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Driving productivity in the echo lab with Vivid™ Pioneer

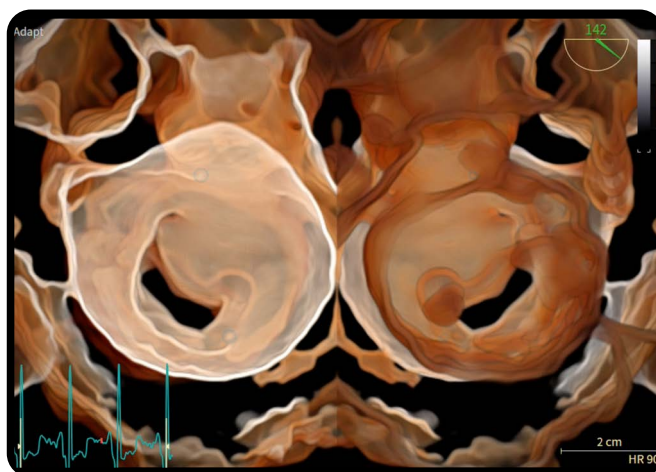
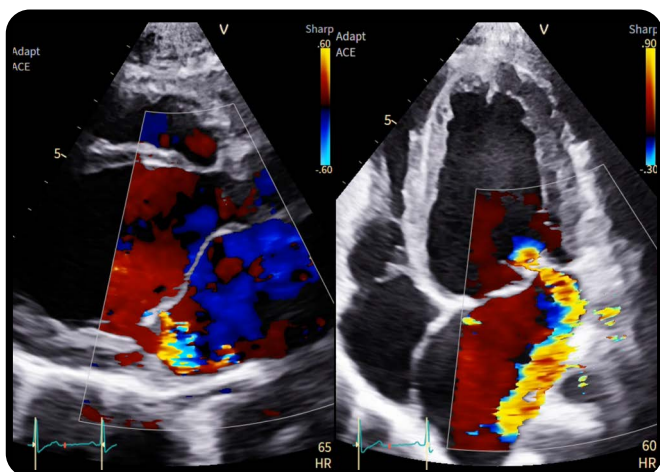
In the echo lab, there's little room for compromise. As patient volumes rise and cases become more complex, balancing efficiency with confidence and consistency is a daily challenge. Image quality is foundational. Clearer images can mean faster measurements, more reliable quantification, and greater diagnostic certainty. AI and automation further streamline workflows, saving valuable time and effort under constant clinical pressure.

These realities shape everyday practice for Professor Erwan Donal and his team at Rennes University Hospital in western France. The Cardiology and Vascular Disease Department provides advanced cardiac imaging, including echocardiography, with a focus on valvular disease, cardiomyopathies, and heart failure. Prof. Donal leads the department's demanding echo lab, which conducts approximately 23,000 studies annually, while the interventional cardiology team also performs an estimated 150 mitral and tricuspid valve interventions each year.

Prof. Donal also oversees efforts that combine leading-edge research with clinical innovation at Rennes University Hospital where he is as Director of the echo lab and leads the Core Imaging Lab, which provides echocardiography expertise and data analysis for large, multicenter clinical trials and research projects across Europe. The dynamic environment supports a high-volume echo practice where innovations in Transthoracic Echocardiography (TTE) and AI-assisted quantification are integrated into daily workflows.

One of those innovations is the Vivid Pioneer ultra-premium ultrasound system. As one of the first to experience the new cardiovascular ultrasound platform, Prof. Donal shares how he feels the system is changing workflow and opening new possibilities for 4D transthoracic echocardiography.





Given your demanding and fast-paced environment, what do you need most from a premium ultrasound system?

Prof. Donal: *The challenge for the echo lab is that we have more and more patients every year. These patients are diverse and complex, often with comorbidities, and in some cases, they're extremely severe. So we need the most efficient workflow possible to make sure we can assess these patients while having them comfortable. From the beginning to the end of the day, we need an ultrasound system that is robust, easy to use, and rapid for everybody. It should be intuitive and reproducible.*

“ *The images are impressive, which improves the ability to quantify more accurately. So, it's not only a question of beauty — it's a question of how we analyze the data.”*

Your team also performs a significant number of mitral and tricuspid valve interventions. How does this add to the complexity and reinforce the need for precise imaging?

Prof. Donal: *These two valves are the most demanding for imagers — especially the tricuspid valve. In Rennes, we're doing research for the Evaluation of Tricuspid Valve Percutaneous Repair System in the Treatment of Severe Secondary Tricuspid Disorders trial, so we are doing a lot of interventions on the tricuspid side. We believe in the value of the treatment for our patients, but it's also very demanding because the quality of the imaging is fundamental. We need to see the tricuspid valve perfectly and to assess the right ventricle and the right atrium. Having access to percutaneous repairs treatment is nice for the patients and good for the institution, but it's also very challenging.*

Considering the importance of image quality — how would you describe your experience with the new Vivid Pioneer system?

“ *With this new generation of Color Doppler, we can see the regurgitation and quantify it much better, not only on the mitral side, but also on the tricuspid side, and the aortic side. So we have the capability to see things that maybe we didn't see before.”*

Prof. Donal: *The previous Vivid E95 was very good, but with the Vivid Pioneer it's better and much easier to get nice images. It means you don't have to change the settings from one exam to the next. The images are impressive, which improves the ability to quantify more accurately. So, it's not only a question of beauty — it's a question of how we analyze the data.*

The Color Flow is also beautiful. With this new generation of Color Doppler, we can see the regurgitation and quantify it much better, not only on the mitral side, but also on the tricuspid side, and the aortic side. So we have the capability to see things that maybe we didn't see before.

Innovation at the core of valve research

Rennes University Hospital hosts a dedicated Core Imaging Lab that delivers advanced echocardiographic expertise and centralized data analysis for large-scale, multicenter clinical trials and collaborative research programs across Europe. The Core Lab supports standardized image acquisition, rigorous quantitative analysis, and high-quality imaging endpoints for academic and industry-sponsored studies.

For image assessment, the Core Lab uses GE HealthCare's EchoPAC™ for advanced cardiac post-processing and quantitative echocardiographic analysis. The software supports multi-vendor compatibility, enabling standardized analysis of DICOM® images acquired from different ultrasound systems. With its advanced quantification tools, EchoPAC enables

reproducible analysis of echo data supporting consistent, high-quality results across study sites.

How would you describe the Core Lab?

Prof. Donal: *The Core Lab is accredited and the key words to describe it are quality, robustness, and efficiency. The Core Lab is dedicated to assessing mitral and tricuspid valve images from around the world. With images coming from a range of machines and places, we need a system that can quantify data from different sources.*

How does EchoPAC facilitate assessment?

Prof. Donal: *EchoPAC is fundamental for the Core Lab activities. The fact that we have EchoPAC, we can quantify every exam — and we use only DICOM data, so we can quantify valvular heart disease, the LV and RV function.*

Prayuth Rasmeehirun: *EchoPAC is an amazing software for reading echoes because it can be used offline. You can go back to your workbench and measure things offline, which saves you time with the patient and helps if you forget to measure something while scanning. You can also shift your color and increase or reduce the gain, which makes post treatment easier.*

What are the advantages of EchoPAC in this research setting?

Marina Saadi: *EchoPAC gives us the ability to perform offline analysis, which really helps the Core Lab function. We receive exams from other places and analyze them all in one location. It allows us to perform blind analysis for clinical trials without access to the patient or the machine that performed the exam. With EchoPAC, we are able to perform*



Prayuth Rasmeehirun, MD, Fellow Corelab Echo, CHU Rennes



Marina Saadi, MD, PhD, Fellow Corelab Echo, CHU Rennes

advanced measurements, such as strain, calmly, efficiently, and productively.

Prayuth Rasmeehirun: *EchoPAC can perform measurements automatically, so you won't have to rely on manual calculations. This makes your life easier, especially when performing many measurements, and working on multiple research projects. Plus, EchoPAC is also important because it allows us to perform all measurements on DICOM images. For example, strain analysis can be performed directly on DICOM data.*

How would you describe the learning curve?

Marina Saadi: *It's a program that's easy to learn and greatly helps with offline analysis, while the system can continue functioning and attending other patients.*

Prayuth Rasmeehirun: *EchoPAC has the same user interface as Vivid Pioneer so, in my opinion, there's zero learning curve to use it.*

Prof. Donal: *It's very rapid, robust, easy-to-use, and every single fellow can use the solution. Everybody understands how it works and it's convenient. There are many people who come into our Core Lab, so we can teach them how to use the new EchoPAC very rapidly.*

How has Vivid Pioneer impacted your transthoracic imaging and why do you think it's important for other clinicians?

Prof. Donal: *Vivid Pioneer delivers outstanding 2D image quality, which remains essential in everyday practice. At the same time, we have been discussing the value of 4D echocardiography for many years, particularly in Transesophageal Echocardiography (TEE), and increasingly in Transthoracic Echocardiography (TTE). The fact is that most physicians are still not using 4D echo in TTE. With the new Vivid Pioneer platform, you can acquire 4D in both left and right ventricles in almost every patient. This means we can hope for all cardiologists to routinely adopt 4D images in TTE.*

“Today, we have a platform that provides 4D imaging not only to visualize structures such as the veins, valves, ventricles, papillary muscles, and the right ventricle, but also to perform robust and reproducible quantification.”

For example, I had a patient who had dilated cardiomyopathy with severe mitral regurgitation. In just a few minutes I captured all the images, including the 4D of the LV. The images are impressive, but what I care about is being able to quantify left ventricular size in systole and diastole, which lets me quantify mitral regurgitation very precisely using a volumetric approach.

Today, we have a platform that provides 4D imaging not only to visualize structures such as the veins, valves, ventricles, papillary muscles, and the right ventricle, but also to perform robust and reproducible quantification. The better the image quality — particularly in terms of resolution and volume rate — the more robust and accurate the quantification will be. With Vivid Pioneer, it's feasible — whereas in the past, it was perhaps more challenging. This is why 4D echocardiography should be adopted more widely in daily clinical practice.

The new system features 4D Auto LHQ, which simultaneously performs 4D quantification of both chambers in fewer clicks. What is the impact of the tool in your clinical practice?

Prof. Donal: *We are doing a 4D acquisition for every single exam that we do in TTE. The goal is quantification, and Vivid Pioneer makes it easy for LV size and LV ejection fraction. On top of that, the assessment of the LA is also robust. So in just a few seconds, we can quantify everything on the left side, and of course, we have a tool that we can use on the right side.*

I think it's useful to have images dedicated to the LV and LA, and separate images dedicated to the RV, because it's very difficult to record everything accurately in a single acquisition. Capturing the LA/LV together with precise quality is challenging. However with Vivid Pioneer, the LA and LV can be quantified quite easily thanks to a 4D acquisition on the left side, and we can apply the same approach to the right side afterward.



Exceptional image quality is foundational for AI-driven insights you can trust. How does Vivid Pioneer translate this into reliable and reproducible results?

Prof. Donal: *The echo lab is very busy and we need to perform exams as fast as we can. We sometimes need AI tools to speed up the process and get quantitative measurements in a small period of time. Vivid Pioneer has a new AI software for automatic Doppler measurements expanding its capabilities. AI Cardiac Auto Doppler works for every type of Doppler, is more robust than the Vivid E95, and allows us to clearly see what the system is doing. We can obtain excellent quantitative Doppler Tissue Imaging (DTI) assessments and quantify valvular heart disease, including stenosis, very nicely.*

“We have many echo machines in the echo lab, with different physicians, fellows, and nurses practicing echoes every day. It’s important that everyone feels comfortable with the platforms. Vivid Pioneer is really easy to use.”

It’s easy to obtain a high-quality Doppler and have the quantification done by AI. Whether it’s performed by me or by a fellow, the result is essentially the same, making it reproducible. Beyond image quality, this tool speeds up the workflow, allowing us to see patients more rapidly and efficiently. I really hope the community will adopt this because it’s rapid, robust, and works extremely well.

What features are particularly valuable in improving visualization and workflow for your echo lab and structural heart interventions?

Prof. Donal: *We perform a significant number of interventions and use many tools. Of course, we can quantify the mitral valve annulus and tricuspid valve annulus using 4D Auto MVQ or TVQ, but the visualization of the valves is much better.*

We perform a lot of 4D acquisitions that can be displayed nicely thanks to Flexi-Slice (MPR). Flexi-Slice was already good with the Vivid E95 system, but with Vivid Pioneer it’s much better — and actually faster. We can navigate through the volume to make sure there are no issues with the chordae, indentations, or unusual anatomies. We also have 2-Click Align, for instance, that allows us to align with the mitral valve and the tricuspid valve perfectly in 2 clicks.

“ I need a machine that moves with me. Vivid Pioneer is beautiful, very convenient to use, but also lighter.”

These tools improve the way we display images in the echo lab, but they're even more important in the cath lab, where FlexiSlice and 2-Click-Align are ready to use in a few seconds.

Why is portability essential for you, and what sets Vivid Pioneer apart?

Prof. Donal: I'm using the system in the echo lab and the cath lab, so I need a machine that moves with me. Vivid Pioneer is beautiful, very convenient to use, but also lighter than the Vivid E95. There is a battery, and also a transportation mode, which means we don't have to turn the system off when moving rapidly between places. This is very convenient because in just a few seconds I can be efficient and

acquire images if needed. This is really a new capability of the system that was not possible before.

Ease and simplicity have come up repeatedly in our conversation. Can you comment on the learning curve given your wide range of users?

Prof. Donal: We have many echo machines in the echo lab, with different physicians, fellows, and nurses practicing echoes every day. It's important that everyone feels comfortable with the platforms. Vivid Pioneer is really easy to use — features are easy to find and everything is obvious. We don't have to think, “Where is this button?” or “How can I do 4D?”

And it's not just for me — it's the same for the fellows. For example, I observed a fellow who was able to perform a TTE perfectly including 4D. Vivid Pioneer is easy to understand and there aren't too many buttons, so it's something we can really adopt — from the youngest to the most experienced staff.

How is the new ultrasound system changed the way you work, and what do you see as its true value?

Prof. Donal: Vivid Pioneer is really providing something new. Thanks to this platform, we now use 4D in every single TTE exam, which is very convenient and been a goal for a while. It's clearly improving the robustness of our assessments.

On top of that, the Color Doppler is really amazing and much better than what we had before. We can visualize valvular leaks and quantify everything much better than in the past. Vivid Pioneer is also designed for the cath lab. Overall, the image quality, the improvements on Color Doppler, and the ease in obtaining high-quality images make communication with the interventionalist much easier. ■



Professor Erwan Donal, MD, PhD, is a Professor of Cardiology at the University of Rennes and a senior cardiologist at Rennes University Hospital (CHU Rennes), where he serves as Director of the echo lab and leads the Core (Core Imaging) Lab. His clinical and academic work focuses on advanced cardiovascular imaging, with particular expertise in echocardiography, valvular heart disease, heart failure, and structural heart disease assessment. Prof. Donal specializes in quantitative and multimodality imaging, standardization of imaging measurements, and the use of imaging in clinical trials. His research interests include myocardial function analysis, imaging biomarkers, deformation imaging, myocardial work, and the application of echocardiography and cardiac imaging to improve diagnosis, risk stratification, and outcomes in cardiovascular disease.

Prof. Donal is a paid consultant for GE HealthCare. The statements by Prof. Donal described here are based on his own opinions and on results that were achieved in his unique setting. Since there is no “typical” hospital/clinical setting and many variables exist, i.e., hospital size, case mix, staff expertise, etc. there can be no guarantee that others will achieve the same results.

The statements by Dr. Rasmeehirun and Dr. Saadi are based on their own opinions and on results that were achieved in their unique setting. Since there is no “typical” hospital/clinical setting and many variables exist, i.e., hospital size, case mix, staff expertise, etc. there can be no guarantee that others will achieve the same results.