PHILIPS

Ultrasound

EPIQ CVxi



Designed for cardiology. Built for better care.

EPIQ CVxi cardiovascular ultrasound system
EchoNavigator R3 cardiac fusion imaging



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 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 enabling 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 remains challenging to perform complex procedures such as mitral valve repair, septal defect closure, ASD closures, transaortic 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 TAVR 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 clinical insights
- Teamwork is increasingly 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

Superb image quality is now complemented by the latest OLED technology and other advances of EPIQ CVxi.





89% of clinicians who saw the new 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]

Confidence for even your most difficult cases

EPIQ CVxi is a new direction for premium echo, featuring an exceptional level of clinical performance for interventional echo exams across a wide range of patients to meet the challenges of today's demanding practices.

Every heart matters

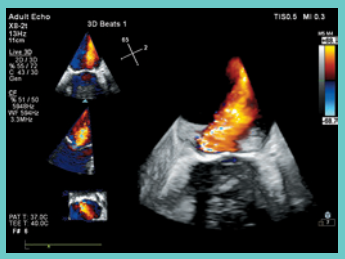
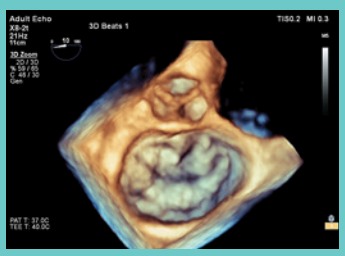
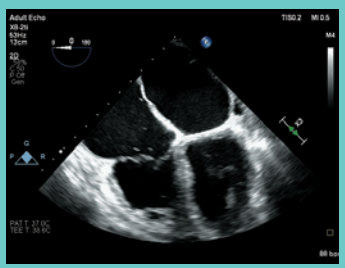
Start with the outstanding contrast of the organic light emitting diode (OLED) monitor. Add leaps in transducer technology, visualization, Anatomical Intelligence and 3D image alignment tools, and you have an ultrasound system designed for your cardiovascular challenges. EPIQ CVxi offers the high-quality images and clinical information to allow for answers with certainty. Because every patient matters, every image counts.

* 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.

Creating new realities, redefining clinical expectations

Next-generation clinical capabilities
Philips pioneered groundbreaking technologies such as xMATRIX and PureWave. The revolutionary ***n***SIGHT Imaging architecture and accelerated graphics processing unit (GPU) capabilities of EPIQ CVxi make xMATRIX and PureWave even more powerful, providing for advanced visualization through photorealistic 3D rendering with moveable light source, our highest frame rates with Hyper 2D, and a system that's ready for the next generation of transducers and algorithms.

Superb resolution down to the pixel level
Proprietary ***n***SIGHT Imaging architecture is unlike anything that has come before. It captures an enormous amount of acoustic data from each transmit operation and performs digital beam reconstruction along with mathematically optimized focal processing to create real-time images with exceptional resolution and uniformity.

	Conventional	EPIQ CVxi *n*SIGHT Imaging	
Frame rate	 Users must choose between frame rate and image quality.	 More than doubles the frame rate without impact to image quality. Creates focused images with fewer transmit operations so you can experience both highly detailed ultrasound images and extraordinary temporal resolution.	 High volume rates in one-beat color zoom
Uniformity	 Best resolution is limited to transmit focal zone.	 Corrects focus during beam reconstruction for uniformity. Achieves uniformity through coherent beam reconstruction algorithms that apply mathematical focal correction coefficients continually at all depths of the image.	 Live 3D volumes with good image quality throughout
Penetration	 Exhibits penetration limitations and poor sensitivity to weak signals.	 Superb penetration across full range of frequencies. Reinforces weak tissue signals with the ultra-wide dynamic range and unique beam reconstruction of the architecture, allowing enhanced penetration at higher frequencies, even on difficult patients.	 X8-2t TEE four-chamber view

Live 3D imaging

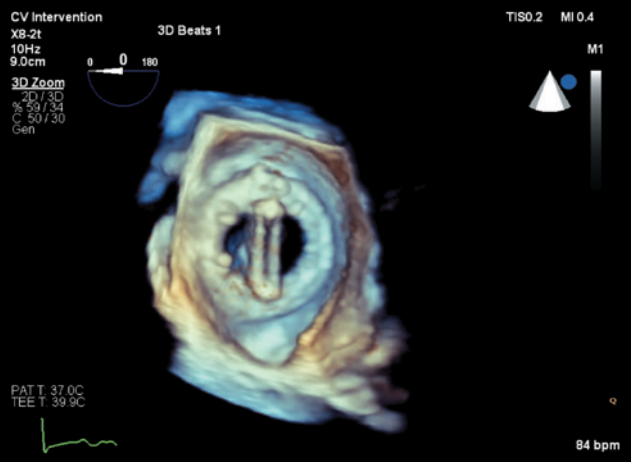
Philips xMATRIX performance becomes even more powerful with the X8-2t Live 3D transesophageal transducer. Its acoustic design provides higher frequencies and width, providing increased resolution and tissue filling in 2D and Live 3D.

Acquisitions in a single beat

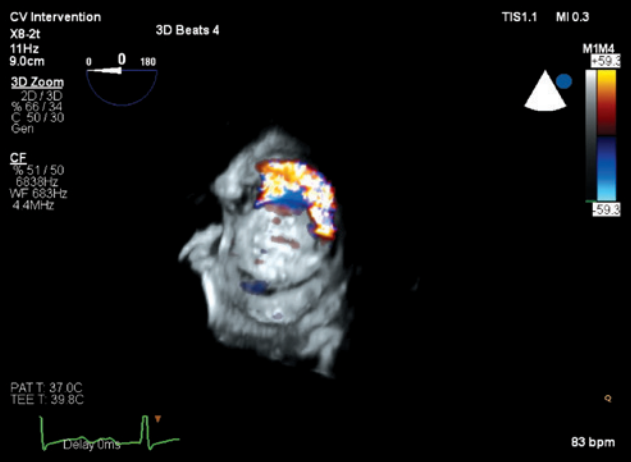
The X8-2t transducer brings true one-beat acquisitions and our highest volume rates in Live 3D and Live 3D color flow to transesophageal imaging, without compromise to image quality. Its handle is designed with a real-time configurable function button, allowing for additional functionality while imaging.



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



Live 3D Zoom of mitral valve replacement



Live 3D Zoom of perivalvular leak

A new dimension to 3D workflow

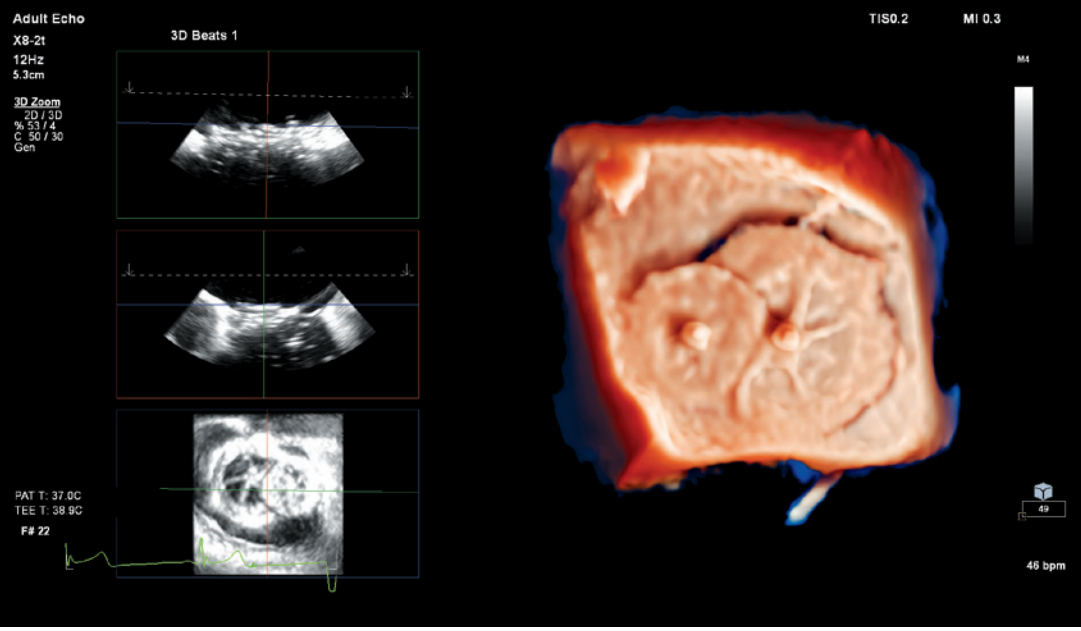
More data in fewer steps
Fast, efficient exams save clinician time and provide for an excellent patient experience. With an interface designed specifically for cardiology and new 3D workflow tools such as QuickVue, FaceCrop, AutoVue and MultiVue, we have reduced the number of steps needed to get the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

QuickVue
The intuitive workflow of QuickVue allows easy cropping of a Live 3D data set during imaging review or during interventional procedures.

AutoVue
A single click with AutoVue lets you obtain specific and standardized views of cardiac structures during Live 3D imaging.

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.

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



Atrial septal defect closure is shown in MultiVue one-click image alignment with cardiac TrueVue.

* Based on responses from 38 respondents.

True illumination

Philips cardiac TrueVue, with its virtual light source, is a proprietary advanced 3D ultrasound display method that delivers amazing, lifelike 3D ultrasound images, and gives you the ability to move the light source anywhere in the 3D volume.

Better visualization of interventional devices

TrueVue photorealistic 3D rendering is designed for better visualization of interventional devices. TrueVue's virtual light source and the simulation of light interacting with tissue can make it simpler to visualize the location of catheters and devices relative to anatomy during interventional procedures. It can help with the communication of complicated echo images among caregivers in the interventional suite, providing viewing context for the echo image to enhance procedural confidence.

For all 3D volumes

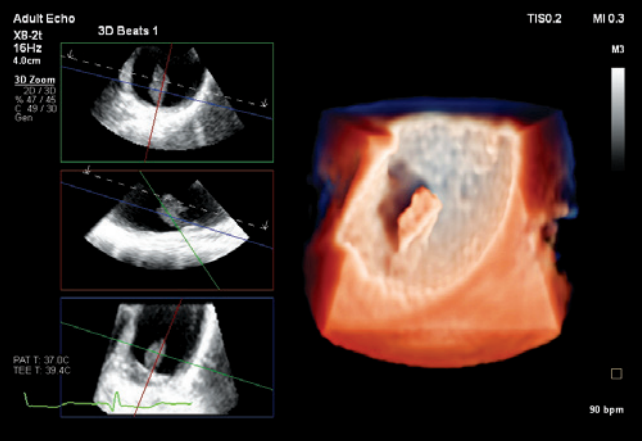
TrueVue illuminates tissue detail and creates depth perception like never before with all 3D volumes, diagnostic or interventional, on TTE and TEE. It can help with the communication of complicated echo images among caregivers in the interventional suite, providing viewing context for the echo image to enhance procedural confidence. By combining Philips exceptional image quality with the photo-realistic echo imaging of TrueVue, EPIQ CVxi brings your 3D images to life.

90% of clinicians who saw the new EPIQ CVxi felt the TrueVue 3D photorealistic rendering improved viewing of anatomical structures, thus increasing clinical confidence.*[1]

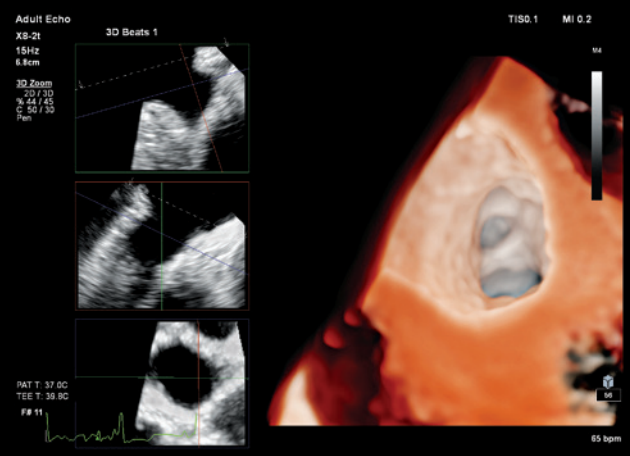
Fingertip control with TouchVue

The touchscreen user interface has been designed to improve 3D workflow, and allows users to pinch, zoom and rotate the 3D data set via fingertip control.





Live 3D Zoom showing aortic thrombus using TrueVue



Live 3D Zoom of left atrial appendage using TrueVue

* Based on responses from 42 respondents.

Intelligence turns images into answers

EPIQ CVxi is our most intelligent premium ultrasound system ever, offering a complete set of easy-to-use quantitative tools to turn reproducible data into information to guide treatment.

Advanced automation

More data is available than ever before, requiring tools for you to simplify and quicken the process of acquiring reproducible data and turning it into valuable information for your patients.

At the heart of this powerful architecture is advanced automation, designed to elevate the standards of ultrasound systems with anatomical recognition, protocols for automatic functionality and proven quantification. Exams are easier to perform and more reproducible, and deliver new levels of clinical information.

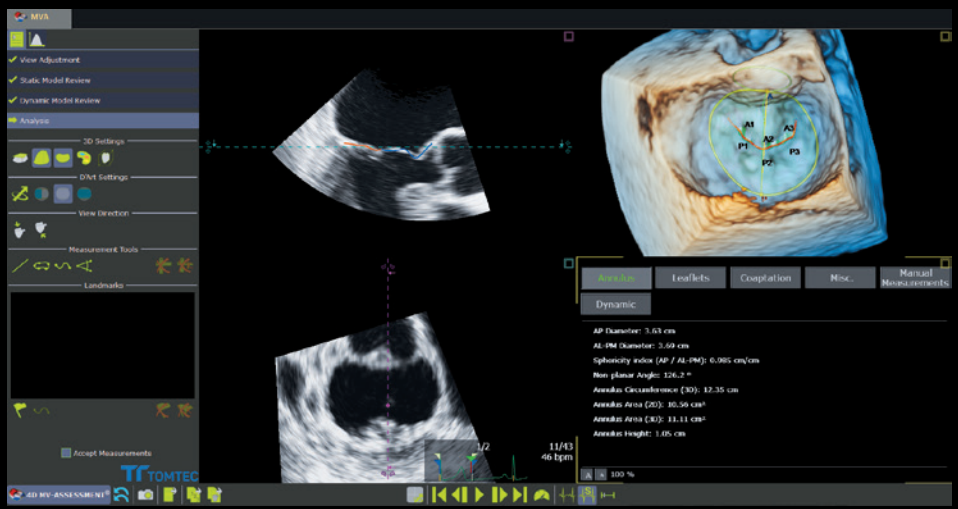
Built-in models drive exam simplification

The robustness of advanced automation 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.

TOMTEC 4D Mitral Valve Assessment (MVA)

MVA is a TOMTEC application designed to take a Live 3D volume of the mitral valve and turn it into an easy-to-interpret dynamic model in just few simple steps, providing access to a comprehensive list of MV measurements and calculations.

97% of clinicians who saw the new EPIQ CVxi believed quicker left-heart quantification would result in increased lab throughput.*[1]



MVA takes a Live 3D volume of the mitral valve and turns it into an easy-to-interpret dynamic model in just few guided steps.

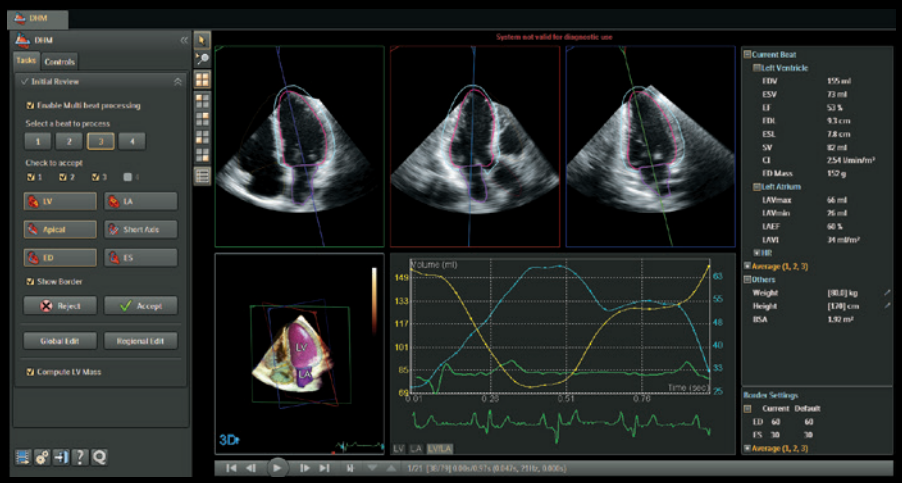
* Based on responses from 41 respondents.

Dynamic HeartModel[A.I.]* full cycle cardiac quantification

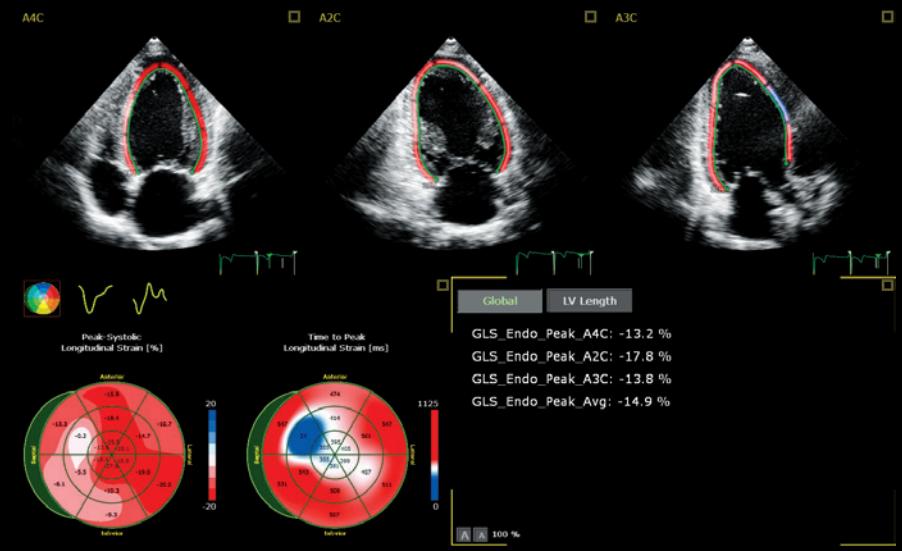
Dynamic HeartModel[A.I.]* is a 3D tool that can provide robust, reproducible ejection fraction (EF) in just seconds. This intuitive and validated application is designed to deliver the confidence of cardiac chamber quantification that fits into everyday workflow. Dynamic HeartModel[A.I.]* shows moving contours for left ventricle (LV) and left atrium (LA) volumes. It also offers measurement of LV mass, cardiac index, complete LA volumes, and index. A multi-beat analysis allows the user to analyze different beats from the same acquisition and average the results with one acquisition.

TOMTEC AutoStrain LV, LA and RV

AutoStrain LV, LA and RV, developed by using advanced automation technologies, delivers one-button-push, fast and reproducible longitudinal strain measurements for LV, LA and RV. AutoStrain LV, LA and RV provides more parameters to assist physicians in better evaluating overall heart function without adding more exam time to everyday clinical practice.



Dynamic HeartModel[A.I.]* with volume and time curve visualization of left ventricle and left atrium.



AutoStrain LV with measurements of global longitudinal strain, derived by LV AP4, AP2 and AP3 views, with bull's-eye visualization.

* A.I. refers to Anatomical Intelligence.

Automated mitral valve measurement

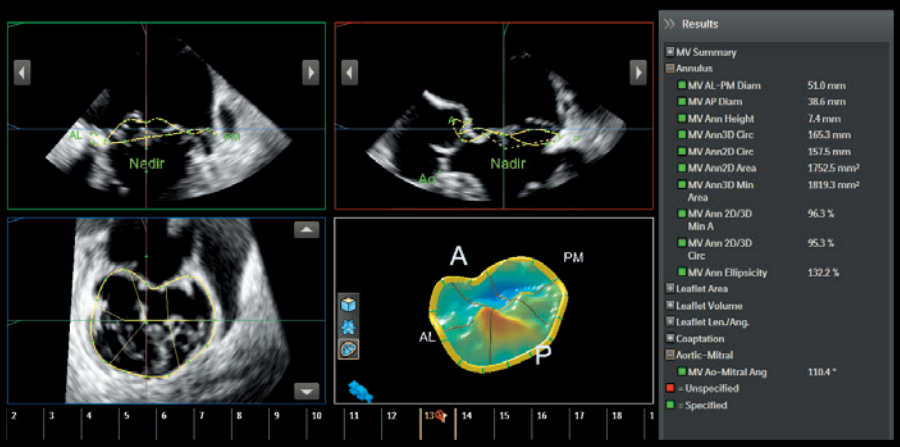
The Mitral Valve Navigator[A.I.] (MVN[A.I.])* is a Q-App designed to take a Live 3D volume of the mitral valve and turn it into an easy-to-interpret model in eight guided steps, providing access to a comprehensive list of MV measurements and calculations. Internal comparison of MVQ to MVN[A.I.]* Q-Apps measured 89% fewer clicks, meaning essential data can be captured more efficiently.

Automated speckle analysis

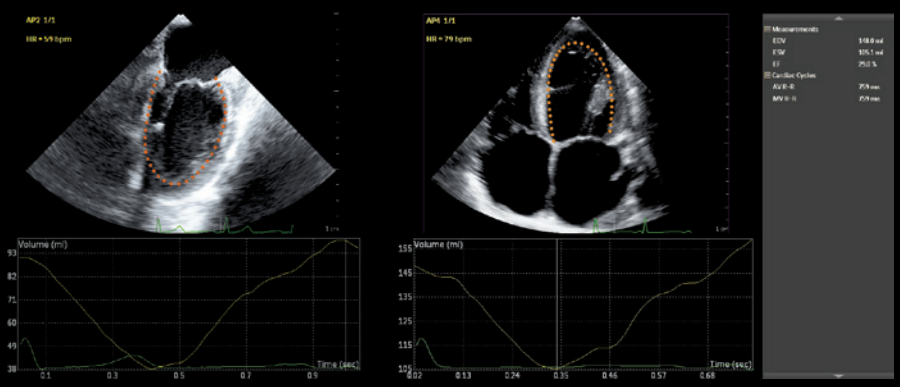
Automated Cardiac Motion Quantification[A.I.] (aCMQ[A.I.])* uses speckle mechanics to provide 2D global longitudinal strain (GLS) speckle measurements. An EF is also calculated for a holistic evaluation of the left ventricle function.

EF on all your patients

Automated 2D Cardiac Quantification[A.I.] (a2DQ[A.I.])* is the ideal tool for every echo lab and provides rapid access to proven 2D ejection fraction and volumes. AutoEF is available during the study, and so fits in with an everyday echo protocol.



MVN[A.I.]* takes a Live 3D volume of the mitral valve and turns it into an easy-to-interpret model in just eight guided steps.



a2DQ[A.I.]* with ZeroClick technology for fast, reproducible EF on all your patients.

* A.I. refers to Anatomical Intelligence.

EchoNavigator R3 cardiac fusion imaging. Enhanced workflow with EPIQ CVxi.

Simplify navigation, device guidance and evaluation of results

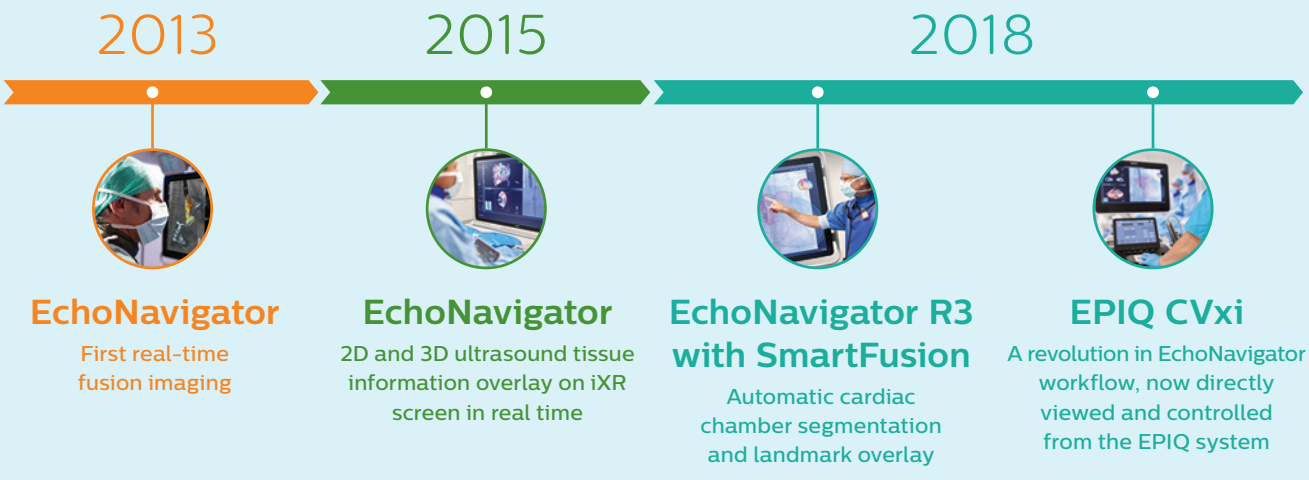
EPIQ CVxi makes it possible to view and control the latest innovation in real-time fusion imaging, EchoNavigator R3. It uses SmartFusion to fuse live TEE and live fluoroscopic images in real time. This allows you to intuitively and quickly guide your device in the 3D space. TEE transducer position and 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 R3 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. 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



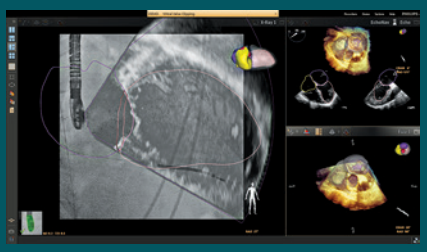
Guided by automatic cardiac models

EchoNavigator R3 cardiac fusion imaging
More data is available than ever before, requiring tools for you to simplify and quicken the process of acquiring reproducible data and turning it into valuable information to help echo guidance, even during the most complex procedure.

At the heart of the powerful architecture of EPIQ CVxi and EchoNavigator R3 are Philips SmartFusion technology and automatic cardiac segmentation, designed to elevate the standards of ultrasound systems with automatic anatomical recognition, automatic cardiac chamber segmentation and procedure-specific landmark visualization, EchoNavigator R3 elevates device echo guidance with a live overlay on X-ray images.

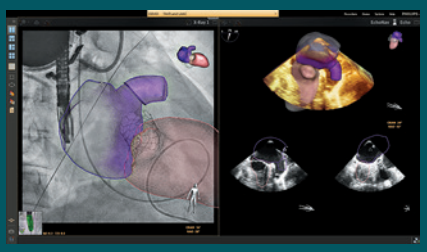
Cardiac landmarks and models powered by TOMTEC from the echo image automatically appear on the X-ray for context and guidance. These models are fully dynamic, reflecting the motion of the patient's cardiac cycle to facilitate understanding of the beating cardiac anatomy, its relation to the X-ray image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



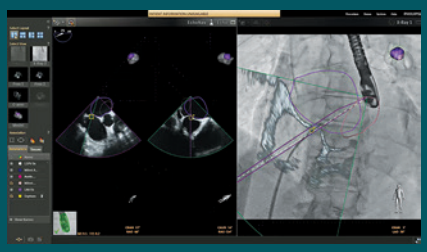
Mitral valve procedure

For mitral valve procedures, the automatic cardiac segmentation, in addition to the ultrasound live 2D/3D imaging, enables 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 elevates the confidence 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 for an enhanced experience.



Teamwork in the lab

Enhance teamwork and communication
Clear communication and understanding are necessary between the echocardiographer and the interventionalist or surgeon to facilitate reaching agreement on how to proceed.

More fully anticipate imaging needs
EPIQ CVxi allows users to display multiple views of Live 3D TEE, segment heart structures, access echo scanning parameters, and localize the echo target on fluoroscopy. Control over fusion imaging and easy access to the X-ray image means that the echo operator can anticipate imaging needs, bringing clarity and enhancing teamwork within the lab. This teamwork can facilitate device maneuvering, which helps simplify procedures.



Elevating intra-procedural echo guidance

Quick, accurate clinical information and optimized echo interventional guidance workflow

The premium ultrasound performance of the EPIQ CVxi dedicated to interventional cardiology can help to address the strains on overburdened hospitals and healthcare systems, which are continually being challenged to provide a higher quality of care cost-effectively.

Benefits of EPIQ CVxi and EchoNavigator R3 in the interventional suite

- **Easy integration** in the cath lab environment with the SmartCable connection
- **Invaluable soft tissue information** real-time overlaid with iXR imaging
- **Display** of iXR imaging on the EPIQ CVxi monitor to elevate communication within the interventional team
- **Optimized workflow** for the challenging environment of the interventional procedures
- **Readiness** for interventional procedures independent of other departments' schedules



Clinical education solutions

The field of structural heart disease is highly dynamic, with the rapid introduction of new devices. We recognize the need to assist with training aimed at developing a quick and thorough understanding of this solution, which is why we offer a wide range of support options to help you get the most out of EPIQ CVxi and EchoNavigator with anatomical intelligence. This includes relevant courses, programs and learning paths designed to help you improve operational efficiency and enhance patient care.



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.



Support request button for immediate access to Philips support.



Philips OmniSphere data intelligence tools help you manage your department, maximize resources and improve workflow.



Exceptional serviceability
The system features a superb modular design for rapid repair.

* Not all services available in all geographies; contact your Philips representative for more information. May require service contract.



Count on us
as your patients count on you

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

ISSL technology
This industry-standard protocol meets global privacy standards and provides a safe and secure connection to the Philips remote services network using your existing Internet access point.

* Philips is rated number one in overall service performance for ultrasound for more than 20 years in the annual IMV ServiceTrak survey in the USA.
** Optional. Not all services available in all geographies; contact your Philips representative for more information. May require service contract.

Always there, always on

We work as one with your team to keep your EPIQ system running smoothly.

Remote service capabilities maximize efficiency
Easy, rapid technical and clinical support through remote desktop enables a virtual visit with a Philips expert.

If you prefer to keep your know-how in-house, the OmniSphere Remote Technical Connect application† allows your BioMed team remote access to Philips systems on your network so that you can have remote service capabilities your way.

Proactive monitoring solutions maximize uptime
Philips proactive monitoring increases system availability by predicting potential system disruptions and proactively acting on them, letting you focus on what is most important – your patients.

Immediate support request at your fingertips
The support request button allows you to enter a request directly from the control panel, for a fast and convenient communication mechanism with Philips experts without leaving your patient, minimizing workflow interruption.

On-cart transducer test provides confidence in your transducer quality
On-cart transducer test provides a non-phantom method to test EPIQ transducers at any time, giving you confidence in your diagnostic information.

Sharing risk, increasing the return on your investment

Partner with us to maximize utilization and uptime of your EPIQ system.

Utilization reports for confident decision-making
Data intelligence tools can help you make informed decisions to improve workflow, deliver quality patient care and decrease the total cost of ownership. The on-board utilization tool provides individual transducer usage data and the ability to sort by exam type. The OmniSphere Utilization Optimizer takes this a step further by providing easy-to-use charts and graphs for all of your applicable* networked Philips systems.

Understanding your needs, designed for you

Our flexible RightFit 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 providing 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:** comprehensive, clinically relevant courses, programs and learning paths designed to help you improve operational efficiency and enhance patient care.

Business optimization tools such as OmniSphere allow you to use the power of data and connectivity to generate actionable insights and enhance productivity to improve your return on investment.

* Check with your Philips representative for system compatibility.



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.

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