YOUR PATIENTS RELY ON **YOU**.
YOU CAN RELY ON **US**.

# Vivid™ **E90**
## U L T R A   E D I T I O N

gehealthcare.com

## 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 2019[1]

**1 in 4**
cardiologists state they are burned out[2]

**>10%**
increase in IHS alone by 2030[3]

**20%**
of sonographers are leaving the profession or taking premature retirement[4]

**108 MILLION**
annual echo exams performed globally[5]

**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 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.

| 2015 | 2016 | 2017 | 2018 | 2020 |
|------|------|------|------|------|
| • cSound™<br>• FlexiSlice<br>• 2-Click Crop<br>• HD*Live* | • Cardiac Auto Doppler<br>• 4D Auto MVQ | • Vmax<br>• 4Vc-D probe | • AutoEF 2.0<br>• AFI 2.0 with AI Based View Recognition<br>• 4D Markers<br>• 4D Auto LAQ<br>• AutoEF 2.0 | • FlexiLight<br>• HD Color<br>• 6Vc-D probe<br>• 4D ICE** |

## LATEST INNOVATIONS



**cSound ADAPT**[7]
Adaptively corrects for ultrasound wave distortions caused by inhomogeneities of the speed of sound naturally present in the patient body
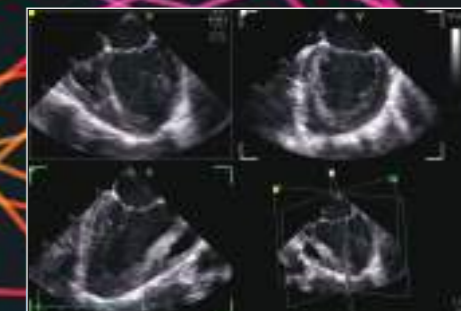
**Optimizes IQ 100x per second**[7]

**Easy AutoEF**[8] **& Easy AFI LV**
Strain and Ejection Fraction measurements with automatic region of interest

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

**9VT-D probe**[10]
Mini 4D trans-esophageal echocardiography (TEE) probe

**Most Compact**
**mini 4D TEE-probe**[10]

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# 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.

## 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

**10-15%** of echo exams result in sub-optimal images[11]

## 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!**

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**
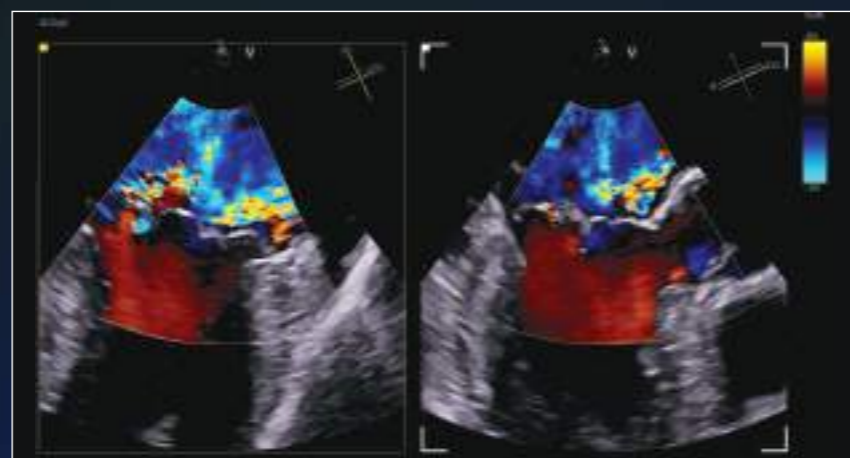
Image captured **with cSound ADAPT**

cSound Adapt optimizes **IMAGE QUALITY** OVER 100 TIMES PER SECOND

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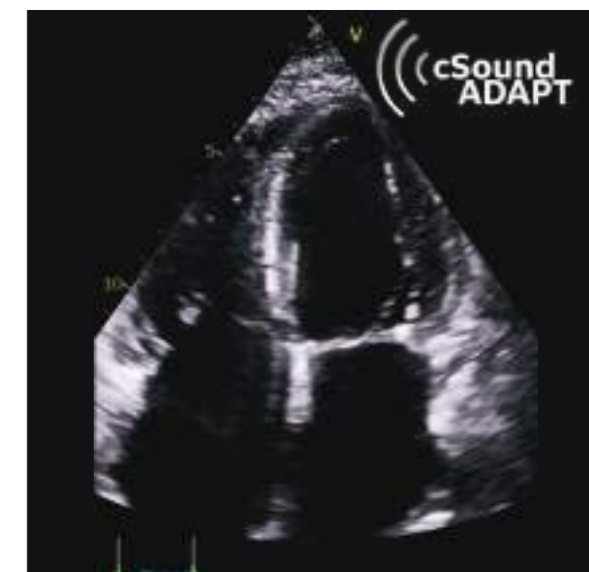
cSound rectifies image distortions for **enhanced image quality**.

**Color Flow – Even better image quality!**

**3.5x** more graphics processing power[12]

"The GE 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

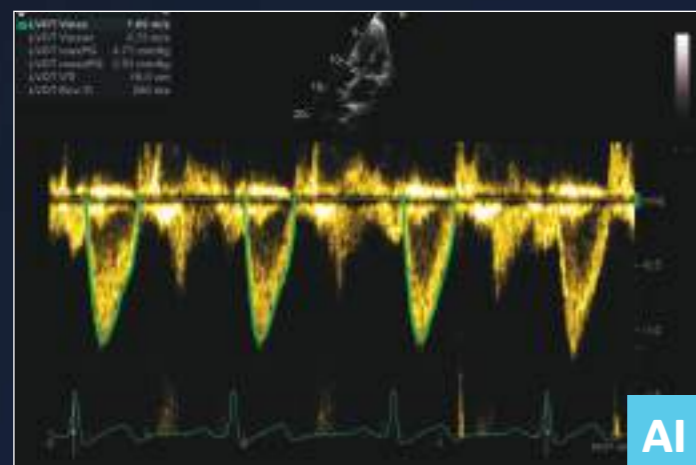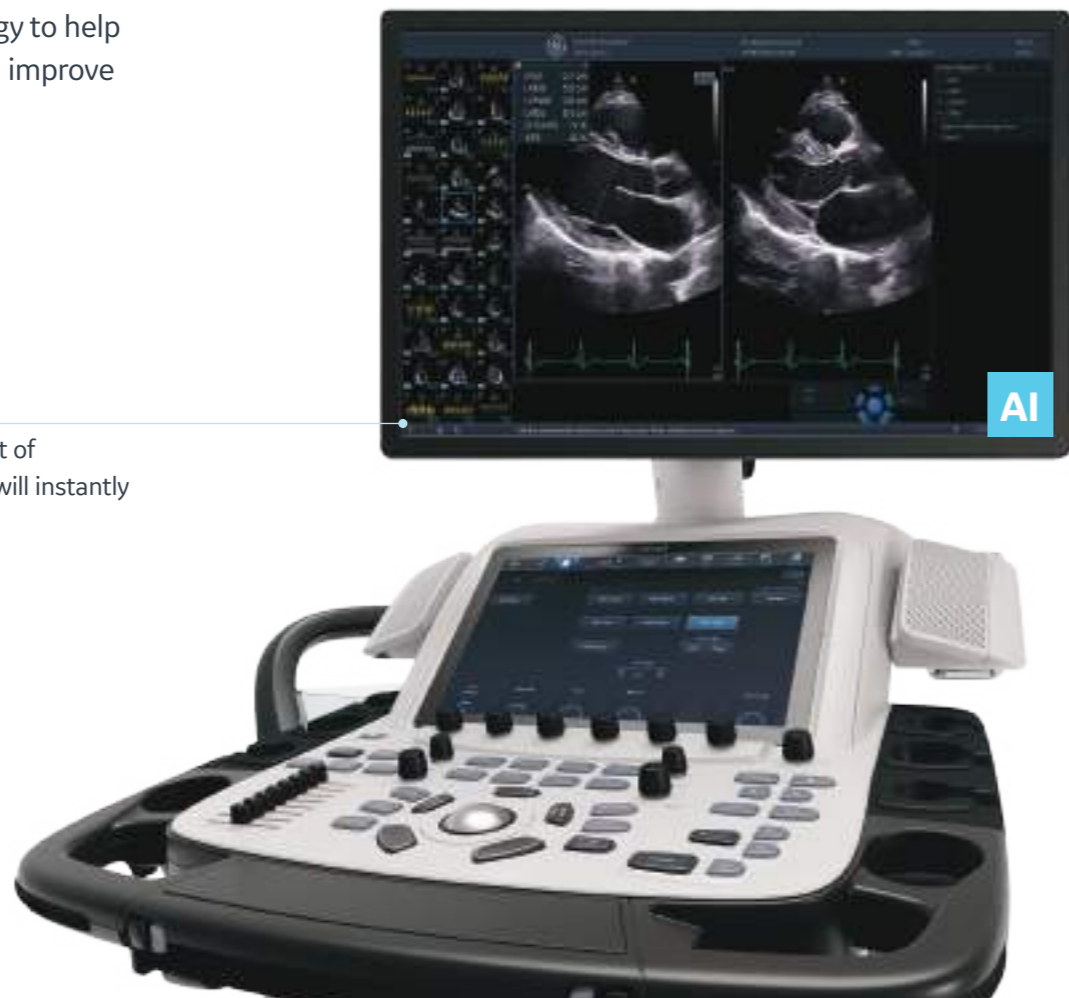**35%** of cardiac sonographers miss work due to pain[15]

## 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**

### AI Auto Measure 2D

With the power of AI, a full set of reproducible measurements will instantly appear on the screen.
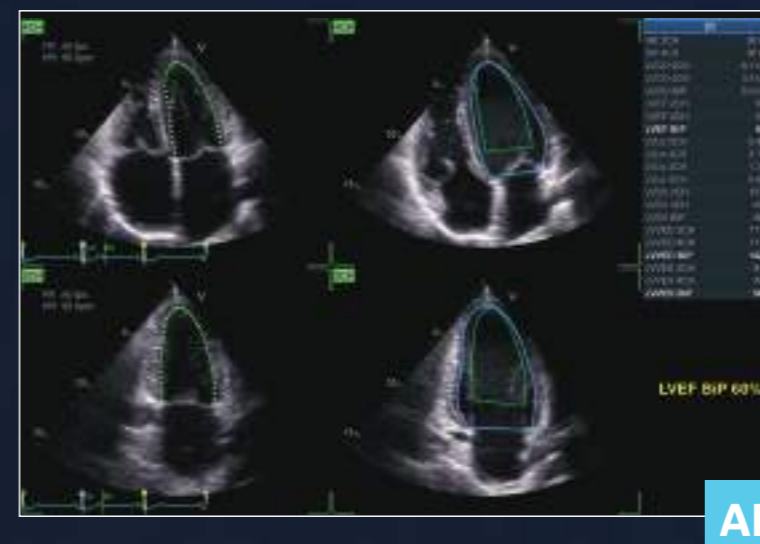
**80%**
**Less clicks**[13]

### 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.

**AI**

**Up to 93% fewer keystrokes**[14]

## LATEST INNOVATIONS



**AI**

### 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**



**AI**
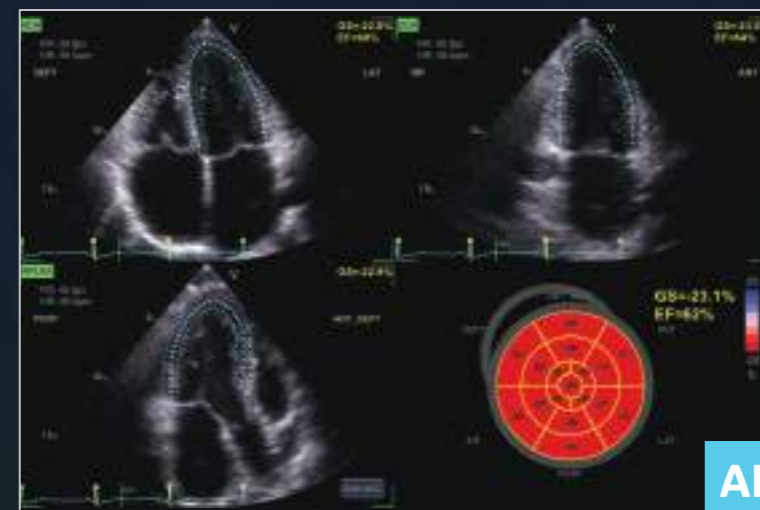
### Easy AFI LV with view recognition

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 strain algorithm enables incredibly robust strain measurements!"*

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

**10%** of pediatric echo diagnostic are driven by misleading anatomy or physiology[15]

## 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 E90 Ultra Edition, with the 12S-D, 6S-D, 6Vc-D probes, was built to address all your pediatric needs.

### 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 children[10]

> "The new 9VT-D probe has become an essential tool for any Tertiary Paediatric Cardiology Department.
>
> Its revolutionary design combines high quality imaging for any paediatric 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 paediatric 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 Noguer**
Head of Pediatric Cardiology
Vall d´Hebron Hospital - Barcelona, Spain

# 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.
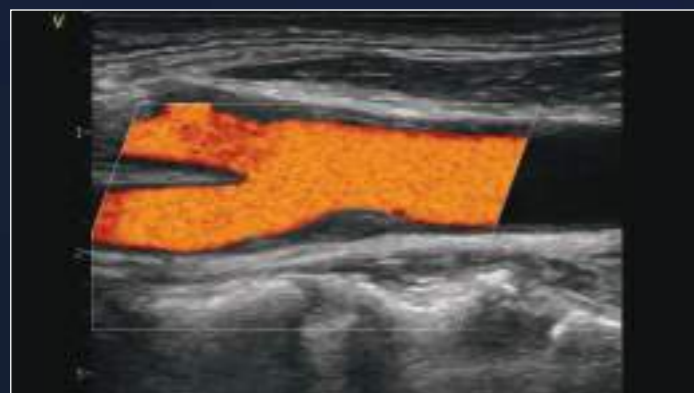


### Blood Flow Imaging

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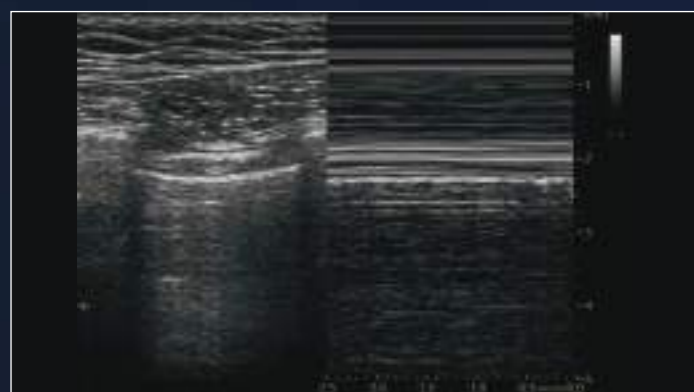


### Lung Assessment

Bedside 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.

## YOUR FLEET. OUR SOLUTION.

Patient care doesn't end when the exam is over. Upgrade to EchoPAC™ to optimize your patient time and your post-processing time.



### FAST WORKFLOW

- Fully integrated workflow with the EchoPAC Plug-in, DICOM® SR transfers to reporting systems, accelerated data transfers in clinical and research operations
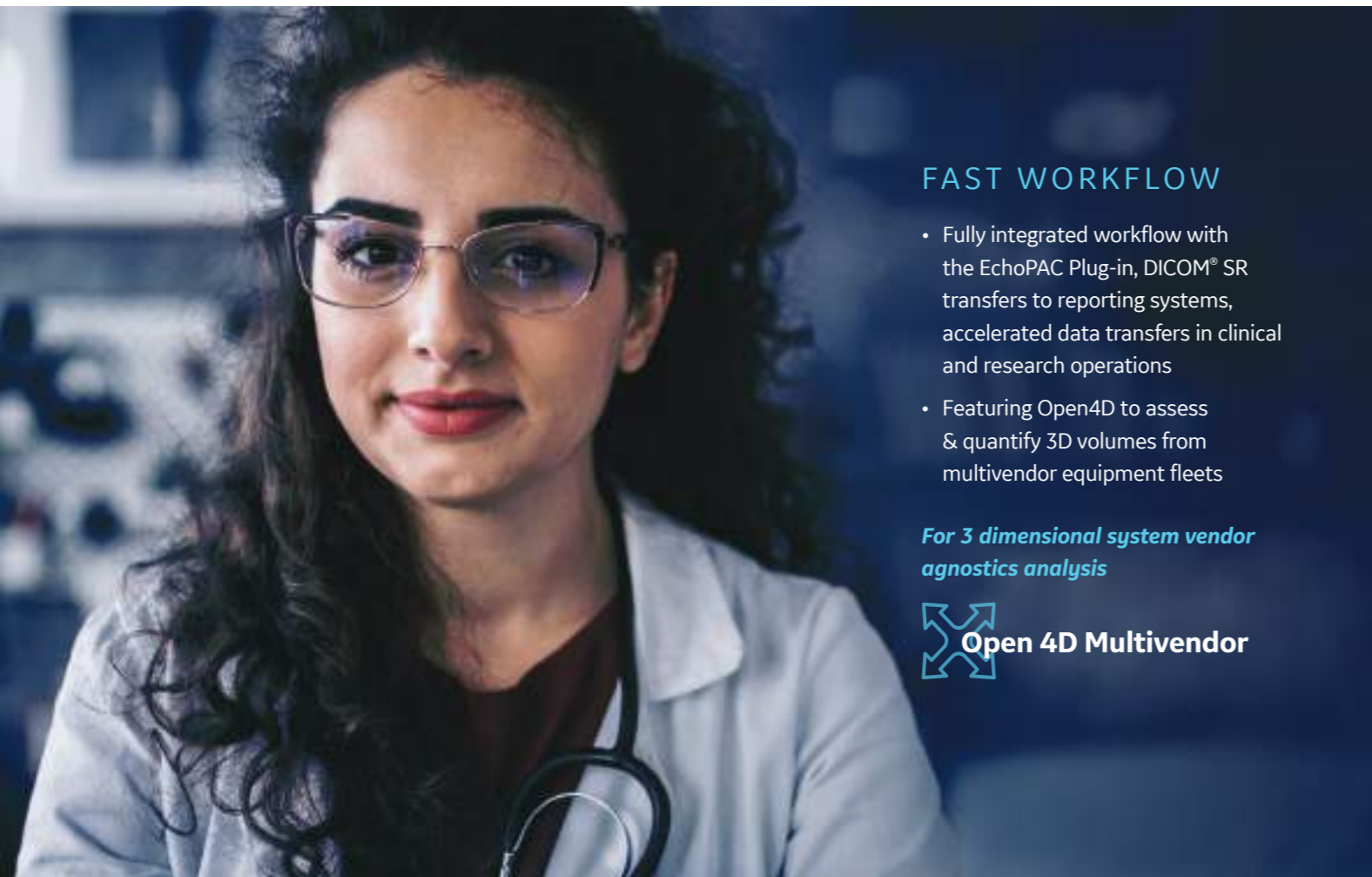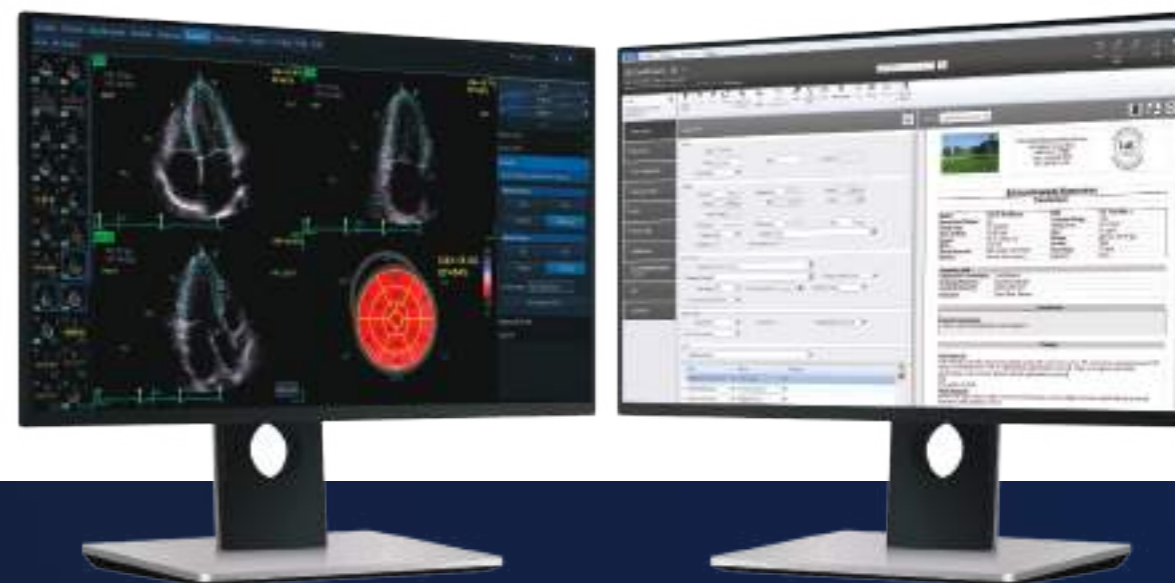- Featuring Open4D to assess & quantify 3D volumes from multivendor equipment fleets

*For 3 dimensional system vendor agnostics analysis*

**Open 4D Multivendor**

### STATE-OF-THE-ART ACCURACY

Full access to all Vivid scanner tools:

- From the most used AI-Powered ones on routine measurements: Easy AFI LV, Easy AutoEF and Auto Doppler Spectrum Recognition
- To the most advanced ones: Myocardial Work is a unique tool using less load dependent parameters than strain alone

*Interested in Myocardial Work?*
Learn more on the publicly available Webinar on the Vivid Club website

### COMFORTABLE EXPERIENCE

- Familiar Vivid user interface, faster staff ramp-up
- Analyzing and reporting from the ergonomic comfort of a workstation
- More focus on patient at acquisition

**Maximize your entire fleet return on investment**

- Transcend your machine performance: regardless of vendor, regardless of machine age, get all the latest Vivid tools
- Save time: get EchoPAC to free-up scanner time and perform your daily analysis off-line including LV quantifications doppler and function assessment

EchoPAC exists as **EchoPAC Software Only** and **EchoPAC Plug-in**

EchoPAC Plug-in is available for:

- GE Healthcare Centricity™ Cardio Enterprise with Intelligent Reporting (IR)
- GE Healthcare ViewPoint™ 6 with EchoPAC Suite[16]
- As a Plug-in to third party PACS.

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

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

## 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 | AI Auto Measure Spectrum Recognition AI |
| AI | BSI |

### CHAMBER QUANTIFICATION

| | Ultra Edition |
|---|---|
| | AI Auto Measure 2D AI |
| | AutoEF on DICOM AI |
| | **Easy AutoEF** |

### AFI FUNCTIONAL IMAGING

| | Ultra Edition |
|---|---|
| AFI Stress | **Easy AFI LV** AI |
| 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 device.**[17]

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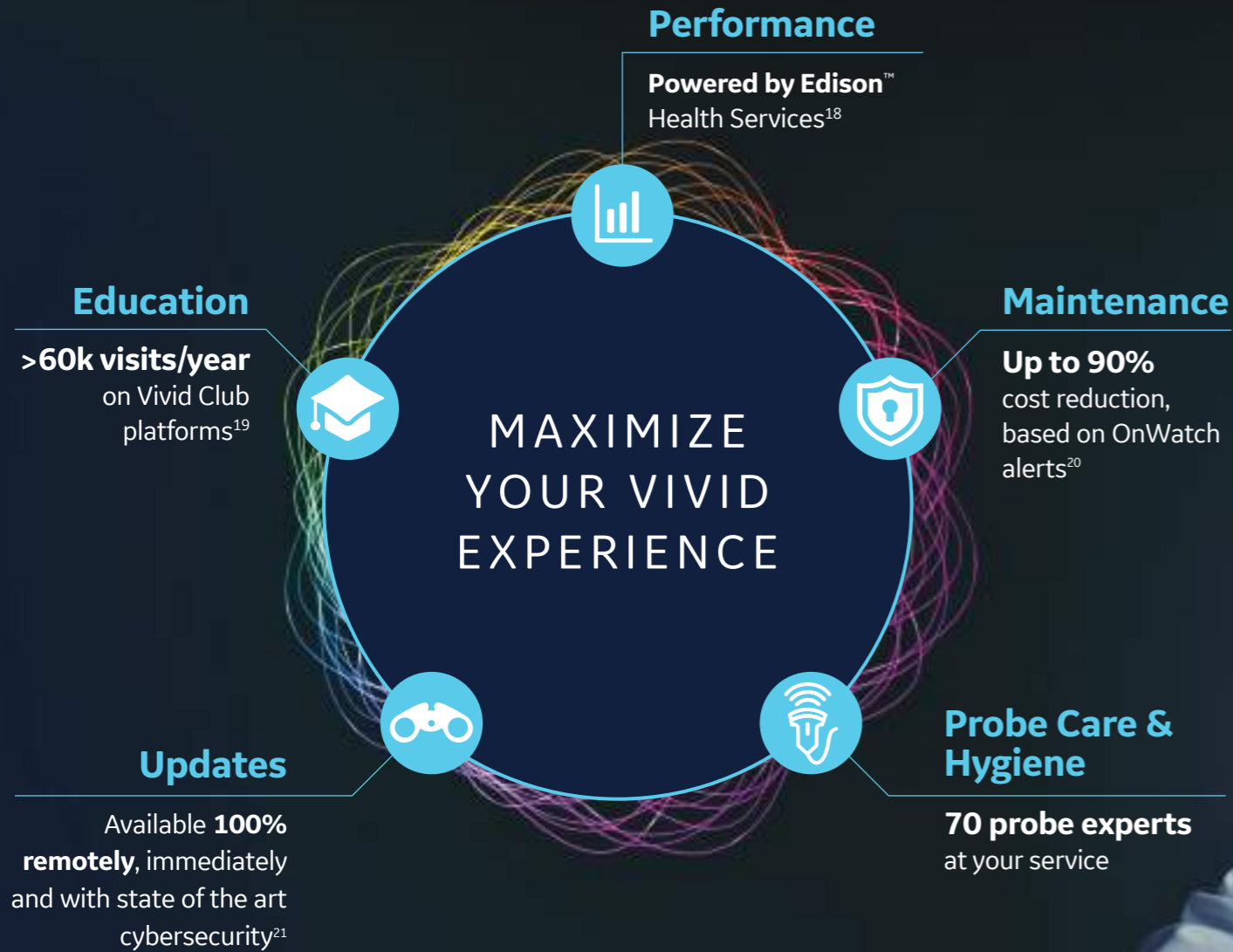The latest Whitepapers and Case Studies presented by the field experts.

### 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.

### Performance
**Powered by Edison™**
Health Services[18]

### Education
**>60k visits/year**
on Vivid Club
platforms[19]

## MAXIMIZE YOUR VIVID EXPERIENCE

### Maintenance
**Up to 90%**
cost reduction,
based on OnWatch
alerts[20]

### Updates
Available **100%
remotely**, immediately
and with state of the art
cybersecurity[21]

### Probe Care & Hygiene
**70 probe experts**
at your service

> "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) provide an interactive, real-time, flexible & convenient way to get education and support.[22]

**Live exchange with peers**

### SONODEFENSE

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

**Advanced cybersecurity & data privacy protection**

### 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 24/7**[21]

### 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**

## About GE Healthcare:

GE Healthcare is the $18 billion healthcare business of GE (NYSE: GE). As a leading global medical technology and digital solutions innovator, GE Healthcare enables clinicians to make faster, more informed decisions through intelligent devices, data analytics, applications and services, supported by its Edison intelligence platform. With over 100 years of healthcare industry experience and around 50,000 employees globally, the company operates at the center of an ecosystem working toward precision health, digitizing healthcare, helping drive productivity and improve outcomes for patients, providers, health systems and researchers around the world.

Follow us on Facebook, LinkedIn, Twitter, and Insights for the latest news, or visit our website www.gehealthcare.com for more information.

**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. EchoPAC Suite is the marketing name for EchoPAC Plug-in

17. Whitepaper "AFI - strain imaging from research to clinical routine"- JB16411XX

18. Imaging Insights is an Edison™ application

19. GE internal data - Website analytics from January 2021 to December 2021

20. GE internal data

21. Based on Software e-Delivery Software installed

22. 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