Vivid™ E9 with XDclear™

healthymagination

imagination at work

Extraordinary capabilities

Whether in TTE or TEE, capture the entire heart in a single beat. Image a valve, or the entire ventricle with excellent image quality. And break down the barriers to routine day-to-day 4D imaging, from acquisition, through navigation and quantification, to archiving.

Vivid E9 is GE Healthcare's first cardiovascular ultrasound system built specifically for 4D imaging—from ergonomics to image acquisition to data management. Available in both 2D and 4D configurations.

Featuring our Accelerated Volume Architecture 4D platform for increased processing power compared to GE Healthcare's previous 4D scanner.

Advanced quantification tools help streamline workflow for enhanced productivity. These tools include 4D Stress and 4D Auto LV Quantification. One-touch ease of use and intuitive workflow puts 4D at your fingertips.

As 4D becomes routine in your clinical practice, you still need excellent 2D image quality.

Vivid E9 handles 2D imaging with equal power, precision, and agility, made possible with our 4V-D transducer, the second-generation 4D transducer, and the M5S/M5Sc transducers single-crystal matrix array and XDclear transducer technology.

Open the door to 4D and its many new possibilities.

Accelerated Volume Architecture

GE's exclusive and patented beam-forming technology, the Accelerated Volume Architecture, provides several times the power of traditional GE ultrasound systems with increased volume size for full volume single beat, as well as for high-volume rate multi-beat 4D acquisition. Using both coherent and harmonic image processing, the system provides computational power, ease of imaging, workflow flexibility and product upgradeability.

Raw data format

The GE Vivid product line has always acquired and stored its data in a specific raw data format, which enables onboard, as well as after-the-fact post-processing capabilities. This flexible and innovative format and storage of pre-scan converted data has enabled development of utilities with high clinical value.

This has resulted in an increase in the ability to perform additional advanced algorithms for all of the steps in the data processing chain, culminating in the release of the Vivid E9 with XDclear.

for every day

XDclear. High speed and image quality to help make your work life easier.

An advanced, intuitive ultrasound leadership system, Vivid E9 with XDclear provides extraordinary image quality for the following imaging modes: 2D, color flow, Doppler, and 4D. It's well-suited for serving your cardiovascular and shared services needs.

Five new imaging transducers—two designed with GE Healthcare's XDclear transducer technology—complement an already robust portfolio of adult, pediatric, vascular, and abdominal transducers.

Vivid E9 with XDclear helps strengthen 4D display and visualization, as well as 2D and 4D quantification. It offers excellent workflow and portability—designed into a powerful, versatile platform built for current and future innovations.

Advanced transducer technology

Thanks to recent advances in transducer technology, XDclear transducers are GE Healthcare's highest-performing transducers. XDclear transducers are designed to deliver more powerful and efficient sound waves, with higher bandwidth and efficiency than traditional GE transducers.

XDclear technology is built on a combination of three innovations in acoustic engineering:

- **Single Crystal** provides a method to "grow" advanced piezoelectric material with the polarity of the molecules aligned to deliver a high-quality acoustic signal with enhanced bandwidth and efficiency.

- **Acoustic Amplifier** design acoustically insulates the core transducer structure from the mechanical housing to capture and redirect unused energy that passes through the crystal. This enhances power efficiency bandwidth and helps reduce noise and heat dissipation.

- **Cool Stack** helps optimize energy use by relieving inherent heat generation that can otherwise reduce sensitivity and penetration.

The result: Impressive penetration and/or high sensitivity—while still maintaining high spatial resolution.

At your service

From your adult and pediatric echo labs, to your interventional suite and OR, Vivid E9 with XDclear can help deliver improved image quality in 2D, 4D, color, and Doppler, for enhanced diagnostic confidence and to help shorten exam times.

Adult echo
By providing superb image quality even on difficult-to-scan patients, Vivid E9 with XDclear helps increase diagnostic confidence and productivity in adult echocardiography.
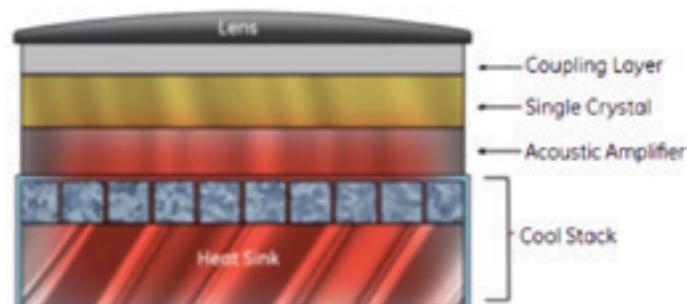
Interventional/OR
With the introduction of the visualization tools Polar Vision and Depth Illumination, Vivid E9 with XDclear offers extraordinary, clear 3D depth perception of cardiac structures during image-guided device placements, as well as during other transthoracic or transesophageal procedures.

Pediatrics
For your pediatric patient population, the echo imaging capability of the Vivid E9 with XDclear can provide lifetime follow-up – from the fetal heart, through pediatrics, to adult congenital heart issues – for excellent patient care.
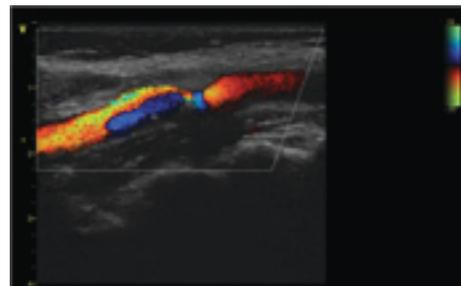
Shared services
With a comprehensive portfolio of transducers that deliver extraordinary image quality on a broad spectrum of body types, Vivid E9 with XDclear is well-suited for a variety of shared services uses, including cardiac, peripheral vascular, abdominal, and OB/GYN.

Lens — Coupling Layer — Single Crystal — Acoustic Amplifier — Cool Stack — Heat Sink

XDclear Technology

Extraordinary image quality

Crisp imaging. Focused workflow. Clear quantification. Vivid E9 makes short work of your routine 2D exams.

2D image quality

Designed with GE's proprietary XDclear technology, the M5Sc transducer delivers excellent endocardial definition and texture. Together with controls like UD Clarity and HD imaging, it helps provide crisp valves and borders across a wide range of patients. Similar image quality is achieved with pediatrics, vascular, abdominal, and TEE transducers.
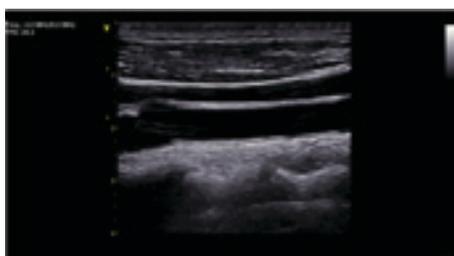

Adult echo color Doppler

The XDclear transducer technology provides the color sensitivity needed for visualization of pulmonary vein inflow.

Abdominal imaging

C1-5-D abdominal image in harmonics for excellent spatial and contrast resolution.

Vascular imaging

Notice the clarity and excellent definition of layers and vessel walls in this carotid image acquired with the new 9L-D Carotid_A preset.

Fetal heart imaging

Fetal heart C2-9-D color Doppler image combining high temporal and spatial resolution.
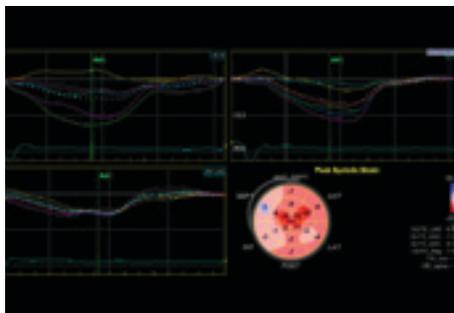
Extraordinary quantification

Based on extensive feedback from clinicians just like you, TTE and TEE on the Vivid E9 are all about making imaging simple, intuitive, and quantifiable to help make your work easy and efficient.
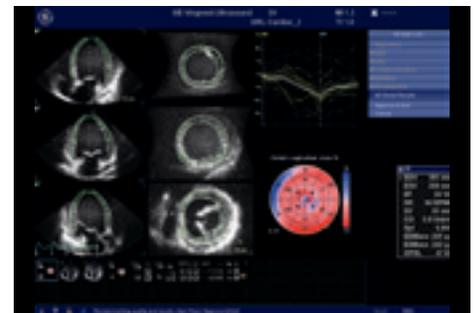
Automated Function Imaging (AFI)

This software tool assesses and quantifies left ventricular wall motion at rest. It calculates a large set of parameters to describe the function of the left ventricular walls. AFI specifically calculates peak systolic longitudinal strain (both segmental and global) and presents the results as parametric images.

As part of its healthymagination validation, a study has shown that AFI offers potential in predicting mortality in patients with suspected LV impairment compared to Ejection Fraction and Wall Motion.[1]
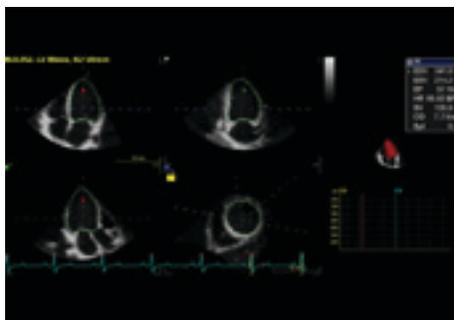

AFI
Bull's-eye as well as segmental traces showing reduced longitudinal strain, likely due to right coronary flow obstruction.

4D Strain
As an extension to the 4D LV Mass tool, both global and regional strain values are calculated based upon a spatial speckle-tracking algorithm. The end result is presented in a Strain Bull's-eye plot accompanied by time-strain curves and cut planes for enhanced visual tracking assessment.
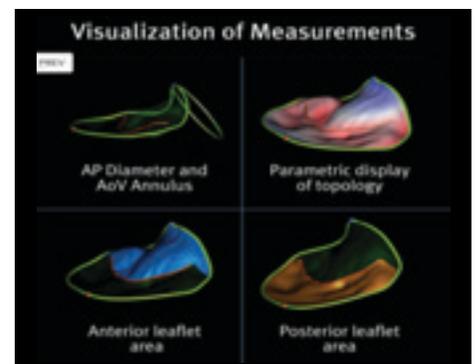

4D Auto LVQ
A mesh-based surface-tracking model, the 4D Auto LVQ quantification tool provides you with a graphical output of pure 4D volume data. Utilizing temporal data, it delivers reproducible results for automatic volumes and ejection fractions.

4D LV Mass
Using the above-mentioned mesh-based surface-tracking model, by adding the epicardial border, an LV Mass and an LV Mass Index is derived from the same data set.

MV Assessment
The semi-automated MV Assessment tool, now also available on Vivid E9 for TEE and TTE, provides the ability to include quantitative results for the mitral valve apparatus, into the patient exam.

[1]Stanton et al, 'Prediction of all-cause mortality from global longitudinal speckle strain: Comparison with ejection fraction and wall-motion scoring', Circulation: Cardiovascular Imaging, 2009; 2: 356-364

Extraordinary workflow

The Vivid E9 helps make 4D imaging as easy as 2D imaging. It can bring remarkable enhancements to your entire 4D workflow process, thanks to fast, consistent reproducibility.

4D Views

SAX 4D Stress Views

4D Views

4D Views provides you with "one-touch" options to view images such as 4-chamber, 2-chamber, APLAX, mitral valve, septum, and aortic valve. After a rapid alignment, it takes the full volume acquisition data set and, with the touch of a button, automatically crops away the volume to instantly deliver the view you want. 4D Views helps reduce the manual cropping and cutting of conventional 3D workflow—a time-consuming process that's difficult to teach and learn.
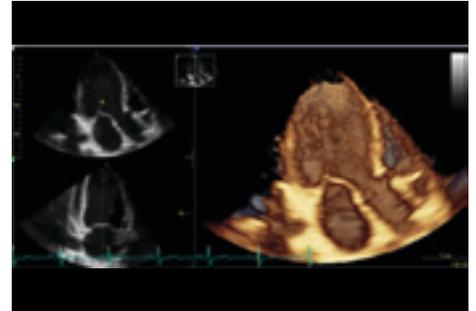
4D Virtual Store

This innovative feature helps reduce the size of patient studies by using image pointers to refer back to the original full-volume data set, rather than saving multiple large data sets for every new crop view or measurement.
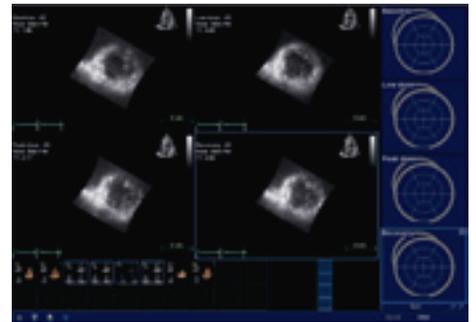
Advanced 4D User Tool Box

For 4D Auto LVQ and 4D Views, an automated tool, Auto Align, helps simplify and speed up the process of aligning the left ventricle. Multi-Slice Imaging provides you with a live imaging mode where you can chose between viewing 5, 7, 9, or 12 slices, for simultaneous acquisition and assessment. Dynamic Multi-Slice and Dynamic Crop enable continuous display of the same structures throughout the cardiac cycle, compensating for out-of-plane motion in short-axis views, potentially improving the accuracy of wall-motion scoring.

4D Stress

Helping improve workflow for stress echo procedures, 4D Stress is an innovative first step in helping you integrate 4D into the routine of your day-to-day clinical practice. Acquire full volume,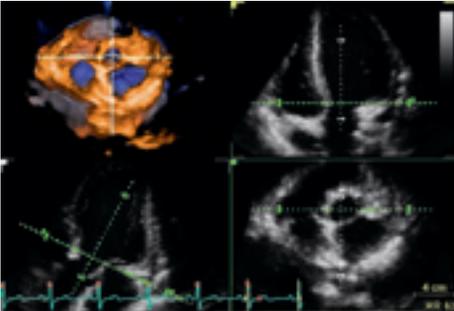 then using 4D Stress, the Vivid E9 cuts that volumetric view into three planes for short-axis analysis and three planes for long-axis analysis, so you can view images more easily. With the Vivid E9, you can now visualize short-axis slices of the entire ventricle under stress. See views you've never seen before with conventional echo, which only shows you one slice in the short-axis view.

Scan Assist

With Scan Assist, you can quickly customize the system for your departmental protocols for CRT optimization, and let the system guide you to the next view, mode, and measurement. There are also templates for both exercise and pharmacologic stress, all customizable using Scan Assist. Also available for 4D TTE and TEE.
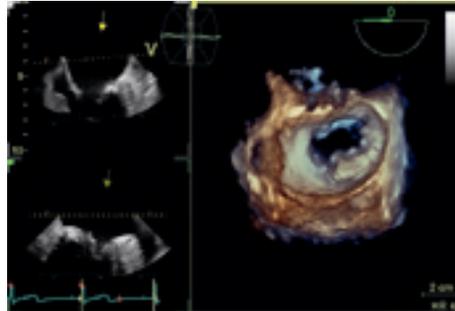
Scan Assist Pro

With Scan Assist Pro, you can customize the system for your standard echo, vascular, and abdominal exams. The protocols assist you throughout each step of an exam by automatically setting up modes and measurements, as well as annotations, helping enhance image acquisition consistency and helping reduce the number of keystrokes. Also available for 4D TTE and TEE.
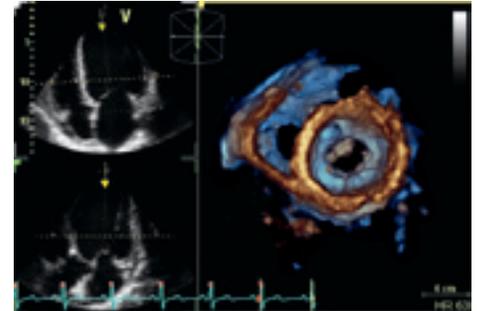
FlexiSlice

Easily switch from volumes to slices and back in live or replay mode.

Extracting 2D slices from 4D volumes can be a complicated process. FlexiSlice is an intuitive, interactive tool for obtaining many 2D or render views in either live or replay mode. With FlexiSlice, you can slice in any direction, and easily select a slice view to be projected as a render image.

Image shown is a left ventricle outflow track.
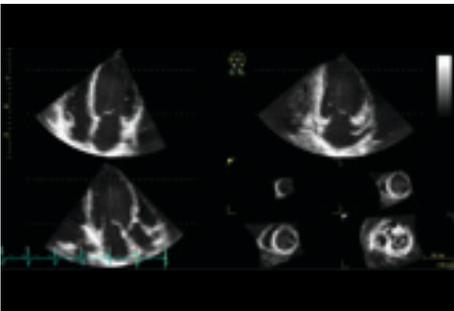

FlexiZoom

See the mitral valve in 4D TEE with one push of a button.

Visualizing the mitral valve in live mode typically requires extensive cropping, rotation, and translation. FlexiZoom provides a fast, efficient way to see a surgeon's view of the mitral valve to help increase flexibility and reduce keystrokes. There's no need to turn the volume toward you, manually crop into it, or rotate it to position the aortic valve above the mitral valve. FlexiZoom's intuitive user interface enables flexible, quick and easy visualization of the structures of interest. You don't need to adjust gains to optimize the image. Just push a button, and FlexiZoom does it all for you.

2-Click Crop

Click and drag. See any 4D view in live mode or replay.

Obtaining standard or non-standard views during live scanning or replay can be difficult. A simple, quick, extremely intuitive live crop tool, 2-Click Crop lets you crop from the inside out, starting with two extracted scan planes.

Image shown is a 4D TTE view of the mitral valve.

Multi-slice

Multi-slice imaging, available in live or replay, helps the user extract conventional long-axis and short-axis views from 4D volume data sets.

Image shown is from a 4D TTE volume loop, extracting the three conventional long-axis views and four short-axis slices simultaneously.

Depth Illumination

A new depth color map enables illumination of structures by an imaginary movable light source, casting a shadow to help improve depth/distance perception. Shown above is an ASD closure device.

Polar Vision

The Polar Vision option is designed to enhance communication in the cath lab and OR, introducing a new stereo vision technology combining polarized stereo with depth rendering displayed on a dedicated 3D monitor.

From its slim, lightweight, maneuverable design, to its adjustable electronic keyboard, the Vivid E9 system is ergonomically designed to be easy to handle and operate.

Extraordinary ergonomics

Adjustable LCD display

The 17-inch, all-digital high-definition LCD display tilts and swivels to a comfortable viewing angle.

Highly mobile

40% smaller and 30% lighter than console-based ultrasound systems,* the highly mobile Vivid E9 is ready to roll right to the bedside.

User adaptable

Using one-touch ergonomics, the Vivid E9's keyboard position, LCD display angle and touch panel interface can be easily configured to your preferences.

Front and rear handles

Handles on both the front and rear of the Vivid E9 make it easy to transport the system.

Accessible touch panel controls

The Vivid E9's touch panel uses fewer hard keys, making the keyboard smaller and the keys larger for easier access.* Expanded 4D imaging controls are organized for an easy 4D workflow with flexibility.

Adjustable floating keyboard

With one touch, you can easily adjust the height and position of the Vivid E9 keyboard. Once comfortably positioned, just lock it in place to help prevent accidental shifting.

Easy keyboard storage

The keyboard stores conveniently out of the way in a drawer when not in use.

Convenient data management

Data management options are conveniently located with multiple USB ports and a DVR recorder.

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