PHILIPS

VesselNavigator

Endovascular procedures

Making the difference
with Live Image Guidance

Key benefits
Supports navigation through complex vessel structures, enhancing clinical outcomes
Use a pre-acquired CTA or MRA
Designed to be intuitive and easy to use by providing step-by-step workflow guidance

Our Live Image Guidance intuitively integrates multi-modality imaging and workflow guidance to help you open doors to new procedures and techniques, and deliver important clinical value where it's needed most – at the point of patient treatment.

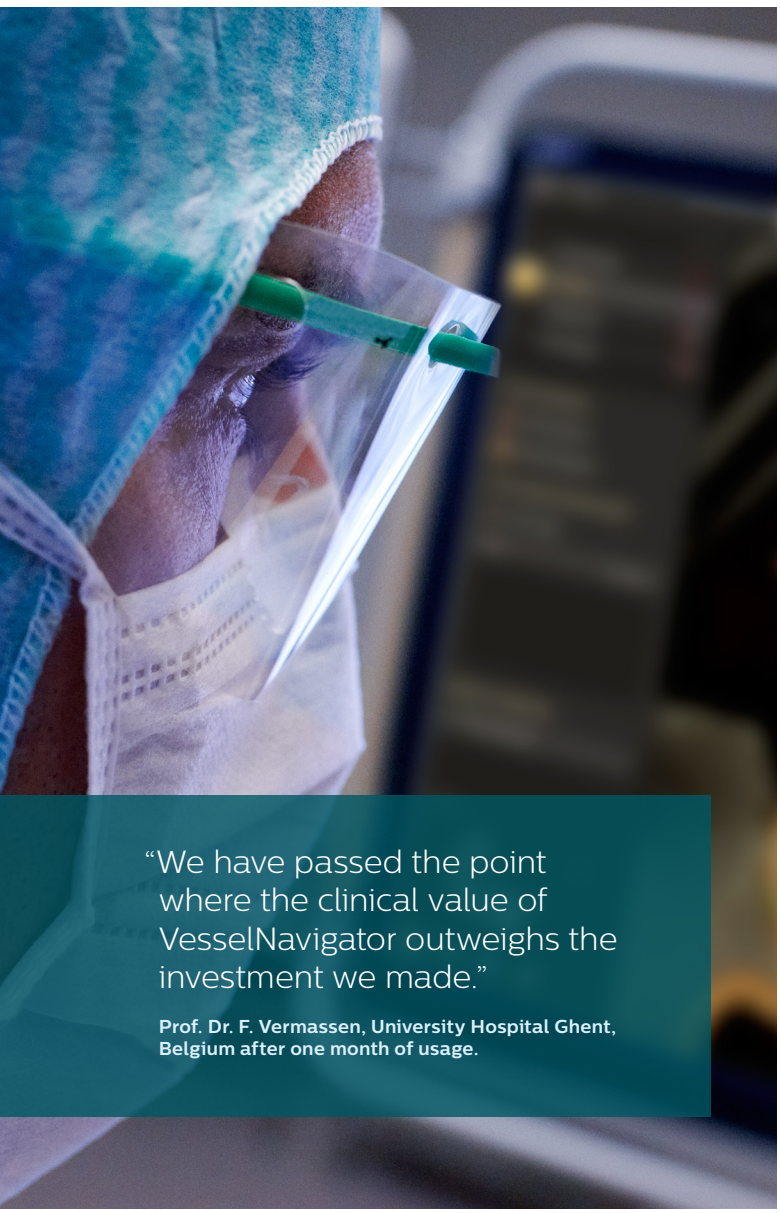
When delicately navigating a guidewire or inserting a stent in challenging endovasculature, seeing the full perspective of anatomy is crucial. Using X-ray and contrast medium efficiently is also very important, especially for vulnerable patients. We've designed VesselNavigator to help you meet these challenges. Its images are your three dimensional compass during endovascular procedures. They allow surgeons and interventionalists to plan, perform, and follow-up procedures with confidence.

VesselNavigator, Philips next generation image fusion technology, allows reuse of 3D vascular anatomical information from existing CTA and MRA datasets as a 3D roadmap overlay on a live X-ray image. With its excellent visualization, VesselNavigator provides an intuitive and continuous 3D roadmap to guide you through vasculature during the entire procedure.

Intuitive and accurate 3D guidance

Greater insight and confidence in finding and treating the problem

Our Live Image Guidance expands clinical capabilities through intelligent and intuitive integration of multi-modality images at the point of treatment, enabling confident diagnosis and real-time therapy monitoring.



3D image fusion in advanced endovascular procedures

Studies[1,2] have shown that a 3D perspective of anatomy is desirable for catheter guidance and device placement because of its advantages over 2D imaging. Previously acquired diagnostic CTA and MRA datasets show the 3D anatomical structure of vasculature, in a way that's similar to an open surgery view.

Now with VesselNavigator clinicians can easily segment the 3D vessel structures from these datasets and fuse them with the 2D fluoroscopy image to get the 3D perspective of anatomy in the X-ray image.

VesselNavigator real-time navigation

VesselNavigator can be used for many types 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.

VesselNavigator's 3D image fusion offers numerous advantages compared to 2D imaging and 3D roadmap alone:

Real-time navigation supports confident decisions during procedures

Unlike 2D angiography images which can be limited by vessel superpositioning or foreshortening,[1] VesselNavigator provides three dimensional views of vasculature that allow you to easily define the right projection angle[2] for navigation and stent placement. With the use of ring markers you can easily indicate the ostia and landing zones.

Lower barriers
for minimally invasive interventions

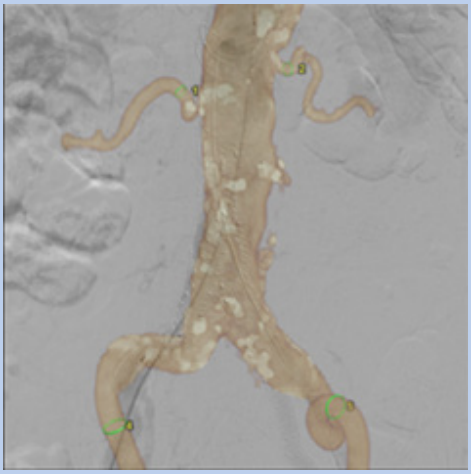


Figure 1: 3D anatomy fused with live 2D image. Courtesy of Prof. Dr. J. Brunkwall

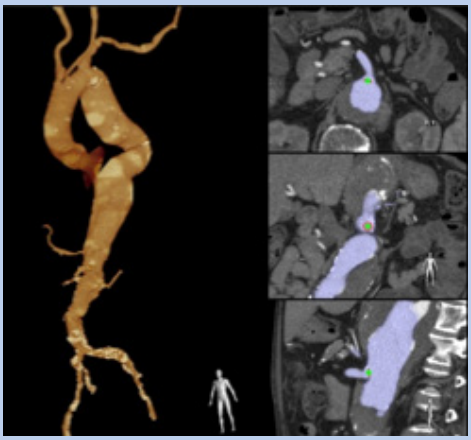
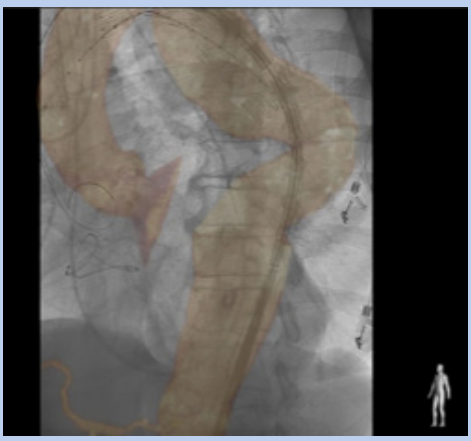


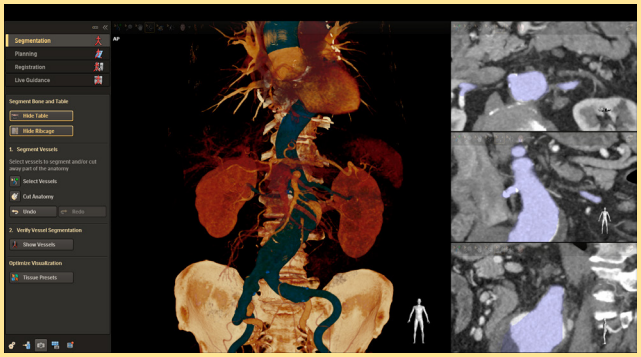
Figure 2: One-click segmentation of aorta and relevant side branches. At the right side CT orthogonal cross sections of selected side branch for accurate ring marker placement



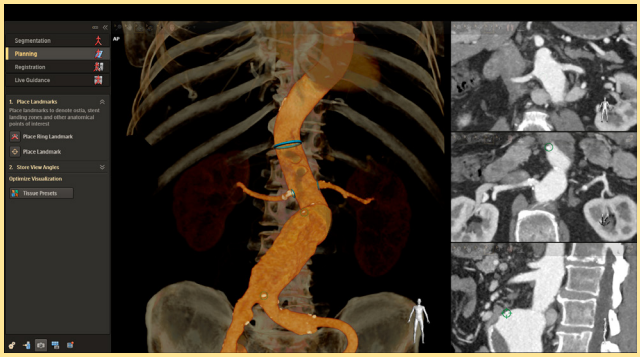
Figured 3: Snapshot recorded during live three-dimensional navigation with VesselNavigator. Live fluoroscopy was superimposed on a preacquired CTA dataset, showing the deployment of the stent graft in the aneurysm of the thoracic aorta. Courtesy of Prof. Dr. J. Brunkwall

Better user experience
to promote consistency and efficiency

We are committed to optimizing the user experience to support clinicians in each of their procedures by combining disease centric tools, patient data, and procedural protocols in a single suite.

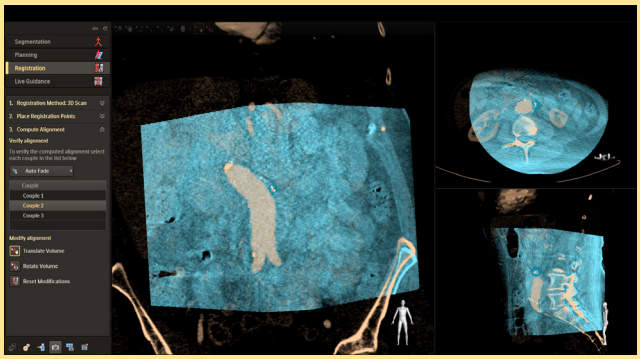


1: Select vessels for overlay with a one-click vessel segmentation

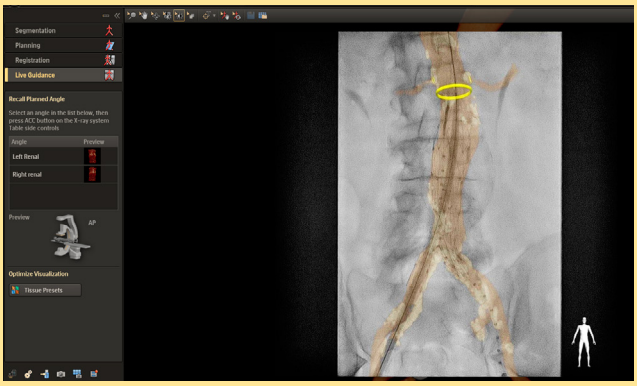


2: Add ring markers for ostia and landing zone indication and to define planning angles

3a. Fuse the CT or MR dataset with the 2D images by matching bony landmarks on two fluoroscopy or X-ray runs



3b. Fuse the CT or MR dataset with the 3D images by selecting three points in both datasets



4: Start with live 3D image guidance

Step-by-step use

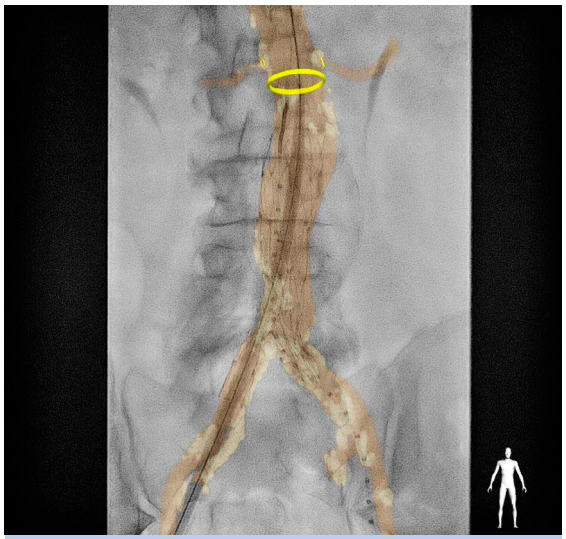
stay focused on your patient

During a procedure it is critical to maintain full focus on the patient and the treatment. So the step-by-step use of VesselNavigator is of utmost importance. 3D navigation should be easy to use for all clinicians, no matter what level of experience they have with image fusion. Through its advanced imaging capabilities, VesselNavigator is the tool that creates a seamless clinical workflow. It guides you through four simple steps:

1: Select the vessels for overlay with a one-click vessel segmentation
2: Add ring markers for ostia and landing zone indication and define planning angles
3a: Fuse the CT or MR dataset with the 2D images by mapping on bone structures or
3b: Fuse the CT or MR dataset with the 3D images by selecting three points in each dataset
4: The fused image can now be used as Live Image Guidance during the procedure

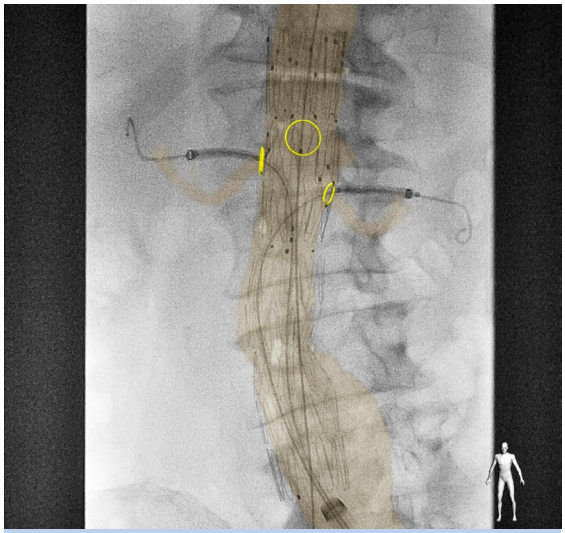
During the procedure VesselNavigator provides a real-time overlay in any projection and any table and system position. You can also choose from a variety of excellent volume rendering visualization options, customizable per physician preference.

Case gallery



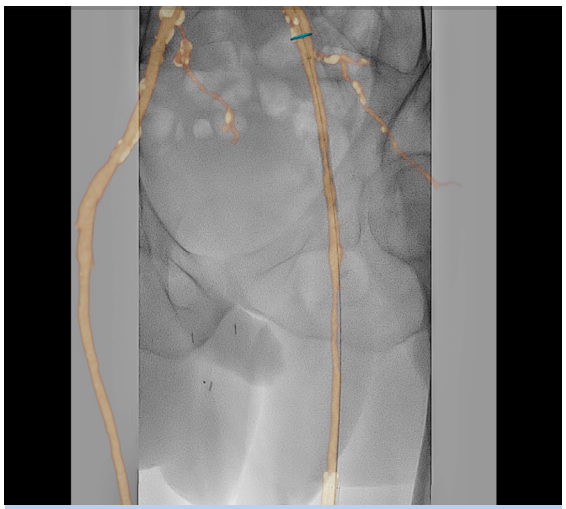
69Y/M, Endovascular aortic aneurysm repair
Contrast medium: 36 ml
Air Kerma: 410 mGy
Fluoro time: 11 min
Procedure time: 45 min

Courtesy of Prof. Dr. M. Schermerhorn



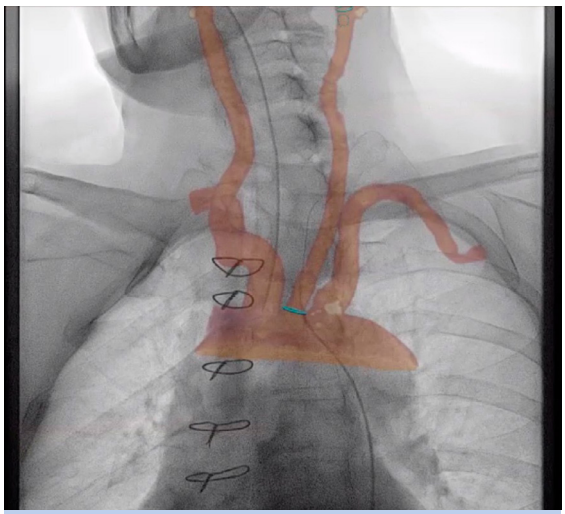
70Y/M, Endovascular repair of juxtarenal abdominal aortic aneurysm
Contrast medium: 115 ml
Air Kerma: 2165 mGy
Fluoro time: 57 min
Procedure time: 2:14 hours

Courtesy of Prof. Dr. M. Schermerhorn



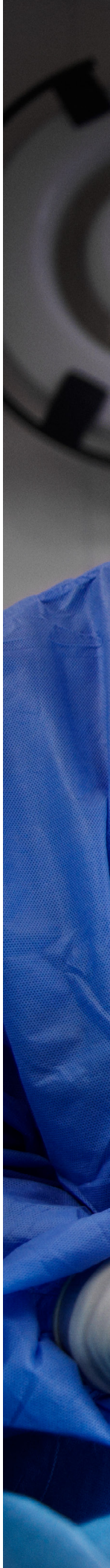
71Y/M, lower left peripheral in stent restenosis
Contrast medium: 40 ml
Air Kerma: 86 mGy
Fluoro time: 7 min
Procedure time: 1:30 hours

Courtesy of Prof. Dr. F. Vermassen



77Y/M, Left common carotid stenosis
Contrast medium: 40 ml
Air Kerma: 55 mGy
Fluoro time: 9 min
Procedure time: 50 min

Courtesy of Prof. Dr. F. Vermassen



References

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

2 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

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