POWERED BY AI

ELEVATED BY YOU

Vivid™ E90
Ultra Edition

Vivid

gehealthcare.com/vivid

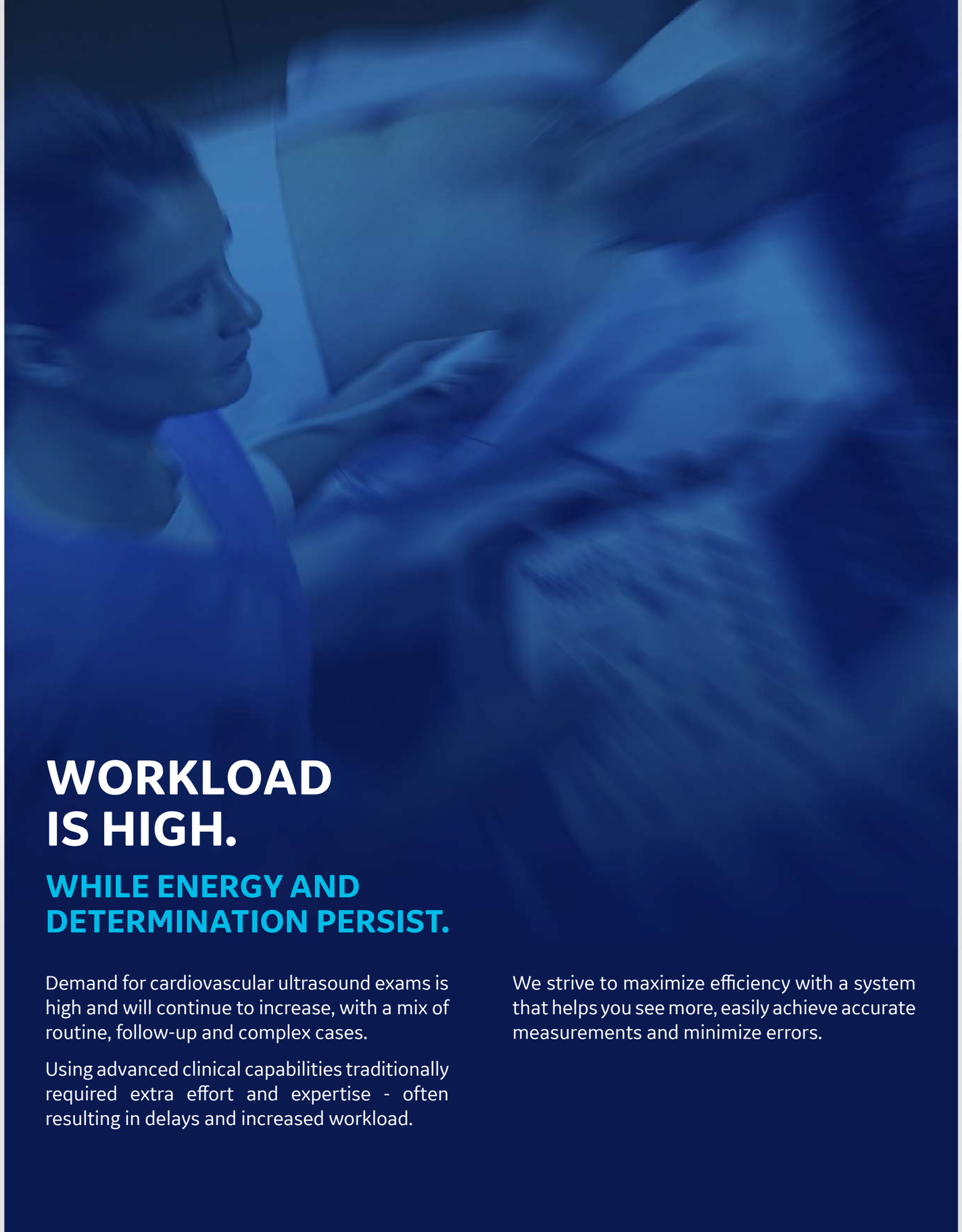
By 2030,

40.5%

of the US population is projected to have some form of Cardiovascular Disease (CVD)[1]

~104m

annual echo exams performed globally[2]



WORKLOAD IS HIGH.

WHILE ENERGY AND DETERMINATION PERSIST.

Demand for cardiovascular ultrasound exams is high and will continue to increase, with a mix of routine, follow-up and complex cases.

Using advanced clinical capabilities traditionally required extra effort and expertise - often resulting in delays and increased workload.

We strive to maximize efficiency with a system that helps you see more, easily achieve accurate measurements and minimize errors.

10-15%

of echo exams result in sub-optimal images[3]

90%

of sonographers experience symptoms of Work Related Musculoskeletal Disorders (WRMSD)[4]

$120+

billion yearly

direct and indirect costs for employers[4]

Vivid E90
Ultra Edition

Powered By Edison

Designed to provide you with uncompromised image quality, advanced visualization capabilities and easy measurements – while helping reduce tedious tasks and inter-observer variability. [5]

Leverage the cSound imaging platform

We are committed to support the vital work you do with patients every day. Leveraging artificial intelligence powered by GE Healthcare's Edison™ platform, we've taken the extraordinary processing capacity of our breakthrough software beamformer, cSound™, to a whole new level.

Empower your care team with the expanded advantages of artificial intelligence of the Vivid™ E90 Ultra Edition system.

Achieve clinical excellence

Advanced quantification tools provide you with the ability to evaluate problems and pursue the path forward. Count on a full suite of intuitive tools to make your work easy and efficient. Accomplish reproducible results with advanced capabilities for quantifying heart function and valve anatomy in 2D and 4D.

Master complex exams

Due to a growing population of difficult to scan patients, XDclear™ probes combined with cSound beamformer technology make a difference in many of your exams, helping you quickly and easily acquire diagnostic images with confidence and without contrast.

Optimize your practice

Help maximize reimbursements with Automated Functional Imaging (AFI). Vivid E90 Ultra Edition also offers vast flexibility enabling superb performance in a range of exams including: stress-echo, vascular, abdominal, OB/GYN and small parts applications. Standardized and simplified procedures help increase patient throughput and optimize productivity.

Select either 22" OLED monitor or 24" LCD monitor

Intuitive 12" LCD touch screen

Adjustable floating keyboard

Convenient keyboard storage

Convenient cable management

Low power consumption with efficient and low-noise cooling

Easy mobility

MODERN ERGONOMICS

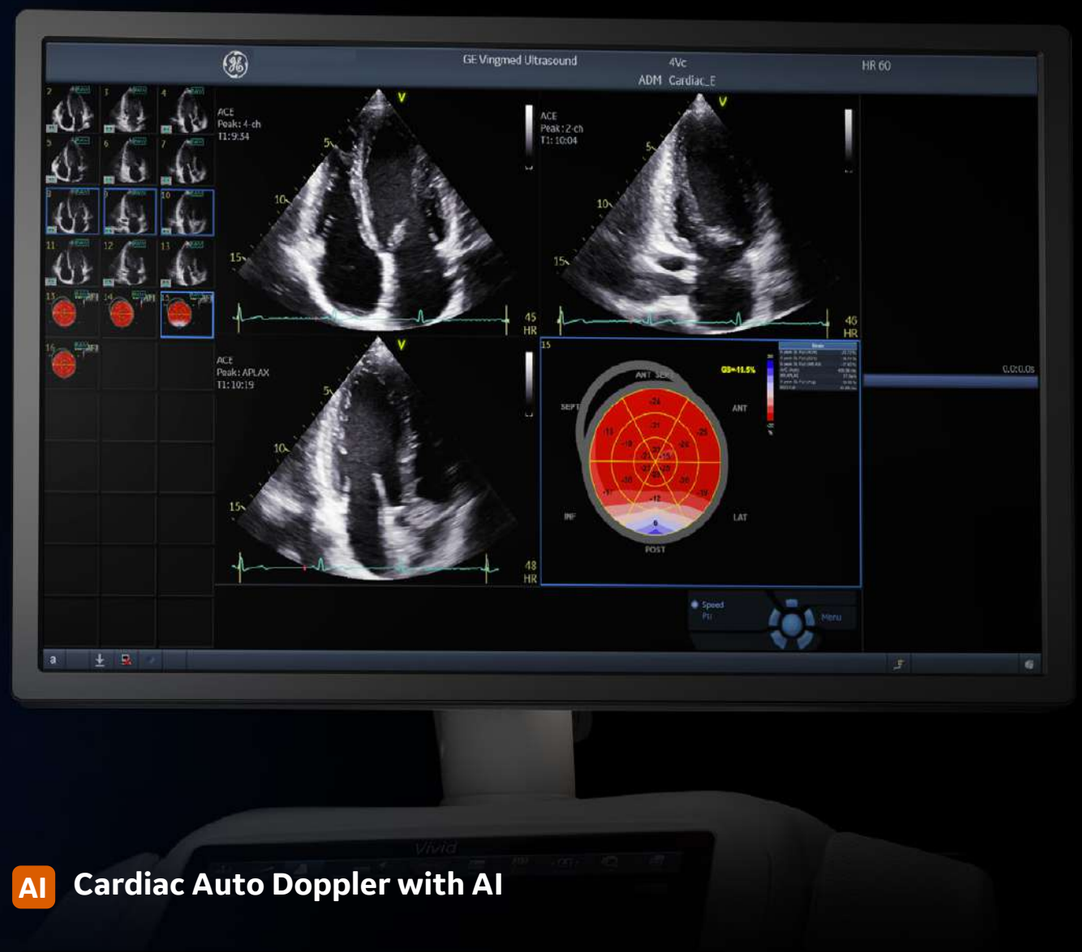
A familiar, yet modern and efficient design.

Your time is precious.
Save it.

DETECTABILITY[5]
98%

AI AFI LV with AI-based View Recognition

Fully automatic recognition of the apical imaging views and measurements of GLS and segmental longitudinal Strain for LV.



POWERED BY AI

Improve diagnostic speed and accuracy

Vivid E90 Ultra Edition introduces the latest AI-based technology to help reduce tedious tasks and improve workflow efficiency. You can diagnose more confidently and accelerate exams via automated (AI-driven) Cardiac Doppler and 2D LV measurements.

The results are impressive. Exam time is reduced, and operator fatigue minimized with up to 80% less clicks to get 2D measurements, and inter-observer variability diminished. [5]

Discover the many innovations brought by the Vivid Ultra Edition, and more importantly, how these can contribute to make clinical practice - Elevated by You.

Ultra Fast.
Ultra Precise.
Ultra Efficient.

AI Cardiac Auto Doppler with AI

REDUCED TIME PER MEASUREMENT

UP TO 93%

Fewer Keystrokes [6]

LOWER INTER OPERATOR VARIABILITY

REDUCE VARIABILITY

~3x

Standardized exams with greater reproducibility [6]

ACCELERATED WORKFLOW

Productivity improvement

POWERED BY AI

ELEVATED BY YOU

At GE Healthcare we strive to empower you by reducing wasted time and effort. We aim to remove tedious tasks and help make every moment count for your patients – seeing problems clearly and quickly, performing procedures with great precision... and providing quality of care for all.

Powered By Edison

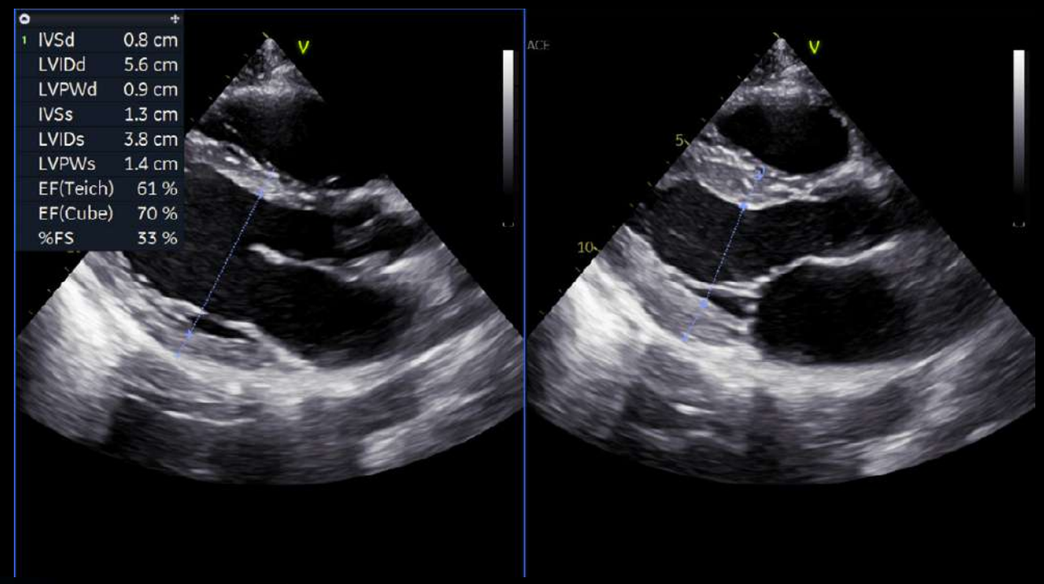
CLINICAL EXCELLENCE
for the Echo Lab

LESS CLICKS, UP TO[5]

-80%

AI Auto Measure 2D

With the power of AI, the manual caliper measurements can be completed with 3 clicks: **Freeze – Measure – Auto.** A full set of reproducible measurements will instantly appear on the screen.

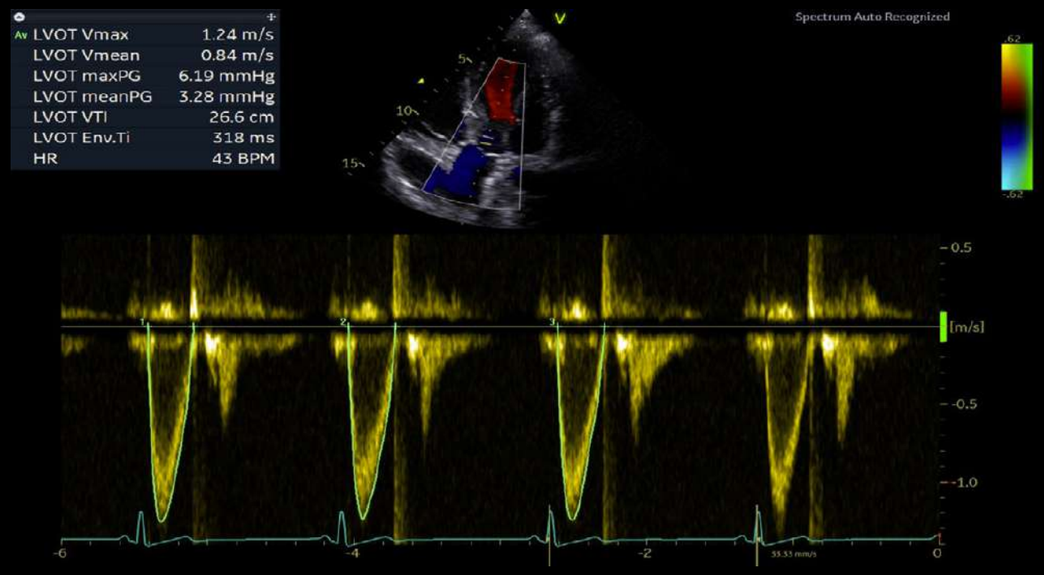


ACCURACY[5]

98%

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.



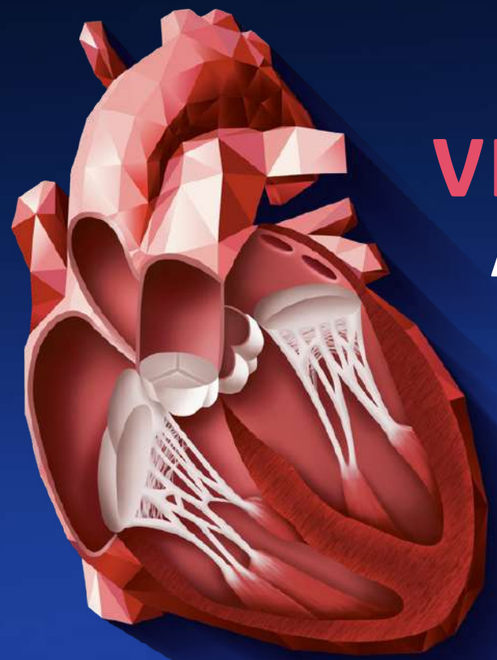
CLINICAL EXCELLENCE

for Pediatric Imaging

The smallest cardiac patients can pose the biggest care challenges with difficult to diagnose, severe conditions.

The Vivid E90 Ultra Edition helps you acquire images on a wide range of pediatric and neonatal patients, quickly and with few system adjustments enabled by Dynamic Auto Optimization. Two dedicated pediatrics probes, 6S-D and 12S-D, and two curved array probes, C1-6-D and C2-9-D, help you examine deep anatomy or shallow structures without sacrificing spatial or dynamic resolution.

Vivid E90 Ultra Edition



VIVID HEART APPLICATIONS

A wide range of clinical applications for use in Core Echo Lab, Interventional and Pediatrics.

FLOW QUANTIFICATION	Ultra Edition
Cardiac Auto Doppler AI	AI Auto Measure Spectrum Recognition AI
	BSI

CHAMBER QUANTIFICATION	Ultra Edition
	AI Auto Measure 2D AI
	Auto EF on DICOM

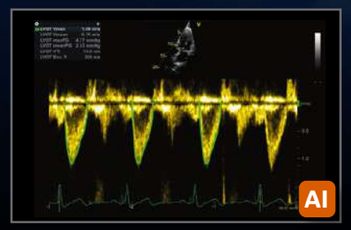
AFI FUNCTIONAL IMAGING	Ultra Edition
AFI Stress AI	AFI LV with AI-based View Recognition AI
MyoCardial Work	AFI RV
	AFI LA

APPLICATIONS POWERED BY AI

VIVID HEART APPLICATIONS

FLOW QUANTIFICATION

Your time is precious. Save it.



Cardiac Auto Doppler

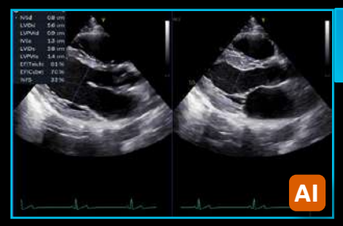
Semi-automatic Cardiac Doppler measurements.

Benefits:

- Enhances reproducibility of follow-up studies when used in automated mode[6]
- Offers Doppler measurement in multiple cardiac cycles as recommended by guidelines for irregular heart rhythms[7,8]
- Supports less experienced users with advanced automation

CHAMBER QUANTIFICATION

Precision at the heart of quantification.



Ultra Edition

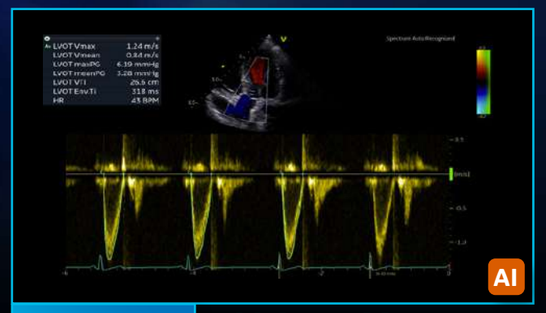
AI Auto Measure 2D

Semi-automated LV dimension measurements (2D calipers) in the parasternal long axis view, reducing manual interactions.

Benefits:

- Achieves fast measurements of left ventricle dimensions:
  - Up to 80% less clicks [5]
  - No need to scroll to look for ED and ES frames
  - Reduce manual workflow during analysis of cardiac images
- Improves reliability and repeatability of measurements - potentially increasing reproducibility for follow-up studies

New in Ultra Edition



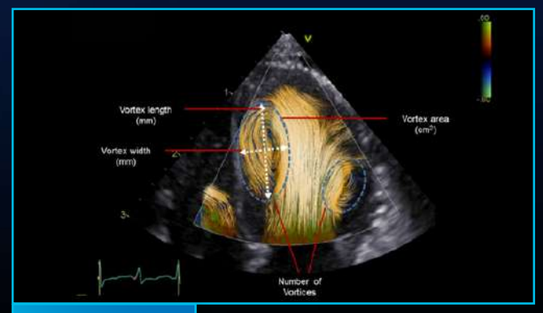
Ultra Edition

AI Auto Measure Spectrum Recognition

Semi-automatic selection of appropriate spectral Doppler measurement tool.

Benefits:

- Enables fewer manual interactions by automatically opening the appropriate measurement tool[5]
- Works seamlessly with Cardiac Auto Doppler
- Enhances reproducibility of follow-up studies when used in automated mode[5]
- Supports less experienced users with advanced automation



Ultra Edition

BSI 2.0

Insights into complex blood flow patterns such as vortex formation and duration.

Benefits:

- Provides multiple modes for visualizing blood flows, such as display of velocity vectors and pathway comets
- Provides complementary information for diagnosis of dilated cardiomyopathy and heart failure
- Opens new clinical research possibilities by providing measurements for studying vortex properties, such as vortex location, size and duration (time between 2 events)

New in Ultra Edition

Ultra Edition

Auto EF

Powered by AI-based View Recognition, Auto EF provides semi-automated quantification of left ventricular volumes and ejection fraction.

Benefits:

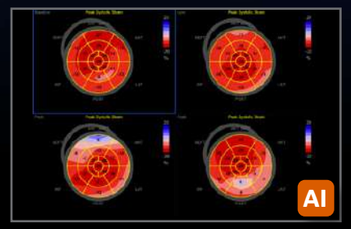
- Achieves fast measurements of ejection fraction
- DICOM® support. Assessment of the left ventricle ejection fraction also on data sets acquired on other vendors' systems for follow-up studies

APPLICATIONS POWERED BY AI

VIVID HEART APPLICATIONS

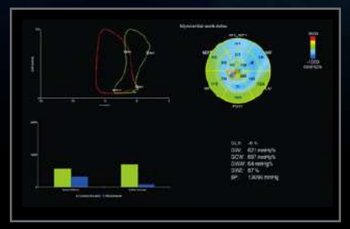
AFI FUNCTIONAL IMAGING

From diagnosis to prognosis.



AFI Stress

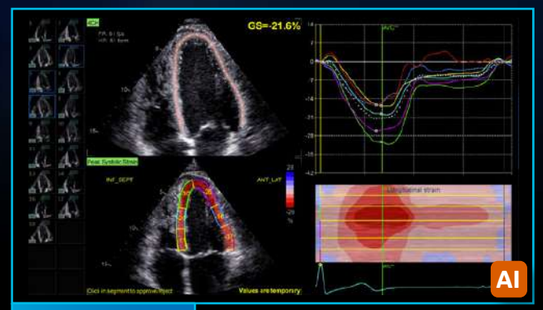
This artificial intelligence-based tool provides Doppler measurements over all heart cycles for the most common parameters, supporting consistent results and potentially saving time in both adult and pediatric TTE studies.



MyoCardial Work

Using new and reduced load dependent parameters, Myocardial Work may provide more accurate and reproducible results, important especially for follow-up of patients over time. The new parameters are based upon the results obtained with AFI (longitudinal strain) by accounting for the systolic blood pressure measured at rest immediately prior to the echo exam, as well as the MV and AV opening and closure times.

New in Ultra Edition



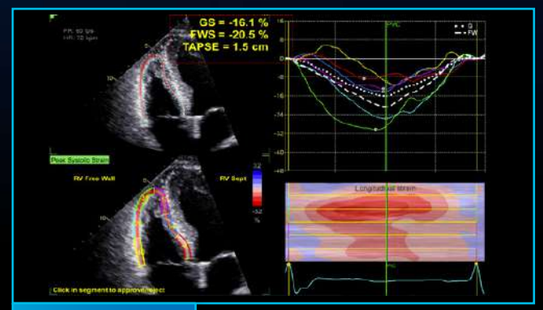
Ultra Edition

AFI LV with View Recognition*

Powered by AI-based View Recognition, AFI LV provides semi-automated quantification of left ventricular global and segmental strain.

Benefits:

- Offers advanced industry pioneered speckle tracking algorithm for quantifying myocardial deformation
- Works seamlessly - integrated ejection fraction calculation
- Supports Adult and Pediatric TTE and Adult TEE images
- Provides time savings via automatic selection of the appropriate 4-chamber, 2-chamber and APLAX images for analysis
- DICOM support. Assessment of the left ventricle ejection fraction also on data sets acquired on other vendors' systems



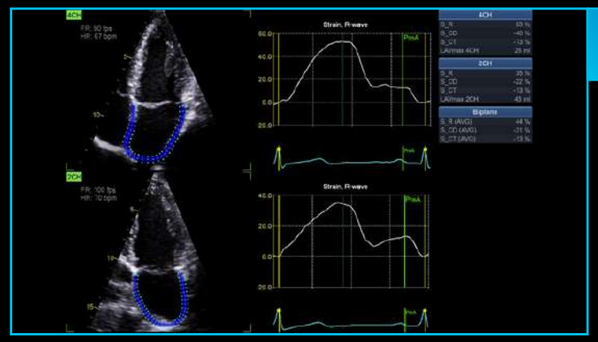
Ultra Edition

AFI RV

AFI RV is a novel tool to assess the right ventricular function by advanced speckle tracking echocardiography.

Benefits:

- Offers renown Vivid AFI user interface and workflow to allow current and new users easy adoption
- Supports right ventricle free wall strain, global strain and Tricuspid Annular Plane Systolic Excursion (TAPSE)
- Follows the 2018 EACVI-ASE Strain Standardized Task Force guidelines
- Supports right ventricle images also from previous releases



Ultra Edition

AFI LA

AFI LA Strain is a novel method to assess the left atrial function allowing global strain to be measured using speckle tracking echocardiography.

Benefits:

- Offers Vivid renown AFI user interface and workflow allowing users to easily adopt
- Supports left atrium strain, volumes and emptying fraction measurements
- Follows the 2018 EACVI-ASE Strain Standardized Task Force guidelines
- Supports left atrium images also from previous releases

*View Recognition is only applicable to images acquired with TTE probe on GE systems

APPLICATIONS POWERED BY AI

SEAMLESS WORKFLOW INTEGRATION

POST PROCESSING & REVIEW

OPEN STANDARDS

INTEGRATION WITH YOUR WORKFLOW

EchoPAC Software Only and EchoPAC Plug-in:

- Analyze and review data from GE Healthcare Vivid family of scanners, as well as DICOM images from other ultrasound systems.
- Access all Vivid measurement and review tools utilizing GE Healthcare Raw Data or industry standard DICOM data
- DICOM Image transfer with optional GE Healthcare Raw Data transfers images easily in your existing workflow
- DICOM SR Measurement Transfer including standard and custom measurement allows seamless integration with GE Healthcare and other industry reporting systems and EMRs [11]

EchoPAC Plug-in is available for:

- GE Healthcare Centricity™ Cardio Enterprise with Intelligent Reporting (IR).
- GE Healthcare ViewPoint™ 6 with EchoPAC Suite [10]
- As a plug-in to third party PACS

With Centricity Cardio Enterprise IR, routine adult echo reports are

83% **complete before the physician opens the exam to review.** [9]

SonoDefense

ADVANCED CYBERSECURITY AND DATA PRIVACY PROTECTION

Healthcare institutions are under growing threats of cyberattacks – and the implications for data security, patient privacy, and the quality and cost of care are staggering.

The SonoDefense strategy consists of SIX LAYERS, with each layer enhancing the overall security of the system and help protect patient data.

Protecting against these threats and safeguarding your patients and your institution requires more than anti-virus protection. SonoDefense is GE Healthcare's multi-layer strategic approach to cybersecurity and patient data privacy for ultrasound.

SonoDefense is designed to:

- Keep the ultrasound machine safe and functional in the face of cyberthreats
- Protect patient data on the machine from unauthorized access
- Enable you to successfully implement patient data and security policies, while still managing product daily workflows

SonoDefense strategy applies to Vivid portfolio:

- Windows® 10 IoT Secure Operating System provides multi-layered security
- Application whitelisting prevents malware execution
- Configurable user security provides user authenticationand access control
- Data encryption protects stored data and during transmission
- Network firewall disables unneeded operating system services
- Integrates with existing facility security infrastructure

Healthcare is a soft-target for hacking and ransomware.[12]

$4B **cost added in 2019**[13]

Ultrasound is especially vulnerable to operator-dependence leading to

VARIABILITY

between exams[15]

Constrained budgets increase pressure to

DO MORE with less[14]

and to optimize assets

Probe mishandling can lead to damage which can cause faulty data and may lead to incorrect medical decisions[16, 17]

[POP] PERFORMANCE OPTIMIZATION PARTNERSHIPS

Purchasing a GE Healthcare ultrasound is not only getting access to a high-technology or remarkable clinical applications. It's about enjoying a new user experience, at every step of ownership. We help you to outperform today, while preparing your department for tomorrow's challenges.

STAFF EXCELLENCE

A comprehensive portfolio of training for clinical and technical users.

Helping you and your team build customized development plans to foster excellence and increased confidence.

ASSET OPTIMIZATION

Customizable dashboards for asset utilization and consulting services to provide actionable insights.

Achieving more with your assets to improve patient care and realize department strategic plans.

PROACTIVE MANAGEMENT

Use digital technology and tools to minimize expensive and disruptive unplanned downtime.

Proactive monitoring to help reduce cost and revenue loss from unplanned failures and automated updates for peace of mind.

IMPROVED UPTIME

Best-in-class repair services to drive uptime. Fully scalable from full coverage to shared maintenance.

Thoroughly aligned with your own in-house capabilities, providing the right balance between staff autonomy and our expertise.

DEVICE PROTECTION

Keep your device state-of-the-art with software upgrades, new applications and security patches.

Optimizing your device to drive clinical and operational benefits and help you stay ahead of the game, without changing your equipment.

PROBE PERFORMANCE

Customizable portfolio of solutions for probe lifecycle needs to improve availability and performance.

Proactive probe care that may help you increase diagnostic quality, decrease cross-contamination risk and expand the life span of the transducers.

*Ready to make your Vivid **POP**?*

Complete lifecycle solution for clinical, operational & financial outcomes.
You take care of your patients, we'll take care of you.

PARTNERSHIPS DRIVE RESULTS

GE Healthcare is by your side to overcome these risks, helping you to:

- Keep your systems up and running, safe from breaches and cyberattacks
- Achieve more with your existing systems, without changing your investment plan
- Improve your activity, exam flow and staff planning, based on comprehensive data and reports
- Create comfort zone for your teams, reaching operational efficiency and clinical excellence
- Achieve high standard in probe-related cross-contamination and diagnostic errors

UNLEASH THE POWER OF CONNECTED DEVICES

Your Vivid system has been designed to provide you with an optimal user experience. Connectivity is the key element to enjoy it fully, whenever and wherever you need it, regardless of site access restriction and planning constraints.
Discover a new world of services, included in every package:

REMOTE TECHNICAL SUPPORT

Access to experts anytime, anywhere

InSite™ connectivity enables OnDemand and real-time access to remote GE Healthcare experts

- Reduce disruptions
- Decrease system downtime
- Improve asset usage and staff productivity

It provides secure remote connectivity without requiring any open inbound ports or VPN connection.

REMOTE FIX

UP TO 40%

issues fixed remotely with InSite [18]

NEW REMOTE SUPPORT

Real-time and interactive applications support

Digital Expert [19] and **STAR** provide an interactive, real-time, flexible & convenient way to get education and support.

- May help improve training outcomes
- Increase capacity and efficiency
- Train staff on a short timeline

PREDICTIVE MAINTENANCE

Know the failure before it occurs

Transform unplanned downtime into planned service events with **OnWatch** technology. It provides automated, 24/7 system monitoring, capable of detecting a system failure before it occurs. Any deviation alerts our GE Healthcare engineers, who proactively work to keep your operations running smoothly.

COST SAVINGS

UP TO 90%

cost reduction, based on OnWatch alerts [18]

NEW AUTOMATED UPDATES

No need to worry about your system safety

Get automated software updates with **eDelivery** along with safety patches enabled by remote software download.
SonoDefense provides the highest level of cybersecurity to keep your systems up-to-date, with no impact on your operations. No on-site intervention needed.

DATA DRIVEN INSIGHTS

All the insights you need to decide, at your fingertips

Better decisions start with better data **iCenter™** is a secure, cloud-based asset management tool that offers comprehensive data analytics for your systems. It provides insights to make informed decisions and helps improve operational performance, optimize patient flow and maintain compliance standards.
MyGEHealthcare App is a complementary app that gives you access to the data 24/7 directly on your smartphone. You can receive notifications and create a service request anytime, anywhere.

About GE Healthcare

GE Healthcare is 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 , or visit our website www.gehealthcare.com for more information.

† Requires current cSound version

1. Forecasting the Future of Cardiovascular Disease in the United State, AHA Policy Statement, 2011, source: CIR.0b013e31820a55f5
2. Frost & Sullivan - 2018 Market Research Report on Global Ultrasound Imaging Procedure Volume
3. 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
4. Work Related Musculoskeletal Disorders In Sonography, Society Of Diagnostic Medical Sonography, 2018, Susan Murphey, BS, RDMS, RDCS, CECD https://www.sdms.org/docs/default-source/Resources/work-related-musculoskeletal-disorders-in-sonography-white-paper.pdf?sfvrsn=8
5. The Role of AI in Streamlining Echocardiography Quantification White Paper, Kristin McLeod - JB80498XX
6. 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
7. European Association of Echocardiography recommendations for standardization of performance, digital storage and reporting of echocardiographic studies (Eur Journal of Echo 2008 – Evangelista, Badano, Monaghan, Zamorano, Lancellotti).
8. Recommendations for Quantification of Doppler Echocardiography: A Report From the Doppler Quantification Task Force of the Nomenclature and Standards Committee of the American Society of Echocardiography (JASE 2002)
9. Centricity Cardio Workflow v7 Intelligent Reporting out-of-the-box configuration compared to 2017 IAC guidelines excluding doppler. CCW Intellgent Reporting Outcome - JB74831XX
10. EchoPAC Suite is a marketing name for EchoPAC Plug-in
11. With the DICOM SR support, Measures & Analysis (M&A) for an exam can be sent at the end of the exam or when exported from local archive. The destination can be either a server on the network (Storage SCP) or a removable media (DICOM Media) depending on the DICOM dataflow selected. Custom measurements supported only for Adult Echo (TID5200) and Pediatric Heart (TID5220).
12. https://www.ncbi.nlm.nih.gov/pubmed/27689562
13. Data Breaches Will Cost Healthcare $4B in 2019, Threats Outpace Tech, healthitsecurity, source: t.ly/xrAA
14. 5 Tips for Controlling Costs in Hospitals and Biomed Shops, source: t.ly/I9n7
15. Errors in Sonography, DOI: 10.1007/978-88-470-2339-0_8. https://www.researchgate.net/publication/279616130_Errors_in_Sonography
16. e. a. M. Mårtensson, «High incidence of defective ultrasound transducers in use in routine clinical practice», European Journal of Echocardiography, vol. 10, no. 3, pp. 389-394, 2009. https://academic.oup.com/ehjcimaging/article/10/3/389/2396618 https://probehunter.com/wp-content/uploads/FULLTEXT01.pdf
17. A multicentre survey of the condition of ultrasound probes, Ultrasound. 2016 Nov, Published online 2016 Aug 1. doi: 10.1177/1742271X16662301. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5098704/
18. GE internal data
19. Digital Expert is only offered in the USA

©2020 General Electric Company. All rights reserved.

GE, the GE Monogram, Vivid, cSound, XDclear, HDlive, EchoPAC, ViewPoint, Centricity, Edison, iCenter, iLINQ and InSite are trademarks of General Electric Company. GE Healthcare, a division of General Electric Company.

DICOM is the registered trademark of the National Electrical Manufacturers Association for its standards publications relating to digital communications of medical information.

Ultra Edition is not a product name, it refers to the 2020 release of the Vivid portfolio

Third party trademarks are the property of their respective owners.

JB00859XX