



GE HealthCare

Vivid™ E90

Ultra Edition

Your patients rely on you.
You can rely on us.



Today's challenges

Increasing demand, coupled with limited cardiology staff, results in additional workload challenges for the entire medical community.



17 million

people died from CVDs in 2019¹



1 in 4

cardiologists state they are burned out²



>10%

increase in Ischemic Heart Disease (IHD) alone by 2030³



~20%

of sonographers are leaving the profession or taking premature retirement⁴



~108 million

annual echo exams performed globally⁵



x2

Shortage of health workers is **set to double**⁶



Your patients rely on you. You can rely on us.

Patient care isn't just a job for you. It's a calling. A mission.

Of late, that mission has changed. Increased workloads, fewer skilled staff and increased demands on your time, resources and expertise are now the norm.

Getting the right images under this pressure is challenging.

But this isn't just a job for you and you have no intention of sacrificing quality in your practice when so much is at stake.

The Vivid E90 Ultra Edition[†] cardiovascular ultrasound system has been updated to meet today's challenges. To allow further improved image quality in both 2D and 4D as well as reduce tedious tasks and inter-operator variability, from the simple to the most complex cases.

Because your patients rely on you, you can rely on us.

Your expertise. Our innovations.

Building on a history of advancements of cardiac patient care, GE HealthCare has been a true pioneer introducing breakthrough technologies, such as Color Doppler systems (1986) and 2D and AFI Speckle Tracking (2005).

Discover the latest leading innovative technologies that continue to push the technical capabilities of the Vivid Ultra Edition* system for the benefit of you and your patient.

- | | | | | |
|---|--|--|--|---|
| <p>2015 →</p> <ul style="list-style-type: none"> • cSound™ • FlexiSlice • 2-Click Crop • HDlive™ | <p>2016 →</p> <ul style="list-style-type: none"> • Cardiac Auto Doppler • 4D Auto MVQ | <p>2017 →</p> <ul style="list-style-type: none"> • Vmax • 4Vc-D probe | <p>2018 →</p> <ul style="list-style-type: none"> • AutoEF 2.0 • AFI 2.0 with AI Based View Recognition • 4D Markers • 4D Auto LAQ | <p>2020 →</p> <ul style="list-style-type: none"> • FlexiLight • HD Color • 6Vc-D probe • 4D ICE™ • AFI RV • AFI LA |
|---|--|--|--|---|

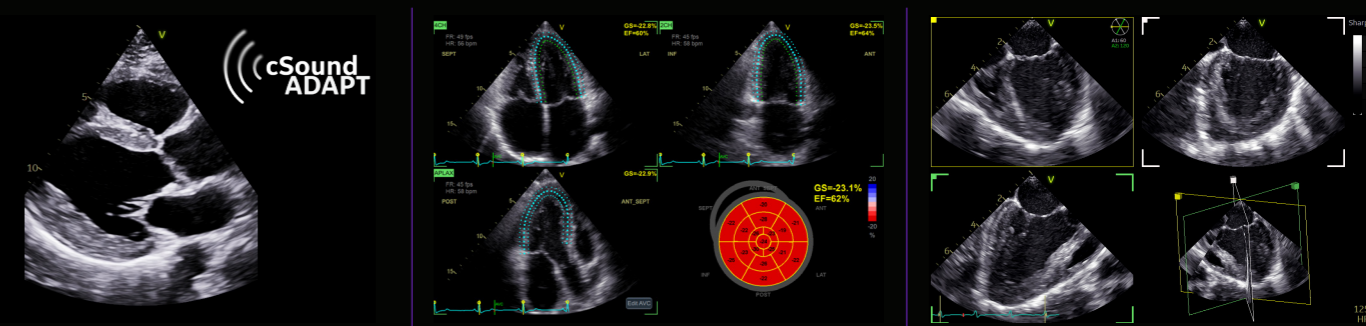


Vivid E90 Ultra Edition Achieve clinical excellence.

Designed to provide you with uncompromised image quality, advanced visualization capabilities and easy measurements – while helping reduce tedious tasks and inter-observer variability.


Upgrade now!

Latest innovations





cSound ADAPT⁷

Adaptively corrects for ultrasound wave distortions caused by inhomogeneities of the speed of sound naturally present in the patient body

 **Optimizes IQ 100x per second⁷**

Easy AutoEF⁸ & Easy AFI LV

Strain and Ejection Fraction measurements with automatic region of interest

 **Only 1 Click**  **In 15 seconds (on average)⁹**

9VT-D probe¹⁰

Mini 4D trans-esophageal echocardiography (TEE) probe

 **Most Compact mini 4D TEE-probe¹⁰**

Modern ergonomics

Adjustable to each operator and each sitting position

- Articulating monitor arm
- Single-hand push for up/down and left-right adjustment

Excellent operator interface

- 23.8" HDU monitor
- Intuitive 12" LCD touch screen
- Adjustable floating keyboard
- Low noise cooling

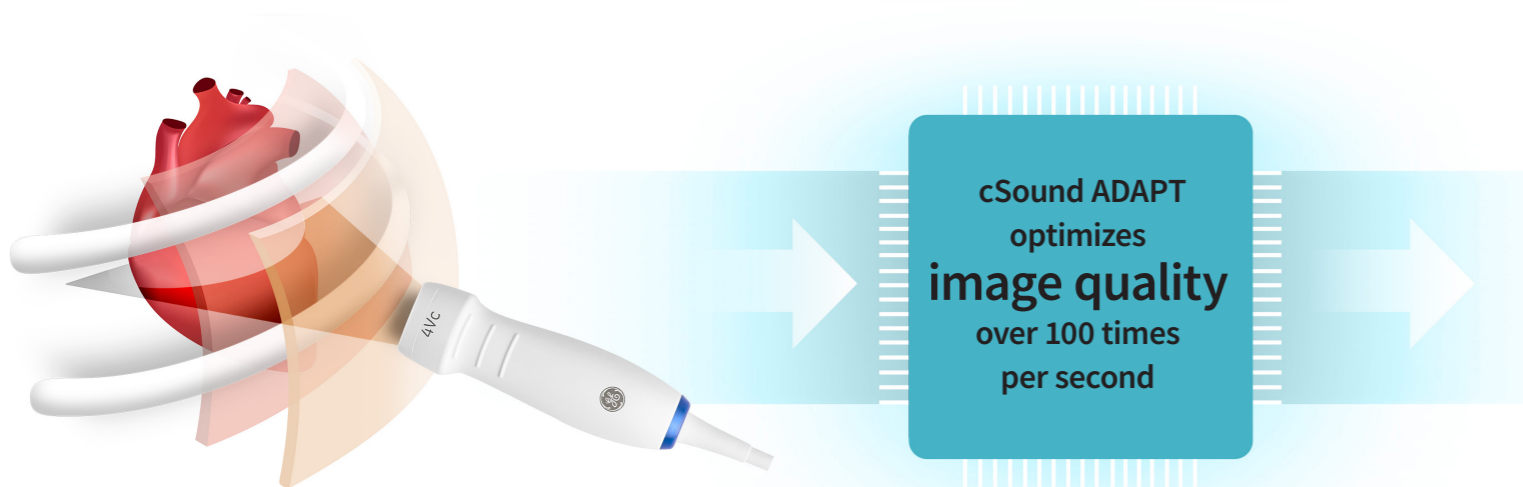
Easy to maneuver

- Ergonomic, easy to push handle

Your vision. Our superb images.


With the renowned superb image quality from cSound,[™] now Vivid Ultra Edition goes a step further with the launch of cSound ADAPT for the 4Vc-D probe.

 **New internal design!**



Ultrasound waves are distorted by different patients' habitus. Inhomogeneities in body structure (made of very different speed-of-sounds, such as bone or tissue) cause **image quality degradation.**

cSound ADAPT was built and verified on **40.000** frames of channel data recordings.

 **10-15%** of echo exams result in sub-optimal images¹¹

With the objective of improving the scanning experience on hard-to-scan patients, cSound ADAPT was developed to correct ultrasound aberrations that may degrade image quality. cSound[™] ADAPT tackles the challenge of ultrasound wave distortions, you will enjoy improved image contrast and resolution – optimized in real time, at over 100 times per second,⁷ in every patient.

Image captured without cSound ADAPT

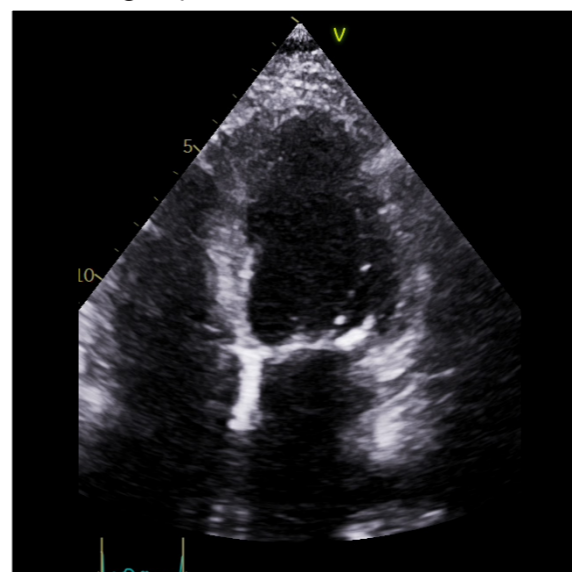
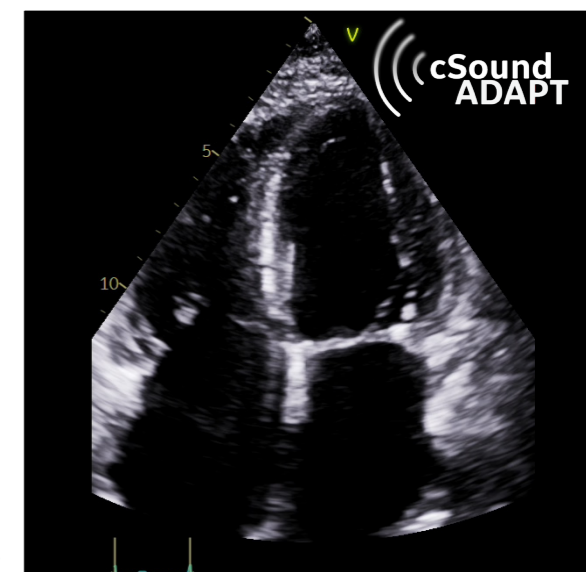
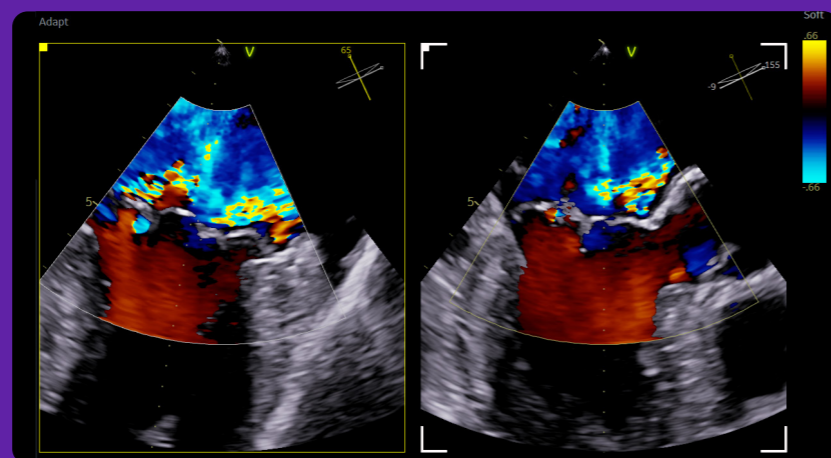


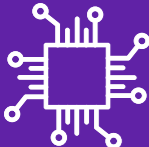
Image captured with cSound ADAPT



cSound rectifies image distortions for **enhanced image quality.**

Color Flow – Even better image quality!



 **3.5x** more graphics processing power¹²

“ The GE HealthCare 4Vc-D probe with cSound ADAPT sharpens images, increasing contrast resolution and improving diagnostic confidence. In our use we experienced that the imaging enhancements reduced non diagnostic images, improved productivity and workload by reducing scan time and improving ergonomics.”

– Lill Merete Skretteberg Lindøe
Echo technician
Oslo University Hospital, Norway

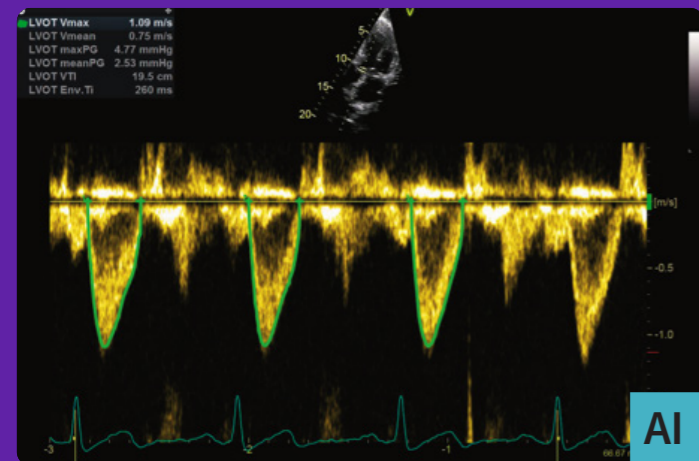
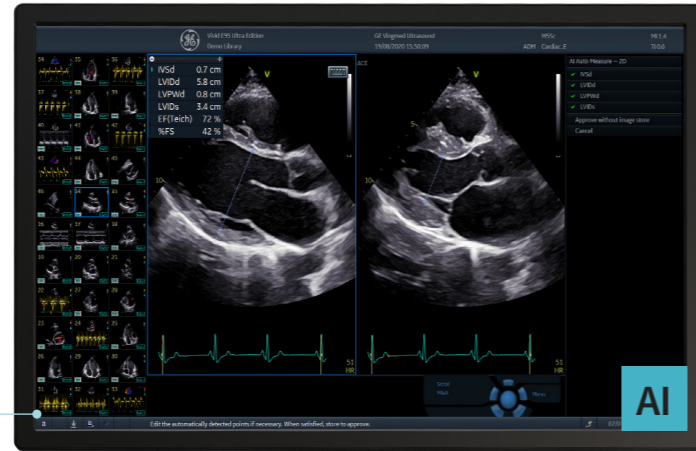
Your time. Our workflow tools.

Vivid E90 Ultra Edition introduces the latest AI-based technology to help reduce tedious tasks and improve workflow efficiency.

AI Auto Measure 2D


With the power of AI, a full set of reproducible measurements will instantly appear on the screen.


 **80%**
Less clicks¹³



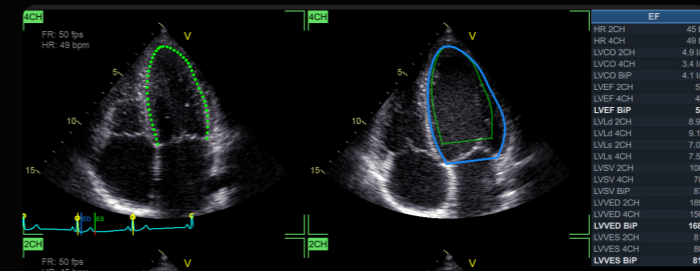
Cardiac Auto Doppler with AI Auto Measure Spectrum Recognition

With the power of AI, a wide range of Doppler measurements can be completed with 2 clicks: Freeze – Measure. A Doppler trace and full set of associated measurements will instantly appear on the screen.

 **Up to 93% fewer keystrokes¹⁴**


 **35%** of cardiac sonographers miss work due to pain¹⁵

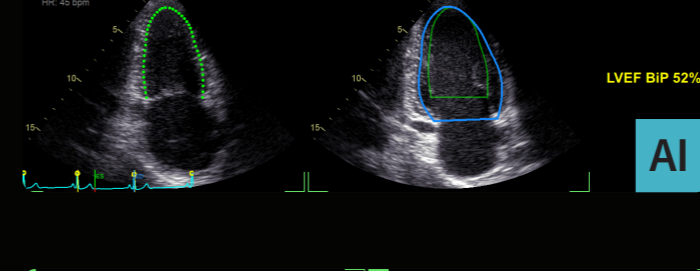
Latest innovations



Easy AutoEF


Our AI-based Auto ROI detection algorithm allows users to complete ejection fraction, with no manual interaction apart from initiating the tool and approving the results.

 **EF results in just 1 click**



Easy AFI LV with View Recognition

Our AI-based global and segmental strain measurements require no manual interaction apart from initiating the tool and approving the results. Additionally, you will be able to view EF measurements.

 **EF and strain results in 15 seconds (on average)**

“ The new Easy AFI LV speeds up strain measurements and simultaneously provides an automated LV ejection fraction measurement. Once good standard views are acquired, the GE HealthCare strain algorithm enables incredibly robust strain measurements!**”**

– Prof. Erwan Donal
Cardiologist
University Hospital Center, Rennes, France

Your most challenging patients. Our relentless support.

The smallest cardiac patients can pose the biggest care challenges with difficult to diagnose, severe conditions. To help clearly visualize small anatomies, Vivid E90 brings you the latest in 4D breakthrough TEE and TTE technologies.



Vivid E95 Ultra Edition, with the 12S-D, 6S-D, 6Vc-D probes, was built to address all your pediatric needs.



“The new 9VT-D probe has become an essential tool for any Tertiary Pediatric Cardiology Department.

Its revolutionary design combines high quality imaging for any pediatric patient from neonates to teenagers, both in 2D and 3D, and the most advanced and user friendly real time 4D tools that help users obtain clinically meaningful images.

The new 9VT-D probe is an essential tool to ensure an optimal result for pediatric patients during cardiac interventional procedures, both in Cath lab and EP lab, and during any complex cardiac surgery intervention as it offers perfect real time visualization of any cardiac structure.”

– Dr. Ferrán Rosés i Noguera
Head of Pediatric Cardiology
Vall d’ Hebron Hospital - Barcelona, Spain

⇒ 10%

of pediatric echo diagnostic are driven by misleading anatomy or physiology¹⁵

Introducing, 9VT-D probe!

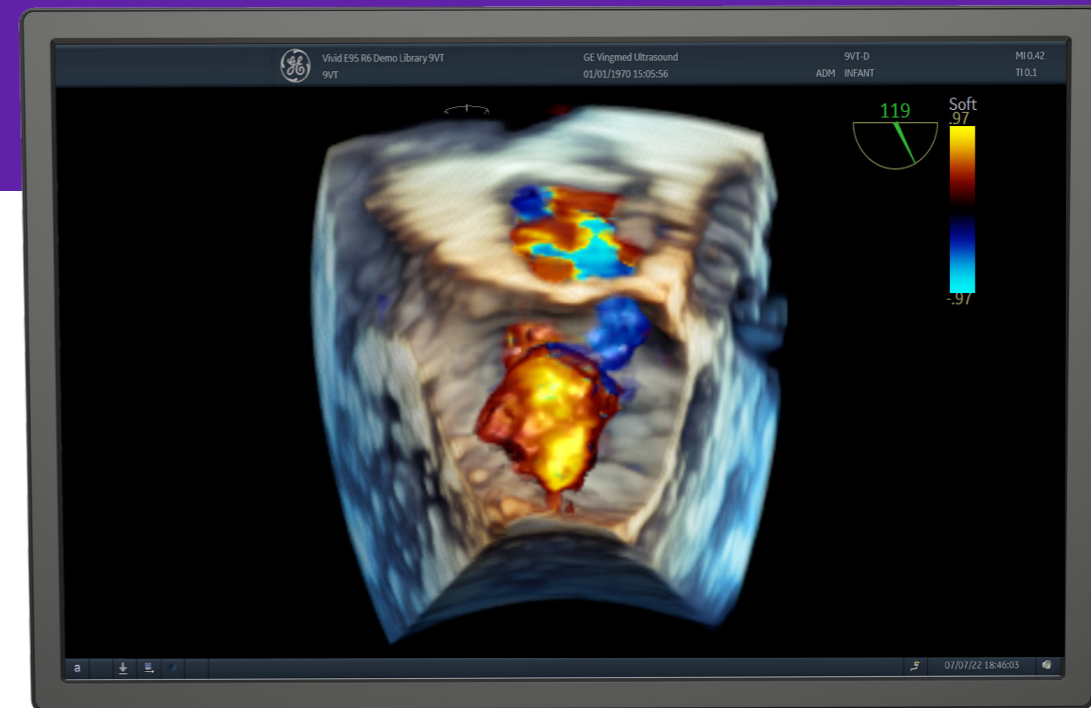
4D TEE probe designed for a broad range of pediatric and interventional procedures and for patients as small as 5 kg.

- All 2D, 4D, Color and Doppler modes
- Cardiac, Pediatric and Coronary applications
- Scan depths down to 18 cm



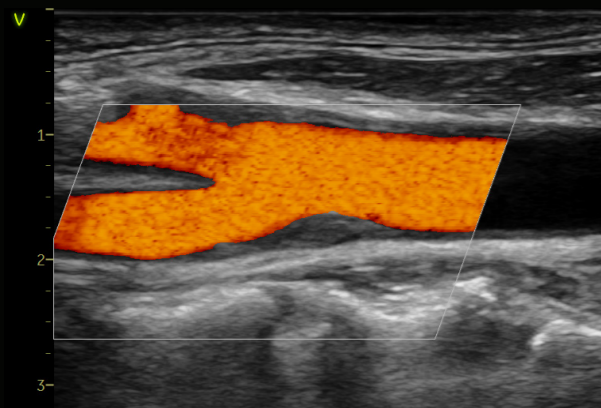
↙ **Most Compact**
↗ mini 4D TEE-probe

1st
4D TEE probe designed for small children¹⁰



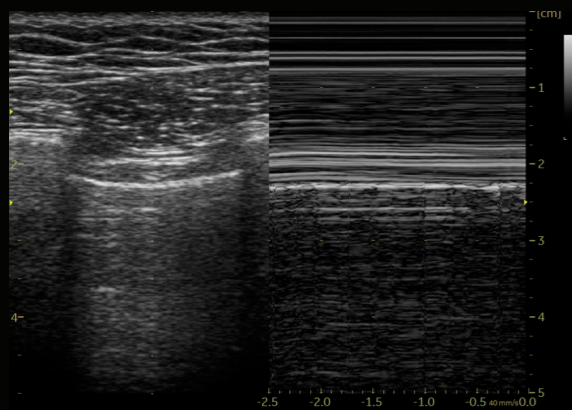
Beyond cardiology.

The demand for multi-purpose, cost efficient ultrasound systems with uncompromised image quality is growing. Your Vivid E90 Ultra Edition will exceed your expectations across a wide range of applications.



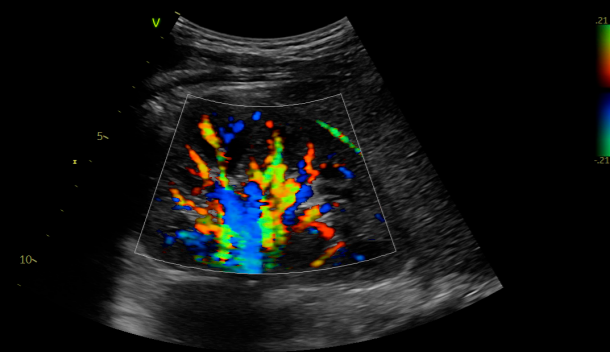
Blood Flow Imaging

Combines color Doppler with grayscale speckle imaging to help improve delineation of blood flow without bleeding into vessel wall.



Lung Assessment

Beside lung assessment is made easier with dedicated FAST and lung presets that help to quickly optimize images.



Abdominal diagnosis

Visualize tissues and flow patterns with greater details thanks to Vivid E90 Ultra Edition's high-resolution imaging.



EchoPAC Connect†

Connect† from anywhere,¹⁶ at any time, to any console.¹⁷



Connect from anywhere¹⁶

EchoPAC Connect† provides you with the flexibility you need to accommodate to the unique way you work, whether your department is equipped with GE HealthCare ViewPoint™ 6 server, Centricity™ PACS, or any 3rd party PACS vendor.¹⁷ Perform your measurements & diagnosis – using both 2D & 3D images – on site or remotely, with the same excellent quality as on your acquisition consoles.

Multi-vendor¹⁸

With EchoPAC Connect†, you can enjoy a wide spectrum of 2D & 3D Vivid applications, from standard to most advanced measurements, regardless of which console was used to acquire your patients' images.

Enjoy the proven robustness of AFI LV, or exceptional GE HealthCare 4D measurement applications like TVQ (Tricuspid Valve Quantification) usable on all images acquired in your department, from both, Vivid systems and non-GE HealthCare consoles.¹⁸

The power of EchoPAC

EchoPAC Connect† benefits from the latest AI-based technology introduced on Vivid Ultra Edition†, aimed to reduce tedious tasks and improve workflow efficiency.

Obtain measurements in 1 simple click with Easy AutoEF and Easy AFI LV. **Measurements can be obtained in less than 15 seconds.⁹**

Reduce tedious tasks of most common exams with AI Auto Measure Spectrum Recognition and AI Auto Measure 2D, and minimize the number of clicks needed to acquire standard measurements.¹³

Seamless workflow integration

EchoPAC Connect† provides you with a seamless workflow experience thanks to a centralized server installation and DICOM® server, which automatically transfers data from all acquisition system.¹⁷ whatever the brand, directly to your EchoPAC Connect†.

So, whether your department is equipped with a GE HealthCare ViewPoint server, Centricity PACS or any 3rd party PACS,¹⁷ the seamless integration of EchoPAC Connect† will simplify your everyday workflow. Dongle-free. Peace of mind. Your EchoPAC Connect† is available at any time, from any computer, from anywhere, without the need to use dongle.



“The new Easy AFI LV speeds up strain measurements and simultaneously provides an automated LV ejection fraction measurement. Once good standard views are acquired, the strain algorithm enables incredibly robust measurements!”

– Prof. Erwan Donal
Cardiologist
University Hospital Center, Rennes, France

“I am amazed by the measurements you can perform on EchoPAC after the patient has left!”

– Dr. Lamin E.S. Jaitheh
Consultant Cardiologist & Lecturer in Cardiology Department of Internal Medicine
Edward Francis Small Teaching Hospital/School of Medicine & Allied Health Sciences,
University of the Gambia

† EchoPAC Connect is a marketing name for EchoPAC Plug-in (v206) combined with a GE HealthCare Host. It is possible for several EchoPAC Plug-in users to open the same patient records. However, only the first user will have access to all the features of EchoPAC Plug-in. Other users will have read-only access to the patient records. This behaviour may change depending on the host in which EchoPAC Plug-in is integrated.

Your skills. Our support.

In the core echo lab and even beyond cardiology, smart applications support your know-how. The Ultra Edition applications highlighted in **bold** are referent to our latest release.

Flow Quantification	Ultra Edition
Cardiac Auto Doppler <small>AI</small>	AI Auto Measure Spectrum Recognition <small>AI</small>
	BSI

Chamber Quantification	Ultra Edition
	AI Auto Measure 2D <small>AI</small>
	AutoEF on DICOM <small>AI</small>
	Easy AutoEF

AFI Functional Imaging	Ultra Edition
AFI Stress	Easy AFI LV <small>AI</small>
MyoCardial Work	AFI RV
	AFI LA



Your community. Our collaboration.

Vivid is much more than just a system. Make the most of your Vivid experience with our community resources and learning opportunities.

www.gehealthcare.com

On our website you will find content available to the general public with top industry Key Opinion Leaders, Learning Academy on Strain including Whitepapers and Case Studies.



Vivid Talks

Our “Meet the Expert” sessions (Vivid Talks) on wide-ranging subjects from EchoLab to Interventional.



Strain Learning Academy

Our Learning Academy is dedicated to supporting the industry in advancing strain measurement adoption.

60%

of all strain measurement clinical research publications has been done on a GE HealthCare device.¹⁹

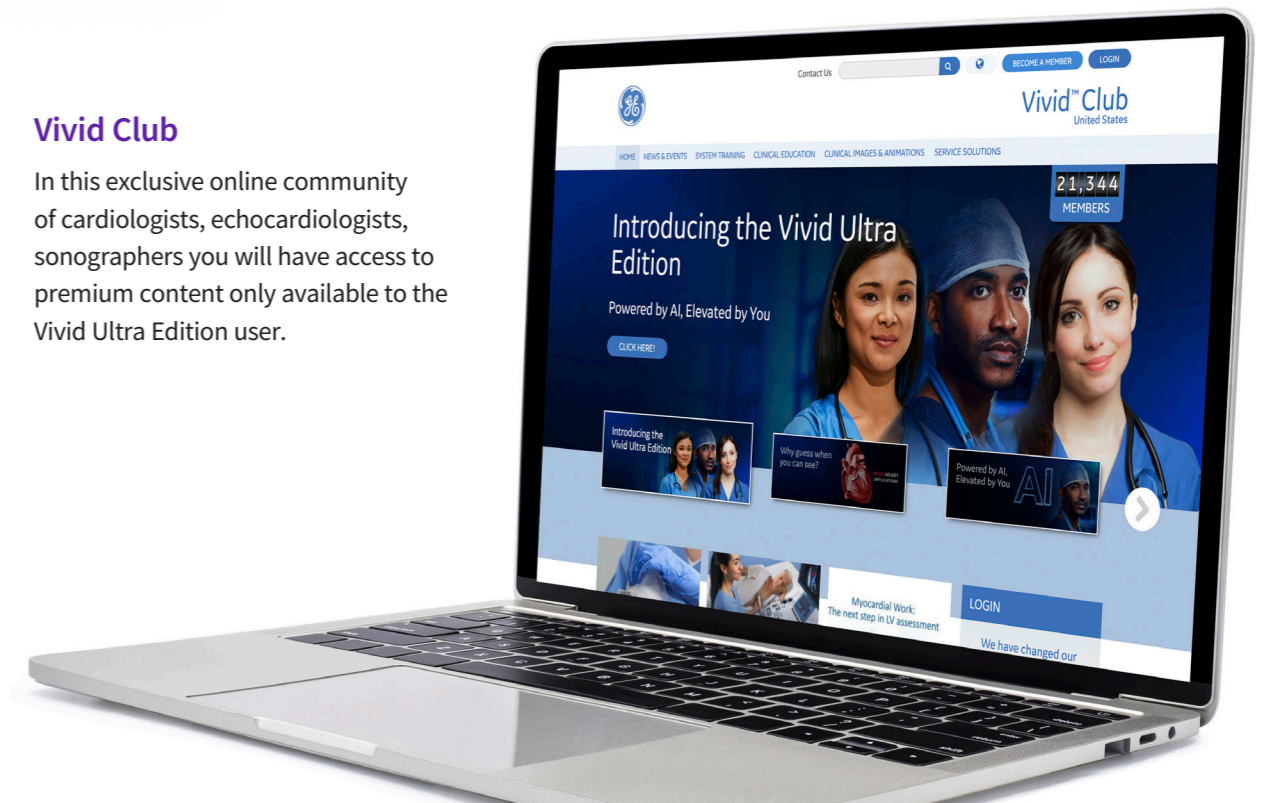


Whitepapers & Case Studies

The latest Whitepapers and Case Studies presented by the field experts.

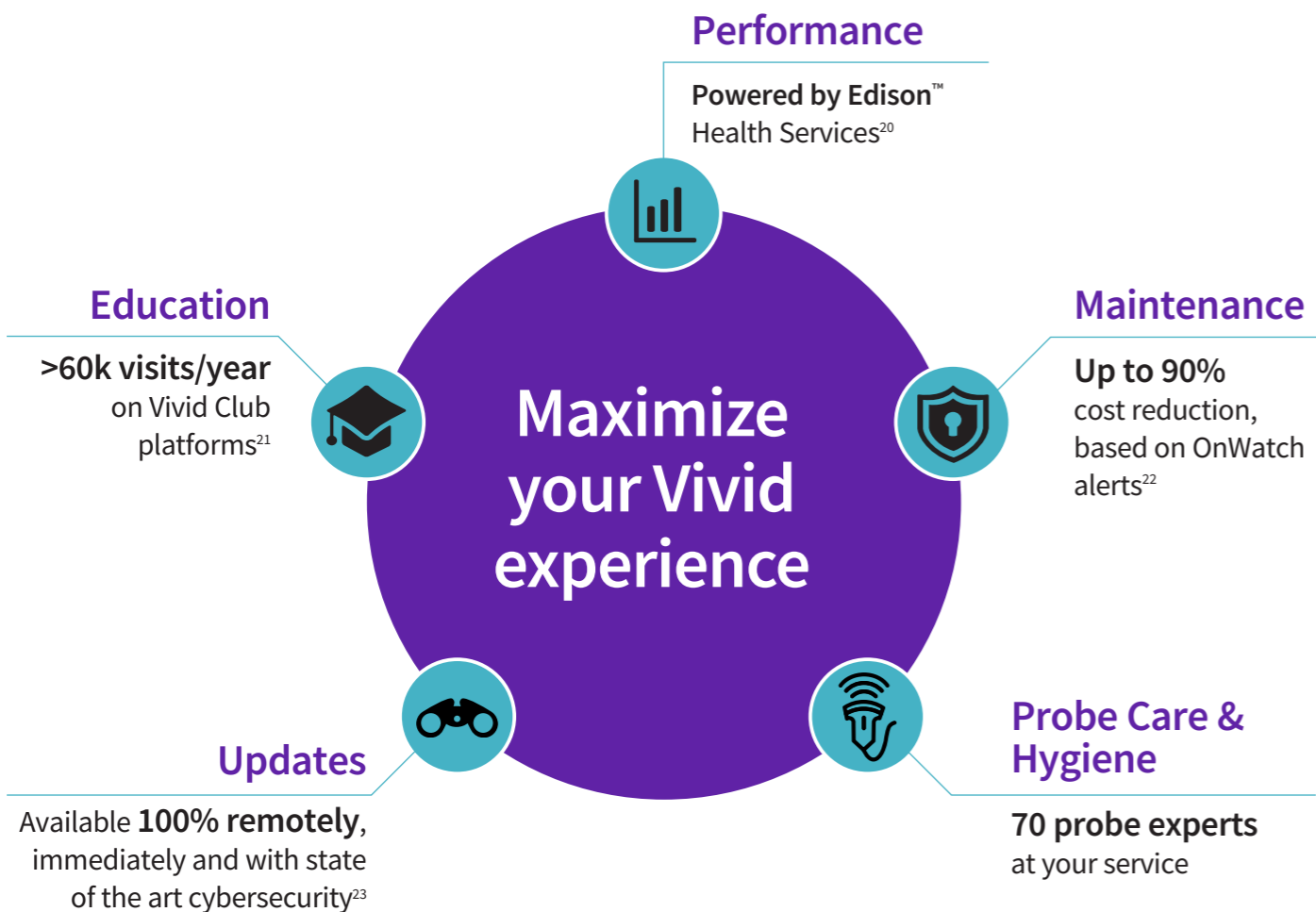
Vivid Club

In this exclusive online community of cardiologists, echocardiologists, sonographers you will have access to premium content only available to the Vivid Ultra Edition user.



Outperform today. Prepare for tomorrow.

Maximize the Vivid lifecycle experience while minimizing your total cost of ownership.



“The implementation of Imaging Insights/Ultrasound Excellence in my biomedical unit for the cardiology and gynecology departments ultrasound equipment has opened the door to better utilization of my systems and distribution of activity, all of which has allowed me to improve our operational efficiencies, cost investment and service to patients.”

– Mrs Valérie Boissart
Head of Biomedical Engineering Department
Luxembourg Hospital Center



Digital Expert/STAR**

Digital Expert (and STAR) provides an interactive, real-time, flexible & convenient way to get education and support.²⁴

 Live exchange with peers


Automated, Remote SW Downloads

Get automated software updates along with safety patches enabled by remote software download. Your system stays up-to-date, making it more reliable.

 Updates 24/7²³

SonoDefense

SonoDefense is GE HealthCare’s six-layer strategic approach to cybersecurity and patient data privacy for ultrasound.

 Advanced cybersecurity & data privacy protection

Imaging Insights

Imaging Insights is an Edison™ application that combines analytics and coaching to help ultrasound management teams to optimize clinical and operational performance.

 Operational Performance

References:

* Ultra Edition is not a product name, it refers to the 2022 release of the Vivid portfolio.

** Only available in the US.

1. World Health Organisation | <https://www.who.int/news-room/fact-sheets/detail/cardiovascular-diseases-cvds>.
2. Laxmi S. Mehta et.al. | Clinician Well-Being. Addressing Global Needs for Improvements in the Health Care Field | Journal Of The American College Of Cardiology Vol. 78, No. 7, 2021.
3. Moien AB Khan et.al. | Global Epidemiology of Ischemic Heart Disease: Results from the Global Burden of Disease Study | <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7384703/>.
4. Stephanie David | Importance of Sonographers Reporting Work-Related Musculoskeletal Injury: A Qualitative View | JDMS 21:234-237 May/June 2005 <https://journals.sagepub.com/doi/pdf/10.1177/8756479305274463>.
5. Source: Healthcare Infrastructure and Procedural Volume for Ultrasound Imaging, Frost & Sullivan, 2018. Approx. 108.12 million echo exams are performed annually; Calculation based on 26% total global prevalence of CVD cases (422 million) undergoing echo exam; extrapolated from US study indicating roughly 26% of total prevalent CVD cases underwent echo exams percentage value validated from reports. https://www.prb.org/wp-content/uploads/2015/12/2015-world-population-data-sheet_eng.pdf.
6. World Health Organization | A universal truth: no health without a workforce. Nov 2013. <https://www.bmj.com/content/347/bmj.f6804>.
7. cSound ADAPT: Continuous beamforming optimization, adapting to patient anatomy and probe position whitepaper - JB20851XX.
cSound Adapt is exclusively available for Vivid E95 and Vivid E90.
8. Easy AutoEF is restricted for use with adult TTE on GE Healthcare raw B-mode data loops of the LV. Easy AutoEF does not support left ventricles with septal bulge.
9. Time to strain measurement result may vary with heart rate, frame rate and Vivid system. Verification of performance done by GEHC clinical application specialists using Vivid system (DOC2739637).
10. The content herein refers to 2022 release of Vivid portfolio. 9VT-D probe is exclusively available for E95 and E90. Vivid. Ultra Edition is released as of 25th August 2022.
11. Kurt M, Shaikh K, Peterson L, et al. Impact on contrast echocardiography on evaluation of ventricular function & clinical management in a large prospective cohort. J Am Coll Cardiol. 2009; 53(9):802-810.
12. 3.5 times more processing power claim refers to the 2022 release of the Vivid portfolio. This Graphic Processing Unit is exclusively available for Vivid E95 and E90.
13. The Role of AI in Streamlining Echocardiography Quantification White Paper, Kristin McLeod and Jurica Sprem - JB20789XX.
14. Based on results of time and motion study conducted by GE "JB49055XX - Cardiac Auto Doppler"; study results indicated time savings related productivity increase up to ~8 on an annual basis for a facility per sonographer.
15. Oscar J. Benavidez et.al. | Diagnostic Errors in Pediatric Echocardiography Development of Taxonomy and Identification of Risk Factors | <https://www.ahajournals.org/doi/full/10.1161/CIRCULATIONAHA.107.758532>.
16. For diagnostic use, in citrix environment using Hospital IT network.
17. Enabled by ViewPoint 6 Desktop integration.
18. EchoPAC Plug-in provides basic and advanced viewing and quantitative analysis capabilities for 2D, 4D and multi-dimensional ultrasound parametric images from the GE HealthCare Vivid™ family of scanners, DICOM® images and 3D/4D from multi-vendor ultrasound fleet.
19. Whitepaper "AFI - strain imaging from research to clinical routine"- JB16411XX.
20. Imaging Insights is an Edison™ application.
21. GE internal data - Website analytics from January 2021 to December 2021.
22. GE internal data.
23. Based on Software e-Delivery Software installed.
24. Digital Expert is only offered in the USA. Digital Expert is not a functionality provided by Vivid systems. Digital Expert is separate from Vivid systems and is for education and training purposed only.

About GE HealthCare

GE HealthCare is a leading global medical technology, pharmaceutical diagnostics, and digital solutions innovator, dedicated to providing integrated solutions, services, and data analytics to make hospitals more efficient, clinicians more effective, therapies more precise, and patients healthier and happier. Serving patients and providers for more than 100 years, GE HealthCare is advancing personalized, connected, and compassionate care, while simplifying the patient's journey across the care pathway. Together our Imaging, Ultrasound, Patient Care Solutions, and Pharmaceutical Diagnostics businesses help improve patient care from prevention and screening, to diagnosis, treatment, therapy, and monitoring. We are an \$18 billion business with 51,000 employees working to create a world where healthcare has no limits.

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Ultra Edition is not a product name, it refers to the 2022 release of the Vivid portfolio.

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