

PHILIPS

Ultrasound

EPIQ CVxi



Designed for cardiology.
Built for better care.

EPIQ CVxi cardiovascular ultrasound system



New challenges require new tools

Today's interventional cardiology departments are under pressure to implement cutting edge imaging solutions that will not compromise workflow efficiency, diagnosis, treatment or patient care. At Philips, we understand your challenges as well as your commitment to providing outstanding diagnosis and care, fast. We also believe that, through specialized, patient-centric care, we can improve both outcomes and experiences. There's always a way to help make life better.

Treatment is changing for structural heart disease

A paradigm shift is under way in the treatment of structural heart disease. The proliferation of effective, minimally invasive interventional procedures combined with the emergence of new devices is facilitating a transition to less invasive care.

Complex procedures remain challenging

Increasing numbers of patients with structural heart disease can be treated with catheter-based techniques, yet it can remain challenging to perform complex procedures such as valve repair and replacement, septal defect closure, trans-aortic valve implantation and repair, left atrial appendage closure, and paravalvular leak closure. Long procedure times and steep learning curves are common.

Tapping into critical insights

3D transesophageal echocardiography (TEE) imaging provides critical insights into soft tissue. While X-ray has been invaluable for visualizing catheters, coronary stents and valve repair and replacement devices, emerging new procedures heavily rely on ultrasound guidance. Often, the differing representation of X-ray and ultrasound images requires spending valuable time and effort to mentally align them during the procedure.

Focused on interventional cardiology

Philips EPIQ CVxi delivers the exceptional image quality you expect in a premium ultrasound system, along with efficiencies in procedure guidance driven by new interventional dedicated tools and a cardiology focused interface.

Key trends in interventional cardiology

- Dynamic field with continuous emergence of new devices and therapies
- Teamwork is critical among the echocardiologist, interventional cardiologist and surgeon for correct intra-procedural decisions and guidance
- Greater reliance on the Live 3D anatomical and functional insights of echocardiography imaging to support procedural guidance



Philips trusted xMATRIX technology along with nSIGHT Plus image formation enables advances in TEE image quality required for today's interventional imaging needs.



89% of clinicians who saw the EPIQ CVxi perceived it as able to drive improved confidence during procedure guidance due to improved image quality, advanced workflow* and advanced visualization tools.**¹

* MultiVue Live 3D cropping and MPR alignment tool. Based on responses from 38 respondents.

** TrueVue and the OLED monitor. Based on responses from 38 respondents.

Confidence in diagnosis

X5-1c transducer

Philips trusted xMATRIX technology along with nSIGHT Plus image formation enables advances in transthoracic echo (TTE) image quality required for today's echo imaging needs. The X5-1c transducer, combined with nSIGHT Plus and innovative design with curved nose, provides enhanced clinical information in 2D and 3D transthoracic imaging over a standard phased array transducer. The benefits may be decreased exam time due to faster access to echo windows, increased confidence in quantification results, and improved imaging, especially of the more difficult structures such as tricuspid and pulmonic valves, as well as the LV Apex.

Early detection to enhance cardiac care

AutoSTRAIN integrated on the EPIQ CVxi uses Philips advanced automation such as Auto View Recognition, Auto Contour Placement and speckle tracking to enable robust, reproducible one-button global longitudinal strain (GLS) measurements. This efficient tool for routine clinical use in LV, LA and RV strain measurements aids early detection of heart function change.



**X5-1c
xMATRIX TTE
transducer**

Auto Measure

There are certain measurements which are needed for every echo exam. Current manual methods can be time-consuming and have high inter- and intra-user variability. Auto Measure provides fully automated ways to measure Doppler, ventricular length and 2D PLAX images. Our proven A.I.-empowered algorithm delivers fast and consistent measurements.*

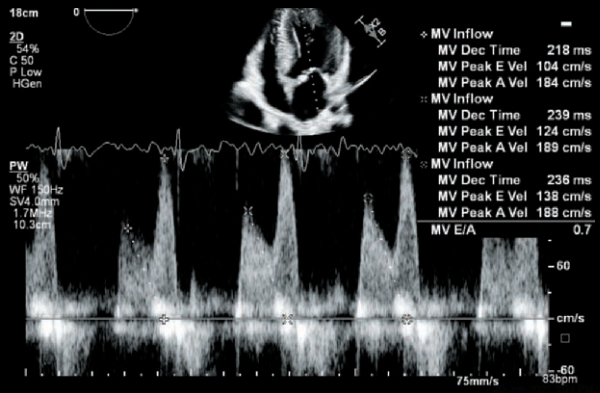
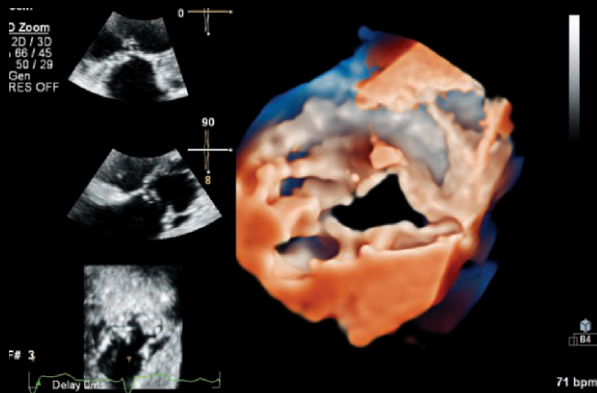


Auto Measure may reduce the time for standard 2D echo measurements by up to **51%.***

Full cycle quantification, every day

Dynamic HeartModel offers LV and LA functional information in the same application from the same cardiac cycle. One-button workflow is made possible by advanced automation to automatically label and initiate border tracking. 3D Auto RV segments, identifies borders and aligns views of the right ventricle, so that clinicians can quickly perform quantification and check measurements.

* External study with external sonographers comparing the results of 18 exams with and without Auto Measure.



Live 3D imaging

Philips xMATRIX performance becomes even more powerful with the X8-2t Live 3D transesophageal transducer and *n*SIGHT Plus image formation.* The result is excellent 2D, 3D and multiplanar reconstruction (MPR) image quality.

Acquisitions in a single beat

The X8-2t transducer brings true one-beat acquisitions and our highest volume rates in Live 3D and Live 3D color flow to transesophageal imaging, without compromise to image quality. Its handle is designed with a real-time configurable function button, allowing for additional functionality while imaging.

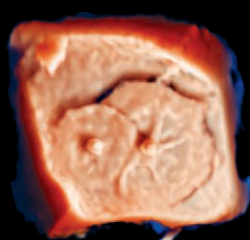


X8-2t xMATRIX transducer for next-generation Live 3D TEE.

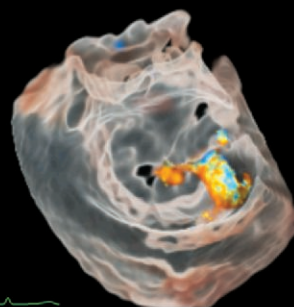
* As compared to first-generation X7-2t transducer and *n*SIGHT.



Cardiac TrueVue and MPR of septal occluder device



Cardiac TrueVue Color with Glass to see complete color flow without losing anatomical context



A new dimension to 3D workflow

More data in fewer steps

Fast, efficient exams save clinician time and provide for an excellent patient experience. With an interface designed specifically for cardiology and new 3D workflow tools such as MultiVue, Philips has reduced the number of steps needed to get the data you want from any volume acquisition, and for greater capabilities during interventional exams.

Advancing interventional procedures with MultiVue

EPIQ CVxi with MultiVue real-time alignment solution puts control in the hands of the echocardiologist to deliver the right image at the right moment. MultiVue allows one-click cropping of a Live 3D image during interventional procedures, and one-click alignment of the catheter within cardiac anatomy. This was previously not possible using manual tools.

Get better visualization of cardiac structures for procedure guidance in fewer steps, confidently visualize the region of interest for echo-guided interventional procedures such as mitral valve repair, and obtain faster 3D measurements for device sizing.

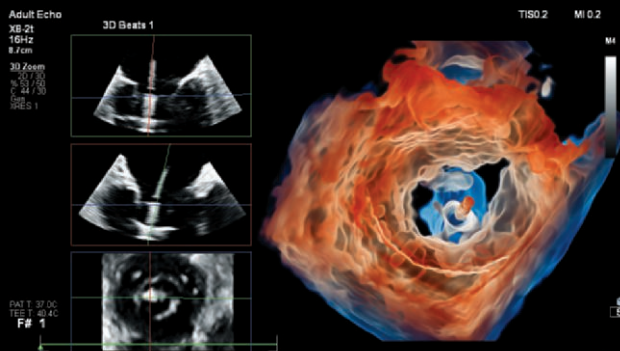
Better visualization of interventional devices

TrueVue photorealistic 3D rendering is designed for better visualization of interventional devices. The lighting of TrueVue can make it simpler to visualize the location of catheters and devices relative to anatomy during interventional procedures.

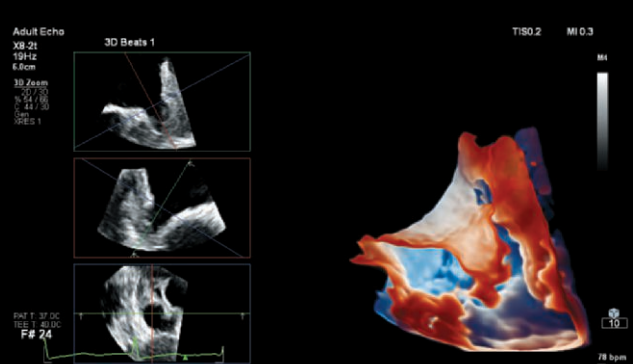
Cardiac TrueVue Glass

Obtain a detailed view of morphology using ultrasound. Cardiac TrueVue Glass can help enable a cast-like rendering of any 3D structure, and is especially useful when assessing morphology of a structure, e.g., the left atrial appendage. This can be performed live or on an image that has already been acquired.

94% of clinicians who saw the EPIQ CVxi thought the MultiVue real-time alignment solution could help to reduce the risk of choosing an incorrectly sized device during interventional procedures.¹



Cardiac TrueVue Glass and MultiVue MPR aligned with a mitral valve repair device



Cardiac TrueVue Glass showing left atrial appendage morphology



Procedural confidence

Sizing and proper alignment of new cardiac devices can be challenging, affecting cost as well as the experiences of both the clinician and patient. The EPIQ CVxi has advanced capabilities tailored to interventional solutions, with the streamlined workflow to make interventional procedures predictable and practical for everyday use. Philips solutions in imaging and measurement can provide appreciation of morphology and size for devices, which may reduce time in the OR.

3D Auto LAA for LAA sizing

Acquire the LAA ostium size quickly and easily with 3D Auto LAA. Using automation reduces inter- or intra-user variability, increasing confidence during procedures.

3D Auto MV for mitral valve quantification

Analyze the complex anatomy of the mitral valve in 3D as well as its dynamic mechanics. Geometric measurements such as annular dimensions, leaflet morphology and coaptation descriptions can be used from the initial discovery of MV disease or pathology to support device planning, and through monitoring of pre- and postoperative cases.

Gain complete visualization of LAA morphology and ostium size in **70% less time** by using TrueVue Glass and 3D Auto LAA*



* Results based on internal comparison between 3D Auto LAA and 3DQ on a set of 15 3D LAA data sets of randomized subjects.



EPIQ CVxi: integrated real-time fusion imaging

Simplify navigation, device placement and evaluation of results

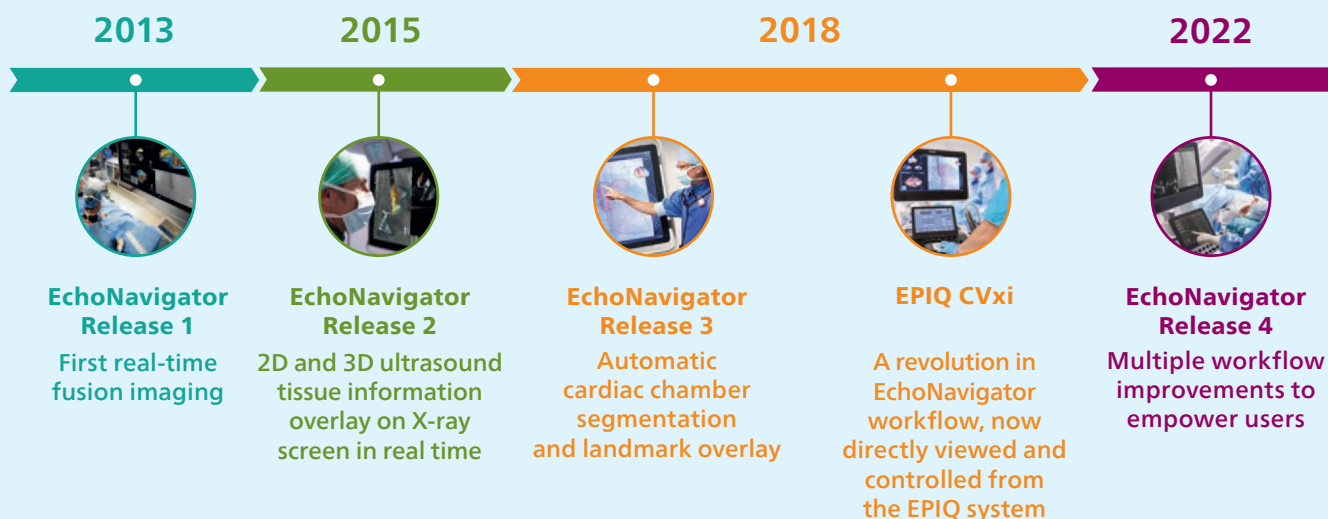
EPIQ CVxi comes with integrated EchoNavigator R4.0 real-time fusion imaging. EchoNavigator R4.0 automatically uses SmartFusion to fuse live TEE and live fluoroscopic images in real time. This allows you to quickly guide your device in the 3D space. TEE transducer position and orientation are automatically tracked in the X-ray image, allowing the echo and X-ray images to move in sync when the C-arm is repositioned.

EchoNavigator R4.0 on the EPIQ CVxi

EPIQ CVxi also allows echocardiologists full control of live fusion imaging directly from the ultrasound console. See live X-ray and real-time 2D/3D imaging, place markers and manage overlay of live echo and X-ray with the touch of a finger. The echocardiologist can now fully focus on imaging for procedure guidance, allowing the interventional cardiologist to focus entirely on the patient, device manipulation and procedure management.



Leading the way with EchoNavigator



Guided by automatic cardiac models

EchoNavigator R4.0 cardiac fusion imaging

At the heart of the powerful architecture of EPIQ CVxi and EchoNavigator R4.0 are SmartFusion technology and automatic 3D segmentation of the anatomy based on model algorithms. These include models for the mitral valve and the transeptal area.

Cardiac landmarks and models from the echo image automatically appear on the X-ray image for context and guidance. Heart models are fully dynamic, reflecting the motion of the patient's cardiac cycle to facilitate understanding of the beating cardiac anatomy, its relation to the X-ray image and also to the device's

position. The procedure preset function automatically selects the relevant cardiac structure related to the procedure at hand.

Built-in models drive exam simplification

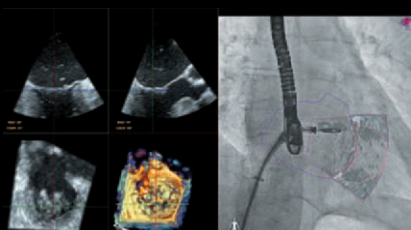
The robustness of the automatic heart modeling is driven through advanced algorithms* built from multiple data points from many different heart shapes with various cardiac conditions. Sophisticated modeling adapts to certain atlas shapes to a patient's individual organ to help drive either automation of repetitive steps or more complete computer-driven analysis with minimal user interaction.

EchoNavigator reduces radiation dose by **52%** in LAA occlusion**



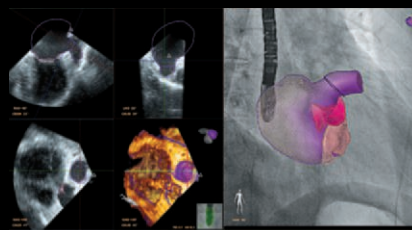
* See Philips AI-enabled solutions registry here: https://www.philips.com/a-w/about/artificial-intelligence/ai-enabled-solutions#triggername=less13_isc13

** Jungen et al. Left Atrial Appendage Closure Guided by Integrated Echocardiography and Fluoroscopy Imaging Reduces Radiation Exposure. PLoS One. 2015 Oct 14;10(10). This claim is based on a single center study. The 52% reduction is a comparison of radiation dose between two groups of patients (with (n=17) and without (n=17) EchoNavigator guidance). This claim is limited to left atrial appendage occlusion.



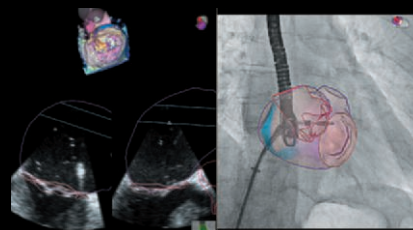
Mitral valve procedure

For mitral valve procedures, the automatic segmentation, in addition to the ultrasound live 2D/3D imaging, allows the overlay of the MV annulus with clear representation of the most important valve's reference points.



LAA closure procedure

For left atrial appendage (LAA) closing procedures, the overlay of appendage's model and pulmonary vein location assists in device guidance.



Transeptal puncture

The puncture and crossing of the interatrial septum is a key step in a variety of procedures which require access into the left side of the heart. The live ultrasound soft tissue information, in combination with the septum's marker, provides key information on the X-ray monitor.

Advanced fusion that advances with you

EchoNavigator R4.0 builds on nearly a decade of innovation in fusion technology.

Fast, multi modality guidance

- Integration of EPIQ CVxi touchscreen gives the echocardiologist seamless control of fusion imaging
- Quickly switch between standard echo and EchoNavigator image fusion
- Use touchscreen controls to adjust views and layout
- Place 3D markers and add anatomical landmarks with your fingertips

Enhance teamwork and communication throughout the heart team

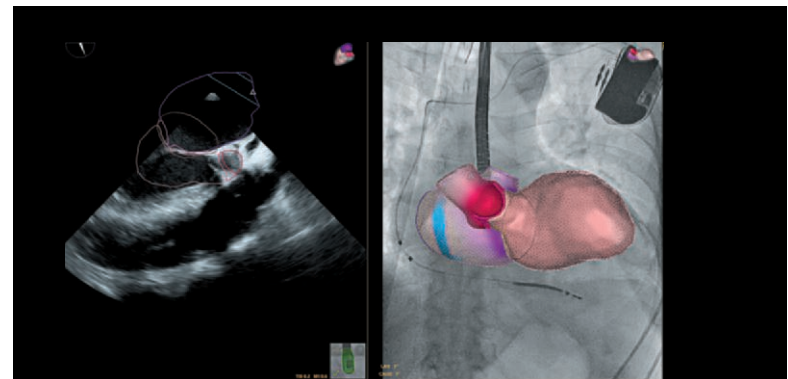
- Gain context and guidance with cardiac landmarks and models from echo imaging automatically appearing on X-ray
- Follow easy step-by-step guidance to create annotations of the optimal transseptal area, based on the distance of the transseptal area to the mitral valve

Automated anatomical insights

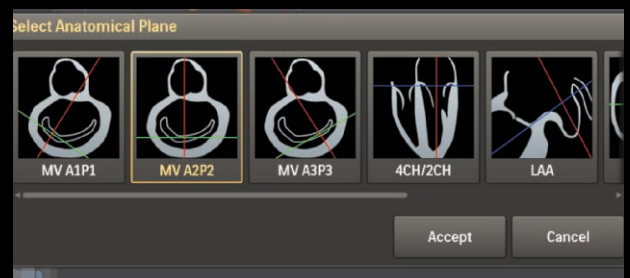
- Automatically set the MPR planes based on 3D heart modeling
- Select from a variety of clinical views with the auto MPR present gallery, including aortic valve, mitral valve and left atrial appendage
- Simplify the process of live 3D echo cropping and device alignment with MultiVue integration
- Visualize cardiac structures and devices with TrueVue photorealistic 3D echo rendering overlaid with a live X-ray



EchoNavigator touchscreen interface on EPIQ CVxi

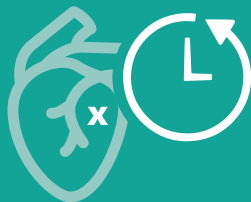


Auto cardiac model overlay and transseptal area visualization



AutoView function allows you to automatically set the position and orientation of MPR planes

EchoNavigator significantly reduces transseptal puncture time*



* Afzal et al., Neth Heart J (2017) 25:131–136; Safety and efficacy of transseptal puncture guided by real-time fusion of echocardiography and fluoroscopy. This claim is based on a single center study with limited number of patients. This claim is limited to mitral clipping and left atrial appendage occlusion.

A smart investment

Built to withstand the rigors of daily use, EPIQ offers low operating costs and is backed by Philips support and value-added services. The EPIQ system boasts a low total cost of ownership, making it a smart investment*

Enhance uptime

- Modular design for enhanced reliability and rapid repair
- Philips remote services** monitoring, which corrects issues using a standard Internet connection, reducing the need for service calls
- Access to our award-winning service organization

Responsive relationships

The value of a Philips ultrasound system extends far beyond technology. With every EPIQ system, you get access to our award-winning service organization, our competitive financing, and educational programs that help you get the most out of your system.

EPIQ offers a defense-in-depth strategy, implementing a suite of security features designed to help clinical IT professionals and healthcare facilities provide additional patient data privacy and virus protection, as well as protection from unauthorized access via the ultrasound systems on hospital networks.

Understanding your needs, designed for you

Our flexible service agreements, education offerings and innovative financing solutions can be adapted to meet your needs and strategic priorities.

- **Technology Maximizer Program** helps keep your system performing at its peak by continuously offering the latest software from Philips at a fraction of the cost of the same upgrades purchased individually over time.
- **Xtend Service Coverage** lets you choose additional service coverage for your ultrasound equipment at the time of purchase to more easily calculate your total cost of ownership.
- **Clinical education solutions** provide comprehensive, clinically relevant courses, programs and learning paths designed to help you improve operational efficiency and enhance patient care



Support request button for immediate access to Philips support.



* ECRI. Evaluation: Philips Healthcare Epiq Elite premium general-purpose ultrasound scanner. Health Devices 2020 Dec 22. ECRI Institute. Evaluation background: premium cardiac ultrasound scanners. Health Devices 2018 Jan 31.

** Service agreement required for access to Philips Remote Services. Access to the Internet required. Not all remote features available in all countries; contact your Philips representative for details.



References

1. Results obtained during user demonstrations performed in December 2017 with the EPIQ CVx and the iE33 systems. The research was designed and supervised by Use-Lab GmbH, an independent and objective engineering consultancy and user interface design company. The tests involved 42 clinicians from 17 countries. The various types of cardiac customer segments represented were adult diagnostics and interventional, adult diagnostics, and pediatric diagnostics and interventional.