1 Fowkes FG, Rudan D, Rudan I, Aboyans V, Denenberg JO, McDermott MM, Norman PE, Sampson UK, Williams LJ, Mensah GA, Criqui MH. Comparison of global estimates of prevalence and risk factors for peripheral artery disease in 2000 and 2010: a systematic review and analysis. Lancet. 2013;382(9901):1329-40.

2 Hybrid atherectomy refers to the Phoenix family of products. 2.4 mm deflecting catheter is the only device with directional cutting ability.

3 Gutiérrez Castillo D1, San Norberto García EM, Fidalgo Domingos L, Fuente Garrido R, Estévez Fernández I, Vaquero Puerta C.[Incidence of contrast induced nephropathy in patients who underwent an aortic endovascular repair. Rev Port Cir Cardiotorac Vasc. 2015 Apr-Jun;22(2):101-107

4 S. Jens, Henk A. Marquering , Mark J. W. Koelemay, Jim A. Reekers. Perfusion Angiography of the Foot in Patients with Critical Limb Ischemia: Description of the Technique.

5 Tacher V, et al (2013). Image Guidance for Endovascular Repair of Complex Aortic Aneurysms: Comparison of Twodimensional and Three-dimensional Angiography and Image Fusion. J Vasc Interv Radiol, 24(11), 1698-1706. Doi: 10.1016/j.jvir.2013.07.016.

6 Sailer AM, et al (2014). CTA with fluoroscopy image fusion guidance in endovascular complex aortic aneurysm repair, Eur J Vasc Endovasc Surg. 2014 Apr;47(4):349-56. Doi: 10.1016/j.ejvs.2013.12.022.

7 Results are specific to the institution where they were obtained and may not reflect the results achievable at other institutions.

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How to reach us
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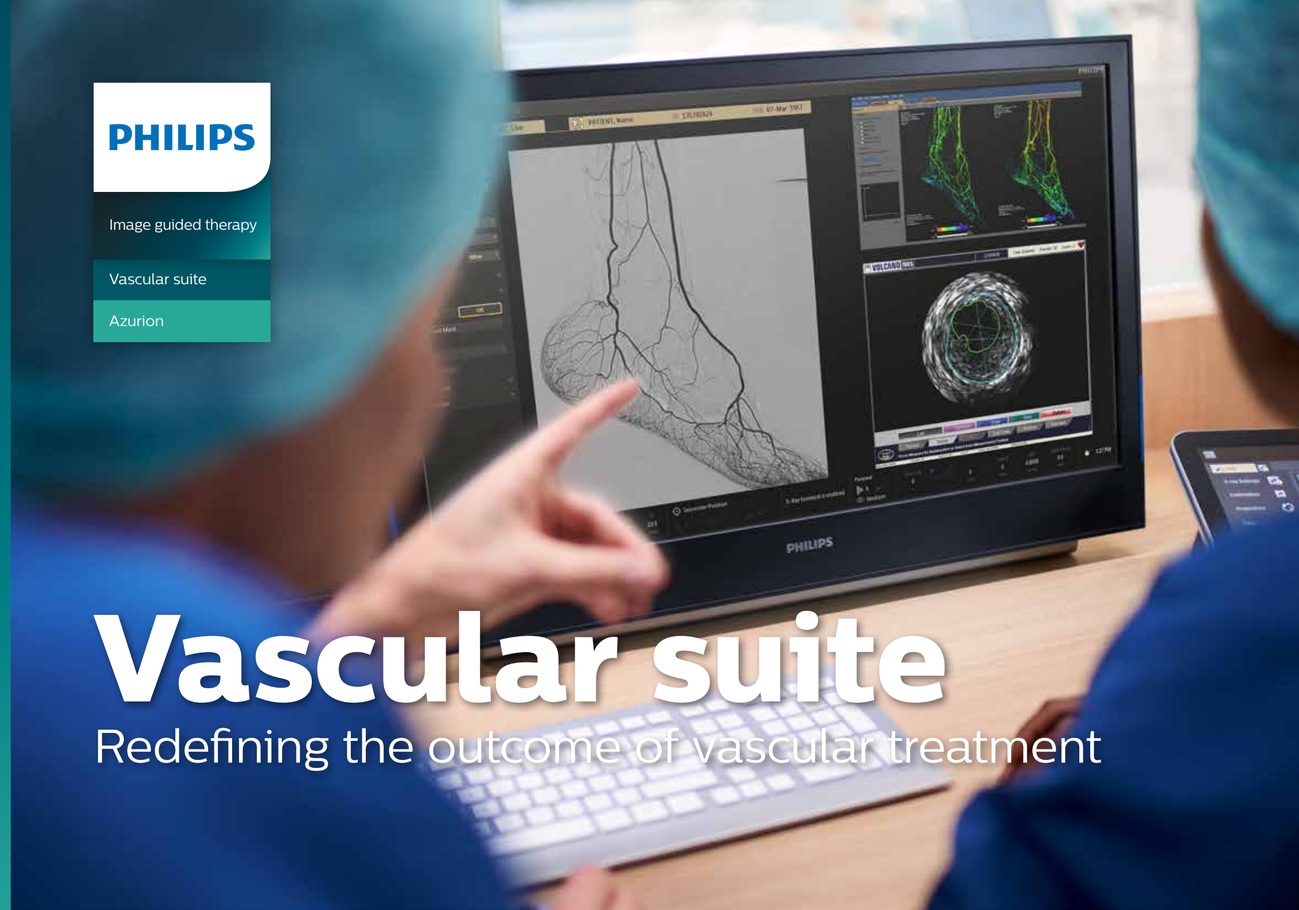
healthcare@philips.com

PHILIPS

Image guided therapy

Vascular suite

Azurion



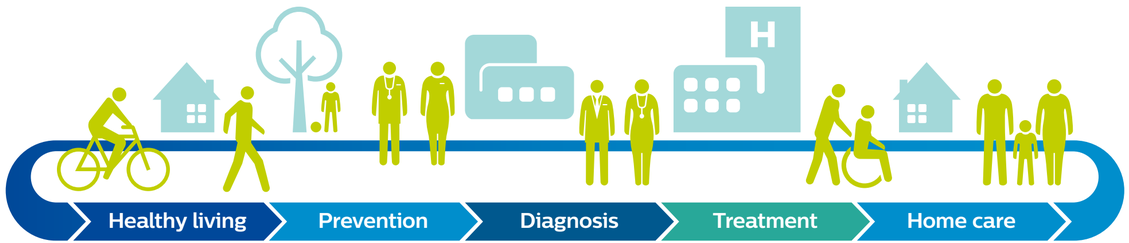
Vascular suite

Redefining the outcome of vascular treatment

Defining the future
of Image Guided Therapy

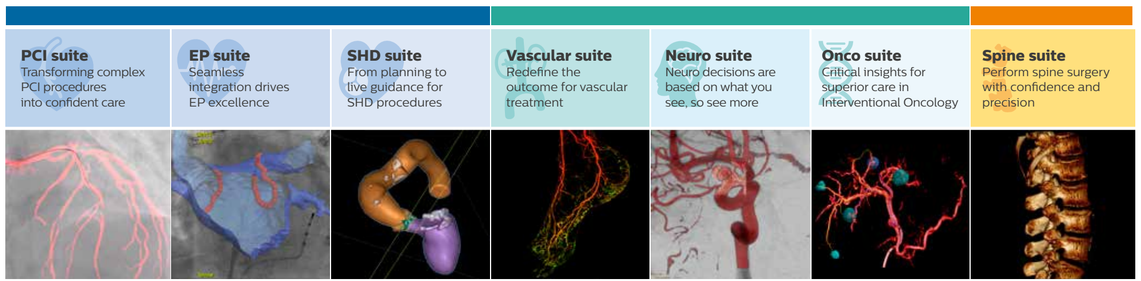
Innovative solutions across the health continuum
At Philips, we're here to support you in providing optimal care to your patients. Across the health continuum, we cover the full range of consumer and patient needs, from living healthily, to being diagnosed and treated for an illness, to recovery or chronic care at home. We look across the health continuum because when it comes to health, it's the only way you can see.

The areas of diagnosis and treatment are the focus of Philips Image Guided Therapy. They account for 70% of all healthcare costs, and this landscape is rapidly evolving. The expansion of interventional procedures and the development of new technologies continue to open up new possibilities and applications. This in turn opens the way for more targeted diagnosis and new, more complex treatment options.



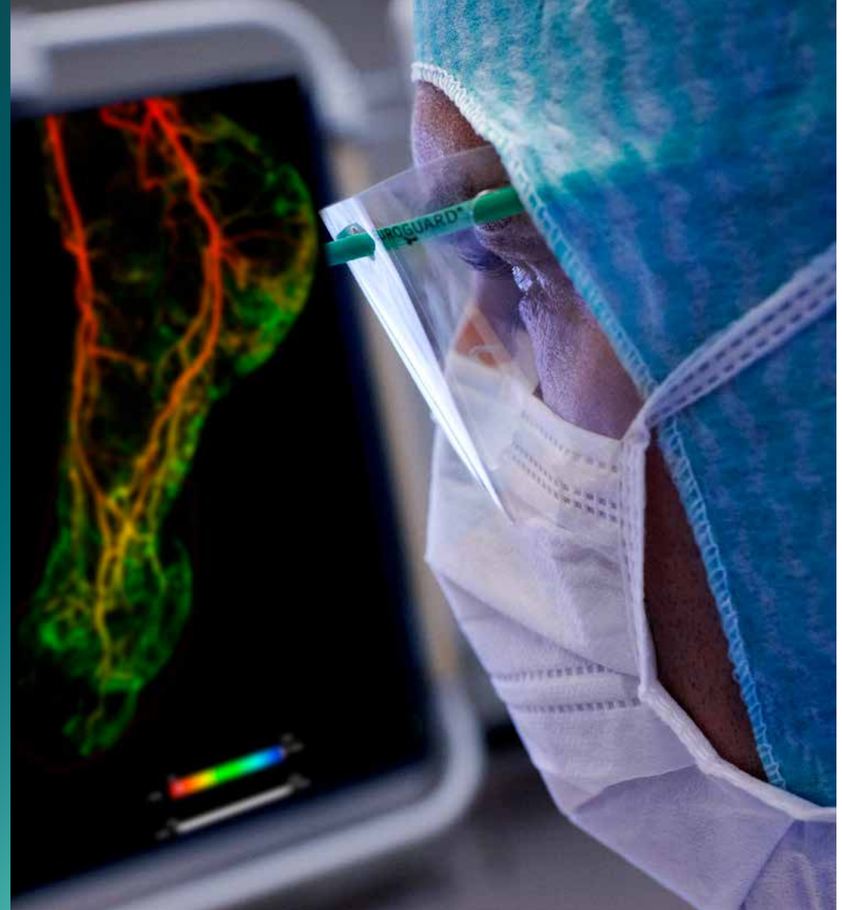
Clinical demands are getting more specific. So are we.
During an interventional procedure you are focused on making the best decisions you can for each patient. Each patient and each disease has very specific challenges, complexities, and needs. As the number of procedures and patients goes up, you can see the need for better forms of image guidance and interventional devices for effective treatment and decision making. At the same time, optimized workflows are key to improving efficiency. That's why we created clinical suites; a flexible portfolio of integrated technologies, devices and services for a broad range of interventional procedures.

Each of our clinical suites offers specific image guided therapy solutions to provide more choice and flexibility for exceptional care. So you can be confident in your performance and in the fact your patients are receiving exceptional care. Together we aim to create the future of image guided therapy.



Key benefits

- Making therapy simpler, more informative, and less invasive to promote confident decisions
- Supports standardization and consistency of vascular lab workflow to save time, money and reduce variability
- Excellent visibility at ultra low X-ray dose levels for a comprehensive range of clinical procedures with ClarityIQ technology.



Vascular suite

Redefining the outcome of vascular treatment

As a physician, you are confronted with an increasingly demanding and diverse landscape – inside or outside your treatment room.

To treat the growing epidemic of peripheral artery diseases, we see a clear need for standardization of endovascular treatment strategies. Real-time guidance is imperative during the procedure in selecting the correct vessel, device and pathway, but also to precisely position devices to improve outcomes and expand adoption of these interventions. For aortic disease, radiation exposure and contrast medium are a concern for elderly and otherwise frail patients. These procedures are lengthy and often unpredictable. Shorter procedures could reduce contrast medium and radiation exposure.

The Vascular suite has been designed to support diverse peripheral, aortic, visceral, arterial, and venous procedures. From restoring vessel patency and implanting a device to treating an aneurysm or occlusion – Vascular suite enables clinicians to deliver fast, effective, and simplified procedures.

Based upon the Azurion platform, Vascular suite supports increased confidence in decision-making and deployment of devices through dedicated interventional tools and a rich portfolio of relevant devices.

The tools provide remarkably detailed insights into anatomy, pathology, and perfusion during each phase of procedures as you decide, guide, treat, and confirm. Workflow innovations can support interventional teams in dramatically reducing overall procedure time and our technology enhances staff and patient safety by managing radiation and contrast dose efficiently.

With the Vascular suite, you have the innovations at hand that empower you to redefine outcomes for your vascular patients.

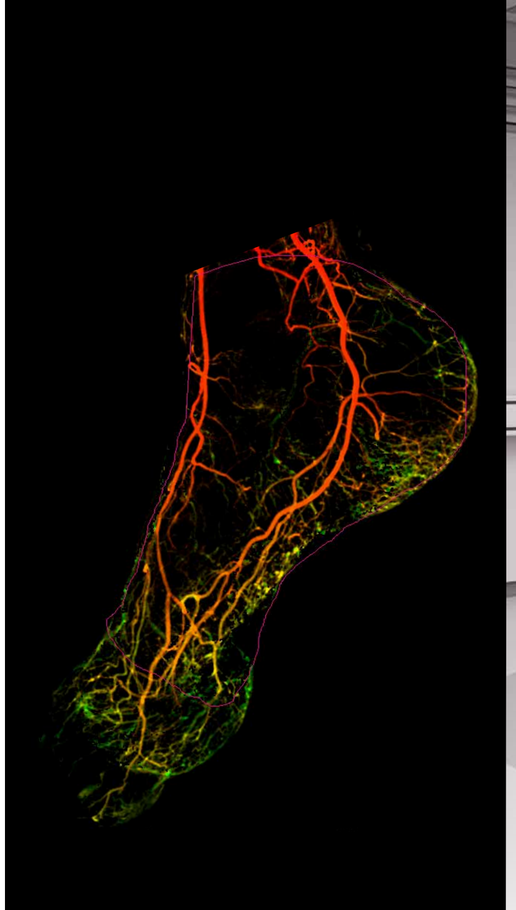
Peripheral artery disease

Focusing on standardization to redefine PAD outcomes

The number of people living with diabetes continues to climb,[1] bringing peripheral artery disease (PAD) and critical limb ischemia (CLI) interventions to epidemic levels. Today patients with PAD and CLI have more options, including endovascular interventions and below the knee procedures. This is in part due to new devices that are designed to make treatment more durable and facilitate retreatment – aspiring to leave nothing behind. To standardize this fast evolving landscape, the medical community and manufacturers are working towards the creation of evidence to answer clinical dilemma's and define novel guidelines. Philips participates actively to further standardization of CLI procedures from both the imaging and device perspectives.

Our Vascular suite provides workflow options, dedicated interventional tools, and relevant vascular devices to support high levels of standardization and redefine outcomes for your PAD patients. They support each step of your procedure – as you decide, guide, treat, and confirm.

Decide Guide Treat Confirm



Workflow options that optimize lab performance and dose management

ClarityIQ technology
Excellent visibility at ultra low X-ray dose levels for a comprehensive range of clinical procedures with ClarityIQ technology.

TSM and FlexVision Pro
CT patient information from external source (e.g. PACS database) readily at hand and controllable at table side

TSM and FlexVision Pro
Gives you full control of all system inputs including intravascular ultrasound (IVUS) and CX50 vascular ultrasound at tableside to save time and unnecessary walking in and out of the sterile area.

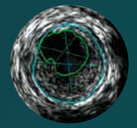
Zero Dose Positioning
Helps you manage dose by positioning the system or table on Last Image Hold so you can prepare your next run without using fluoroscopy.

Roadmap Pro
SmartMask provides a continuous real-time visualization of the leg as you navigate to the region of interest, making efficient use of iodinated contrast media and radiation dose.

With the ever growing number of PAD patients, Azurion offers a number of workflow innovations designed to help vascular teams work efficiently and consistently, while maintaining a single-minded focus on the patient and keeping radiation dose low during peripheral vascular interventions:

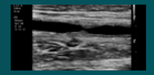
Peripheral artery disease

Effective guidance in treatment and decision making



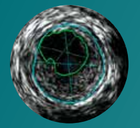
IVUS

Live X-Ray guidance



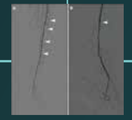
CX50 ultrasound system

Live X-ray guidance

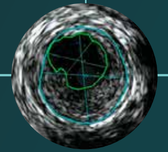


IVUS

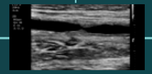
Decide



Live X-ray guidance
Live X-ray guidance with ClarityIQ technology creates high definition images of vessels with exceptional vascular detail to support precise treatment strategies, navigation, and follow-up.

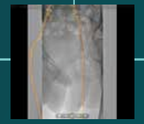


Intravascular ultrasound (IVUS) Identifying the correct vessel to treat is the goal during treatment planning. IVUS cross-sectional images compliment angiography and helps clinicians assess the presence and extent of disease, plaque geometry, and morphology.



CX50 ultrasound system
Premium image quality Ultrasound at table side to support determination of device location in relation to vessel structure.

Guide

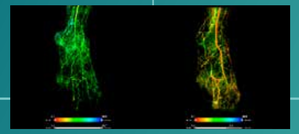


3D image guidance
3D Image guidance provides an intuitive and continuous 3D roadmap based on existing CTA and MRA dataset or a 3D rotational angiograhpy volume acquired in the angio suite overlayed on a live X-ray image. It provides insight into the exact position of the guide wire and catheter within the vessel during navigation. It offers a high level of precision thanks to real-time compensation for gantry, table, and small patient movements.

Treat

Philips IGT Devices
During treatment, you have to decide if it is safe to treat the lesion, and size and type of device should be used, and where to place the stent for best long term patency. Philips IGT Devices provides a portfolio of peripheral device solutions that allow you to personalize treatment decisions for each patient.

Confirm



2D Perfusion
How do you know if you have done enough?
2D Perfusion enables you to obtain stable, reliable, and instant information of the foot perfusion[3] while the patient is still on the table, to assess treatment effect. This image analysis tool provides functional information about tissue perfusion based on a digital subtraction angiography (DSA). You can compare perfusion characteristics in micro- and macro-circulation, pre- and post-intervention to quantify the effects of revascularization procedures immediately after the procedure.

2D Perfusion

Real-time results, instant assessment

A burning clinical need

When it comes to performing CLI procedures, there is a lack of guidelines for the optimal treatment approach.[1] Restoring vessel patency has not been shown a reliable predictor for clinical outcome -e.g., wound healing or improved symptoms.[2,3] Conversely, wound healing is known to also occur in patients that were not treated endovascularly.[3]

2D Perfusion imaging technology provides interventionalists with an objective understanding of the impact of their treatment to help determine the outcome of perfusion procedures.

Key benefits

- Compare perfusion characteristics in micro- and macro-circulation, pre-and post- intervention
- Obtain stable, reliable, and instant information of the foot perfusion[4]
- Instantly visualize and measure to assess treatment effects at a glance
- Supports determination of treatment endpoint

Case: Balloon Angioplasty of the distal Posterior Tibial Artery.

Patient:

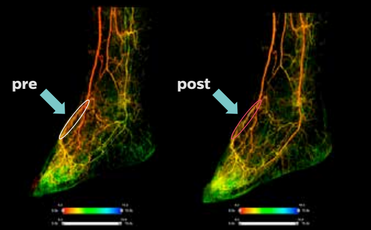
- 55 year old male
- Diabetic
- Critical Limb Ischemia
- Recent amputation of the 3rd toe, bad healing of the wound.
- Posterior tibial artery occluded and fibular (peroneal) artery is fragile but without significant stenoses.

Treatment:

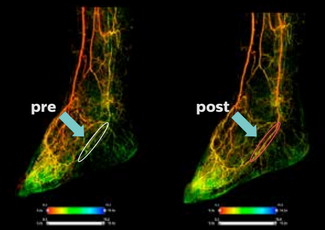
- Balloon Angioplasty of the distal part of the Posterior Tibial Artery.
- Peroneal Artery is too fragile to treat

"2D Perfusion angiography is a huge help in deciding when to end endovascular treatments"

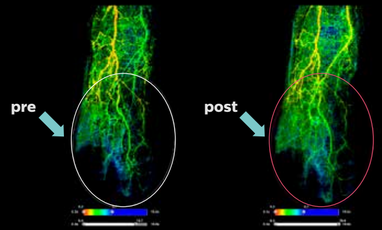
Prof. Jae Kyu Kim, MD & Nam Yeol Yim, MD - Chonnam National University Hospital, South Korea



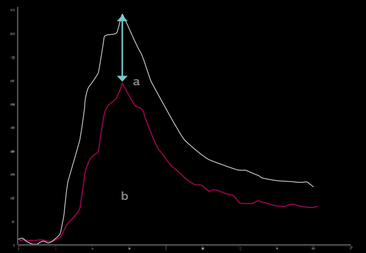
Stealing effect in Dorsalis Pedis Artery (DPA), based on pre and post comparison



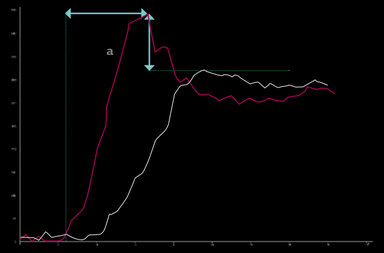
Posterior Tibial Artery (PTA) shows more and faster flow after treatment



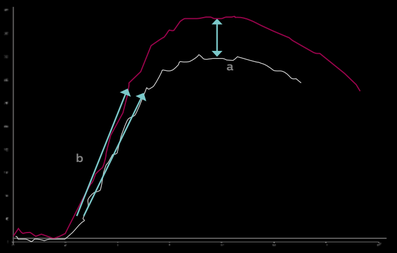
The forefoot is supplied with more blood after treatment



- Peak density drops after treatment in the DPA
- Area under curve reduces after treatment, indicating less blood to flow through the region of interest. This suggests a stealing effect due to opening of the PTA.



- Conversely to the effect in the DPA, the PTA perfusion has increased.



- Considering the whole forefoot, the perfusion characteristics have improved.

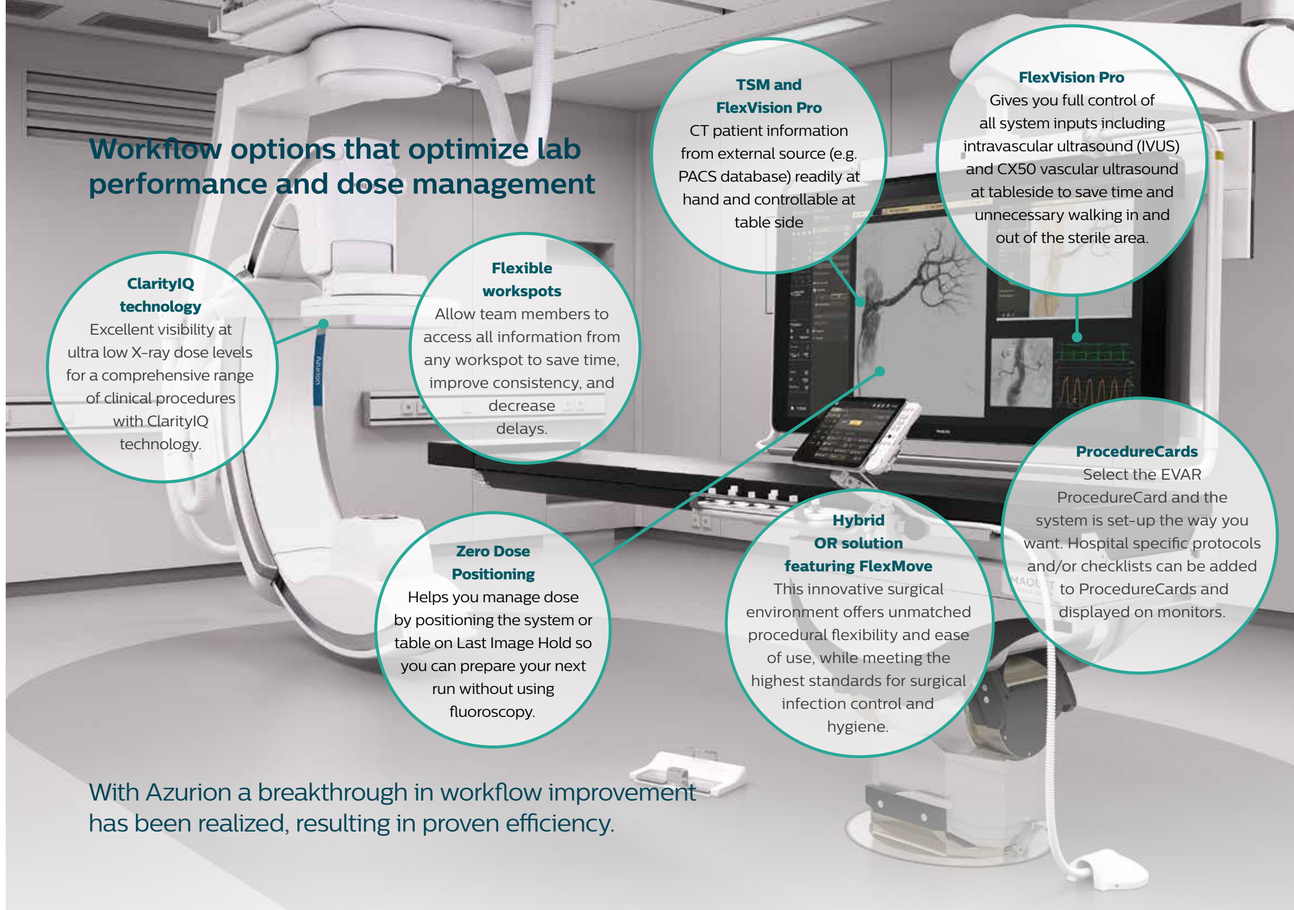
Aortic disease

Targeting efficiency to redefine aortic outcomes

Endovascular treatments of aortic diseases are becoming longer and addressing more complex anatomy. Radiation and contrast medium usage are a concern, specifically for elderly and health-impaired patients.

Contrast-induced nephropathy (CIN), in particular, has been associated with an increase in complications and prolonged hospital stay.[3] At the same time, modular stents are replacing expensive tailored stents to increase availability and cost-effectiveness of suitable grafts. Integrated imaging modalities are driving higher precision in treatment planning, guidance, and follow-up.In this dynamic area, there is a clear need for imaging technologies which improve accuracy, efficiency, and patient safety. Our Vascular suite offers premium workflow improvements and dedicated interventional tools to improve procedural efficiency and redefine outcomes for your patients with aortic disease.

Decide | Guide | Treat | Confirm



Aortic disease

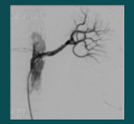
Superior care in Aortic procedures

Decide

VesselNavigator
Pre-operative CTA or MRA imported into VesselNavigator

Live X-ray guidance with ClarityIQ technology
Each patient has unique requirements when it comes to choosing the right device. 2D DSA with ClarityIQ technology generates high definition images of vessels with outstanding vascular detail to support precise treatment strategies, navigation, and follow-up.

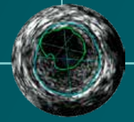
Guide



Live X-Ray guidance

CX50 ultrasound system
A realistic visualization of vasculature is required to effectively access the arterial system. Our integrated CX50 ultrasound system provides premium quality images of the radial artery and veins to support radial access interventions.

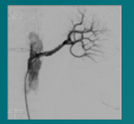
Treat



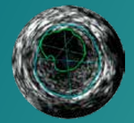
Intravascular ultrasound (IVUS)
IVUS cross-sectional images compliment angiography and helps clinicians assess the presence and extent of disease, plaque geometry, and morphology.

VesselNavigator
The goal during aortic procedures is to place endovascular stentgrafts, quickly and precisely, while using minimal radiation and contrast. VesselNavigator provides an intuitive and continuous 3D roadmap to guide you through vasculature during the entire procedure. This reduces the need for a contrast enhanced run to create a conventional roadmap. One study showed an average of 170 ml contrast reduction during endovascular repair of complex aortic aneurysms with the use of VesselNavigator CTA image fusion guidance.[5] A reduction in average procedure time from 6.3 to 5.2 (1.1) hours during FEVAR/BEVAR with VesselNavigator CTA image fusion guidance has been shown in a recent study.[6]

Confirm



Live X-Ray guidance



IVUS

XperCT Dual
With aortic repair, the detection and management of endoleaks is important while the patient is still on the table. XperCT Dual can visualize endoleak morphology. XperGuide enables percutaneous access for treatment with needle path planning and live fluoro overlay for placement.

VesselNavigator

Reduce your need for contrast medium

VesselNavigator allows image fusion of existing CTA or MRA vascular anatomical information with X-ray, to serve as a live 3D roadmap

VesselNavigator real-time navigation

VesselNavigator can be used for any type of endovascular procedure. It is especially beneficial for complex and tortuous vasculature where it is challenging to accurately navigate and place stents or for procedures where contrast use should be minimized.

Contrast medium usage and procedure efficiency

VesselNavigator's roadmap covers the entire MR or CT volume, so you can navigate through the entire vessel without needing to make contrast runs at each step of the procedure.

A study of 23 patients[5] has shown to reduce average contrast medium usage from 235 to 65 ml (72%) during endovascular repair of complex aortic aneurysms with the use of Philips CTA image fusion guidance. No intraprocedural contrast agent injection was required to create a roadmap.

Besides reducing contrast, VesselNavigator can reduce procedure time significantly. A study of 62 patients[6] showed an average reduction in procedure time from 6.3 to 5.2 hours during FEVAR/BEVAR procedures with the use of Philips CTA image fusion guidance.

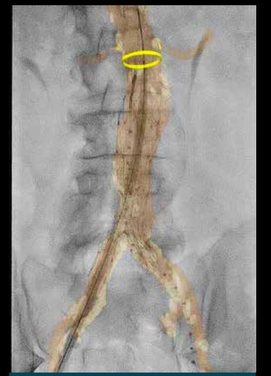
Key benefits

- Supports navigation through complex vessel structures, enhancing clinical outcomes
- A pre-acquired CTA or MRA reduces the need for contrast enhanced runs
- CTA Image Fusion Guidance may lead to shorter procedure times
- Intuitive and easy to use with step-by-step workflow guidance

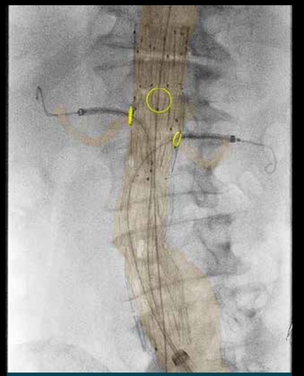
"After one month of usage, we have passed the point where the clinical value of VesselNavigator outweighs the investment we made."

Prof. Dr. F. Vermassen, University Hospital Ghent.

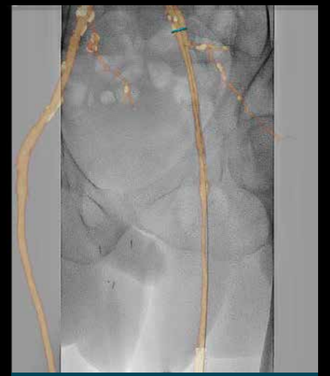
VesselNavigator provides three dimensional views of vasculature that allow you to easily define the right projection angle[2] for optimal navigation and stent placement. With the use of ring markers you can easily indicate the ostia and landing zones.



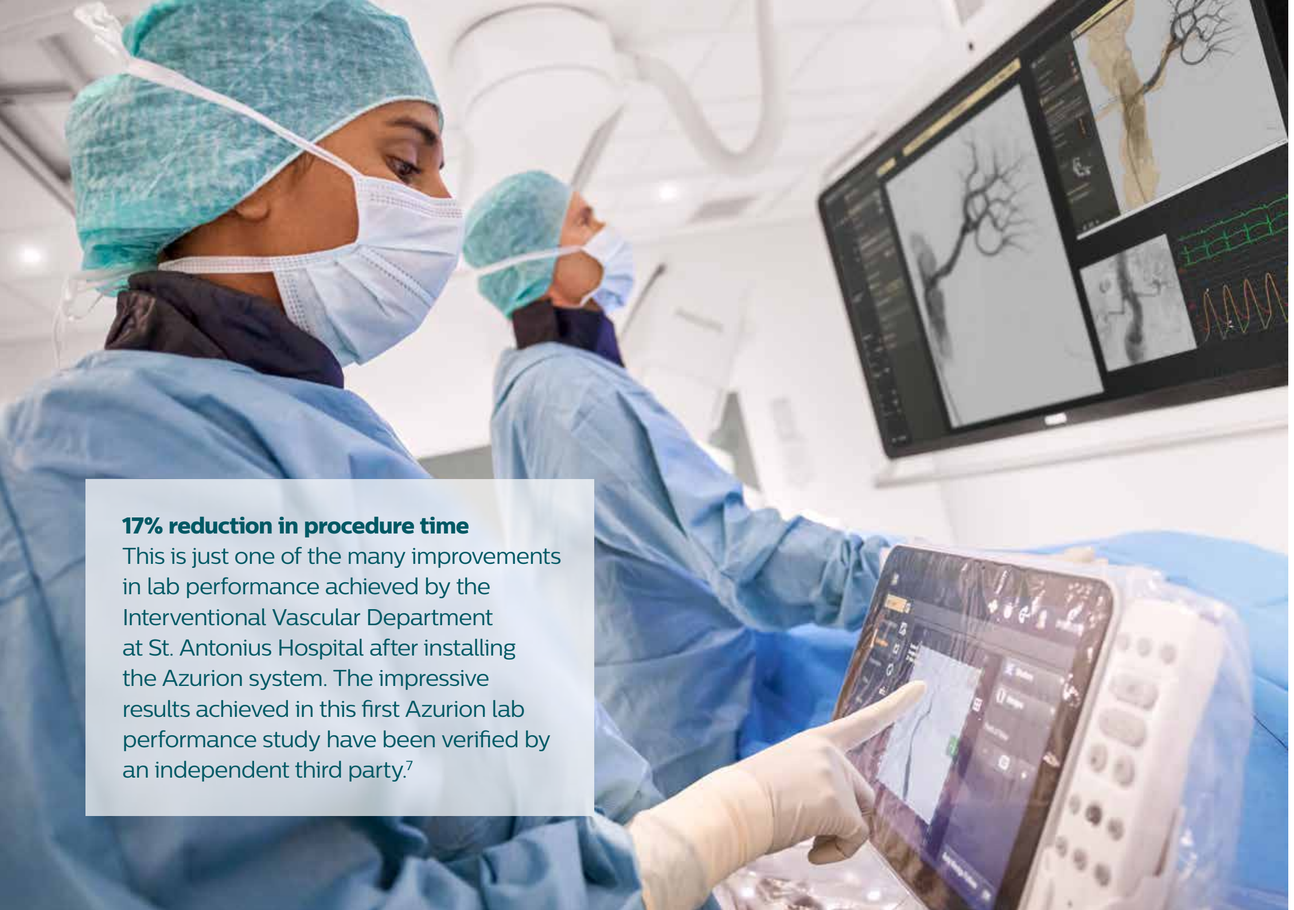
69Y/M, Endovascular aortic aneurysm repair
Contrast medium: 36 ml
Air Kerma: 410 mGy
Fluoro time: 11 min
Procedure time: 45 min
Courtesy of Prof. Dr. M. Schermerhorn



70Y/M, Endovascular repair of juxtarenal abdominal aortic aneurysm
Contrast medium: 115 ml
Air Kerma: 2165 mGy
Fluoro time: 57 min
Procedure time: 2:14 hours
Courtesy of Prof. Dr. M. Schermerhorn



71Y/M, lower left peripheral in stent restenosis
Contrast medium: 40 ml
Air Kerma: 86 mGy
Fluoro time: 7 min
Procedure time: 1:30 hours
Courtesy of Prof. Dr. F. Vermassen



17% reduction in procedure time
This is just one of the many improvements in lab performance achieved by the Interventional Vascular Department at St. Antonius Hospital after installing the Azurion system. The impressive results achieved in this first Azurion lab performance study have been verified by an independent third party.[7]

Vascular suite solutions

We offer a comprehensive range of options and support to help you realize a suite that fits your clinical and budgetary requirements. Our offerings also include advanced education, efficiency programs, and RightFit service agreements.

Our image guided therapy Vascular suite is a combination of the Azurion platform, interventional solutions, devices, workflow options, accessories, education, and services.

Over the past decade, we built extensive experience in integrating advanced x-ray imaging in a surgical environment. Azurion is a breakthrough platform that offers an unparalleled workflow experience. Combined with our intergration partners, advanced imaging, devices portfolio, training and services, we offer a premium Hybrid OR set-up that allows you to optimize performance and deliver superior care to your patients.

System platform
Azurion 3 F15, 7 C20, 7 C20 FlexMove
ClarityIQ technology

Vascular products
2D Perfusion
VesselNavigator
XperCT Dual
Open Trajectory
XperGuide
3DRA
3D Roadmap

Vascular devices
Pioneer Plus
Visions PV
Phoenix Atherectomy
Turbo-Power laser
Turbo-Elite laser
Turbo-Tandem catheter
Stellarex DCB
AngioSculpt

Integrated tools
CX50x Matrix ultrasound
Xper IM
IntelliSpace CardioVascular
DoseWise Portal
DoseAware

Integrated tables