



PHILIPS

CT in TAVI

Bringing precision to aortic valve replacement planning

Philips IntelliSpace Portal CT TAVI Planning application

The value of CT in TAVI

Unlike conventional open-surgical aortic valve replacement, direct visualization of the valve and annulus has been lacking for less invasive transcatheter aortic valve implantation (TAVI). Imaging is necessary for appropriate valve sizing, and is done pre-procedure because for some patients no suitable valve size is available, such as patients with an aortic annulus diameter of <18 mm. Imaging is also required to evaluate the ideal pathway for access (transfemoral vs apical, subclavian, or trans-aortic). CT imaging can reveal the extent of aortic valve calcification and appropriate fluoroscopic projection angles for the C-arm to produce orthogonal views of the valve.¹

A minimally invasive approach to aortic stenosis

Aortic stenosis is the most common valvular heart disease, affecting an estimated 2-4% of adults older than 65 years. In the US, there are more than 50,000 surgical aortic valve replacements each year, with hospital mortality of 9% in aortic stenosis patients older than 65 years. Currently the prognosis of symptomatic patients with severe aortic stenosis is very poor and 40% of these patients older than 75 years are not considered candidates for surgery. TAVI is a minimally invasive alternative to conventional surgery and is seeing rapid adoption and has been shown to reduce mortality by more than 60%.²

CT imaging in TAVI to advance patient care

The CT TAVI Planning application is intended to be used for patients with aortic valvular disease, severe symptomatic aortic stenosis or tricuspid aortic valve. The intended part of the body for this application is the human heart, specifically the ascending aorta, aortic root, coronary ostia and left ventricle in order to assess the aortic valve in pre-operative planning of transcatheter aortic valve replacement procedures.

CT TAVI Planning is a non-invasive post-processing application providing 3D model-based segmentation of the aortic valve and aortic arch. The CT TAVI Planning application provides assessment and measurements of relevant heart structures for TAVR-device sizing, and provides a reasonable starting angle for C-arm position in the catheterization laboratory to the Interventional team performing the procedure (to be used during the procedure itself).

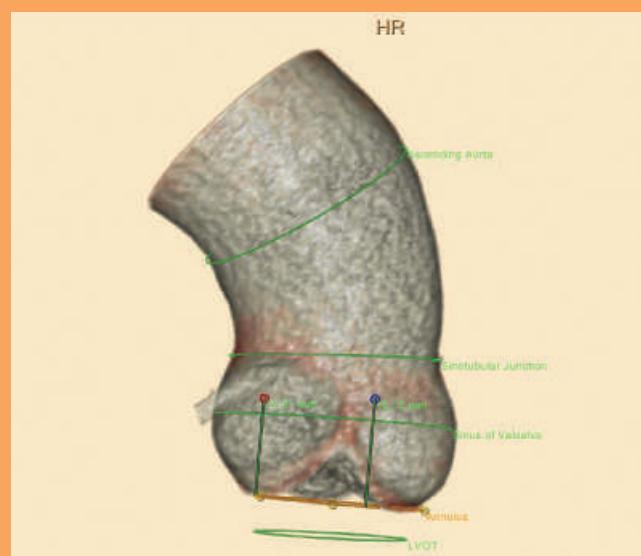


The user may bookmark and save results at any point to work on later, share with another user, or distribute findings.

The physician retains the ultimate responsibility for making the determination of patient eligibility or which device is implanted based on standard practices and additional imaging modalities such as echocardiography.

IntelliSpace Portal unlocks the power of enterprise-wide distributed data

IntelliSpace Portal is a powerful thin-client solution for advanced image review and analysis. It offers the flexibility to diagnose and collaborate virtually anywhere. This integrated clinical solution is multispecialty, multimodality, and multivendor.*



CT TAVI Planning allows users to view and edit planes if needed.

*Please contact your local Philips representative for details on multivendor coverage.

Images courtesy of Sheba Medical Center.

Philips CT TAVI Planning application

Qualitative assessment

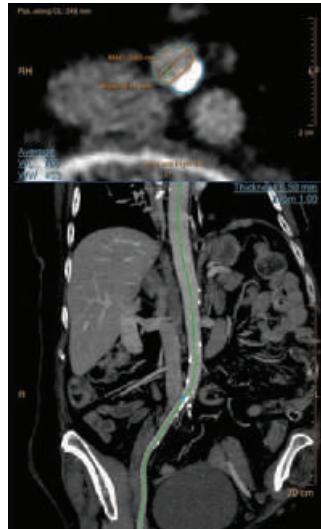
- Visual assessment of amount of aortic valve calcification

Advanced algorithms

- 3D model-based segmentation of the tricuspid aortic valve, ascending aorta, and left ventricle
- CT TAVI Planning application provides assessment and measurements of relevant heart structures such as left and right coronary ostia, aortic annulus, sinotubular junction, left ventricular outflow tract, sinus of valsalva, and ascending aorta planes
- Measurements of the aortic annulus, left ventricular outflow tract, sinotubular junction, sinus of valsalva, ascending aorta and distance to coronary ostia for TAVI-device sizing
- Image data reconstructed with traditional filtered-back projection (FBP) or iterative reconstruction techniques
- Processing of DICOM-compliant image data from multiple vendors with ECG-gated contrast-enhanced CT scans

Visualization

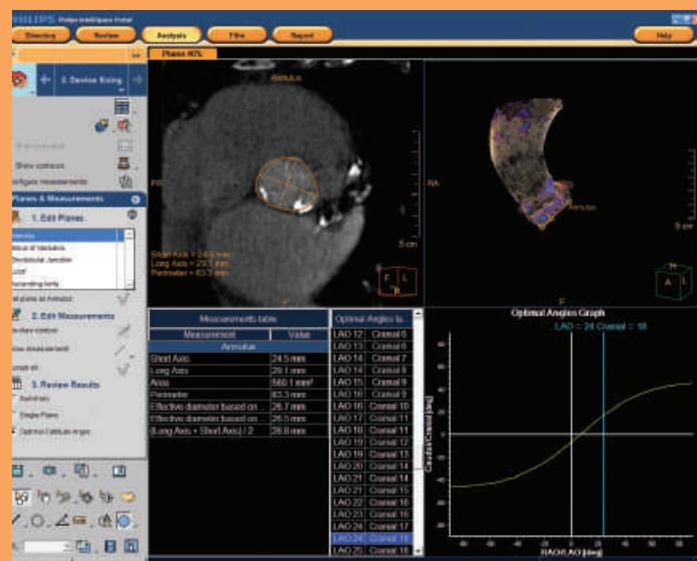
- Axial, coronal, sagittal and volume renderings
- Visualization of defined landmarks and planes such as left/right/non-coronary aortic valve cusps, left and right coronary ostia, aortic annulus, left ventricular outflow tract, sinotubular junction, sinus of valsalva, ascending aorta
- Standard cath lab view (right coronary cusp in center) with three nadirs aligned along the annulus plane



IntelliSpace Portal also provides advanced visualization tools to assist clinicians in determining the appropriate access route for the TAVI device.



CT TAVI Planning allows users to review results, including images, distances, and measurements table.



The user can interactively adjust the image on "Optimal Angles Graph" to determine the appropriate C-arm angle.

References

1. Achenbach S, Delgado V, Hausleiter J, Schoenhagen P, Min JK, Leipsic JA. SCCT expert consensus document on computed tomography imaging before transcatheter aortic valve implantation (TAVI)/transcatheter aortic valve replacement (TAVR). JCCT. 2012;6:366–380. <http://dx.doi.org/10.1016/j.jcct.2012.11.002>.
2. The PARTNER Trial Investigators. Transcatheter aortic-valve implantation for aortic stenosis in patients who cannot undergo surgery. N Engl J Med. 2010 Oct 21;363(17):1597–607. doi: 10.1056/NEJMoa1008232. Epub 2010 Sep 22.

The images and descriptions contained herein provide technical specifications and optional features which may not be included with the standard system configuration. Contact your local Philips Representative for a complete specific system details.

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