



**PHILIPS**

Image guided therapy

Neuro suite

Azurion

# Neuro suite

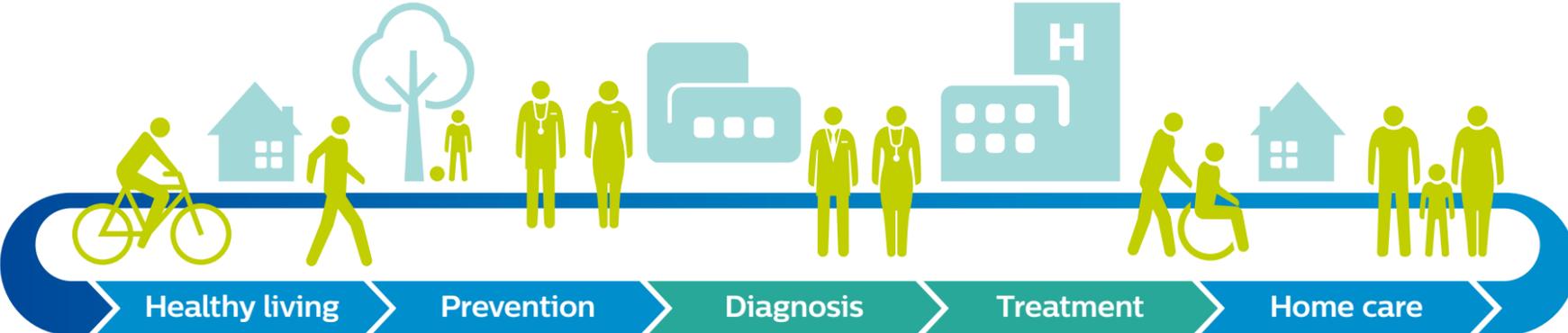
Neuro decisions are based on what you see,  
so see more

# Defining the future of Image Guided Therapy

At Philips, we look beyond technology to the experiences of patients, providers and caregivers across the health continuum, from healthy living to prevention, diagnosis, treatment and home care. We unlock insights leading to meaningful innovations from hospital to home.

Our integrated solutions – packaged suites of systems, smart devices, software and services – combine broad and deep clinical expertise, technology and services, actionable data, consultative new business models and partnerships. Together, with our customers, we can transform how care is delivered and experienced, to help deliver upon the Quadruple Aim: improved patient experience, better health outcomes, improved staff experience, and lower cost of care.

At Philips Image Guided Therapy, we have played a pioneering role in image-guided minimally invasive therapy for cardiovascular disease since the inception of the field back in the 1950s, thanks to our expertise in X-ray imaging systems. We aim to both improve existing procedures and introduce new procedures so that more patients can benefit from image-guided therapy. We also develop new business models to cater for new care settings, such as ambulatory surgery centers and office-based labs, and drive improved lab performance. Today our clinical partners benefit from complete procedural solutions to treat a wide range of diseases – from cardiovascular disease to stroke, cancer, and spine conditions.



**Clinical demands are getting more specific. So are we.**

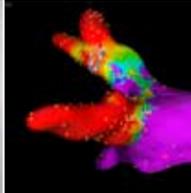
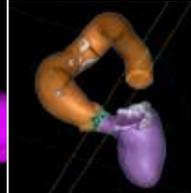
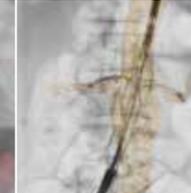
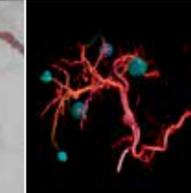
During an interventional procedure you are focused on making the best decisions you can for each patient. Each patient and each disease has very specific challenges, complexities, and needs. As the number of procedures and patients goes up, you can see the need for better forms of image guidance and 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.

## Introducing Clinical Suites

Helping to bring across our comprehensive clinical propositions

<p><b>Coronary suite</b> Transforming complex PCI procedures into confident care</p> 	<p><b>EP suite</b> Greater insight and confidence in EP procedures</p> 	<p><b>SHD suite</b> Confidence and Efficiency in Structural Heart Interventions</p> 	<p><b>CHD suite</b> Gentle care. Powerful insights.</p> 	<p><b>Vascular suite</b> Redefine outcomes for vascular treatment</p> 	<p><b>Neuro suite</b> Neuro decisions are based on what you see, so see more</p> 	<p><b>Onco suite</b> Critical insights for superior care in interventional oncology</p> 	<p><b>Lung suite</b> All-in-one diagnosis and treatment of lung cancer</p> 	<p><b>Spine suite</b> Perform spine surgery with confidence and precision</p> 
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# Neuro suite

Neuro decisions are based on what you see, so see more

The field of neuro intervention is changing rapidly as more diseases are treated with less invasive techniques. New devices offer new treatments, but smaller and less radio opaque devices also present new challenges when it comes to placement and treatment assessment.

Time is a critical aspect of clinical outcome in acute ischemic stroke treatment. To reduce the door-to-reperfusion time for these patients, we see the need for rapid triage and CT-like imaging in the interventional suite. In elective neuro interventions, such as cerebral aneurysm treatment, new, more complex devices become available. For this, quality imaging in 2D and 3D is essential for accurate treatment planning, device navigation, and assessment of device placement. During complex AVM procedures, real-time guidance is invaluable for developing the correct treatment plan and mitigating risk during the procedure.

Enter our Neuro suite. Based upon the Azurion platform, it's superior imaging puts you in firm control whether you're treating an acute stroke patient, visualizing the smallest intracranial vessels, precisely placing a flow diverter, or working slowly through a complex AVM. You can work with the confidence that comes from using sophisticated imaging technologies and neuro options that are the result of intensive research with clinical leaders and industry pioneers in neuro interventions.

Our Neuro suite with Azurion can simplify your workflow<sup>2</sup>, can help shorten procedure time, and manage radiation dose, and that means everything for your patients' care.



## Key benefits

- Supports high-precision diagnosis and treatment of ischemic stroke in the same room
- Enhances neuro workflow and patient handling to promote efficiency and consistency
- Displays vessel anatomy and device apposition to the lumen in never-before-seen detail
- Elevates treatment confidence with dynamic live image guidance through complex vascular lesions

## Be ready to take on new challenges in **ischemic stroke treatment**

The stroke landscape has changed dramatically in recent years based in part on the many studies that have shown the efficacy of thrombectomy in combination with iv-tPA as a first line treatment for ischemic stroke. The number of comprehensive stroke centers is rising rapidly, driven by better clinical outcomes and the logistical benefits compared to primary stroke centers. We are also seeing a shift from time-based to image-based patient selection for ischemic stroke treatment. As diagnostic imaging in the interventional suite becomes more sophisticated, we see opportunities for image-based patient selection to dramatically shorten stroke workflows.<sup>1</sup>

Our Neuro suite has been developed to address these trends. It provides workflow options, dedicated interventional neuro tools, and neuro accessories to support high levels of procedural efficiency and redefine outcomes for your stroke patients. The Azurion system supports each step of your procedure – as you decide, guide, treat, and confirm treatment results.

**12% reduction in in-lab preparation time supported by ProcedureCards<sup>2</sup>**

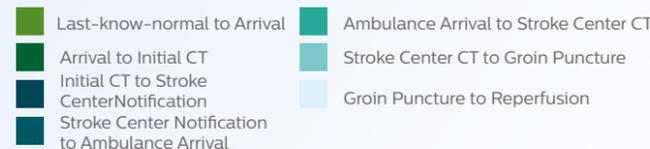
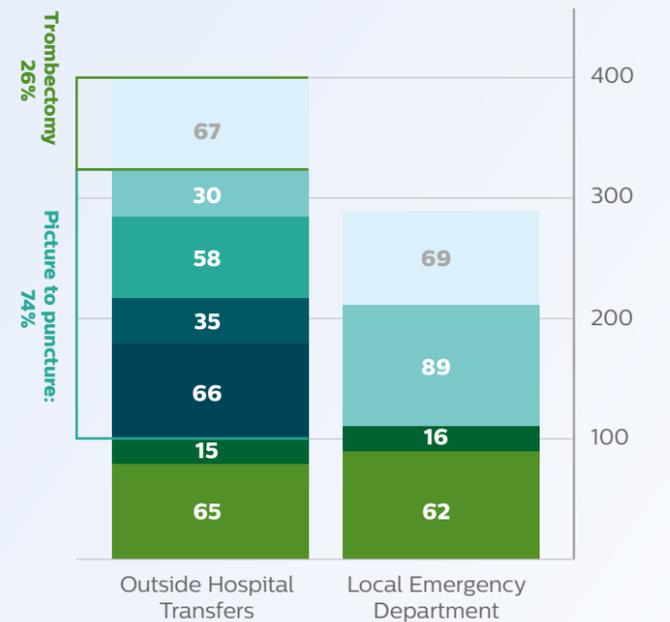


### Acute Ischemic Stroke

The need of rapid triage and intervention “Delays in the workflow cause onset-to-reperfusion times of multiple hours. Long imaging-to-groin puncture times contribute significantly to the total delay”.

#### Last known Normal To Reperfusion (min)

From Sun et al; Circulation, 2013 12; 127(10): 1139-48  
Data courtesy of Grady Memorial Hospital, Atlanta (GA)



## Workflow options that can help you optimize lab performance

**Neuro headrest**  
Can be used to restrain restless patients under conscious sedation to help reduce motion artefacts during the procedure

**Touch screen module Pro**  
Allows table side control of images and applications with tablet ease to save time and unnecessary walking in and out of the sterile area.

**Instant Parallel Working**  
Allows team members to work on different tasks at the same time without interrupting each other to shorten procedure times for critical stroke patients.

**FlexVision Pro**  
Gives you instant access and full control of pre-operative diagnostic scans, patient information, planning tools at table side.

**ProcedureCards**  
streamline and standardize system set-up and reduce preparation errors in acute ischemic stroke procedures. Hospital specific stroke protocols and/or checklists can be added

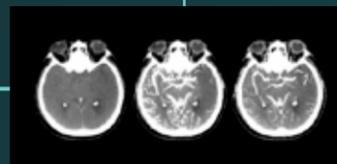
Azurion offers a number of workflow innovations designed to help on-call staff work efficiently and easily, while maintaining a single-minded focus on the patient during acute ischemic stroke interventions.

# Comprehensive diagnostic and treatment

support for ischemic stroke patients

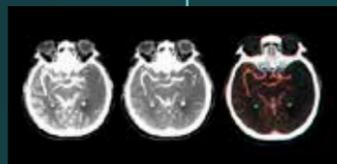
## Decide

Identify if the patient has an ischemic or hemorrhagic stroke, locate the affected area and assess the state of the penumbra and amount of salvageable tissue.



### Comprehensive stroke diagnosis based on three SmartCT Soft Tissue (CT-like) scans

- Non-contrast CBCT aids detection of early ischemic changes.
- Early phase CBCT helps to identify the proximal occlusion.
- Late phase contrast enhanced CBCT supports detection of collaterals.



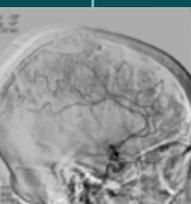
### Dual View to see collateral filling

Viewing early and late phase CBCT volumes side by side enhances identification of penumbra and enables visualization of collateral filling.



### SmartCT Vaso IV to check location and length of a clot

SmartCT Vaso IV allows visualization beyond the clot with peri-procedural imaging of the distal vessel aspects in ischemic stroke. By retrograde filling, vessel structures before and after the clot become visible. The SmartCT Vaso 3D roadmap can be used to visualize clot retrieval devices.

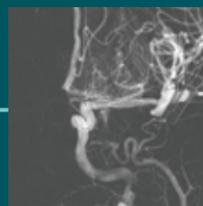


### Maintain sharp images using 2D DSA with ClarityIQ technology

## Guide and Treat

## Guide and Treat

When navigating and treating stroke pathology, clinicians need to be able to visualize the exact location of the clot and assess if and how the clot can be reached.



### Enhance visualization of vasculature with Roadmap Pro

This advanced double contrast roadmap helps enhance visualization of overlapping vessels while balancing radiation exposure to make informed decisions about whether the clot can be reached and which route to use.



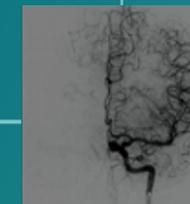
### Gain anatomical references with SmartCT Angio and Roadmap

The SmartCT Roadmap provides anatomical references to support precise navigation of guidewire, catheter, and device to the clot.

## Confirm

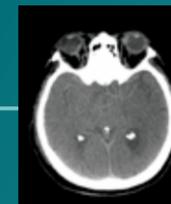
## Confirm

After stroke treatment, there is a need to confirm if all clot material has been removed and to check for bleedings while the patient is still in the interventional lab.



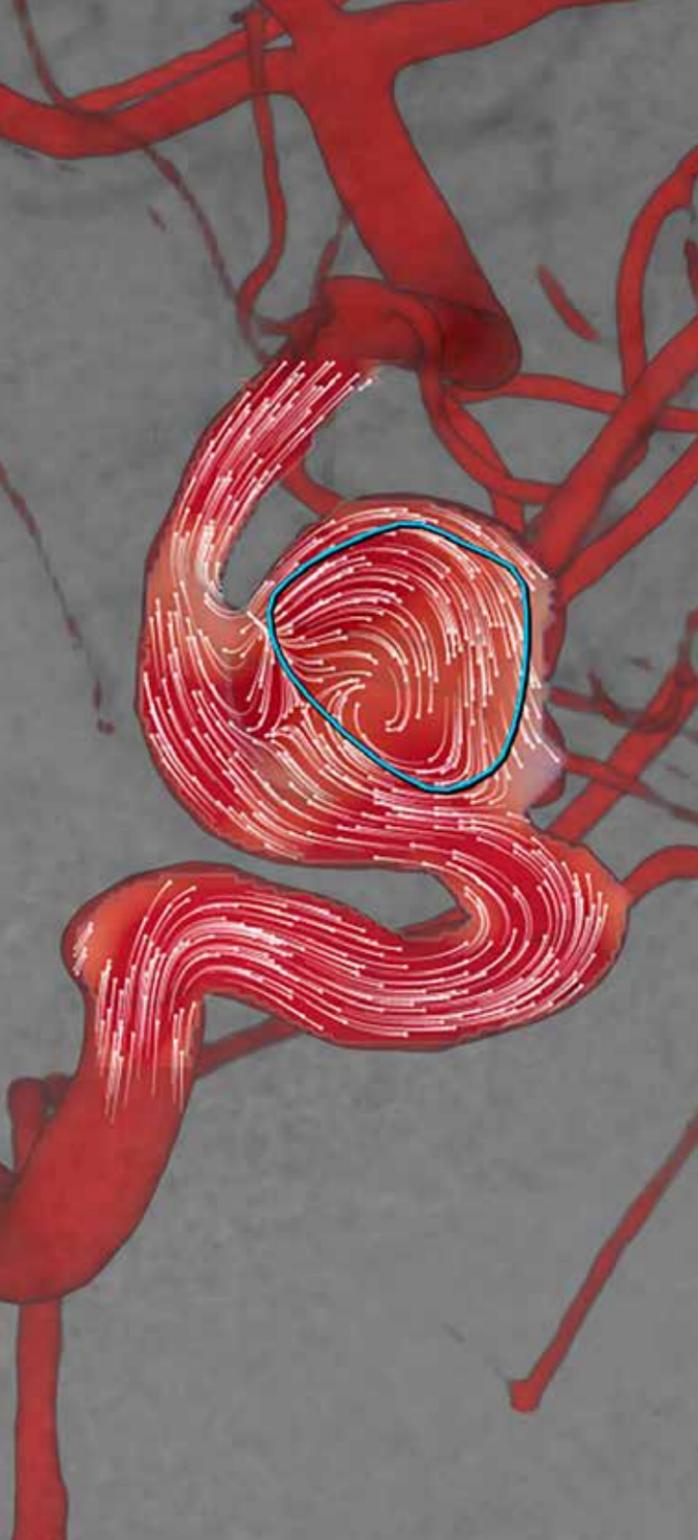
### Confirm treatment success with DSA run-off

High quality DSA visualizations allow you to assess if you have retrieved the complete clot and if pieces of clot have been dispersed distally in the brain. You can evaluate the restoration of blood flow to the penumbra and check for peri-procedure bleedings.



### Peri-procedure check of bleedings with SmartCT Soft Tissue

Use CBCT (CT-like) images in the Neuro suite to check treatment success and bleedings.



## See clearly and navigate effectively when **treating cerebral aneurysms**

Flow diverter (FD) stenting has become an established technique for treating cerebral aneurysms. New techniques and devices inspired by the flow diversion principle are being used more often, and new coil technologies are increasingly taking ground over traditional coiling. For bifurcation aneurysms, intrasaccular embolization devices are becoming mainstream. Visualizing these new, less opaque devices present new challenges during treatment planning and device placement. In this dynamic area, superb 2D and 3D imaging is crucial to guide treatment decisions and device placement, while managing radiation dose efficiently.

Neuro suite provides workflow options, dedicated neuro interventional tools, and neuro accessories to help improve procedural accuracy and reduce radiation exposure for staff and patients during aneurysm interventions. They support each step of your procedure – as you decide, guide, treat, and confirm treatment results.



## Innovative neuro interventional workflow

- ProcedureCards**  
Streamline and standardize system set-up and reduce preparation errors. Select the Aneurysm ProcedureCard and the system is set-up the way you want. Hospital specific aneurysm protocols and/or checklists can be added to ProcedureCards and displayed on monitors to support consistent workflow.
- 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.
- Neuro headrest**  
Can be used to help reduce motion artefacts during the procedure.
- Clarity IQ**  
ClarityIQ technology provides high quality imaging for a comprehensive range of clinical procedures, achieving excellent visibility at low X-ray dose levels for patients of all sizes.
- Touch screen module Pro**  
Easily review large data sets from table side with the tablet ease of the Touch Screen Module Pro. Collimate on clinical images with a fingertip and pinch, zoom, pan and flag images for processing.
- Full table side control with FlexVision Pro**  
FlexVision Pro gives you full control of all connected applications and interventional tools at table side to save time and unnecessary walking in and out of the sterile area.

Our Neuro suite with Azurion offers a number of workflow innovations designed to simplify your workflow, shorten procedure time, and manage radiation dose during aneurysm interventions:

# Clinical solutions

that support efficient decision making and treatment of cerebral aneurysms

## Decide

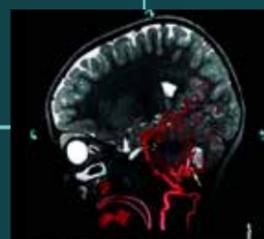
Obtain insight in the vasculature and visualize the location, size and neck of the aneurysm to optimize treatment planning.



**3D visualization of tortuous pathologies with SmartCT Angio**  
SmartCT Angio (3D-RA) provides a volumetric view in a few seconds\* to assist with assessment of location, size, neck, and severity of aneurysm for treatment planning. 3D-RA also provides high spatial resolution volumes and automatically compensates for patient movement.

## Decide

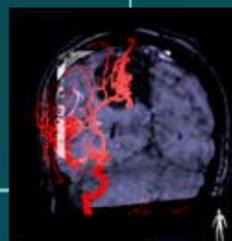
**Visualize lesion boundaries and corresponding vascularization with MR-CT Roadmap**  
Use a previously acquired CT angio or MR angio scan and overlay it with live fluoroscopy to visualize lesion boundaries and corresponding vascularization for risk assessment. Re-using pre-acquired data helps you manage X-ray dose and contrast medium.



## Guide

### Guide and Treat

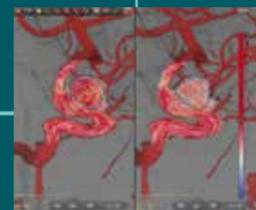
New technologies and devices make it more challenging than ever to efficiently navigate to the feeding vessel and accurately position devices - all while avoiding arterial dissection and spasms and managing contrast agent and radiation use.



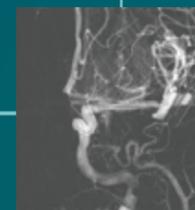
**Dynamic 3D image guidance through neurovascular structures with SmartCT Roadmap**  
SmartCT Roadmap enhances visualization of overlapping vessels to support precise navigation of guidewire and catheter through complex vasculature. Offers a high level of precision with real-time compensation for gantry, table, and small patient movements.

## Treat

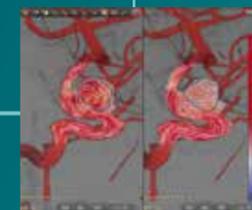
**Visualize blood flow patterns with Aneurysm Flow**  
Visualize and quantify blood flow patterns in the parent vessel and aneurysm sac to obtain key information that can assist deployment of flow diverters and other embolization devices.



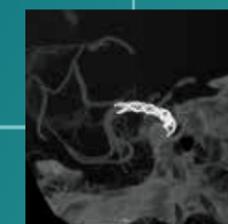
**Enhance visualization of cerebral vasculature with Roadmap Pro**  
This advanced roadmap helps enhance visualization of overlapping vessels while balancing radiation exposure. It can be customized to see advancement during coil placement.



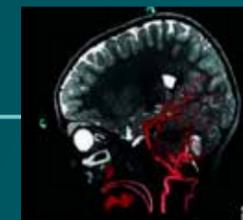
**Post-treatment flow calculations with AneurysmFlow**  
Evaluate changes in blood flow in the aneurysm pre and post, by calculating the change in Mean Aneurysm Flow Amplitude (MAFA ratio) before and after flow diverter placement.



**Enhance imaging of vessels in the brain with SmartCT Vaso IA**  
SmartCT Vaso is an acquisition technique that combines a high resolution CBCT with a contrast injection to enhance visualization of endovascular stents, flow diverters, and other devices and of vessel morphology down to the perforator level. It is increasingly used for follow-up of aneurysms treated with flow-diverter stents to check device positioning.



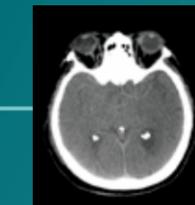
**Support accurate guidance of devices with MR-CT Roadmap**  
Visualize lesion boundaries and corresponding vascularization to enhance accurate navigation through challenging pathologies, while reducing unnecessary contrast and manage X-ray dose.



### Confirm

After aneurysm treatment, check proper device placement and deployment in the context of the feeding vessel, the neck, and the sac of the aneurysm. Efficiently measure the effect of the device placed and check for possible arterial dissections while the patient is still on the table

**Peri-procedure check of bleedings with SmartCT Soft Tissue**  
Use CBCT (CT-like) images in the Neuro suite to check treatment success and identify bleedings.



## Confirm

\*3D reconstructions at higher resolution settings may take longer times.

# SmartCT- Experience easy 3D visualization and measurement to enhance interventional confidence

The Philips Image Guided Therapy clinical application software SmartCT, to be used at the Azurion image guided therapy platform, enriches our exceptional 3D interventional tools with clear guidance that is designed to remove the barriers to acquiring 3D images in the interventional lab

SmartCT supports state of the art quality of care regardless of the user's level of experience with 3D imaging<sup>3</sup>. Via the touch screen at the table, you can access clinically tailored 3D acquisition protocols and advanced visualization and measurement tools that depict the type and extent of disease with great detail.

## Empowers you to easily adopt 3D imaging

- Easy room preparation to help position equipment and the Azurion system for a 3D acquisition
- Easy protocol selection via pictorials
- Injection protocol suggestion based on literature
- Easy isocentering with visual feedback to confirm your field of view position without using X-ray dose<sup>5</sup>
- Easy 3D acquisition – you know when acquisition is completed and you can release the push button or pedal

**100%** of customers found that controlling SmartCT is intuitive and easy to learn<sup>4</sup>

**88%** believe they can have more focus on their patient – thanks to full table side control with the touch screen module<sup>4</sup>



## Provide superb care

Increases clinical confidence for diverse vascular procedures with advanced 3D imaging, visualization and measurement tools.



## Optimize lab performance

Easily control advanced 3D acquisition, visualization and measurements at table side to improve lab flexibility and efficiency.



## Outstanding user experience

Acquire 3D images and interact with all SmartCT 3D features in a more natural and effortless way.



### SmartCT Angio

This X-ray acquisition technique generates a complete high-resolution 3D visualization of cerebral vasculature from a single rotational angiography run – all controlled via the touch screen at the table. This can improve visibility of tortuous or complex anatomy.

#### Key benefits:

- 3D visualization of vascular pathologies from a single rotational angiography X-ray acquisition
- Improve visibility of vasculature in cerebral anatomies
- Acquire and interact with 3D imaging at table side



### SmartCT Soft Tissue

SmartCT Soft Tissue offers a Cone Beam CT (CBCT) acquisition technique augmented with step-by-step guidance. Advanced 3D visualization and measurement tools are accessed on the touch screen module at table side. To support you in acquiring CBCT images first-time right<sup>4</sup> and to streamline your workflow, you are guided through key steps. Once the CBCT scan has been successfully performed, the acquired 3D image is automatically displayed in the SmartCT 3D visualization tool with the appropriate rendering settings and the 3D measurement tools tailored for the selected 3D protocol.

#### Key benefits:

- Step-by-step guidance technique to simplify cone-beam CT acquisition
- Interact with your CBCT image at table side on the touch screen module
- Access advanced 3D measurements at table side on the touch screen module



### SmartCT Roadmap

SmartCT Roadmap facilitates complex neuro vascular interventions by providing live 3D image guidance that can be segmented to emphasize target vessel and lesions, aiding guidewire and catheter navigation through complex vessel structures. All controlled via the touch screen at the table.

#### Key benefits:

- Real-time 3D guidance tool
- Adapts to position changes in real-time
- Variable settings to enhance visualization



### SmartCT Vaso

This technique provides high resolution 3D imaging that reveals key information about cerebral vascular structures to support the highest possible spatial assessment of vessels in the soft tissue context.

#### Key benefits:

- Step-to-step acquisition technique offers guidance to simplify 3D imaging
- Allows direct image inspection with advanced 3D visualization at table side
- Supports peri-procedure check of positioning of flow-diverter stents



# Create your perfect Neuro suite

## System platform

Azurion 7 B20/15, 7 C20  
ClarityIQ technology

## Dedicated neuro products

AneurysmFlow  
SmartCT Angio  
SmartCT Roadmap  
SmartCT Soft Tissue  
SmartCT Vaso  
XperGuide

## Integrated tools

CX50x Matrix ultrasound  
DoseWise Portal  
DoseAware

## Accessories

Neuro head holder  
Neuro table top

## Integrated tables

Our image guided therapy Neuro suite is the result of our ongoing investment in neurovascular imaging technology and our partnerships with clinical leaders and industry pioneers on research and clinical studies to support more informed decision making for neurovascular interventions. Neuro suite is a combination of the Azurion platform, interventional solutions, workflow options, accessories, education, and services. We also offer room solutions and support to create a leading-edge Hybrid OR. Since all solutions are integrated, you have the flexibility to configure a treatment environment that matches your clinical challenges and requirements.

### Azurion – one platform, an endless array of clinical possibilities

Based on the three principles of superior care, lab performance, and unique user experience, Azurion helps to provide a consistent standardization of care. Backed by our clinical suites, it's an invaluable platform to improve workflows and provide new treatment options.

### What makes Azurion so unique?

With its wide range of intervention tools, Azurion is designed to help you perform procedures more efficiently and consistently with fewer complications. It also offers greater user customization and control over every aspect of interventions.



# Increase value

throughout your Neuro Suite lifecycle

## Stay clinically and operationally relevant with Technology Maximizer

To keep your Image Guided Therapy Suite state-of-art with regards to cyber security, clinical, and operational advancements, subscribe to IGT Technology Maximizer – Plus, Pro or Premium offer – for a standard duration of 4 years at point of sale.

Technology Maximizer secures all your eligible Philips imaging equipment with the same technology release level reducing maintenance complexity and simplifying lifecycle management across hospital departments. Maintain peace of mind with imaging equipment that is always up to date, and enhance patient care knowing you will always be first to take advantage of technology innovations.

### Learn more about Technology Maximizer



#### Standard offer

Technology Maximizer Plus

#### Mid-level offer

Technology Maximizer Pro

#### Premium offer

Technology Maximizer Premium Cardiac/Vascular

	Azurion system SW version upgrade	✓	✓	✓
	State-of-the-art security	✓	✓	✓
	Latest available Operation System	✓	✓	✓
	Computer HW refresh to support software upgrade	✓	✓	✓
	Application training for new or enhanced functionality (days)	1	2	2
	New version of existing iApps	✓	✓	✓
	Future iApps in one clinical suite (Coronary, EP, SHD, Vascular, Neuro, Onco, Spine or Lung)	✓	✓	
	Future iApps in one clinical domain (Cardiac or Vascular)			✓

- 1 Ribo M, et al. (2017) Direct transfer to angiosuite to reduce door-to-puncture time in thrombectomy for acute stroke. J Neurointerv Surg. 2017 Apr 26. pii: neurintsurg-2017-013038. doi: 10.1136/neurintsurg-2017-013038.
- 2 The results achieved in this first Azurion lab performance study have been verified by an independent third party. Results are specific to the institution where they were obtained (St. Antonius hospital, Nieuwegein, The Netherlands) and may not reflect the results achievable at other institutions.
- 3 The user level of expertise required is described in the Instructions for Use as the Intended Operator Profile.
- 4 Evaluated with clinical users in a simulated lab environment with a total of 17 teams consisting of a physician and a radio-tech with different levels of experience.
- 5 It is the operator's responsibility to select the appropriate contrast agent depending on the clinical application. For more information about the indications for use of the contrast agent, refer to the instructions for use of the applicable contrast agent.

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