





Precision at the heart of pediatric care

Transforming complex congenital heart care through imaging

What was once a devastating diagnosis is now one of pediatric cardiology's greatest success stories. Nearly 1 in 100 newborns is affected by congenital heart defects, yet today, more than 90% survive into adulthood — a dramatic shift made possible by decades of innovation.^{1,2} Advances in echocardiography — especially high-performance probes — have led to sharper imaging and greater precision across a broader range of patients, enabling earlier diagnosis and more personalized treatment.



Developing individualized care plans is essential in congenital heart disease (CHD) because each anomaly varies in anatomical structure, clinical complexity, and functional impact. Precision is particularly important in pediatric cardiology, where even small anatomical differences can significantly affect treatment strategy and a patient's overall health trajectory.

Vall d'Hebron University Hospital's Pediatric Cardiology Department, located in Barcelona, is a leading center in Spain for the care, teaching, and research of congenital heart disease — serving patients from the fetal stage to adulthood. With over 40 years of experience, the Pediatric Cardiology Department is recognized as a national reference center for complex pediatric cardiac conditions and has a renowned heart transplant program.

As Chief of Pediatric Cardiology at Vall d'Hebron University Hospital, Dr. Ferran Rosés is actively involved in CHD research and eagerly integrates new technologies to help advance the field — with high-quality imaging at its core. Among the first physicians to explore the capabilities of the new Vivid™ Pioneer ultrasound system, Dr. Rosés has performed echos on patients ranging from newborns to young adults.

We spent time with Dr. Rosés in clinic, observing first-hand how he's using Vivid Pioneer — and asked him to share how it's shaping everyday practice.

Congenital heart disease is a key focus in your department. What are the biggest obstacles you face in understanding anatomy and determining the best treatment?

Dr. Rosés: *My challenge is helping patients with really complex congenital heart disease, particularly the ones where we really need to understand the anatomy to plan treatment. Basically every patient's heart is different, so every congenital heart disease is slightly different. You can then study each patient's heart in a very particular way, so that you can then target and design a treatment.*

Precise imaging plays a critical role in navigating complex heart cases. How would you describe the image quality?

Dr. Rosés: *The image quality of Vivid Pioneer is outstanding. It was mind blowing actually and is quite different from the Vivid E95 system. It takes just a few seconds to adjust to this new way of viewing things, and then you begin to appreciate the quality, the detail, the tissue characterization, and the Radiantflow.™ All of these make a fantastic package.*

To get real detailed anatomy — you really need a very powerful echocardiogram, and Vivid Pioneer is excellent. The 2D image quality for me is what was really striking. You can see the detail of all the structures: the tissue, the muscle, the leaflets, the valves, and that is really helpful to diagnose our patients.

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Every image, every insight in echocardiography starts with the probe. What are your impressions of Vivid Pioneer’s new 6Sc-D probe?

Dr. Rosés: *I think the 6Sc-D probe, which is the new pediatric probe, gives us an edge because we can see things that we could not see with other probes. The accuracy of the image quality is outstanding. You can see much more detailed valves, or an aortic coarctation quantitation for*

example. The image quality allows you to precisely diagnose the problem, so you can then inform the surgeon or the interventionalist.

One thing that is fantastic is that you just use Vivid Pioneer — put the probe on the patient, and the image quality is there for you. You don’t have to do much tweaking because the setup is already done.

Can you talk about the design of the 6Sc-D probe and how it impacts usability, especially in pediatric patients?

Dr. Rosés: *The design is really important. It’s completely new compared to the 6S on the Vivid E95. The major change is the elongated footprint. It’s narrower and longer, which makes it perfect, so you can scan through the ribs and then you have a larger window. It allows you to scan patients from neonate to adults — and the image quality is wonderful.*

Some might believe that it’s not ideal for neonates, but that’s not the case. The fact that it’s narrower is perfect.

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You can scan them from subcostal, from the four-chamber view, and from the long axis-view nicely. It doesn’t matter that it’s slightly longer. The image quality is still perfect.

How does the image quality you’re seeing with the probe impact your clinical confidence in treating this broad group of patients?

Dr. Rosés: *As a pediatric cardiologist it’s all about image quality. For us, it’s all about seeing things. We are morphologists, so we need to understand the anatomy very well. So if you don’t see well, then you won’t be able to treat them well. Having an echo this powerful makes all the difference.*



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How would you describe Vivid Pioneer's Color Flow advancements, which includes a new Radiantflow feature?

Dr. Rosés: The new 'Color' is fantastic. What's really important with Vivid Pioneer is that the color differentiation between the muscle is much better. When you put the Color on, you can see the myocardium very nicely, and then

the color flows through the structures — basically through the vessels or the cavity. The differentiation between the myocardial tissue and the color is perfect. You can see all the valves clearly, and it's much easier to see the ventricular septal defects (VSDs) or other defects in the heart.

At Vall d'Hebron, we are familiar with Radiantflow from GE HealthCare's Voluson™ ultrasound systems for fetal cardiology, but it's new on Vivid Pioneer. It gives you a sense of depth — a 3D-like volume in a 2D image — which is actually very nice. But the color is very different. At first, if you're not used to it, you might think, "Oh my goodness, this is too much." But then, wait a minute — do it a couple of times, and you start loving it. So, the tool grows on you quickly.

When it comes to productivity and workflow, how would you describe Vivid Pioneer's AI and automation tools?

Dr. Rosés: What really matters — apart from the image quality — is being able to do what you need to do, with the system helping you, instead of making things harder. The new AI tools are amazing because they speed the process and it helps you throughout the day. You can do much more because the machine is doing all the work for you.

You can have all the patterns of your Doppler in one click, calculate the ejection fraction very quickly, and acquire 4D volumes of the right ventricle amazingly fast. The machine is helping you do all the quantification

A boy with a big heart

A new chance at childhood thanks to ultrasound innovation technology



Just a few months ago, 8-year-old Erik Jaldin found it difficult to keep up with everyday activities. Born with a serious congenital heart defect, even simple moments of play were exhausting. Today, he's back to doing what kids do best — being a kid. The dramatic change was made possible by specialized treatment and

technology at Vall d'Hebron Hospital, under the care of Dr. Ferran Rosés.

Diagnosed with congenital heart disease in utero, Erik underwent emergency surgery as a newborn in Murcia, Spain. After several additional procedures, he was later transferred to Vall d'Hebron Hospital in Barcelona —

an eight-hour drive from his home in the southeastern part of the country.

"They asked if we wanted to go to Barcelona or Madrid," his mother, Delia Jaldin, recalls. "I said, 'Wherever the best doctors are.' So they sent us here."

“The new AI tools are amazing because they speed the process and it helps you throughout the day. You can do much more because the machine is doing all the work for you.”

analysis. And at the end of the day, that's exactly what you need for your report.

It also means you can spend more time exploring the patient and talking to the family rather than doing manual calculations. I'm not focused on playing with the settings or doing the

measurements because the AI tools are doing that for me. I can concentrate on paying attention to the family, making sure they understand the consultation, and really interacting with the patient.

One of the goals was to make the system more intuitive. What are your thoughts on the new interface?

Dr. Rosés: The Vivid Pioneer is a very easy-to-use machine. The new interface is extremely user-friendly, with everything you need positioned close together, making image acquisition fast and intuitive.

Capturing fantastic images is simple — anyone can do it. You don't have to be an expert in echo because everything is clearly laid out and easy

to find. The way everything is displayed is really useful. It's all fantastic.

If you've worked with a Vivid E95, you could move to Vivid Pioneer without any training. It's very simple, but an improved version. And you will think, “Oh my goodness, this is even better.”

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When Erik first arrived, he was in heart failure living with a single ventricle and a prosthetic valve in the systematic position. He also had a previous pacemaker that was contributing significantly to dyssynchrony, which only worsened his condition. Erik was referred to Dr. Rosés for both assessment and to be added to the transplant list. Diagnostics included imaging with the new Vivid Pioneer ultrasound system.

“We started evaluating Erik's case with our conventional tools, and it was a fantastic surprise when Vivid Pioneer with the 6Sc-D probe provided views that could not be achieved with other probes. The 2D image quality of the myocardium was outstanding and having the ability to capture the entire

ventricle in the image also enabled dyssynchrony analysis using strain,” Dr. Rosés explained. “In Erik's case, it enabled us to clearly identify a dyssynchrony pattern. With that information, we were able to plan the procedure to upgrade him to cardiac resynchronization therapy — which helped him a great deal.”

For Erik's family, the experience has brought more than answers — it's brought hope.

“Thanks to Dr. Rosés and the technology here, Erik is still with us — something that might not have been possible back home. Vall d'Hebron Hospital is always innovating and finding better solutions for patients — like my nephew,” says his uncle, Gustavo Rojas.

For his mother, the progress means reassurance. “It gives us peace and confidence,” she added.

Erik and his family continue to navigate his healthcare journey, but the advanced care he's receiving has already made a meaningful difference in his life.

“He's feeling much better and has got much more energy to do what he wants on a day-to-day basis,” Dr. Rosés explains.

“After surgery, Erik has grown more and can do daily activities he couldn't do before,” Erik's uncle says, smiling. “He gets tired less, and plays football — which he loves. I see a big improvement.”

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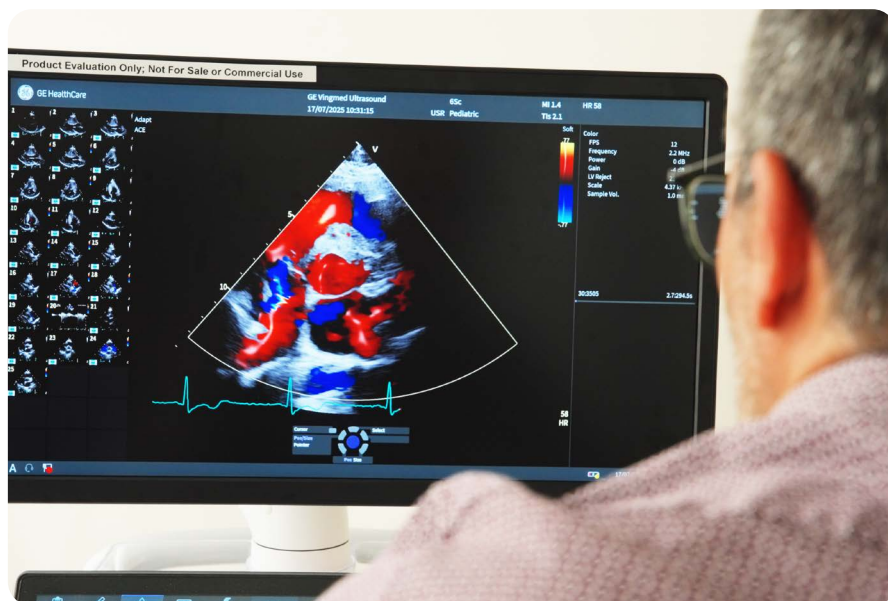
Vivid Pioneer weighs just 104 to 110 kg. How does the lightweight design affect your workflow at Vall d’Hebron University Hospital?

Dr. Rosés: *Vivid Pioneer has a new shape and design that’s much more portable, with a reduced size. That makes it easier to bring to theatres and intervention labs. One good feature is that you can move it around very easily with one hand, which makes it the perfect tool for outpatients and also the theater.*

Is there anything that surprised you about Vivid Pioneer?

Dr. Rosés: *What surprised me the most is that Vivid Pioneer comes with a color, LED light as part of the design. It’s the first thing you see with this machine and it’s perfect for kids. They can set the color and they watch it, which is perfect. They have [GE HealthCare’s] compassion purple as one option, which is a very nice color and works well too.*

We have touched on a number of topics ranging from image quality and probes to workflow and productivity. How would you best summarize Vivid Pioneer?



Dr. Rosés: *Vivid Pioneer has gone back to basics because what matters is the image quality. And that is really outstanding. What really matters here is not the fancy work on top of it. What’s really amazing is that the 2D image quality is much better, and everything that you build on from there is going to be even better. But the 2D image quality is what is really amazing. We’re exploring things that are new for us because we can see it better.*

With pediatric cardiology and the field of echocardiography evolving so rapidly, how meaningful is it to have innovations like Vivid Pioneer?

Dr. Rosés: *When I see one of those machines, I say, “Wow, this is perfect.” But it’s not perfect because it looks nice — it’s perfect because it will actually help someone. And that’s what’s really remarkable here.*

“There’s one way of talking about it, which is calling it innovative or revolutionary, and that’s fine. But what really matters to a doctor is being able to treat patients. The rewarding part, for me, is helping them.”

So if you’re using new technology, if you’re using new tools in everyday practice — or developing new ones that might help people—that’s what’s truly rewarding as a doctor. There’s one way of talking about it, which is calling it innovative or revolutionary, and that’s fine. But what really matters to a doctor is being able to treat patients. The rewarding part, for me, is helping them. ■

Vivid Pioneer provides a clear path to early cardiac care

Advanced echocardiography enables early detection of congenital heart disease — supporting more informed planning and timely intervention. Vall d’Hebron Hospital offers a broad range of pediatric cardiac care that begins before birth and continues seamlessly into the neonatal period. We asked pediatric cardiologist Dr. Gemma Giralt to share her experience with Vivid Pioneer and treating patients during these critical stages.

Can you describe your role at Vall d’Hebron University Hospital?

Dr. Giralt: *I see patients from the prenatal stage up to 18 years old. In my position, I dedicate one day to fetal echocardiography consultations and two days to outpatient consultations. I perform advanced echocardiography, including both 2D and 4D TEE, in preoperative and perioperative settings, as well as TEE monitoring during hemodynamic procedures. Additionally, I spend two days managing patients with CHD admitted to the neonatal ICU.*

Congenital heart disease is a major focus for your team. How early can it be detected?

Dr. Giralt: *Typically, the most complex congenital heart defects can be diagnosed quite early with fetal echocardiography — as early as 16 weeks of gestation. As a referral center, we receive cases from many other hospitals.*

How do you assess the fetal heart for potential anomalies?

Dr. Giralt: *We evaluate the fetal heart using the five recommended views: assessment of visceral situs, inflow*

tracts (4-chamber view), aortic outflow tract (5-chamber view), pulmonary outflow tract (3-vessel view), and great vessels (arch view or “V” sign) — using both 2D imaging and color/pulsed Doppler. In select cases, we also assess myocardial function using strain imaging.

What tools are most helpful in assessing the fetal heart?

Dr. Giralt: *I have been working with GE HealthCare’s Voluson ultrasound systems for 15 years. Our current model is the Voluson E10, and the image quality, color Doppler, and the introduction of Radiantflow are remarkable.*

As patients move from fetal diagnosis to neonatal care, cardiac imaging continues to guide decisions. How has Vivid Pioneer enhanced your clinical capabilities?

Dr. Giralt: *Vivid Pioneer’s 2D and 4D image quality are impressive. The image quality of the 6Sc-D probe is truly incredible, and it allows us to perform high-quality echocardiography even in patients with suboptimal or poor acoustic windows. Because the probe is more linear, it adapts better without the need to apply extra*



pressure, as it fits more naturally into the intercostal space. Clearly, this new probe allows me to perform much more optimal studies.

I love that Radiantflow has now been implemented in Vivid Pioneer. It defines flows very clearly, without overlap, providing a clean appearance while preserving tissue detail. It also shows a sense of volume. Additionally, AI Spectrum Recognition has improved significantly, allowing us to optimize and reduce scan time.

User experience is also important. What aspects of Vivid Pioneer’s design stand out most in your daily workflow?

Dr. Giralt: *Vivid Pioneer has a battery, which is very useful for transport and mobility within the hospital. The new control panel design is also much cleaner. Overall, the design is more user-friendly.*



Ferran Rosés, MD, MSc, is Head of the Pediatric Cardiology Department at Vall d'Hebron University Hospital in Barcelona. He specializes in congenital pediatric cardiology and electrophysiology. Dr. Rosés's research also includes an emphasis on arrhythmias and hereditary conditions, including catecholaminergic polymorphic ventricular tachycardia and long QT syndrome. He has co-authored more than 40 publications and contributes significantly to national and international journals and textbooks.



Gemma Giralt García, MD, is a specialist in Pediatric Cardiology at Vall d'Hebron University Hospital in Barcelona. Her clinical and research focus includes pediatric heart transplant rejection and genomic rearrangements in congenital heart defects. Dr. Giralt is also an active member of the Imaging Section of the Spanish Society of Pediatric Cardiology and Congenital Heart Disease, contributing to advancements in diagnostic imaging and pediatric cardiac care.

- 1 Thomas F. Lüscher, Congenital heart disease: some progress, but still the challenge of a lifetime!, *European Heart Journal*, Volume 38, Issue 26, 7 July 2017, Pages 2021–2023, <https://doi.org/10.1093/eurheartj/ehx372>.
- 2 Diller GP, Breithardt G, Baumgartner H. Congenital heart defects in adulthood. *Dtsch Arztebl Int*. 2011 Jul;108(26):452-9. doi: 10.3238/arztebl.2011.0452. Epub 2011 Jul 1. PMID: 21776319; PMCID: PMC3139408.

Dr. Rosés is a paid consultant for GE HealthCare and was compensated for participation in this article. The statements by Dr. Rosés 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.

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