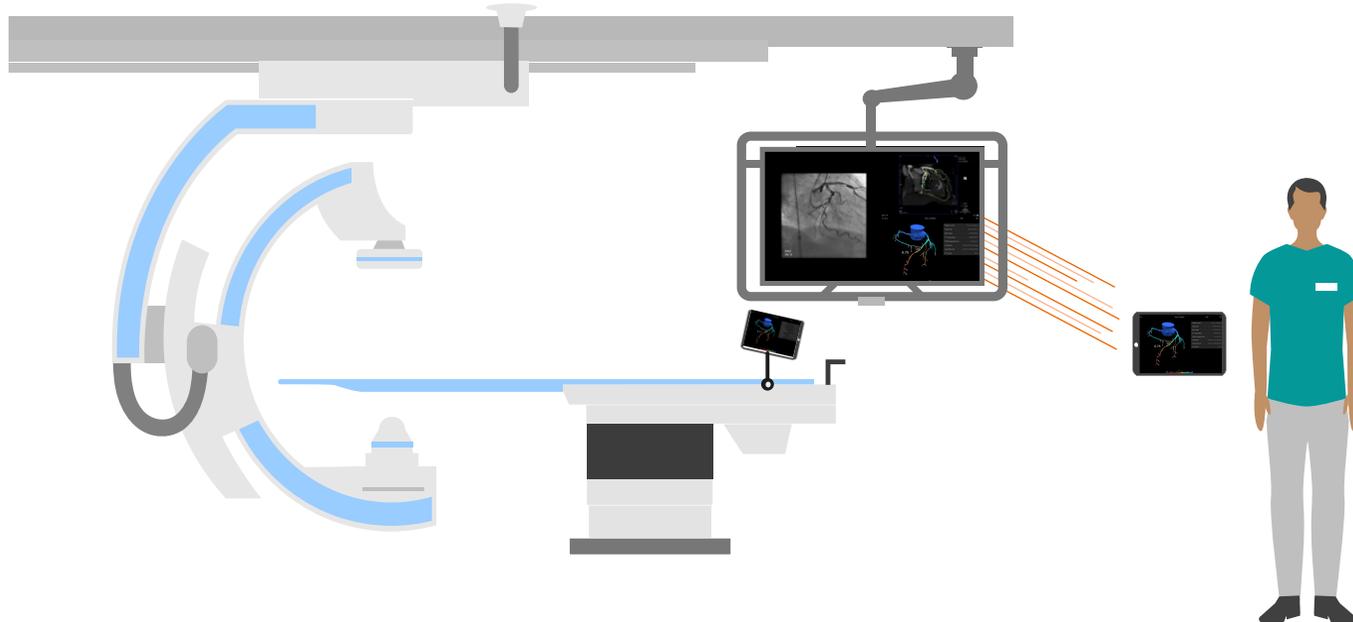


Instadose™ automatically reads the radiation dose accumulated on instadose 2 dosimeters in your facility.

... at tableside with content displayed on Large Display?



Bring your own device to the cath lab



Access of supporting applications during interventions

- Digital Marketplace
- App Store
- Retrieve images from PACS
- Online material
- Video conference

Sterile usage of your device at table side

- Dockable, wireless, easy fixation
- Universal holder for iPad up to 12.9 inch
- Adequate drapes for different iPad sizes

Synchronization with Artis Large Display

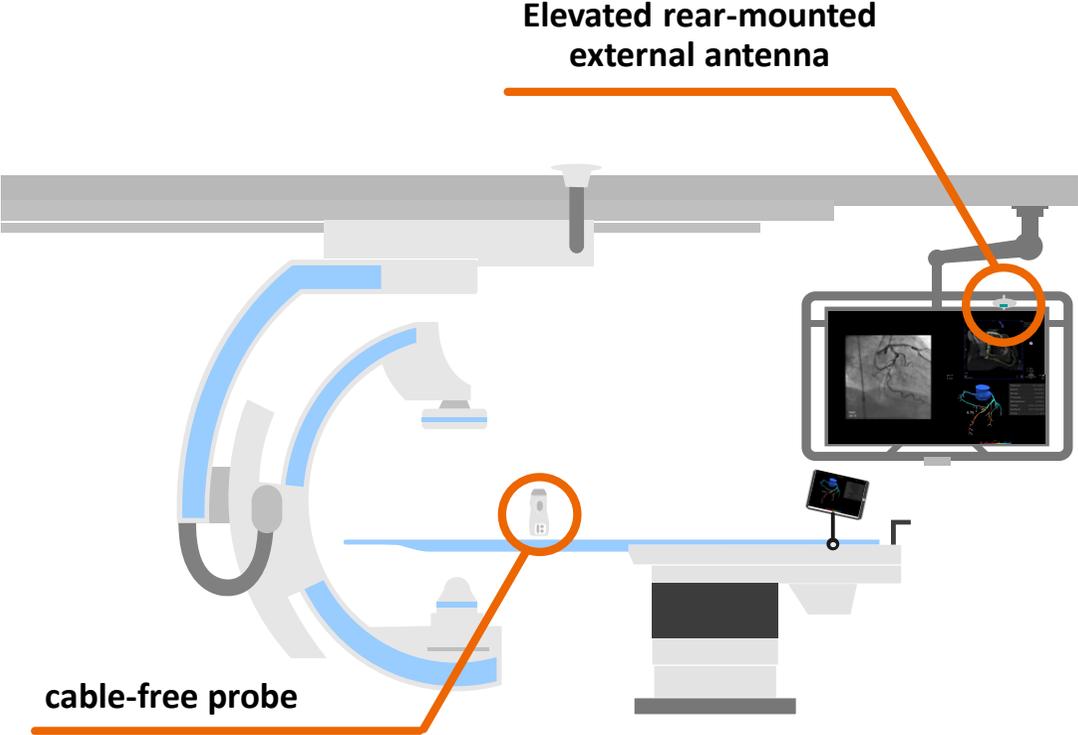
- Larger visualization of your content
- Everything at a glance

Complement your interventional lab with wireless ultrasound capabilities



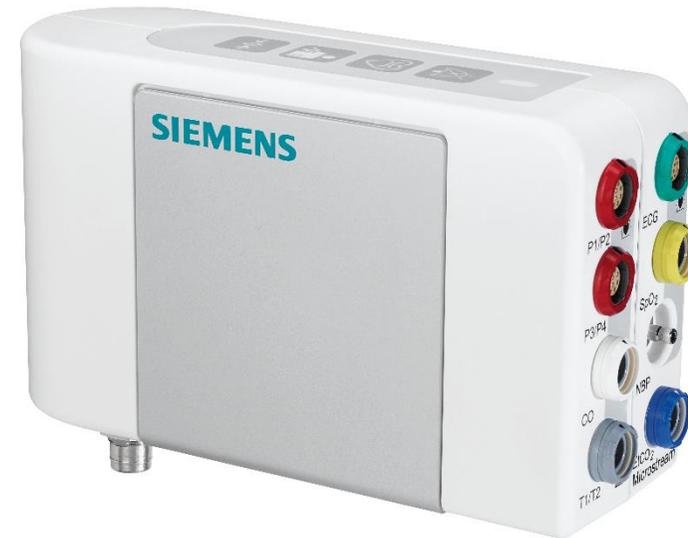
The ACUSON Freestyle Series delivers the most advanced **wireless ultrasound technologies** to add tangible value and enhance clinical and operational efficiencies at the point of care.

- ✓ Zero cables
- ✓ Zero footprint
- ✓ Fully connected



Sensis Vibe – Efficient workflow through integration of Sensis and Artis

- One-stop patient registration via Sensis Vibe
- Flexible mounting of the HemoBox at the table rails
- Integrated tableside control of Sensis key functionality via Artis touchscreen
- Dose values and X-ray images for comprehensive reporting with Sensis



Integration of mapping systems for ablation guidance with electro-anatomical mapping

ENSITE PRECISION™



- Fusion of real anatomy with electro-anatomical map
- *syngo* LA Segmentation results can be transferred to EnSite Velocity* system
- Allows direct importation of *syngo* DynaCT dataset and/or segmented structure to EnSite Velocity System

CARTO³ SYSTEM



- Dedicated components to support CARTO³ functionality w/o image quality interference
- *syngo* LA Segmentation results and stored fluoro data can be sent to CARTO³
- Visualization of CARTO3 on Artis Large Display and on Artis Cockpit displays

RHYTHMIA HDx™ Mapping System



- Dedicated components to support Rhythmia HDx™* functionality w/o image quality interference
- Visualization of Rhythmia HDx™ on Artis Large Display and Cockpit displays

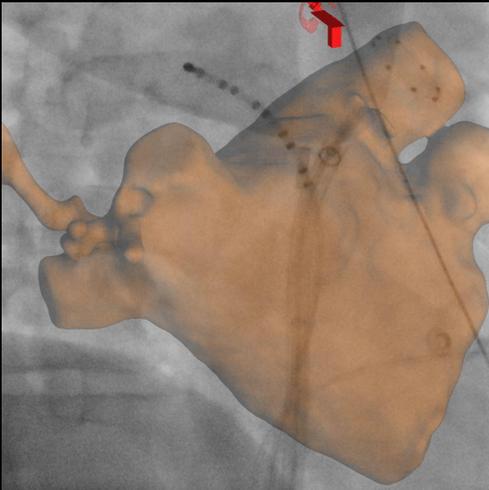
Artis
With PURE[®] zee



Broad procedural use

Broad procedural use

»» Arrhythmias



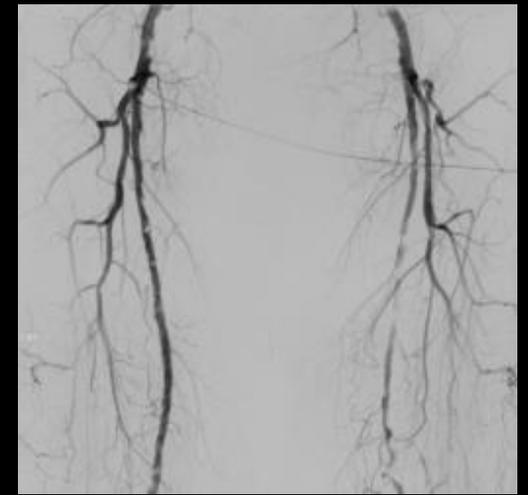
»» Coronary Artery Disease

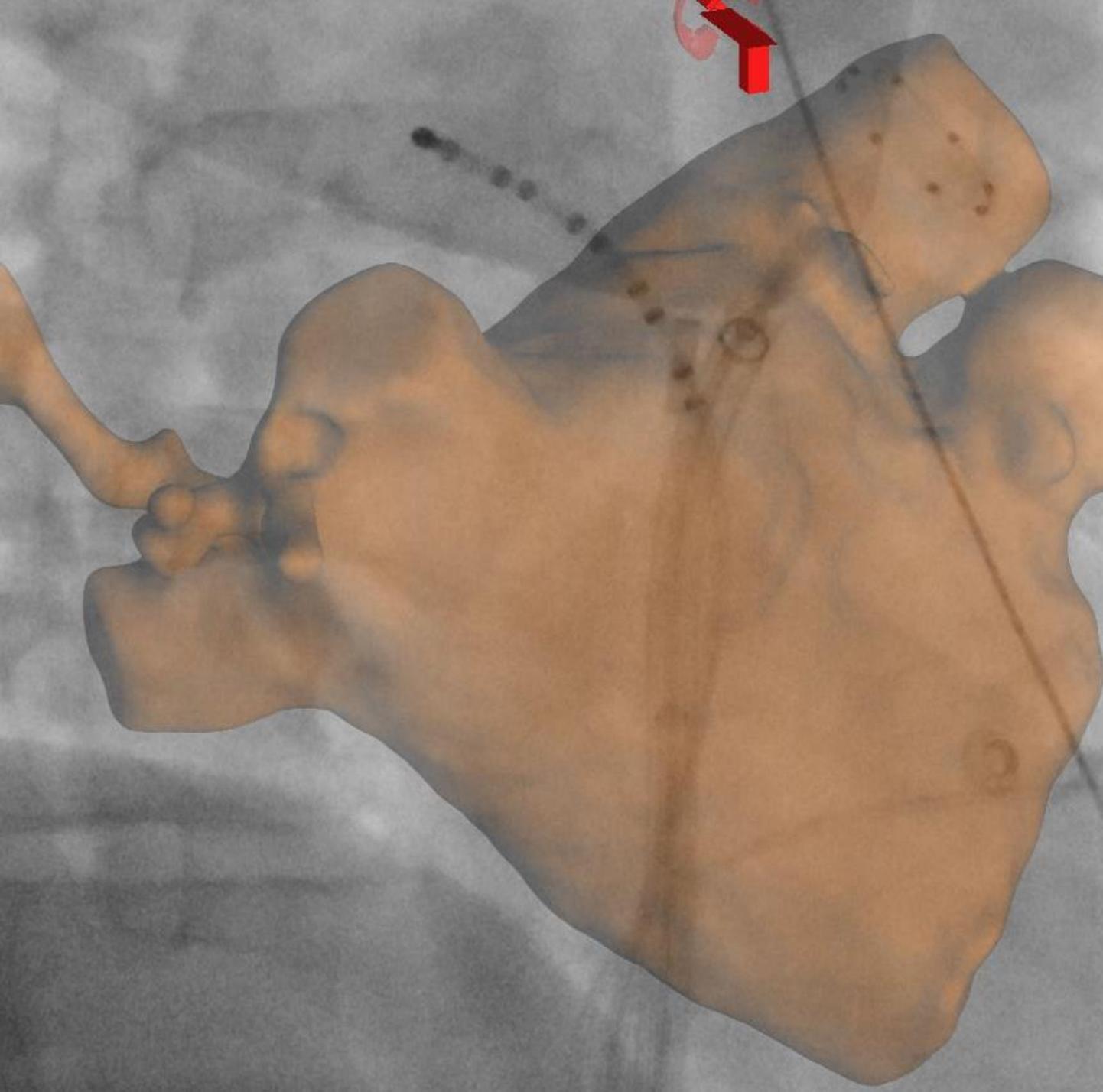


»» Structural Heart Disease



»» Peripheral Artery Disease



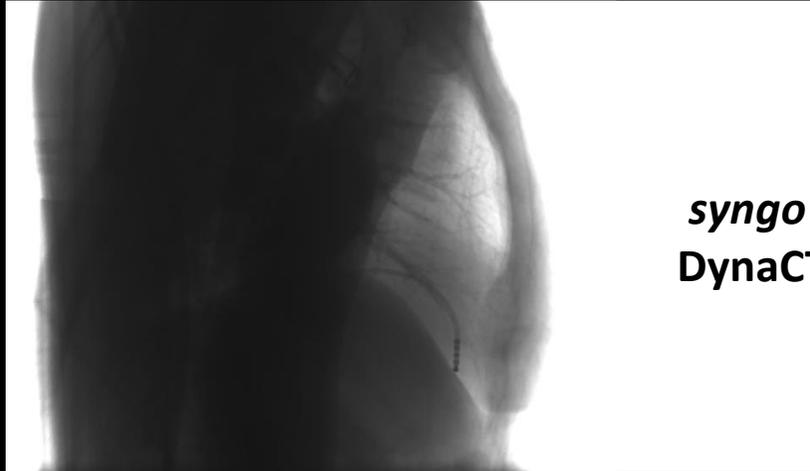


Artis zee in

Arrhythmias

syngo DynaCT Cardiac

Fast reconstruction into CT-like dataset

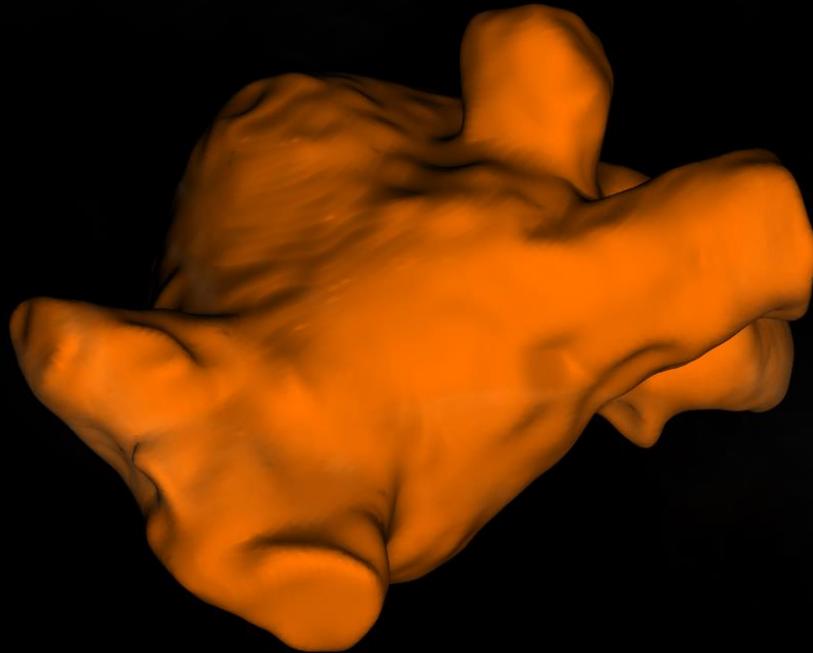


syngo
DynaCT



syngo DynaCT Cardiac acquires 3D dataset with rotational angiography

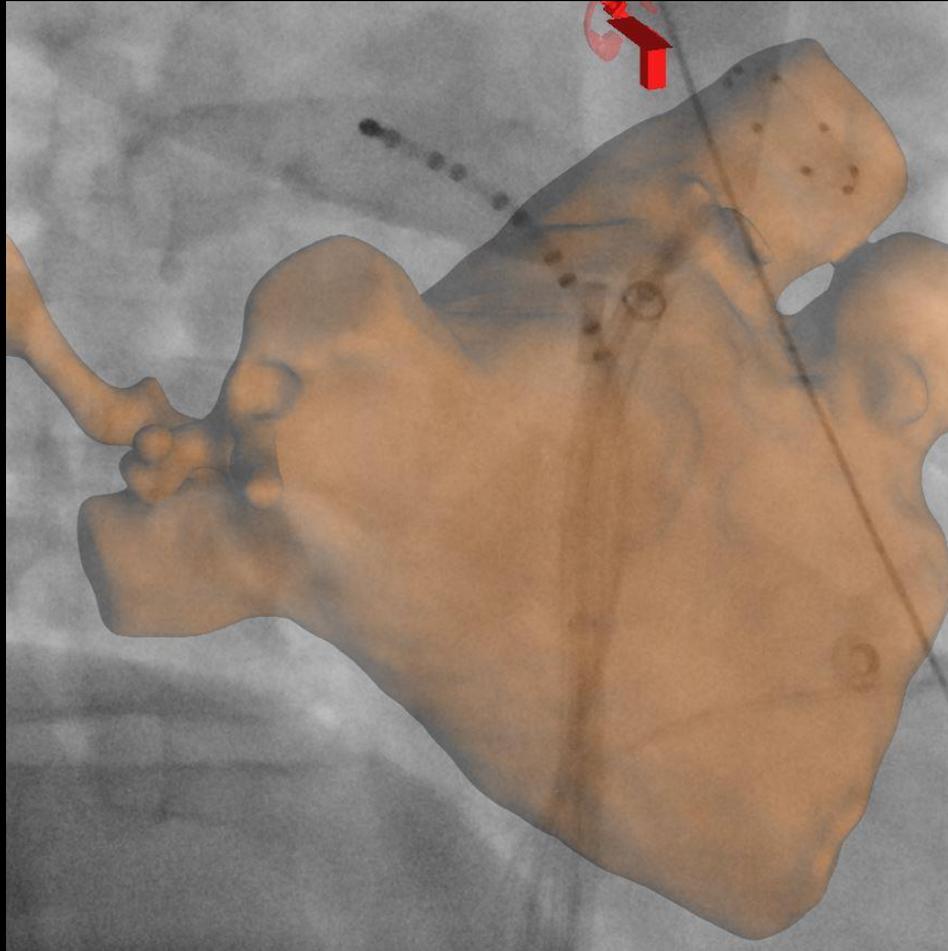
- 5 second acquisition
- 60 frames per second acquisition
- With or without ECG gating
- Fast reconstruction into 512 matrix CT-like dataset



syngo LA segmentation performs one-click segmentation of left atrium within seconds

- Based on pre-operative CT or MR data or alternatively on intraoperative data acquired by 3D rotational angiography
- The LA anatomy can be displayed transparently, in particular for overlay with fluoroscopy images, also just the contour of the 3D object
- The segmented LA can be transferred and used directly with mapping systems from Abbott and Biosense Webster

syngo 3D Roadmap



syngo 3D Roadmap overlays 3D segmentation onto live image

- Guidance software engineered to support ablation of pulmonary veins
- 3D-model is rendered automatically to changes in angulation, zoom and SID
- 3D-model remains in sync with live fluoroscopy and allows real-time guidance in both 2D and 3D views

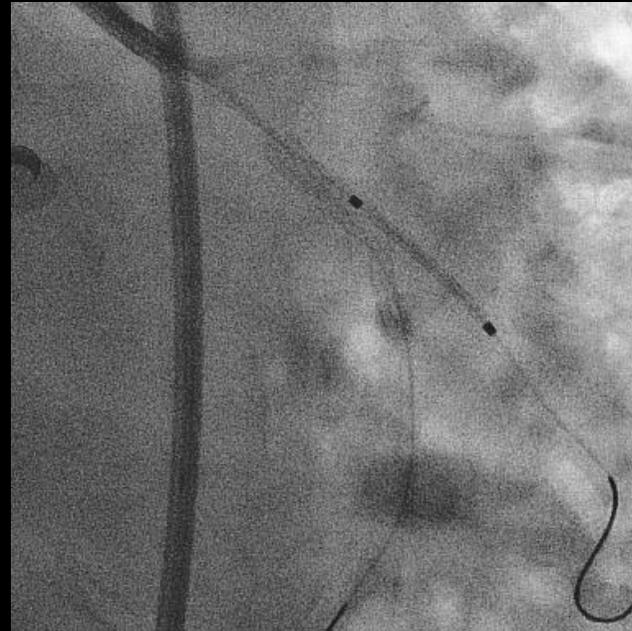
Artis zee in

Coronary Artery Disease

See this ...



... like this!



ClearStent Live allows a real-time verification of the stent positioning while moving the device, eliminating cardiac movement.

- Stent enhancement during acquisition with up to 15 fps
- Potential to speed up procedures and to save contrast agent ¹⁾
- PACS compatibility for review of scenes using any DICOM viewer

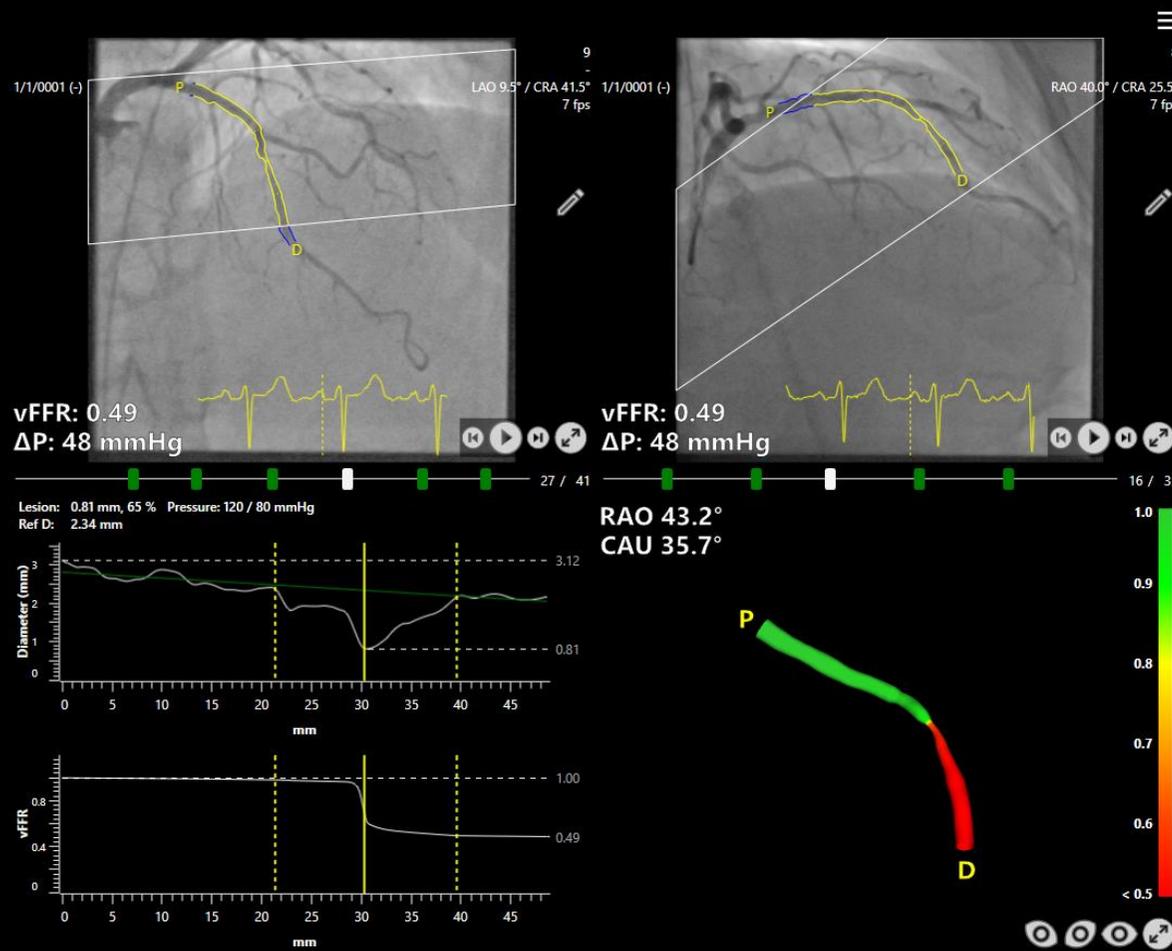


syngo CTO Guidance enables more physicians to treat more complex CTO cases and helps expand the hospital's procedure mix. ¹⁾

- Better planning with automatic segmentation of coronary CTAs
- Guidance during procedures with color-coded COROwaves to avoid foreshortening

Courtesy of University Hospital Erlangen, Germany

¹⁾ Increased success of CT-guided CTOs shown in different studies e.g. Kim et al. Effect of pre-procedural coronary computed tomography angiography on the procedural success of percutaneous coronary intervention for chronic total occlusion – The CT-CTO randomized trial. Presented at EuroPCR 2020.



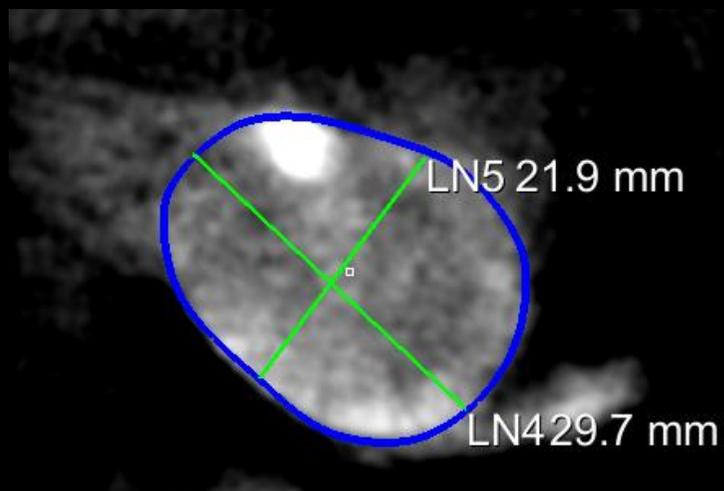
CAAS vFFR is a less-invasive angio-derived FFR calculation method. It's a software-only product that calculates the pressure drop in the coronary arteries.

- Functional and anatomical lesion information
- 3D reconstruction from two 2D angiograms is created fully automatically
- Co-registered vessel FFR value
- Improved workflow possibilities

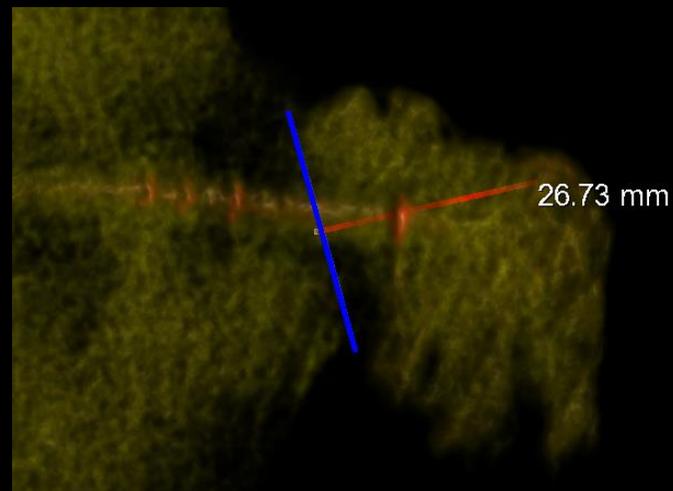
Artis zee in

Structural Heart Disease

Measure the LAA ostium and guide to the landing zone with *syngo DynaCT Cardiac*



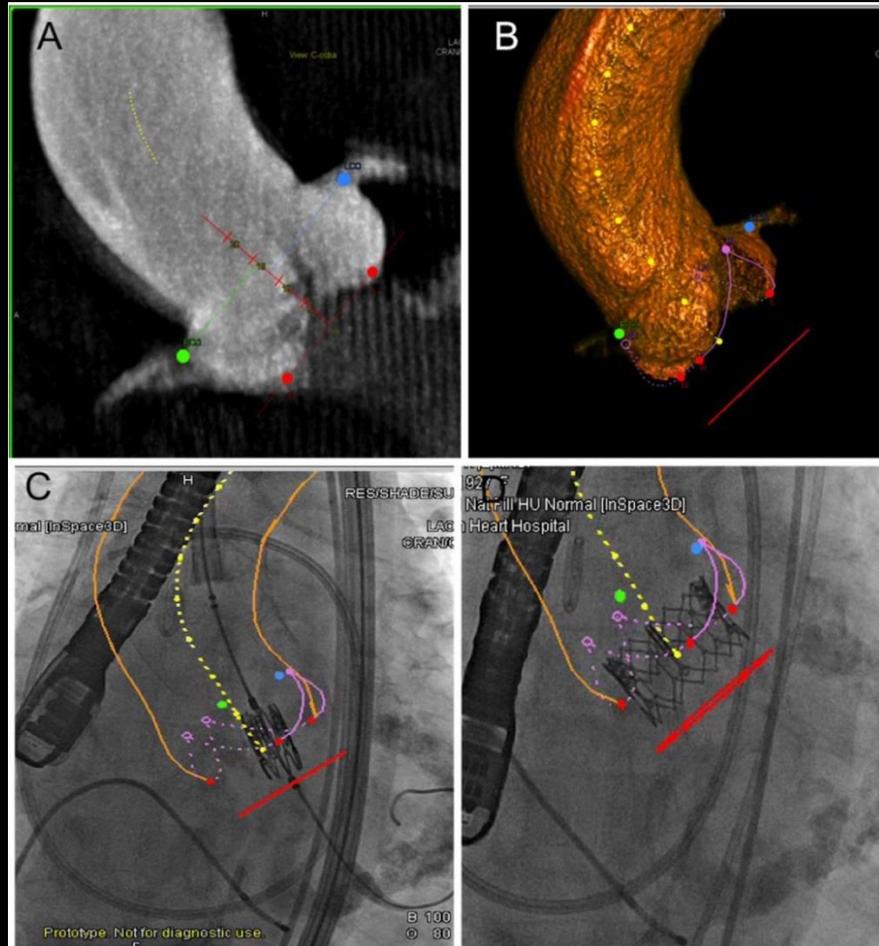
Measurement of LAA ostium on DynaCT reconstruction to define size for occluder device



Measurement of LAA depth and indication of landing zone



Overlay of 3D volumes, contours or points of interest onto live fluoro images



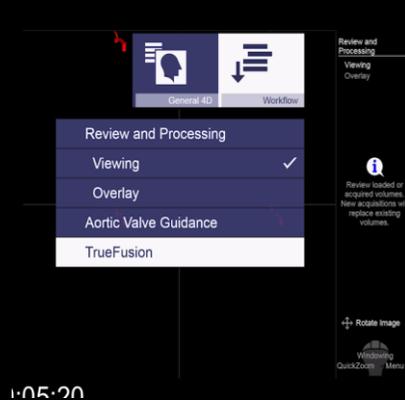
Enhanced workflow for valve positioning with **syngo Aortic Valve Guidance**

- Automatic segmentation of aortic root in syngo DynaCT or CT volume
- Display of aortic root and anatomical landmarks
- Indication of perpendicular view to adjust the C-arm angulation with one injection
- Contour view overlay on live fluoro provides landmarks and clear view on device during valve positioning

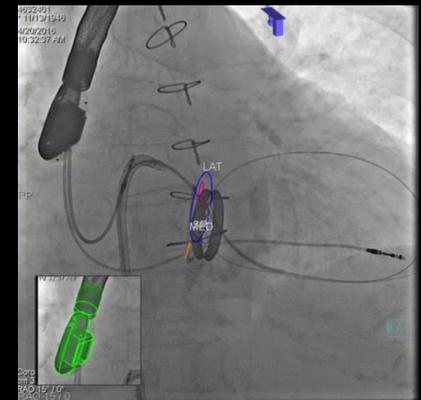
Integrated TEE guidance with syngo TrueFusion

Artis with PURE enables complete handling of fusion workflow from tablesite

Select TrueFusion¹⁾ workflow via on-screen menu



Identify and export landmarks for fusion directly from SC2000 PRIME



Co-registration: Automated probe detection with eSie Sync

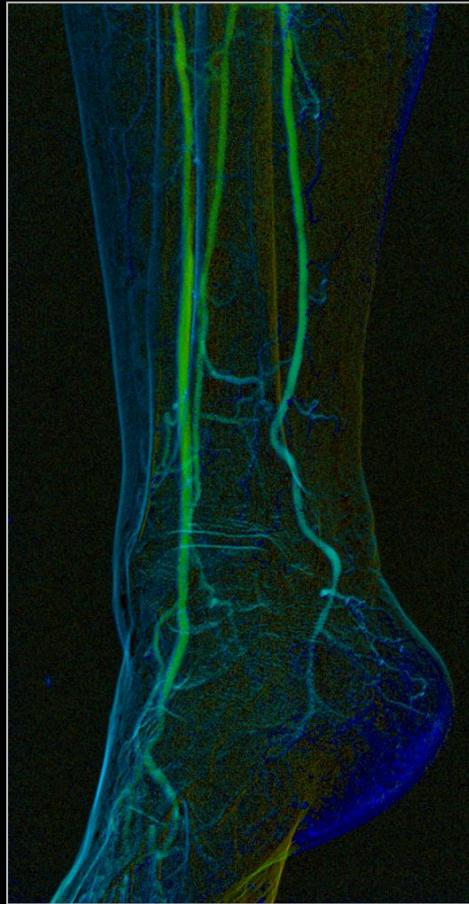
Guidance: Anatomical and functional landmarks fused with live fluoroscopy

Courtesy of New York University Hospital, USA

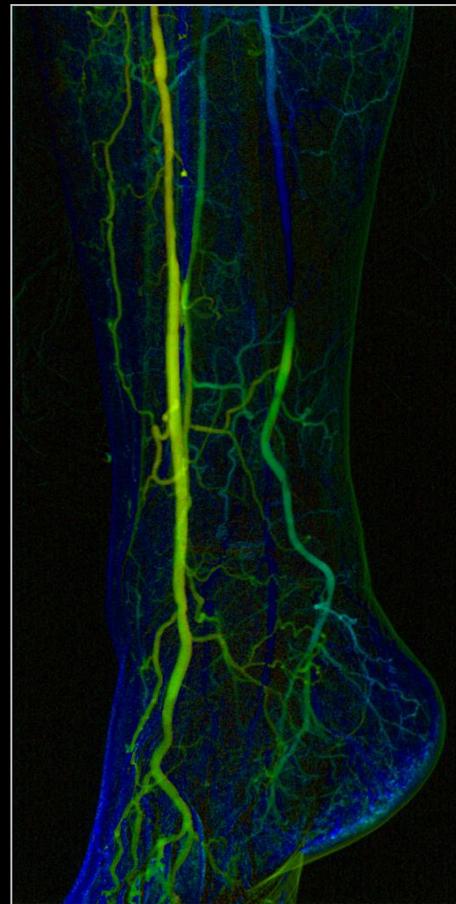
¹⁾ TrueFusion represents a workflow consisting of syngo TrueFusion and TrueFusion echo-fluoro guidance

Artis zee in

Peripheral Artery Disease



Before treatment



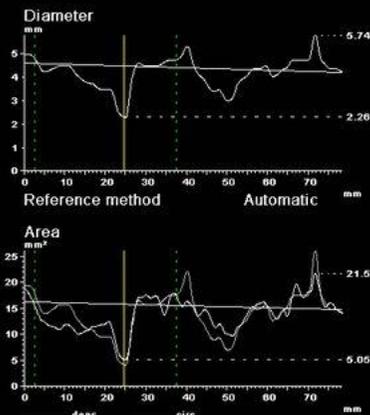
After treatment

Functional imaging with **syngo iFlow** supporting lower limb revascularization

- Understand and analyze the individual flow characteristics of a diabetic foot to support intra-procedural decision making
- Quantify changes in flow to better understand the effect of the treated vessel

it Options Help

Automatic Reference Analysis



Flow Body
 D 1111111
 Sex Other
 Birth Date 1/1/1901
 Accession Number
 Study ID 00
 Physician
 Hospital Institut fuer Roentgendiagn...
 Acquisition Date 8/20/2009
 Series Descr DSA 1 UD
 Frame Number 5
 Rot / Ang 0.80 ; 0.10 °
 Segmentname
 Trial Name
 Intervention
 Cal Factor 0.2477 mm/pix
 Cal Object 0.00 mm SiemensCal (TOD)

Stenosis (%)	
%Diameter	49
%Area Circ	74
%Area Dens	68

Obstruction Segment			
	Diameter (mm)	Area Circ (mm²)	Area Dens (mm²)
Lesion	2.26	4.01	5.05
Ref	4.47	15.70	15.70
Mean	4.01	12.96	12.42

Prox D	4.74 mm
Dist D	4.72 mm
Pos Prox	2.83 mm
Obstruction Length	34.84 mm
Obstruction Volume	452.74 mm³
Plaque Area	18.82 mm²
Plaque Volume	127.67 mm³
Plaque Symmetry	0.33

The report can now be saved

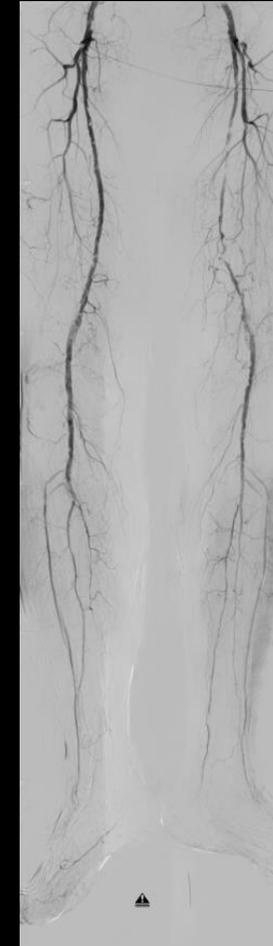
Page 1/2

Stenosis quantification with *syngo* QVA

- Analysis of peripheral vessels (e.g. carotid, renal, iliac and femoral arteries)
- Quantification of lesion length and percentage and severity of stenosis
- Select the right treatment for your patient and perform intraprocedural quality check

Artis zee offers full patient coverage even for **peripheral run-offs**

- Table stepping with floor-mounted system
- Adjustable frame rates and acquisition settings for each step
- **Perivision** for peripheral subtracted run-offs with one injection
- Real-time display of the subtracted images
- Detector in landscape or portrait format



01

Hardware overview

Biplane
Ceiling-mounted
Floor-mounted

03

Broaden your procedure mix

Integration
Broad procedural use

02

**Deliver excellent
image quality**

PURE®
CARE+CLEAR
MEGALIX & AEC

04

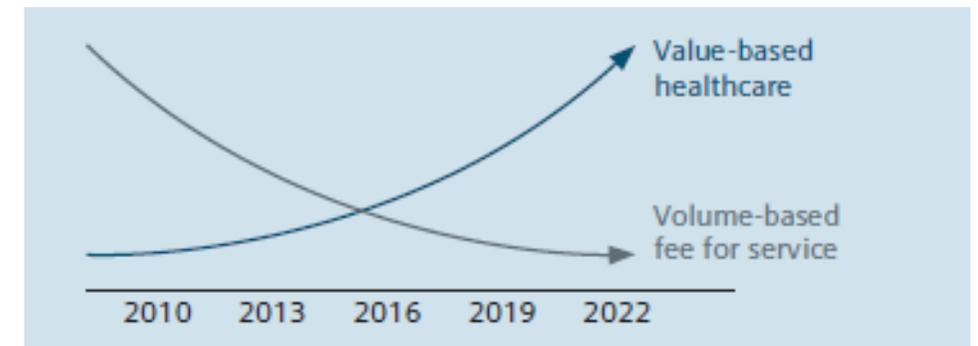
**Invest with
confidence**

Evolve program
Scientific evidence

Your challenge: Focus on better health outcomes despite increasing cost pressure



Healthcare costs continue to rise, putting unrelenting pressure on hospital budgets. Strategic organizations focus on better health outcomes and greater healthcare value to differentiate from peers



... **Artis zee**

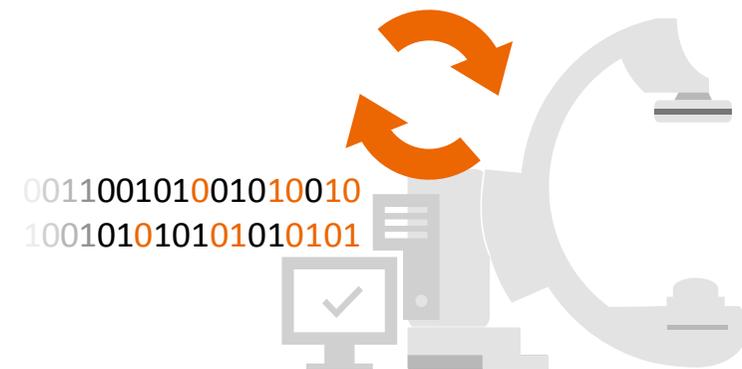
is key to increasing the value of your interventional services

Stay future-proof with excellent upgradeability options

Perform to your full potential today and be ready for what's coming next with the Evolve Program

- Upgrade to latest software version for better performance, speed, reliability, and efficiency
- Access to new clinical and diagnostic applications to drive business opportunities
- Benefit from proactive upgrade planning and hardware replacement.

- ✓ Optimized investment with calculable budget and longer life cycles
- ✓ Simplified technology management and reliable equipment performance
- ✓ Obsolescence protection and enhanced clinical capabilities



Scientific evidence



Dose savings in complex PCIs



Reduction of Radiation Exposure During Complex Interventions for Chronic Total Coronary Occlusions

Gerald S. Werner et al. *Catheter Cardiovasc Interv.* 2017
May;89(6):1005-1012

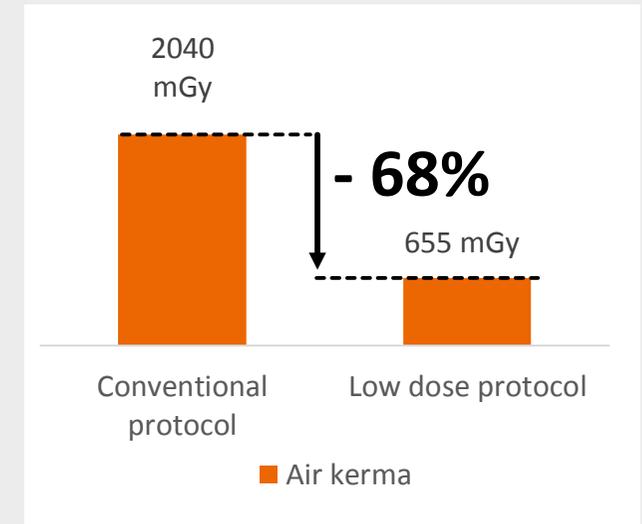
Protocol modifications resulted in a decrease

...of air kerma by **68%**

...of dose area product by **71%**

... of operator dose by more than **50%**

- Procedure duration and success rate were not affected
- Results are also applicable to high BMI patients



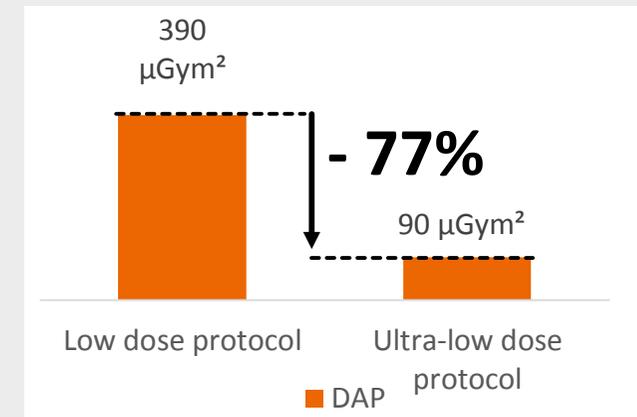
Ultra-low dose protocol for electrophysiology procedures

Significant dose savings with ultra-low dose protocol in left atrial procedures

Felix Bourier et al. Europace. 2016 Sep;18(9):1406-10.

comparison of low dose vs. ultra-low dose protocols showed

77% dose savings in left atrial procedures¹

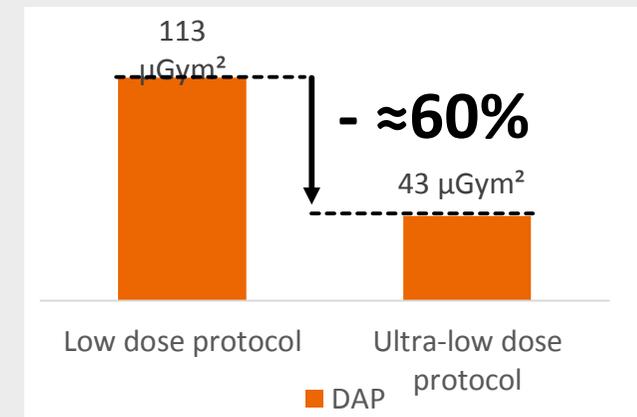


Lowest radiation doses for EP device implantation reported to date² due to ultra-low dose protocols

Martin Eichenlaub et al. Heart Rhythm. 2020 Jan;17(1):90-97.

comparison of low dose vs. ultra-low dose protocols showed

≈60% dose savings in device implantation³



¹ 140 patients

² To author's best knowledge, as of 2019

³ 1173 patients, including single chamber, dual chamber and CRT devices

Data charts have been created based on the published data and are not part of the mentioned publications

Low dose 3DRA protocols in pediatric catheterizations



Dramatic Dose Reduction in Three-Dimensional Rotational Angiography After Implementation of a Simple Dose Reduction Protocol

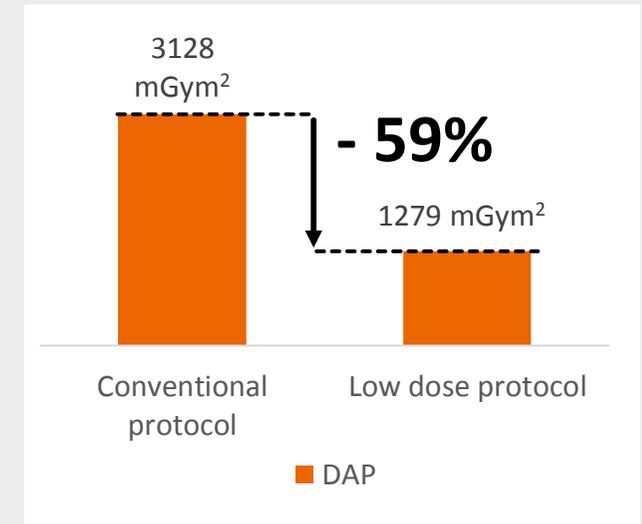
Savine C. S. Minderhoud et al. *Pediatr Cardiol.* 2018
Dec;39(8):1635-1641

Protocol modifications resulted in a decrease

... of Dose area product (DAP) by **59%** in 3DRA

... of effective Dose (ED) by **66%** in 3DRA

... of effective Dose (ED) by **79%** in the entire catheterization



Scan to download our Artis zee family brochure



Thank you for your enthusiasm!

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[siemens-healthineers.com](https://www.siemens-healthineers.com)

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