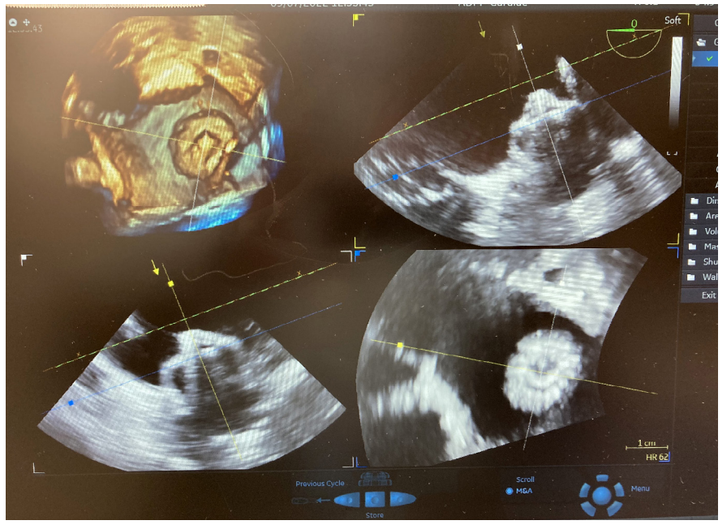
A New perspective in structural heart interventions

4D ICE NUVISION catheter allows for more ease and efficiencies at St. Bernard's Healthcare

Advanced technologies are making inroads in Arkansas that could shape the future of structural heart procedures. Focused on being a center of innovation, St. Bernard's Healthcare in Jonesboro participates in many clinical trials and administrators have made cutting-edge tools a priority for its EP program. Dr. Devi G. Nair, MD, FACC, FHRS, Director of Cardiac Electrophysiology, was an early adopter of the 4D ICE NUVISION™ catheter by Biosense Webster. She sees the imaging technology as an important step forward in performing left atrial appendage closure procedures.



The electrophysiology program at St. Bernard's Medical Center began in 2000 and it includes Three fully functional EP labs (includes one hybrid lab and one satellite EP lab). Along with LAAC implants, the team performs procedures for cardiac rhythm management, including implantation of pacemakers, defibrillators, and cardiac resynchronization devices. Other treatments include laser lead extractions, Impella implants, and ablations for SVT, atrial fibrillation and ventricular tachycardia.

During her past 12 years at St. Bernard's Healthcare, Dr. Nair has embraced emerging imaging technologies that enable minimally invasive structural heart procedures. She says her program is shifting away from TEE towards multiplanar catheters that can simplify procedures and avoid general anesthesia. The move expands access to care for a growing population of patients with structural heart diseases and can improve hospital efficiencies.

Another Dimension

St. Bernard's Healthcare first adopted 2D ICE when it emerged as an alternative to TEE. A few years later in 2022, the team began using the 4D ICE NUVISION catheter with GE HealthCare's Vivid™ E95 ultrasound system. The advanced imaging modality combines 3D images with the fourth dimension of time for a more accurate picture of cardiac function. With an independent rotating tip and a 90x90° field of view, the catheter allows users to obtain crucial views of targeted anatomy to facilitate decision-making.[1,2]

We recently asked Dr. Nair to share her thoughts on the 4D ICE NUVISION catheter in LAAC procedures and her growing EP program.

What are the biggest challenges you face in performing LAAC procedures?

Dr. Nair: *General anesthesia can be a challenge and, in addition to the multiple risks associated with TEE and general anesthesia. Usually, the patients referred for LAAC are elderly and frail and have significant concerns about going under anesthesia. With TEE, there are also challenges with case coordination between multiple providers. It can be difficult to bring all the players into one room, especially when you want to take care of large patient volume in an efficient manner without compromising efficacy and safety. With TEE, we are also tying up two or three TEE probes on one procedural day, which is challenging for the workflow of our imaging program.*

How are you working to overcome some of these challenges?

Dr. Nair: *We started thinking outside the box early on, and in 2018 began using 2D ICE technology to mitigate these challenges. The proof of using ICE is that you can potentially eliminate the need for TEE and the need for general anesthesia. As we started to implement 2D ICE, we also started to implement same day discharge. We then became an early adopter of the NUVISION 4D ICE catheter.*

How would you compare the 4D ICE NUVISION catheter to 2D ICE?

Dr. Nair: *Sizing with 2D alone is always a challenge because I never feel like I get the whole three-dimensional plane of the appendage for measurement. For that reason, I really only use 2D ICE in patients where I can get a CT and size their appendage ahead of time.*

With the 4D ICE NUVISION catheter, you have less manipulation of the ICE catheter in the left atrium and I think that's the key to expanded adoption and quicker learning curves for physicians. There's less of a concern with the 4D ICE NUVISION catheter compared to 2D because you're not having to move the catheter around so much. A lot of it is done on the [Vivid] ultrasound machine. You can continue to go through detailed imaging intra and post procedure, but it's easier to acquire images because you're using electronic steering and three-dimensional assessment from the catheter.

Can you elaborate more on the ability to 'park' the 4D ICE NUVISION catheter to image the LAA and what are the benefits?

Dr. Nair: *With the 4D ICE NUVISION catheter, you place the catheter in the left atrium. You find a good plane or stable plane for the catheter and then leave it there and electronically manipulate on the Vivid system to get your full imaging plane. So even though I'm a single operator it feels like there is a second operator that is maneuvering the ICE catheter remotely. It makes the procedure easier and foolproof because you're not going to miss certain angles or miss certain lobes or miss any leaks. You get a really good understanding of the 3 dimensional anatomy of the heart—of the left atrium, of the left atrial appendage and its relationship to the septum and surrounding structures. It allows you to get a successful implant the first time and you also get very good measurements intraprocedurally, so you can size appropriately without a CT ahead of time.*

Are there any specific features that make the 4D ICE NUVSION catheter stand out?

Dr. Nair: *The 4D ICE NUVISION catheter has near field imaging and many more options on the catheter. What sets it apart is the rotational feature. I think it's the only catheter that gives that whole single plane and the full rotation as well.*

How has utilizing the 4D ICE NUVISION catheter in LAAC impacted patient safety and outcomes?

Dr. Nair: *We feel like we have been able to do these procedures very safely and very effectively with this catheter. Intraprocedural safety has been very good. We haven't seen any higher incidence of complications, effusions, and we haven't had any long-term issues with safety, such as leaks or inappropriate device positionings. We have seen really good closure results in patients as well.*

How has the imaging modality affected your overall workflow?

Dr. Nair: *We've found it's so much easier and efficient to have the 4D ICE NUVISION catheter in the room. With TEE, there's a lot of challenges we tend to forget, for example, cleaning time—especially when you are going back-to-back between two labs. With ICE, the set up is so easy. Our ICE machines are usually in the EP lab and are part of our usual workflow. We're not taking any imaging machines away from anyone. It's the same machine from vascular access at start to post implant assessment and completion of case, so it's almost a seamless procedure. I'm not standing around waiting for anyone else to come to the lab or start their part of the procedure.*

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>
> Dr. Nair

> *"With NUVISION 4D ICE, you have less manipulation, and I think that's the key."*
>
> Dr. Nair

How are these efficiencies making an impact at St. Bernard's Healthcare?

Dr. Nair: *Initially there was a concern that because it's a new technology the procedure times were going to be longer, but that's definitely not the case anymore. The procedure times are similar to TEE, but the room times are much, much shorter because you aren't using general anesthesia.*

We still have to sit down and do the analysis of what it means having the 4D ICE NUVISION catheter compared to bringing all the players [for TEE] together in the room. It just seems more reasonable financially for the team. We're making the procedures efficient and financially feasible without compromising safety.

Based on your experience, how do you project using the 4D ICE NUVISION catheter in your lab moving forward?

Dr. Nair: *Like anything we start, it's usually a slow uptake. While the catheter is intuitive, there is also a learning curve understanding how to electronically steer and learning all the features on the console. But we have had great clinical support from the NUVISION and GE HealthCare team. I think we are at the point where we could start using it more consistently. Around the U.S., I think we're going to see a pretty steep growth in the use of 4D ICE. I definitely feel 4D ICE is going to replace 2D ICE because it's more intuitive and because of ease of use in structural heart procedures.*

The structural heart market is constantly evolving. What is it like to be at the center of so much innovation?

Dr. Nair: *There have been a lot of changes in technology since I started the ablation program here at St. Bernard's. Now I'm able to take care of more patients, in a much safer way, in earlier stages of the disease. And I'm able to give a more comprehensive care package. I think that's big for us to be at the forefront of this field with all these technological partners.* ■

Dr. Devi G. Nair, MD, FACC, FHRS is the Director of Cardiac Electrophysiology, Heart and Vascular Division at St. Bernard's Medical Center in Jonesboro, Arkansas. Her clinical practice focuses on heart rhythm disorders and treating patients with cardiac ablation, pacemakers, defibrillators, cardiac resynchronization therapy devices, and left atrial appendage occlusion therapy. Dr. Nair's research interests include the evaluation of fluoroscopy reduction techniques in cardiac electrophysiology and cardiac resynchronization therapy. She is also focused on quality of life and healthcare outcomes related to atrial fibrillation and sudden cardiac death. Dr. Nair is the principal investigator for the Arrhythmia Research Group and actively participates in multiple clinical trials.

1 4D ICE NUVISION catheter is only available in the U.S.A. The combination of Vivid E95 with 4D ICE NUVISION is not CE-marked. 4D ICE NUVISION is distributed by Biosense Webster

2 Evaluating the role of transesophageal echocardiography (TEE) or intracardial echocardiography (ICE) in left atrial appendage occlusion: a meta-analysis – Akela et al. – 2020 – Journal of Interventional Cardiac Electrophysiology

Doctors are paid consultants for GEHC and were compensated for participation in this article. The statements described here are based on their own opinions and on results that were achieved in their unique setting. Since there is no "typical" hospital and many variables exist, i.e. hospital size, case mix, etc.. there can be no guarantee that other customers will achieve the same results.

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