PHILIPS

Ultrasound

EPIQ 7

The **evolution** of premium vascular ultrasound

Philips EPIQ 7 ultrasound system

The new **challenges**
in global healthcare

Unprecedented advances in premium ultrasound performance can help address the strains on overburdened hospitals and healthcare systems, which are continually being challenged to provide a higher quality of care cost–effectively. The goal is quick and accurate diagnosis the first time and in less time.

Premium ultrasound users today demand improved clinical information from each scan, and faster and more consistent exams that are easier to perform and allow for a high level of confidence, even for technically difficult patients.

Performance

More confidence in your diagnoses even for your most difficult cases

EPIQ 7 is the new direction for premium vascular ultrasound, featuring an exceptional level of clinical performance to meet the challenges of today's most demanding practices.

Carotid artery bulb   **Superficial varicose veins**

The **evolution**
of premium ultrasound

It's our most powerful architecture ever applied to ultrasound imaging – touching all aspects of acoustic acquisition and processing, allowing you to truly experience ultrasound's evolution to a more definitive modality.

Supported by our family of proprietary xMATRIX and PureWave transducers and our leading-edge Anatomical Intelligence, this platform offers our highest level of premium performance.

Key trends in global ultrasound

- The need for more definitive premium ultrasound with exceptional image quality, performance, and intelligence that provides automated views and quantification

- A demand for better workflow and greater throughput due to increased ultrasound exam volumes resulting from an aging population

- A demand to automate most operator functions to allow for ease of use and consistency of exam between users

- The need for ultrasound to address the technically challenging patient

- A movement to use ultrasound first – even for advanced image-guided therapy – due to concerns about radiation dose and exam cost

Creating **new realities**,
redefining clinical expectations

*n*SIGHT Imaging goes beyond conventional ultrasound performance for new levels of definition and clarity.

Philips *n*SIGHT Imaging is a totally new approach

The Philips proprietary *n*SIGHT Imaging architecture introduces a totally new approach to forming ultrasound images. Unlike conventional systems that form the image line by line, *n*SIGHT creates images with superb resolution down to the pixel level.

Extraordinary architecture

*n*SIGHT Imaging incorporates a custom multi-stage precision beamformer along with massive parallel processing. This proprietary architecture 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.

Frame rate

Conventional
Users must choose between frame rate and image quality

***n*SIGHT Imaging**
More than doubles the frame rate without impact to image quality

***n*SIGHT Imaging** creates superbly focused images with fewer transmit operations so you can experience both highly detailed ultrasound images and extraordinary temporal resolution.

Uniformity

Conventional
Best resolution is limited to transmit focal zone

***n*SIGHT Imaging**
Corrects focus during beam reconstruction for superb uniformity

***n*SIGHT Imaging** achieves superb uniformity through coherent beam reconstruction algorithms that apply mathematical focal correction coefficients continually at all depths of the image.

Penetration

Conventional
Penetration limitations and poor sensitivity to weak signals

***n*SIGHT Imaging**
Superb penetration across full range of frequencies

***n*SIGHT Imaging** architecture's ultra-wide dynamic range and unique beam reconstruction reinforces weak tissue signals allowing enhanced penetration at higher frequencies even on difficult patients.

Image quality: the numbers tell the story

Comparing EPIQ 7 to conventional premium systems shows breakthrough advances in imaging performance.

- Up to **76%** increase in penetration (penetration = ability to scan at depths and maintain resolution in order to complete the study*

- Up to **213%** increase in temporal resolution (ability to maintain resolution at high frame rates)*

- Over **85%** completion rate for technically challenging exams using *n*SIGHT Imaging and the PureWave C9-2, as demonstrated in clinical studies**

Full range of transducers supports virtually any vascular application.

* 2013 quantitative engineering study comparing Philips iU22 ultrasound system with EPIQ 7
** Summary of results from EMEA technically difficult patient study (EPIQ), 2014
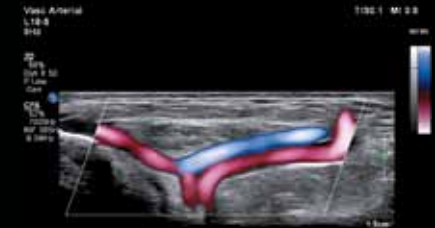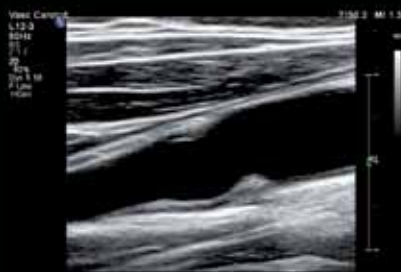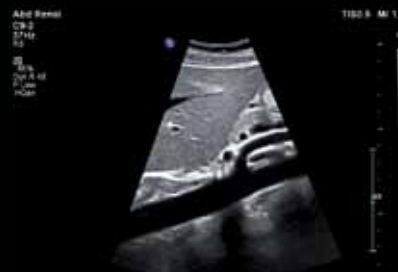
Exceptional images
for a new era
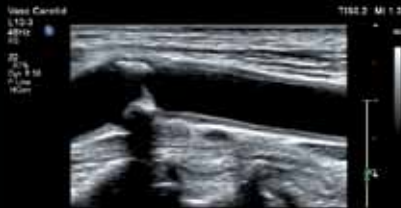
Common carotid artery

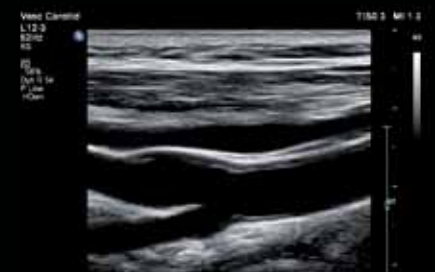**Posterior tibial veins, technically difficult patient**

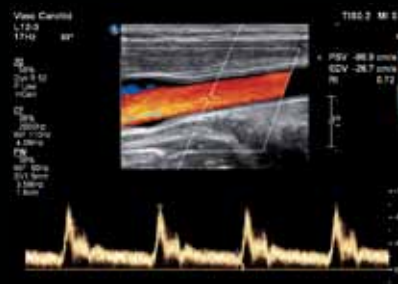**Artery and vein with MicroCPA**
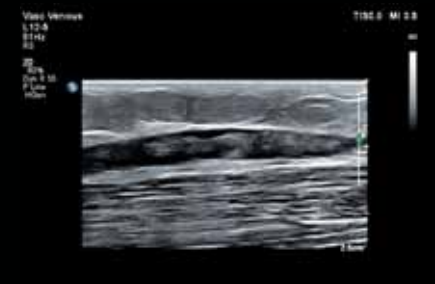

Common carotid artery plaque
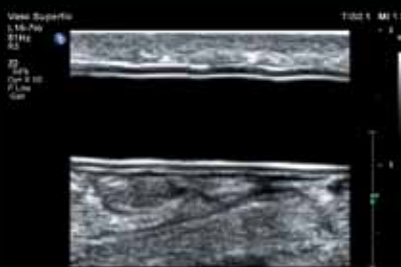

Abdominal aorta

Carotid bifurcation

Greater saphenous vein reflux

Common carotid artery

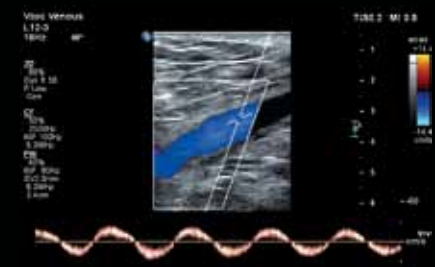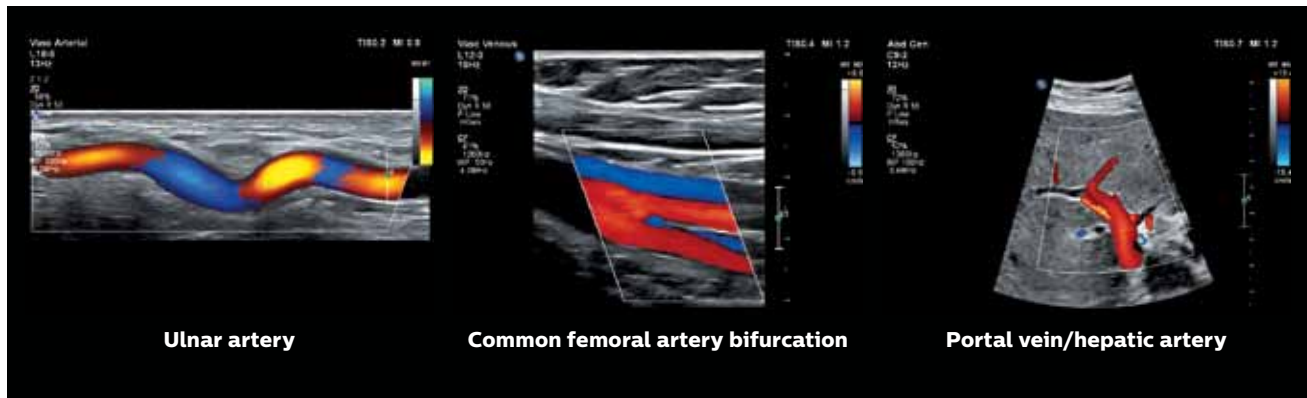**Superficial venous thrombosis**

Venous dialysis access graft

**Renal vasculature**

Abnormal Doppler of femoral vein

The next generation of
Color Flow Imaging

Ulnar artery   Common femoral artery bifurcation   Portal vein/hepatic artery

*n*SIGHT Imaging architecture incorporates new color Doppler technology that increases flow resolution, sensitivity, and frame rate. New proprietary flow algorithms produce exceptional vessel border delineation while preserving 2D imaging characteristics in color Doppler modes. New color map options allow enhanced visualization of flow for color-blind users.

New MicroCPA
for exceptional small vessel visualization

Renal artery   Liver capsule vasculature   Splenic vasculature
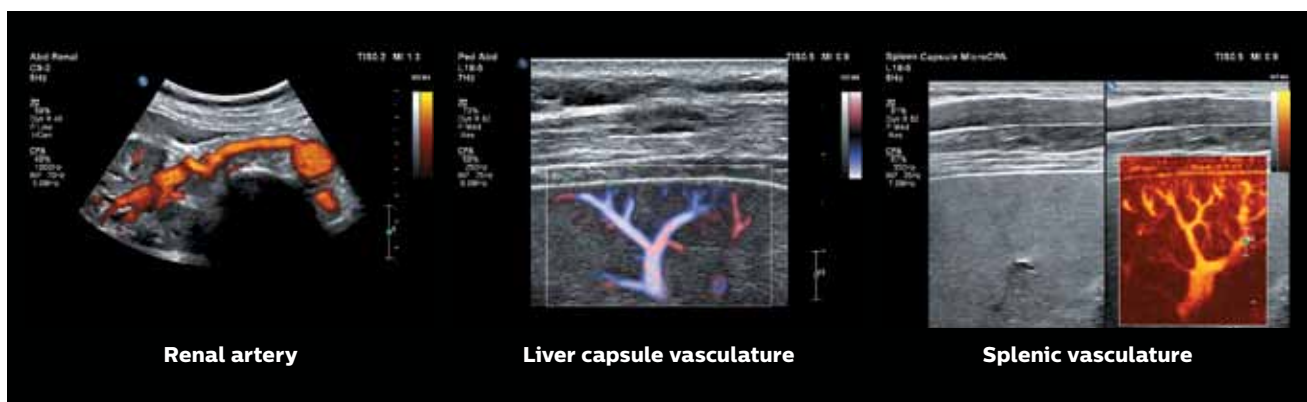
In the past, obtaining flow information in small low-flow vascular structures has been a challenge. Now the EPIQ's MicroCPA feature — visualization of low velocity micro circulation — is quick and simple, allowing for more diagnostic confidence when evaluating organ perfusion or small vascular beds.

Maximize
extreme clinical capabilities

EPIQ 7 offers the ultimate in flexibility to configure any clinical option and application for a true no-compromise cardiovascular imaging system.

xMATRIX is our most leading-edge, versatile ultrasound transducer technology

No other premium ultrasound system can run the complete suite of the world's most innovative ultrasound transducers. With the touch of a button xMATRIX offers all modes in a single transducer: 2D, 3D/4D, Live xPlane, Live MPR, MPR, Doppler, color Doppler, and CPA.
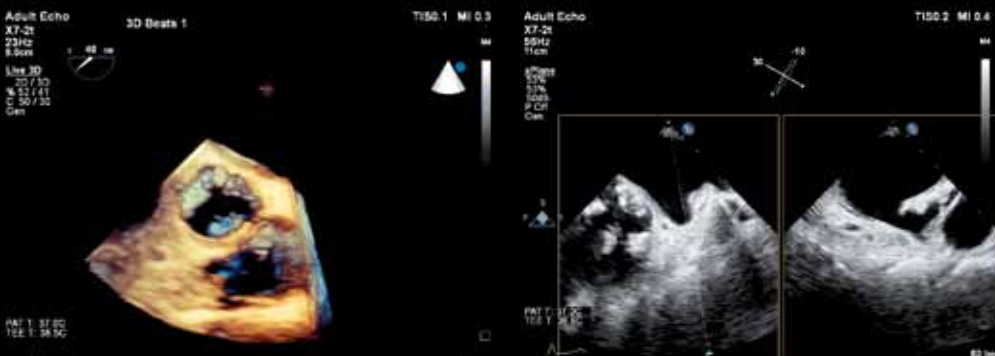
***n*SIGHT Imaging makes powerful xMATRIX technology even more so**

Achieve ultra-thin 2D slices. Use Live xPlane imaging to create two full-resolution planes simultaneously, allowing you to capture twice as much clinical information in the same amount of time. Acquire near isovoxel resolution to reveal images from any plane within the volume. Now it's all possible.

The revolutionary *n*SIGHT architecture of EPIQ 7 makes xMATRIX even more powerful.
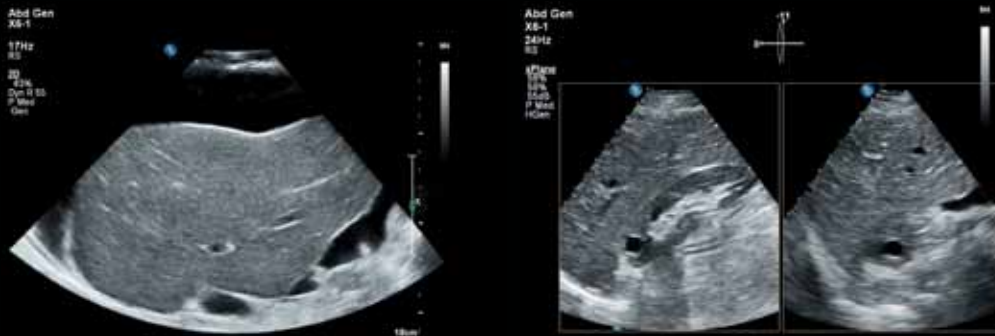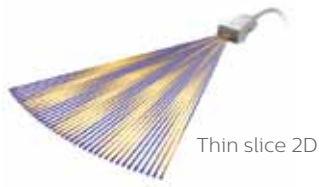

See exceptional image quality at all depths and volume rates across all 3D/4D modes and applications with the X6-1 transducer.
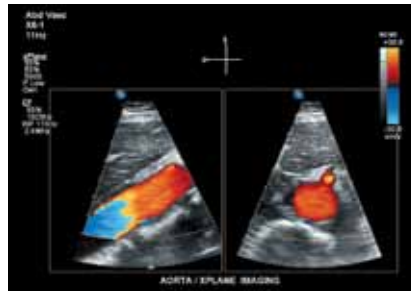

Leading-edge xMATRIX transducers for cardiology include X5-1 for adult cardiology and X7-2t for TEE applications.
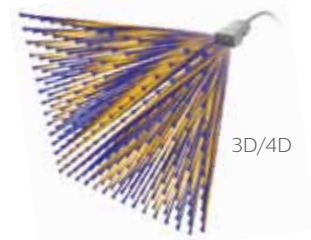
Philips pioneered **xMATRIX** advanced technology

Thin slice 2D

Live xPlane imaging

3D/4D

With xMATRIX, you can achieve ultra-thin, 2D slices.

With xMATRIX, you can use Live xPlane imaging to create two full-resolution planes simultaneously, allowing you to capture twice as much clinical information in the same amount of time.
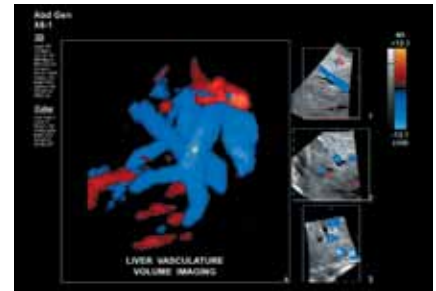
Acquire near isovoxel resolution that reveals superb images from any plane within the volume. Send 3D MPRs in the X, Y, and Z plane to any PACS system with MPR DICOM export. Present smooth, real-time 4D volume data.

Exclusive panoramic volume imaging with **xMATRIX**

Panoramic volume imaging uses Live xPlane imaging to acquire a calibrated volume over an extended field of view. Easily capture, visualize, and quantify a full organ.
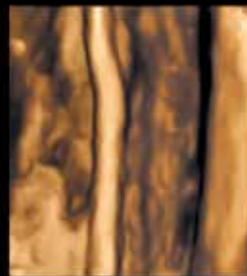
Femoral artery

Abdominal aorta and iliac arteries

xMATRIX panoramic volume imaging allows for whole organ acquisition, visualization, and quantification of anatomical structures and better correlation with other imaging modalities.

The **power of PureWave** to image technically difficult patients

PureWave crystal technology represents the biggest breakthrough in piezoelectric transducer material in 40 years. The pure, uniform crystals of PureWave are 85% more efficient than conventional piezoelectric material, resulting in exceptional performan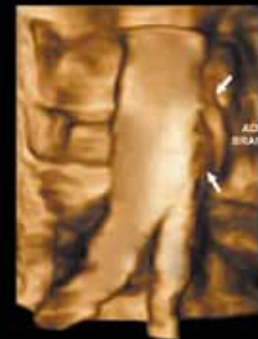ce. This technology allows for improved penetration in difficult patients with a single transducer and for excellent detailed resolution. All xMATRIX transducers incorporate PureWave technology.

PureWave offers enhanced technology for imaging technically difficult patients in a wide range of applications

Apical four-chamber view with mitral regurgitant jet

Liver, technically difficult patient (BMI=55)

PureWave transducers offer the solution for imaging technically difficult patients in a wide range of applications

- PureWave C5-1 and C9-2 for difficult-to-image abdominal and lower extremity applications
- PureWave S5-1 for difficult-to-image cardiology patients and transcranial applications
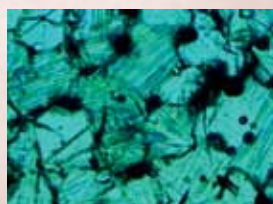
Conventional   (x800)

PureWave   (x800)

PureWave crystals have virtually perfect uniformity for greater bandwidth and twice the efficiency of conventional ceramic materials. The result is excellent imaging and Doppler performance.

Elastography for more definitive information about tissue stiffness

The EPIQ platform supports both strain and shear wave methods of elastography. Highly sensitive strain imaging can be used to rapidly assess relative tissue stiffness values across a variety of applications. Shear wave elastography utilizes a unique pulsing scheme to generate and detect the propagation speed of shear waves, providing an absolute measure of tissue stiffness. In addition, the EPIQ platform is designed to support the future of elastography including quantitative real-time shear wave imaging across a variety of transducers and applications.

Shear wave elastography

ElastPQ uses ultrasound shear wave elastography to provide a non-invasive, reproducible, and easily performed method of assessing tissue stiffness. A special pulse sequence technique using existing transducers produces shear waves in tissue and measures the propagation speed of the waves. Now tissue stiffness samples can be acquired during a routine ultrasound examination of the liver. According to the latest studies,[1] using shear wave elastography may help reduce or avoid conventional liver biopsies. Many studies are suggesting that instead of a costly and painful biopsy procedure, an easy ultrasound exam becomes the routine method to assess liver disease status.

Elasto point quantification

[1] Ferraioli G, et al. Point shear wave elastography method for assessing liver stiffness. World J Gastroenterol 2014 April 28;20(16):4787–4796.

Fast and effective
image fusion and needle navigation

Make confident decisions even in challenging diagnostic cases with fully integrated fusion capabilities that feature streamlined workflows to allow clinicians to achieve fast and effective fusion of CT/MR/PET with live ultrasound.

By combining imaging modalities directly on the ultrasound system, you now have access to an even more powerful diagnostic tool with advanced visualization allowing for fast clinical decisions.
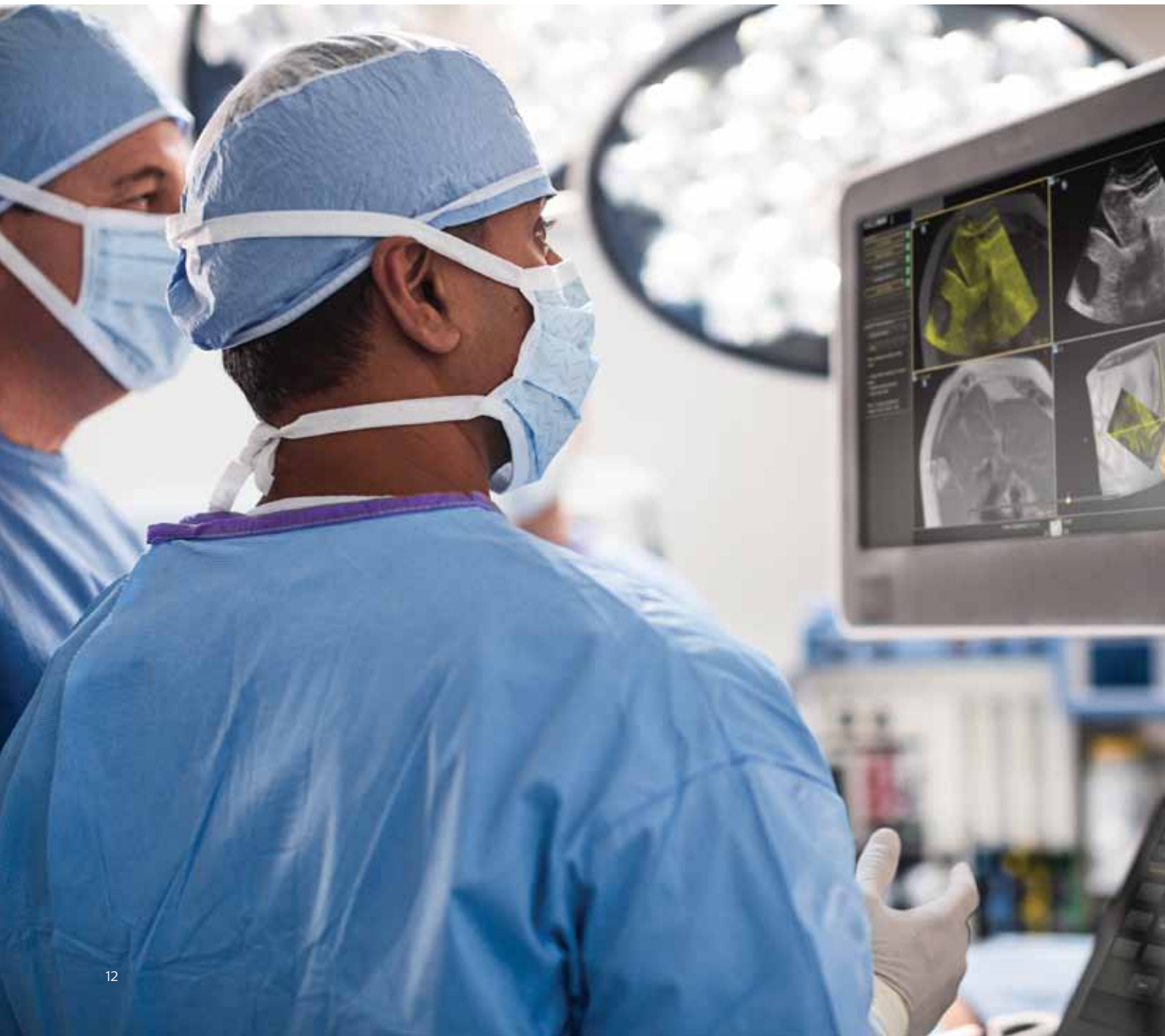
Fusion and navigation

Cerebral artery assessment using transcranial ultrasound and CT fusion

Post EVAR assessment using ultrasound and CT fusion

Expand vascular fusion and navigation capabilities through a range of PureWave transducers including the X6-1 xMATRIX, S5-1 (abdominal and transcranial), C5-1, and C9-2.

Fast and effective image fusion

Make confident decisions even in challenging diagnostic cases with fully integrated fusion capabilities that feature streamlined workflows to allow clinicians to achieve fast and effective fusion of CT/MR/PET with live ultrasound.

By combining imaging modalities directly on the ultrasound system, you now have access to an even more powerful diagnostic tool with advanced visualization, allowing for fast decisions compared to without fusion.

Advanced needle navigation

Needle navigation is a performance-enhancing tool for challenging interventional cases such as a hard-to-visualize small-lesion biopsy or difficult-to-access ablations that are close to critical structures. Procedures may now be completed in less time and with fewer confirmatory scans.[2]

A reusable adaptive needle tracker and an expanded range of coaxial needle-tip tracked instruments offer you a wide range of compatibility with biopsy and ablation devices depending on the degree of procedure complexity.

[2] Kim E, et al. CT-Guided liver biopsy with electromagnetic tracking: results from a single-center prospective randomized controlled trial. American Journal Roentgenology 2014;203:W715-723.

Designed to **reinvent** the user experience

EPIQ 7 has completely reinvented the premium ultrasound user experience. Ease of use, workflow, ergonomics, portability – we've revolutionized how you interact with an ultrasound system from every standpoint, and kept it beautifully intuitive.

More than 80% of sonographers experience work-related pain, and more than 20% of these suffer a career-ending injury.[3] The EPIQ tablet-like interface results in dramatic reduction in reach and button pushes, with 40% to 80% less reach and 15% fewer steps.*

Advanced workflow

The design of the platform features "walk-up usability," meaning that users can perform an exam with minimal training.[4] The system offers the automation to drive efficiency throughout exams with features such as Real Time iSCAN (AutoSCAN), which automatically enhances gain and TGC continuously to provide excellent images in 2D, 3D, or 4D.

Amazingly portable

At just 104 kg (230 lb), EPIQ 7 is lightest in its class and 40% lighter than the heaviest competitive premium system. Easily transport EPIQ 7 on both carpet and tile floors. Place it in sleep mode, move it, and boot up in seconds. The monitor folds down to reduce overall system height for transport, and the integrated cable hooks and catch tray are ideal for portable studies. Wireless DICOM further aids workflow.[†]

Tablet-like touch interface allows quick navigation to system functions with 40% to 80% less reach and 15% fewer steps to complete an exam.

Library quiet

EPIQ 7 is almost silent when running. A noise test determined that EPIQ 7 runs at 37–41 dB, which is equivalent to the sound of a library.

Scanning comfort

Multiple degrees of articulation for both the control panel and 54.6 cm (21.5 in) LCD monitor with 720° of freedom allows for ergonomic alignment, whether sitting or standing, for scanning comfort.

SmartExam

SmartExam decreases exam time by 30–50%, keystrokes by as many as 300 per exam, and results in a high level of consistency among users.[5] It is fast and easy to customize, providing consistent annotation, automatic mode switching, and missed view alerts to streamline exams. The result is more time to focus on your patients, increased confidence in complete studies, less focus on requirements, less repetitive motion, less stress, and improved schedule maintenance and department efficiencies.

Auto Doppler for vascular imaging

Auto Doppler takes time-consuming color box positioning and sample volume placement from ten steps to three steps and reduces the number of repetitive button pushes by an average of 68%.[6]

Active native data

Active native data allows for post-processing of many exam parameters.

Set-up Wizard

Set-up Wizard allows users to step up to the system, easily establish user configurations, and get running quickly.

Access to multimodality images

Use multimodality query retrieve to view DICOM images such as CT, NM, MR, mammography, and ultrasound. Easily compare past and current studies without the use of an external reading station and even review these multimodality images while live imaging.

Easy viewing and efficient use even in darker scanning environments with a large 54.6 cm (21.5 in) wide screen and ambient lighting that provides subtle visual cues for the keyboard, OEMS, and transducer ports.

EPIQ 7 makes it easy to be green

25%
less power

EPIQ 7 is one of the greenest systems we have ever designed. It consumes 25% less power than our legacy premium ultrasound.

[3] Society of Diagnostic Medical Sonography, Industry Standards for the Prevention of Musculoskeletal Disorders in Sonography, May 2003.
[4] External user study where all users had over 90% success (gold standard in usability) on their set tasks with no training on EPIQ, Jan 2013.
[5] University of Colorado, Protocols Study, Apr. 2007.
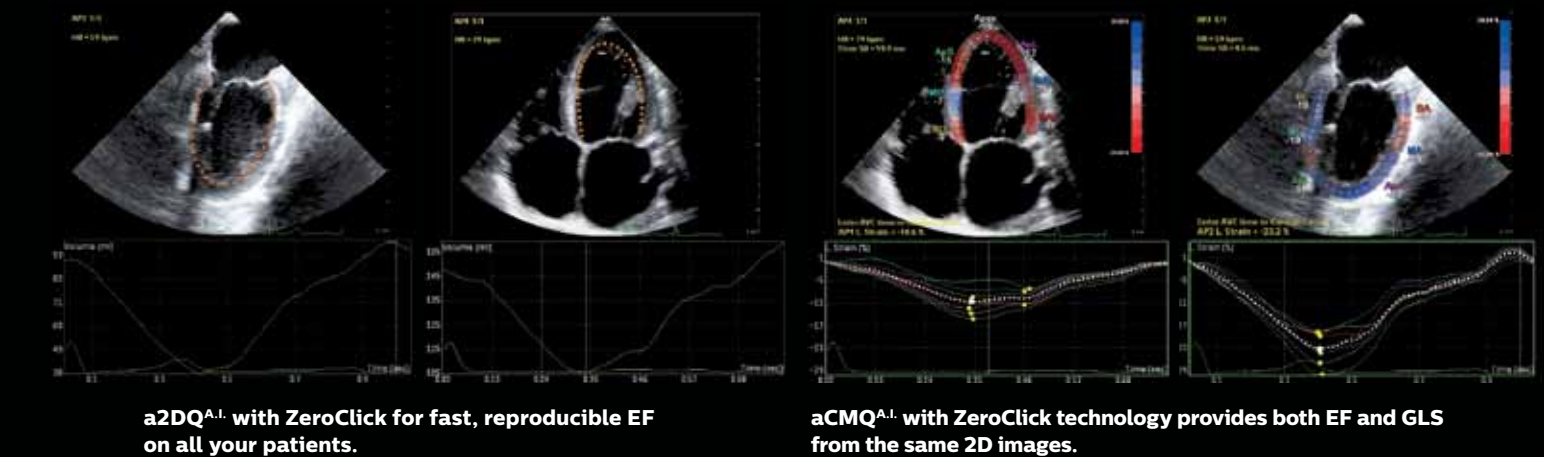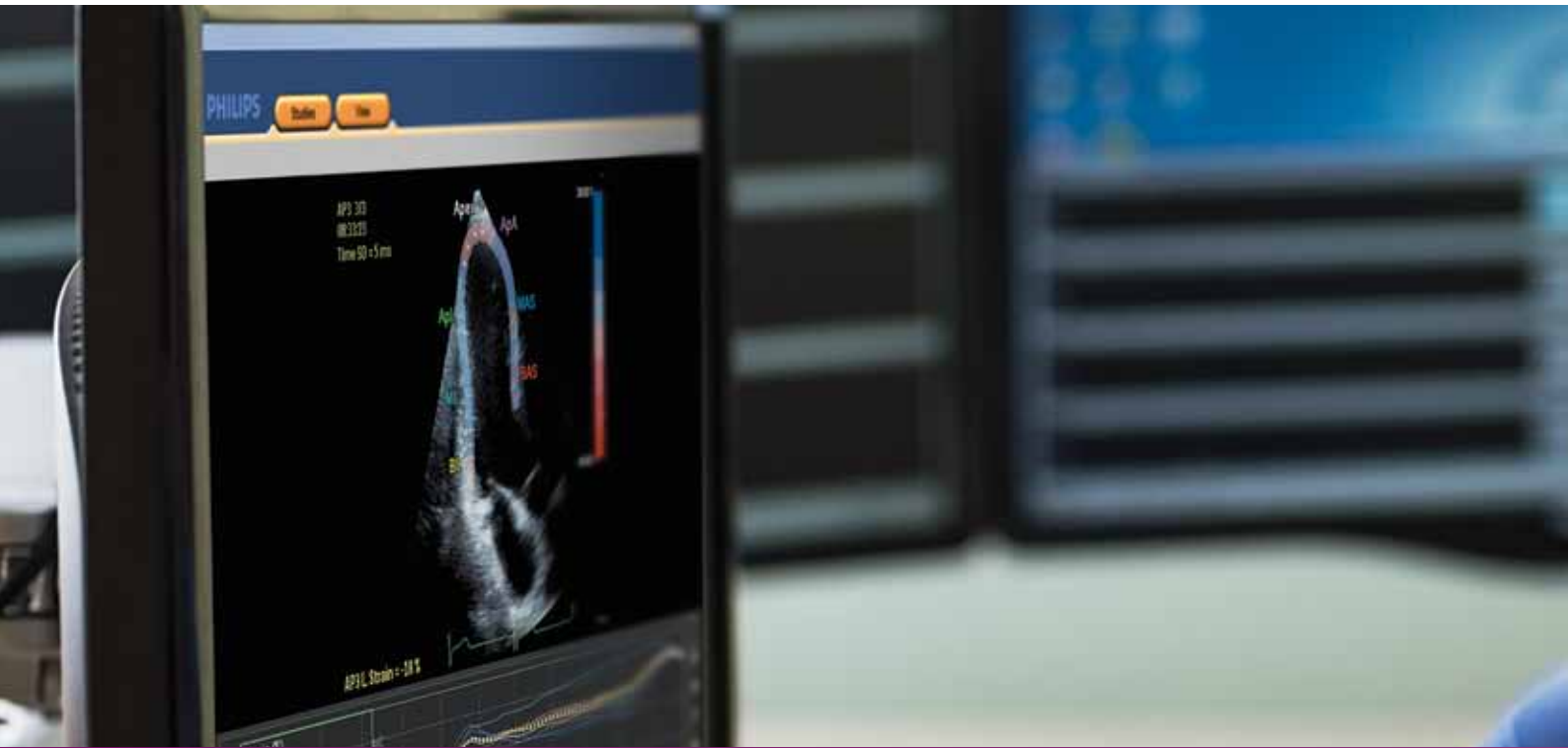[6] Auto Doppler Clinical Study, Dec. 2011.
* 2013 engineering study comparing Philips iU22 ultrasound system with EPIQ 7.
† Check for availability in your geography.

Intelligence
turning images into answers

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

aCMQ[A.I.] **with ZeroClick technology provides both EF and GLS from the same 2D images.**

Q-App quantification applications

EPIQ 7 offers a wide variety of sophisticated Q-Apps
to quantify ultrasound image information.

Vascular Q-Apps

- Intima Media Thickness (IMT)
- General Imaging 3D Quantification (GI 3DQ)
- Region of Interest (ROI)
- MicroVascular Imaging (MVI)
- Vascular Plaque Quantification (VPQ)
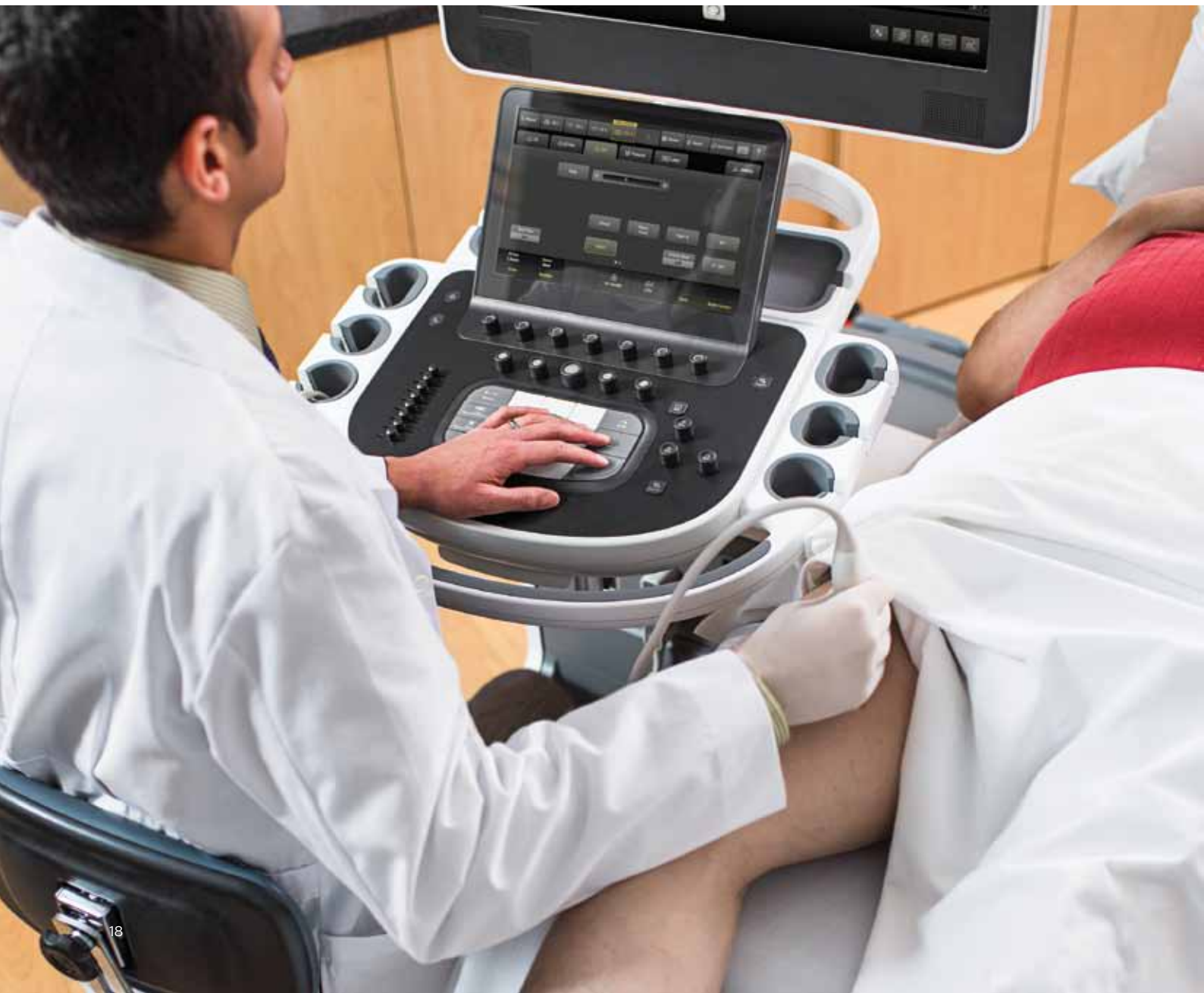
Cardiology Q-Apps

- Strain Quantification (SQ)
- Cardiac 3D Quantification (3DQ)
- Cardiac 3D Advanced Quantification (3DQ Advanced)
- CMQ Stress
- Mitral Valve Navigation[A.I.] (MVN[A.I.])
- Automated 2D Cardiac Quantification[A.I.] (a2DQ[A.I.])
- Automated Cardiac Motion Quantification[A.I.] (aCMQ[A.I.])

*Edit option

Anatomical Intelligence

Achieve new levels of simplicity

At the heart of the powerful EPIQ 7 architecture is our Philips exclusive Anatomical Intelligence Ultrasound (AIUS), designed to elevate the ultrasound system from a passive to an actively adaptive device. With advanced organ modeling, image slicing, and proven quantification, exams are easy to perform, more reproducible, and deliver new levels of clinical information.

AIUS ranges from automating repetitive steps to full-blown computer-driven analysis with minimal user interaction — all using anatomic intelligence and all providing the results you need. In fact, many of our tools come with ZeroClick technology, which means that once loaded, the tool does it all for you.*

Anatomical Intelligence
is the **heart** of EPIQ 7

Automation

**Automated 2D Cardiac Quantification[A.I.] (a2DQ[A.I.]) with ZeroClick technology for adult and pediatric echo**

The ideal tool of every echo lab, Automated 2D Cardiac Quantification[A.I.] (a2DQ[A.I.]) with ZeroClick technology uses AIUS for an Auto-ROI to drive the Q-App and provide rapid access to proven 2D EF and volumes. AutoEF is available during the study and so fits in with an everyday echo protocol.

Automated Cardiac Motion Quantification[A.I.] (aCMQ[A.I.]) with ZeroClick technology for adult echo

The ZeroClick technology of the Automated Cardiac Motion Quantification[A.I.] (aCMQ[A.I.]) uses speckle mechanics to provide reproducible 2D Global Longitudinal Strain (GLS) speckle measurements. A proven EF is also calculated by using the Auto-ROI that drives the automation within the aCMQ[A.I.] Q-App.

Automatic registration for image fusion and navigation

CT and ultrasound vessel and surface registration allow you to complete the challenging task of registering a CT volume with ultrasound in less than one minute – 1/10 the standard alignment time.
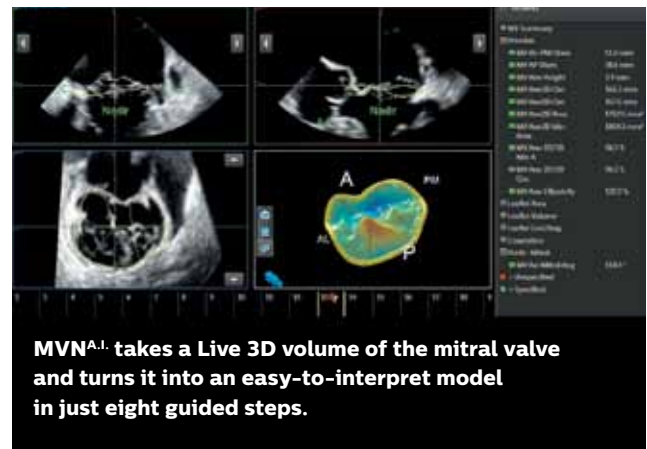

Anatomical Intelligence liver vessel segmentation for CT and ultrasound provides image fusion in less than one minute.
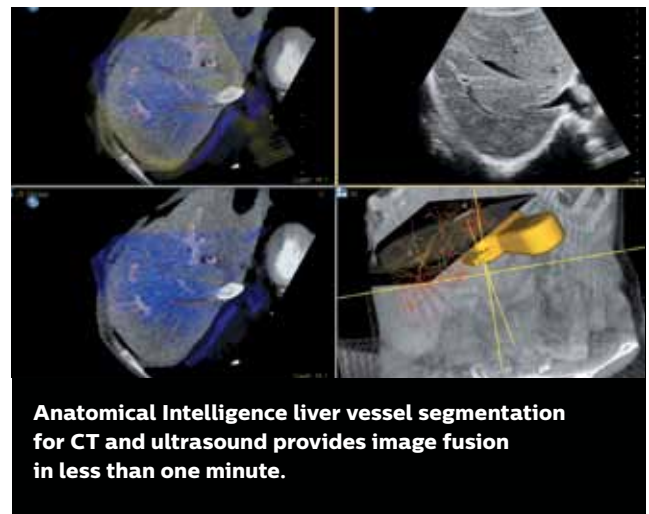
Navigation

The Mitral Valve Navigator[A.I.] (MVN[A.I.])

The Mitral Valve Navigator[A.I.] (MVN[A.I.]) is 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.] tools measures 89% fewer clicks.[3]

MVN[A.I.] saves steps at each part of the process

Annulus data is acquired with 74% fewer clicks,[3] which also provides leaflet tracing with no user interaction. MVN[A.I.] guides the entire process using simple commands and clear graphics, making this a much easier tool to use than previous mitral quantification tools. Results derived from MVN[A.I.] can be seen on the screen as they become available, speeding the process of accessing required data.

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.

Vascular Plaque Quantification (VPQ)

Vascular Plaque Quantification is a non-invasive tool that uses 3D technology to visualize and quantify both the overall volume of vascular plaque in the carotid artery and the percent area of vessel reduction, as well as other characteristics of plaque composition. VPQ may prove to be a valuable tool to aid in determining who is at an increased risk of stroke or cardiovascular disease based on this important measurement of plaque buildup in the carotid artery.

VPQ and the VL13-5 transducer allow advanced analysis of plaque volume and morphology.
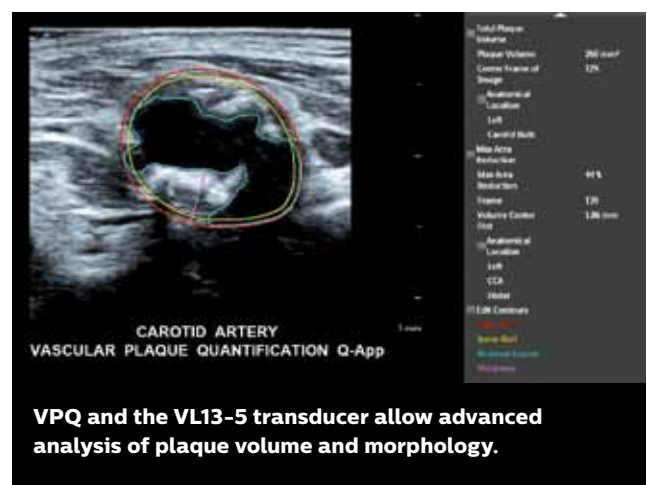
[3.] 2013 QLAB 9 MVQ and QLAB 10 MVN click comparison internal study.

Advanced **support services**
are proactive and predictive

We understand your challenges: uncertain economic times, changing healthcare landscapes, and the impact of healthcare reform. We know that efficient workflows and system uptime are critical success factors in running an effective healthcare business.

Philips is committed to offering innovative solutions to provide you with world–class services that move from reactive to proactive and with predictive service models that provide high system availability and enhanced workflow to help you deliver high quality patient care.

Remote services mean we're closer than ever*

Remote desktop

Spend less time on the phone with a Philips "Virtual Visit" with remote system interaction for fast technical and clinical troubleshooting and guided scanning options.

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.

Online support request

Enter a support request directly from your EPIQ system for a fast, convenient communication mechanism that reduces workflow interruption and keeps you at the system and focused on your patient.

Utilization reports

Data intelligence tools that can help you make informed decisions to improve workflow, deliver quality patient care, and decrease the total cost of ownership. This ultrasound utilization tool provides individual transducer usage and the ability to sort by exam type.

Proactive monitoring

Proactive monitoring allows for the detection and repair of anomalies before they become problems and helps us to better predict potential failures and proactively act on them. Increase system availability, optimize workflow, and promote patient satisfaction by scheduling downtime as opposed to reacting to an unexpected problem.

*Check for availability in your geography.

The remote desktop allows Philips service engineers to gain a live view of your system's console for remote operation, real-time clinical troubleshooting, and issue resolution.

Exceptional serviceability

Philips offers the only ultrasound utilization tool that provides individual transducer usage and the ability to sort by exam type.

The system features superior modular design for rapid repair, getting your system up and running quickly.

Intelligent software architecture

Software is easily optimized, maintained, and restored by the service user without risk to patient data, giving you peace of mind when dealing with software anomalies and confidence that your data is safe.

This software architecture takes patient data privacy to a new level. Patient data is stored on a separate partition and physical location to provide protection and ease of removal, providing you total control of your data.

Clinical education solutions

Our comprehensive, clinically relevant courses, programs, and learning paths are designed to help you improve operational efficiency and enhance patient care.