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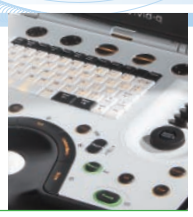
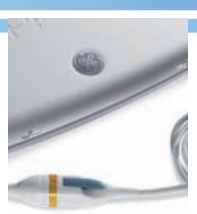
ultrasound post

technical development and medical research – news and facts





Omar Ishrak, President and CEO Clinical Systems, on GE's Commitment to Innovation and Echocardiography

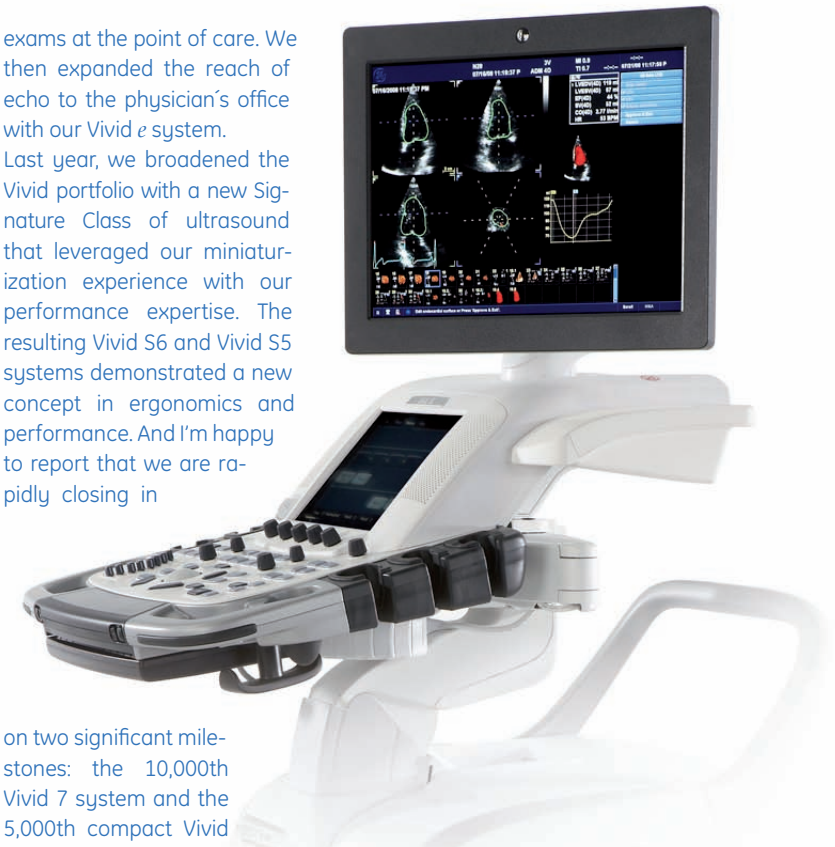
The Future of Cardiovascular Ultrasound

Ultrasound post: Welcome to Omar Ishrak, President and CEO Clinical Systems. It has been ten years since GE acquired the Diasonics Vingmed ultrasound company. What are some of the highlights from the decade?

Omar ISHRAK: When we acquired Diasonics Vingmed in 1998, we vowed the cardiovascular landscape would never be the same, and we dedicated ourselves to annual breakthroughs that would be clinically relevant. It's ten years later, and our commitment to echocardiography is as strong as ever. During the last ten years, we carried on the Vingmed tradition of System FiVe and raw data ultrasound technology platforms with the introduction of the Vivid 7, our high-end PC-based ultrasound scanner that served as the foundation for on-going technological advancements.

We continued enhancing workflow with our EchoPAC information management solution, that permits offline raw data analysis and frees up the ultrasound system for additional exams. We also continued to provide department level information management solutions with Image Vault, an archive and server solution that preserves the raw data from Vivid systems and EchoPAC workstations. Other big achievements include the launch of several new categories of systems, with the Vivid *i* representing GE's first foray into the compact cardiovascular ultrasound market. Our high-performance Vivid *i* took ultrasound out of the echo lab, making it easier for clinicians to perform diagnostic exams at the point of care. We then expanded the reach of echo to the physician´s office with our Vivid *e* system.

Last year, we broadened the Vivid portfolio with a new Signature Class of ultrasound that leveraged our miniaturization experience with our performance expertise. The resulting Vivid S6 and Vivid S5 systems demonstrated a new concept in ergonomics and performance. And I'm happy to report that we are rapidly closing in on two significant milestones: the 10,000th Vivid 7 system and the 5,000th compact Vivid system will be sold this year. Our ten-year anniversary has given us an opportunity to reflect on how our commitment to innovation and echocardiography has lead to not only a complete line of leadership ultrasound products, but advancements in treating cardiovascular disease throughout the world.



Ultrasound post: What is next for Vivid product line?

Omar ISHRAK: We'll be launching a new 4D Accelerated Volume Architecture that is premiering on our Vivid E9* system being rolled out this year at the ESC show. The Vivid E9 is our first system built from the ground up, specifically for 4D imaging. Vivid E9 will open the door to full cardiac studies being performed in a completely 4D environment. We expect the E9 to revolutionize the field of echo by making 4D imaging easy, by providing not only 4D images of the heart in a single heartbeat but also new user tools like Easy 4D and ScanAssist one-touch controls to assist the users by streamlining the 4D exam.

We'll also be raising the bar for compact ultrasound when we introduce our new leadership level Vivid q system. The Vivid q* will feature new quantitative analysis tools and new leading-edge image quality enhancements, bringing even more diagnostic confidence into the equation. And, we are making a new entry into interventional echo with our new ICE* imaging offering, which will be available on the Vivid q and Vivid *i* compact systems.

Ultrasound post: What about the future of ultrasound in general?

Omar ISHRAK: The future of ultrasound is incredibly promising. As 4D imaging gets easier to use and interpret, more clinicians will rely on this safe, non-invasive diagnostic imaging tool. In fact, as impressive as GE's achievements have been during the last ten years, they are only a prologue to the endless possibilities ahead.

*Not approved in all markets.

EDITORIAL – Heinz GLOOR

Vice President / General Manager GE Healthcare Technologies Ultrasound & PCD Europe, Middle East & Africa

Dear Readers,

To highlight GE's commitment to innovation and echocardiography, and to mark the tenth anniversary of our acquisition of Diasonics Vingmed, this issue of Ultrasound Post is dedicated to cardiovascular ultrasound.

We welcome Omar Ishrak, President and CEO GE Healthcare Clinical Systems to this issue, as he shares his thoughts on how the cardiovascular landscape has changed over these past ten years, and how GE's dedication to bringing annual breakthroughs in ultrasound technology and applications has resulted in advancements in the treatment of cardiovascular disease throughout the world.

Over this period, GE's Vivid portfolio of cardiovascular ultrasound systems has broadened as well as deepened, and we are delighted to announce that we have reached a further milestone with the launch of our 4D accelerated imaging architecture. GE ultrasound is at the forefront of the revolution in echo imaging, dedicated to equipping you, the physician, with non-invasive, state-of-the-art, diagnostic imaging tools.

However, new technologies and tools are only half the picture. Professor George Sutherland notes: „ultrasound systems are achieving such incredible levels of sophistication that knowing how to make full use of their capabilities becomes a significant factor in professional success."

GE recognized long ago the importance of "life-long education" - a phrase often used by governments and educational institutes - and at GE, actions speak louder than words. Our International Academy of Medical Ultrasound and our online communities, **Vivid**Club and **Voluson**Club, encourage ultrasound professionals to continually update their knowledge and share their experiences, both online and offline, and to the benefit of all.

I invite you to enjoy this issue of Ultrasound Post.

Yours,
Heinz Gloor

Compact to New Levels **Vivid q***

Start with the legendary Vivid *i*. Expand its advanced features with enhanced exceptional imaging and new quantification tools and the result is the new Vivid q ultrasound system. Introducing the Vivid q cardiovascular ultrasound system, a new milestone in portable echocardiography. This go-anywhere, do-everything system addresses your need to diagnose cardiovascular anatomy and LV function in your most challenging cases – with no compromises.

The Vivid q takes a host of new image quality enhancements migrated from the Vivid 7 including the M4S transducer. The matrix probe technology with M4S probe allows electronic beam focusing in three dimensions and enables higher levels of image quality.

AutoEF, a new automated ejection fraction measurement program designed specifically for the Vivid q, along with the Automated Function Imaging (AFI) feature that was migrated from Vivid 7, enhance decision support with quantitative information that increase your diagnostic confidence. Tissue Synchronization Imaging (TSI), including quantitative analysis, are parametric imaging modes that empower physicians' eyes to see quantitative information in moving, two-dimensional images.

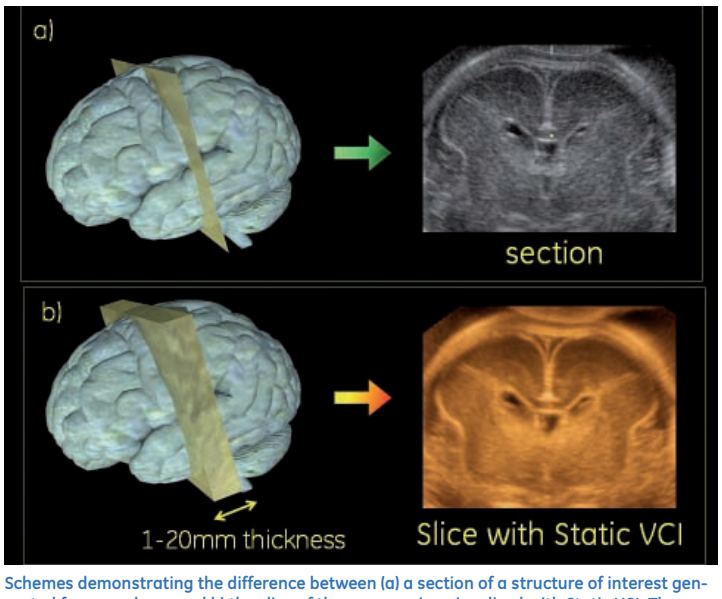
Plus the Vivid q's Intra-Cardiac Echo (ICE)* imaging catheters which open a new interventional window to the heart. And with its 14 probes and compact size, the Vivid q lets you share exceptional ultrasound imaging everywhere.

Greater accuracy. Increased confidence. Streamlined productivity. Vivid q takes you anywhere you want to go.

*Not approved in all markets.

Static Volume Contrast Imaging (Static VCI) – Principle and Clinical Applications

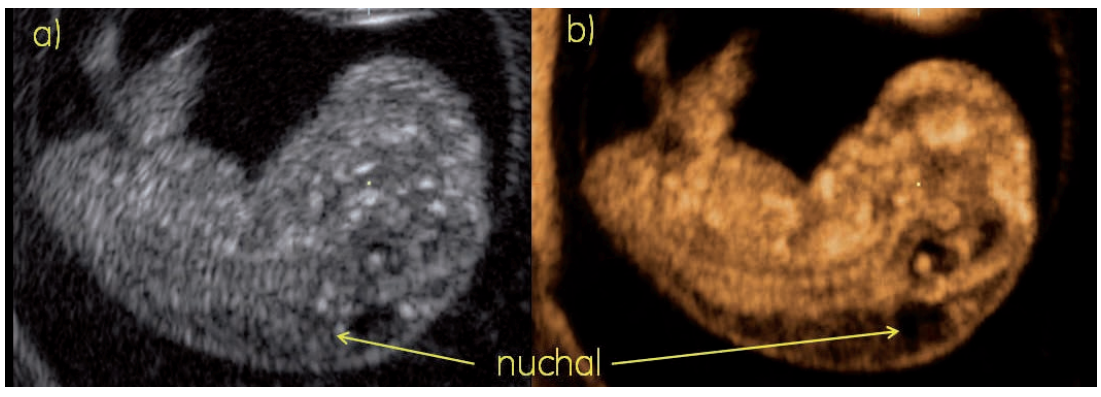
Volume US has been the most rapidly evolving technique in fetal imaging over the last few years. Volume data information can be manipulated using a variety of tools (Magi-Cut, B-Mode color maps, contrast and brightness changes, zoom etc.) to optimize for diagnosis and clinical decision making. One such tool is Volume Contrast Imaging (VCI®) which can be used either during a live 4D scan, or as Static VCI® on a 3D static volume during off-line volume rendering.



Schemes demonstrating the difference between (a) a section of a structure of interest generated from a volume and b) the slice of the same region visualized with Static VCI. The resolution and contrast are increased and speckles and artefacts reduced. The examiner can adjust the thickness of the slice according to the question of interest.

THE PRINCIPLE OF VCI

A 3D volume consists of a number of 2D slices acquired almost simultaneously. Volume quality depends on the 2D image presets, as well as adjustments performed by the examiner prior to acquisition (insonation angle, image contrast, volume box over the region of interest and acquisition speed). VCI was developed to enhance contrast in B-Mode US imaging. The VCI is a projection of a volume onto a 2D screen, to decrease US artefacts in the 3D volume. By superimposing different adjacent images, the information from anatomic structures is enhanced whilst noise and speckles, generated randomly in different slices, are reduced or eliminated. The image has greater contrast resolution, is smoother, and the interface between different tissues is more visually obvious. VCI can be used online on a live 3D acquisition to enhance either the A-Plane (VCI-A) or C-Plane (VCI-C), or as a post-processing technique for static volumes which have been acquired as Static VCI.



Fetus with thickened nuchal translucency (NT). The volume was acquired transvaginally and the oblique or C-plane does not show clearly the finding. By combining with Static VCI the extent of the thickened NTis better appreciated. Compare arrows in a) and b).

CLINICAL APPLICATIONS

Static VCI was developed to increase contrast and resolution in adjacent structures. This technique primarily helps in volumes where the required information is found in a reconstructed plane (e.g. C-Plane or another oblique plane). Here the Static VCI tool improves the reduced level of detail which results from the digital reconstruction. We combine Static VCI either with the single plane view, orthogonal planes, or the Tomographic US Imaging (TUI) display, depending on the information required.

1. First Trimester Scan

The examiner acquires a volume and demonstrates the information of interest in a reconstructed plane, improving the image with Static VCI. Prior to 10 weeks, this technique makes the intracerebral cavities with large rhombencephalon clearly visible. Between 11 and 14 weeks, the nuchal translucency, nasal bone, intracranial structures, intra-abdominal organs and others can be demonstrated.

2. Second Trimester Scan

BRAIN: 3D is combined with Static VCI to demonstrate the corpus

IAMU Course in Cardiovascular Ultrasound

The International Academy of Medical Ultrasound (IAMU) is pleased to announce that it will be running a course on cardiovascular ultrasound this autumn for the benefit of **Vivid**Club members. In recent years, major advances in echocardiography and new tools for cardiologists have not only had a positive impact on productivity and workflow in the echo lab but have also provided greater diagnostic confidence. This course is designed to familiarize physicians with these latest developments.

4D & Multidimensional Imaging: 24 - 25 November 2008, Prague, Czech Republic

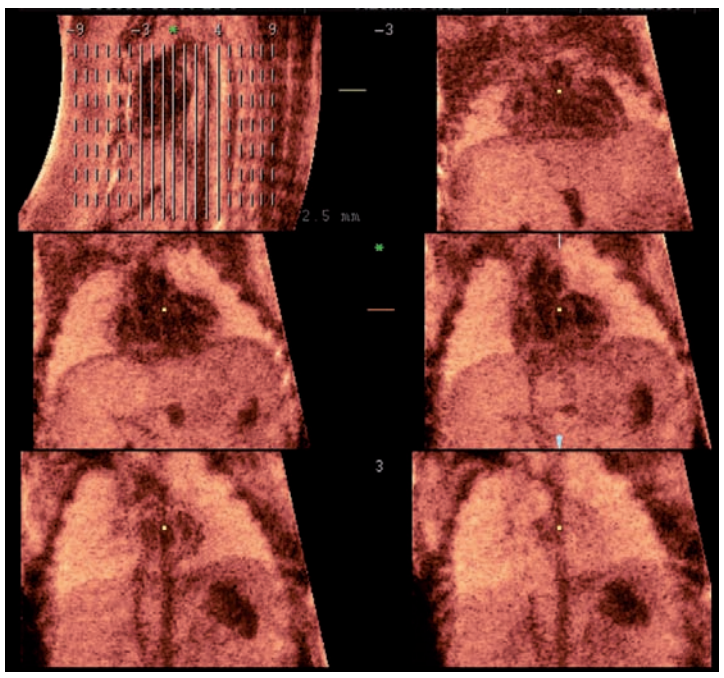
The two-day course will examine the following subject areas:

- Physical principles and basics for 4D and 4D Color Flow Imaging
- Standard views and how to optimize the image
- The Valves – Morphology and Anatomy
- The Ventricles – Acquisition and Quantification
- Congenital Heart Disease
- Hands-on – Acquisition and Quantification using VIVID 7s and EchoPACs

The course chairman is Dr J. D. KASPRZAK. The course will be held in English, and run over two days. Prominent scientists and clinical experts have agreed to lecture on the course and are looking forward to sharing their experience during the theoretical and practical, hands-on sessions.

Go to **www.vividechoclub.net** for further details.

The IAMU course is designed for **Vivid**Club members. If you are not yet a member, simply register at **www.vividechoclub.net** today to enjoy the full privileges of membership, free of charge.



Thorax and upper abdomen as seen in 3D with TUI in combination with Static VCI. Lung, liver, stomach, heart and vessels can be well differentiated from each other (mode: xray combined with minimum)

callosum, the vermis of the cerebellum and some coronal views. With a transvaginal US, obtaining all planes of interest takes time, but 3D plus Static VCI requires only a couple of volumes.

LUNGS: Lung echogenicity is slightly brighter than the liver and heart. Static VCI easily increases the contrast and demonstrates the lung borders, allowing lung anomalies to be easily demonstrated.

KIDNEYS: Under some conditions kidneys may resemble the neighboring bowel. 3D with Static VCI is ideal for demonstrating renal tissue, as in pelvic kidney or in horseshoe kidney.

PALATE: The fetal palate is difficult to render but 3D acquisition from an inferior view can be rendered in orthogonal planes combined with Static VCI.

3. Gynecology

3D with Static VCI applications can demonstrate the normal shape of the uterine cavity, differentiation of a bicornuate uterus, position of the intrauterine device, plus intrauterine findings such as myomas, polyps or early intrauterine pregnancy. The C-Plane is also of great value in demonstrating breast lesions, especially when visualized with 3D combined with Static VCI.

We hope you are encouraged to test this fascinating tool, and are confident the results will be convincing.

Dr Bernard BENOIT,
Princess Grace Hospital, Monaco,
R.CHAOUI, K.S. HELING,
Prenatal Diagnosis and Human Genetics, Berlin, Germany

New 4D Imaging System Vivid E9* – Unveils at ESC

GE Healthcare is launching the Vivid E9 system, its first system built on a new 4D Accelerated Volume Architecture (AVA), and the inaugural system of a new category of ultrasound system – the Expert Series.

Built by our engineers from scratch specifically for 4D imaging, the Vivid E9 allows the user to capture the entire heart in a single heart beat – ungated and unspliced – with the level of image quality required to ensure diagnostic confidence. The Vivid E9 will revolutionize the field of echocardiography by making 4D imaging easy enough to use everyday. The Vivid E9's Scan Assist and Easy 4D tools for 4D acquisitions, 4D quantification and 4D connectivity streamline the 4D exam.

The power of the new 4D Accelerated Volume Architecture on the Vivid E9 also enables the Vivid E9 to achieve exceptional 2D image quality with the marriage of single crystal and matrix array transducer technologies. The ease of use continues with a touch panel, advanced ergonomics and a slim design that makes the system easier to handle and operate.

ICE – A New Window to the Heart

GE's Vivid *i* / Vivid q systems with Intra-Cardiac Echo (ICE)* technology provide exceptional, real-time image guidance, and visualization of anatomical structures to help increase your confidence level when performing complex electrophysiology and interventional cardiology procedures.

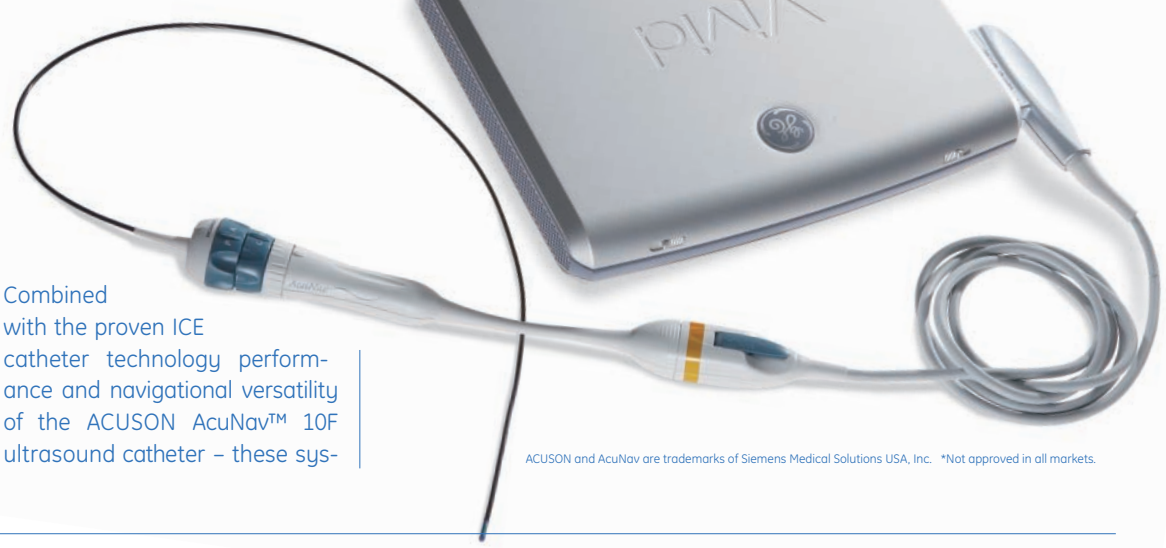
Small and compact, Vivid *i* / Vivid q systems deliver imaging performance equal to that of today's high-end portable ultrasound systems.

Combined with the proven ICE catheter technology performance and navigational versatility of the ACUSON AcuNav™ 10F ultrasound catheter – these systems help cardiologists confidently navigate complex invasive procedures.

By utilizing ICE, you can visualize and identify anatomic structures during therapy, and demonstrate the structural orientation during trans-septal puncture as well as other therapeutic catheters during an invasive procedure.

The strength of the Vivid *i* / Vivid q systems, offering ICE on a compact portable system, provides confidence in demonstrating cardiac anatomy inside the heart, associated with invasive procedures.

The result: Greater clinical confidence. Fewer complications. Expanded capabilities. Increased versatility. And improved workflow.



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GE Healthcare Introduces Ultrasound Fusion:

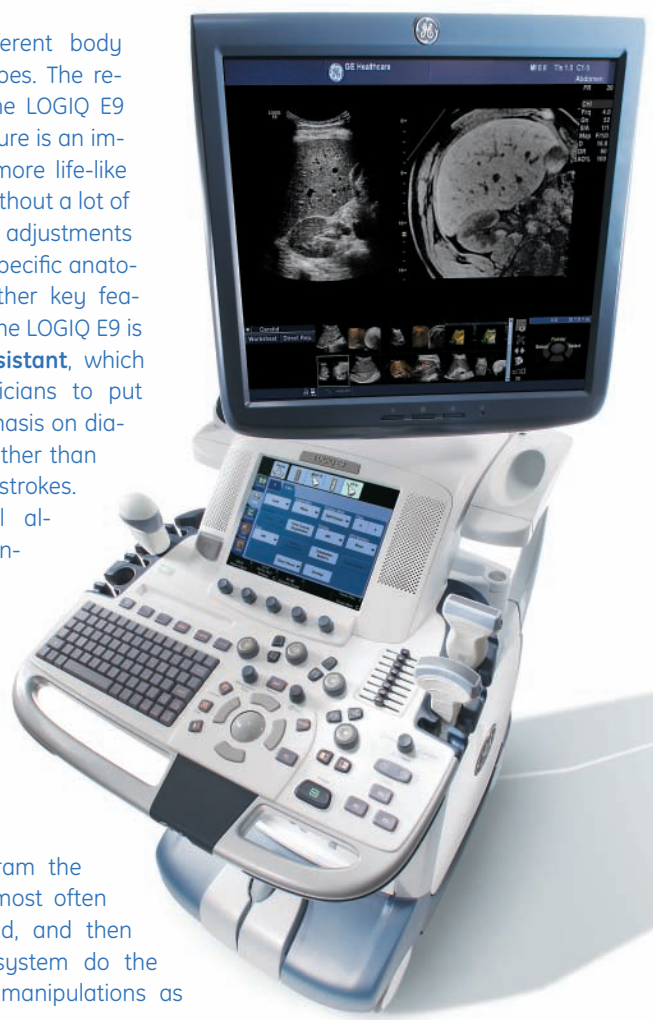
New LOGIQ E9 Merges Real-Time Ultrasound with CT, MR and PET

GE's New Volume Navigation Combines Benefits of Diagnostic Imaging Modalities for Radiology and Vascular Care

WAUWATOSA, WI, SEPTEMBER 2, 2008 - GE Healthcare today announced that the company has launched a new ultrasound system for radiology and vascular applications that fuses ultrasound images with images from other imaging modalities like CT and MR. The new LOGIQ® E9 includes Volume Navigation, an innovative tool which incorporates two key components to maximize the system's new agile ultrasound architecture: 'Fusion' to combine the advantages of real-time ultrasound imaging with the high spatial and contrast resolution of CT, MR or PET; and a **'GPS-like technology'** to track and mark a patient's anatomy during the ultrasound exam, bringing confidence and productivity to both diagnostic and interventional studies.

"GE's new LOGIQ E9 helps address the biggest challenge in ultrasound radiology and vascular care – how to leverage clinical images from previous diagnostic imaging studies for interventional or diagnostic ultrasound procedures," said Terri Bresenham, GE's Vice President of Diagnostic Ultrasound and Information Technology. *"We worked closely with a global team of radiologists and sonographers to develop this new ultrasound architecture, giving clinicians the advantages of imaging modalities - MR, CT and PET – and it is already reigniting the imagination of the ultrasound industry."*

This new GE architecture, called **Agile Ultrasound**, replaces old assumptions of conventional ultrasound systems with new, modular mathematical models that provide more accurate measurements of how sound interacts with different body tissue types. The result of the LOGIQ E9 architecture is an improved, more life-like image without a lot of manual adjustments to view specific anatomy. Another key feature for the LOGIQ E9 is **Scan Assistant**, which aids clinicians to put the emphasis on diagnosis rather than on key-strokes. This tool allows a clinician to pre-program the actions most often performed, and then let the system do the detailed manipulations as the patient is scanned. It improves exam time up to 54 percent, automatically inserts comments, completes measurements, steers Color Doppler, sets up imaging controls and modes, and improves ergonomics.



"GE Healthcare's broader ultrasound objective is to bring quality images, better workflow, and innovative tools to clinicians," said Bresenham.

"This LOGIQ E9 system is entirely innovative for a groundbreaking new generation of ultrasound systems."

CONGRESSES 2008

TOPIC	LOCATION	DATE
EUROP. GASTROENTEROLOGY WEEK	A-Vienna	18.-22. Oct
MEDICA	G-Düsseldorf	19.-22. Nov
EUROECHO	F-Lyon	10.-13. Dec

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