



**PHILIPS**

Cardiology

# Clinical confidence and efficiency in Structural Heart Disease

Creating a center of excellence for Structural Heart Disease at  
Hackensack Meridian Hackensack University Medical Center

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## Daring to compete

Hackensack Meridian Hackensack University Medical Center invests in center of excellence to deliver leading-edge structural heart disease care.

Located just across the river from Manhattan, Hackensack must deliver the highest quality care to effectively compete with other world-renowned academic hospitals in the New York City area. By establishing the Structural and Congenital Heart Center, Hackensack has created an opportunity to differentiate its cardiology services and position itself as a destination for leading-edge structural heart disease treatment.

Philips has partnered with Hackensack to build a hybrid OR that is key to the growth of the Structural Heart Disease (SHD) center of excellence. In this article, Hackensack's lead interventional cardiologist and echocardiographer share their experience with Philips integrated solutions in the lab and their outlook on what's to come in the future of SHD treatment.

### Meet the experts



#### **Tilak K.R. Pasala, MD, FACC, FSCAI**

Interim Director, Structural and Congenital Heart Center  
Program Director, Structural Heart Disease Fellowship

Dr. Pasala leads Hackensack's Structural Heart Disease program. As an interventional cardiologist, he repairs structures and places devices to treat structural heart disease. He expects the technology that supports his efforts to provide ease of use, improved visualization, and predictable procedure times—all so he can deliver optimal outcome, reduce complications, and maximize lab throughput.



#### **Lucy M. Safi, DO, FACC, FASE**

Director of Interventional Echocardiography

Dr. Safi plays a key role throughout the patient care journey. She needs technology that is fast and accurate—so she can deliver clear guidance without making the interventionalist wait for the images. Tools that can deliver high quality images regardless of the operator's skill set are of high value.

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## The trends that are shaping structural heart care today

New valve therapies and expansion of access to younger, lower risk patients drive SHD growth.

With more patients of younger age and lower risk getting referred for structural heart procedures, minimally invasive procedures offer important benefits, such as faster recovery time and less use of anesthesia. Dr. Safi also notes a greater variety of procedures are being performed, including more mitral and tricuspid valve interventions, driven by the fact that clinicians are able perform more interventions percutaneously.

The Structural and Congenital Heart Center at Hackensack is involved in several key clinical trials that will shape the future of SHD. There is a tremendous amount of

innovation in the field around new technologies and devices, and one of the keys to successfully bringing this innovation to patients lies in equipping operators with the support they need to handle new devices and techniques safely and confidently.

**"Imaging, like Philips is doing, is a big component of how safely operators can deploy these new technologies," says Dr. Pasala.**

## A closer look at the care pathway

Structural heart procedures deal with complex anatomical structures that must be clearly visualized to help clinicians confidently diagnose and treat each patient.

From the moment a patient is assessed for structural heart disease, the care team must work together to ensure the patient receives the right diagnosis and the appropriate treatment. Accurate diagnostic images, clear image guidance, seamless communication, and efficient workflows are essential—and the Philips suite of cardiology solutions is purposefully designed to deliver this confidence and efficiency at each point in the patient journey.

### Diagnosis and planning:



As a large referral center, many of Hackensack's challenges lie in the evaluation of pre-procedural imaging—making sure that each patient receives the appropriate exams and that the images are of diagnostic quality so that the patient can be moved quickly and confidently into treatment.

Dr. Safi states, “As an imager, my job is to evaluate all the images and pre-procedural tests that a patient has. Having the right workup and good quality images is necessary, so the patient gets an overall accurate diagnosis.”

Dr. Safi also notes that Hackensack has observed an increase in the number of mitral valve procedures, which bring challenges in assessment and modification due to the complexity of the valve's saddle-shaped anatomy and its tendency to calcify.

Properly sizing and evaluating the function of the valve is a time-consuming process, but Dr. Safi has found the Philips EPIQ ultrasound system to provide excellent 3D imaging, with built-in automation that provides fast, easily reproducible results that are less dependent on the operator's level of experience. Tools such as 3D Auto MV quantify the function, key structures, and size of the mitral valve anatomy to help Dr. Safi and her team quickly and accurately assess each patient and identify the right path to treatment.

Other tools such as Cardiac TrueVue provide new ways to further visualize the mitral valve's function and anatomy.



Cardiac TrueVue Color improves visualization of flow and its location within the anatomy.

### Key features of the Philips EPIQ cardiovascular ultrasound system:

#### xPlane Doppler

Enables accurate representation and doppler quantification of the target flow without losing the correct image alignment.

#### MultiVue real-time alignment

Allows one-click cropping of a Live 3D image during interventional procedures, and one-click alignment of the catheter within cardiac anatomy.

#### EchoNavigator cardiac fusion imaging

Uses SmartFusion to fuse live TEE and live fluoroscopic images in real time. TEE transducer position and orientation are automatically tracked in the X-ray image, allowing the echo and X-ray images to move in sync when the C-arm is repositioned.

#### Cardiac TrueVue Color with Glass

Appreciate the structure of cardiac anatomy and cardiac flow through real-time rendering with a movable light source that can be applied in both echo and color images. Cardiac TrueVue Glass can also enable a cast-like rendering of any 3D structure.

#### 3D Auto LAA for LAA sizings

Acquire the LAA ostium size quickly and easily, using automation that reduces inter- or intra-user variability and increases confidence during procedures.

#### 3D Auto MV for mitral valve quantification

Analyze the complex anatomy of the mitral valve in 3D, as well as its dynamic mechanics. Geometric measurements such as annular dimensions, leaflet, morphology and coaptation descriptions can be used from the initial discovery of MV disease or pathology, to support device planning, and throughout monitoring of pre- and postoperative cases.



## Access and navigation:



Once a patient is diagnosed and moved into treatment, a new set of challenges arise related to ensuring the room is set up correctly and the clinical team has access to the tools and information they need for a successful procedure.

### The Azurion FlexArm interventional from Philips is designed for flexibility and efficiency:

- The Azurion FlexArm gives teams the freedom to position staff and equipment to allow optimal patient access—supporting complex cases and new procedures.
- Azurion procedure cards allow users to tailor customized settings to help ensure the room is set up correctly, shorten procedure time, and reduce variation in care delivery.
- FlexVision Pro can be customized on demand to display all relevant information and quickly change the display when needed during the case. Used together, **FlexVision Pro** and **Touch Screen Module Pro** provide tableside control of compatible applications, including hemodynamic measurements, interventional tools, cardiac PACS and IntraSight.

Dr. Pasala notes, “The Azurion system gives us flexibility in setting up the lab ahead of time. Once we’ve done that, we’re able to function very fluidly and seamlessly, and we find it very useful that it can work around where we are standing.”

## Intra-procedural assessment and treatment:



During the procedure, the interventionalist and imager must work together seamlessly to navigate and deploy the device at the right location. This process relies on the imager using ultrasound to move back and forth between multiple imaging modes—and between 2D and 3D images—to accurately determine device placement.

Both Dr. Pasala and Dr. Safi have seen the value of EPIQ’s multiplanar reconstruction in driving both confidence and efficiency during the procedure.

“If we are able to see the device well on the image, it gives the operators a feeling of confidence and safety,” says Dr. Pasala.

And Dr. Safi observes, “As a proceduralist, when you have literally seconds to get the image and give an

answer, you want the best technology there to help you. Multiview multiplanar reconstruction helps you get the right image quickly.”

Both Dr. Pasala and Dr. Safi have found fusion imaging to be a critically important diagnostic and therapeutic tool in structural heart procedures. Dr. Pasala states, “Where we’re seeing the most advantage is to actually marry everything together into one image – where catheters are well seen on fluoroscopy, where there is a three-dimensional understanding of anatomy, so you’re putting everything together for operators...Now they have all the information they need in procedures.”



A view inside the cath lab at Hackensack.

Both echocardiography and fluoroscopy are essential to interventional imaging—echocardiography visualizes soft tissue, while fluoroscopy visualizes devices. But the two modalities are acquired and displayed in different orientations, which can make understanding and communication difficult during the procedure.

With Philips EchoNavigator, echocardiography and fluoroscopy images display in the same orientation, helping to improve understanding and communication between imager and interventionalist. EchoNavigator allows visualization of both live echocardiography and live fluoroscopy images, to provide accurate views of both soft tissue and devices—and markers placed on echo can appear in fluoro to allow precise guidance.



Azurion FlexVision Pro with Touch Screen Module Pro provides intuitive, seamless control of all available applications at tableside.



EPIQ CVxi with EchoNavigator provides a streamlined workflow experience for live fusion imaging.

“Echo fusion has really helped reduce procedural time and reduce radiation that the patient receives. In these advanced cardiac procedures, we want to make sure we limit the time patients are under anesthesia, limit the radiation they get – it’s always better for patient outcomes,” says Dr. Safi.

### Post-procedural assessment:

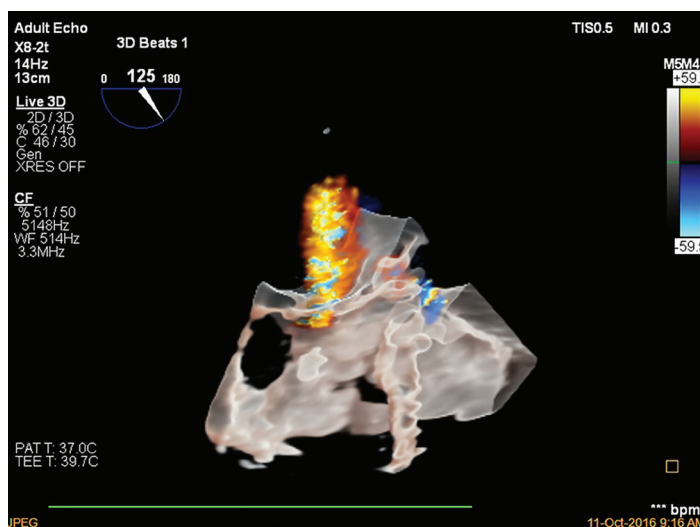


After a device is placed, clinical teams require high-quality imaging and efficient workflows to assess the completeness of treatment and document results. Tools like TrueVue and GlassVue help the echocardiographer visualize any residual leakage and confirm that functional results are as expected.

Dr. Safi states, “TrueVue is very helpful in patients with prosthetic valve replacements. When we use TrueVue, we’re able to move the light source and really take a full look at the prosthesis. If the patient has a perivalvular leak, we can really see where that leak is by moving the light source.”

Cardiac TrueVue Glass is really helpful for multiple things. When we’re doing Mitra Clip procedures or assessing a mitral valve, we’re able to change the density of the tissue to see exactly where the regurgitation is coming from. It saves so much time. When doing LAAO devices, we can make tissue translucent to see the ostium of the left atrial appendage very clearly.”

For interventionalists like Dr. Pasala, an efficient workflow is essential to help assess hemodynamic function and document the results in the clinical documentation system. Azurion’s Touch Screen Module allows Dr. Pasala to confirm hemodynamic function using the Philips Hemo System while automatically documenting results on Xper IM reporting software—directly from the tableside.



Cardiac TrueVue Glass allows users to see complete color flow without losing anatomical context.

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## Shaping the future of structural heart disease treatment

As Dr. Pasala and Dr. Safi consider the future of structural heart disease treatment, they are excited by the tremendous pace of innovation that is happening in the space. Hackensack is on the leading edge of this innovation. It's currently one of three sites enrolled in a clinical trial for a new tricuspid annuloplasty device.

Hackensack is also a leader in transcatheter mitral valve replacement, and the center is involved in two heart failure/structural heart collaborative studies. All these studies are very imaging intensive, and one of the advantages of Hackensack as a trial site is that the center offers advanced imaging capabilities, including fusion imaging from Philips.

As Dr. Pasala considers the future of structural heart disease treatment and how these new innovations can change patient care, he notes, "I think there is value being able to partner and standardize some of the procedural steps from an imaging perspective. Echo fusion and CT fusion are game changers in terms of operator confidence and safety for these new procedures."

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## Conclusion

As Hackensack continues to grow its Structural Heart center of excellence, its clinicians have recognized the value of partnership with Philips in helping them deliver optimal outcomes with efficiency.

Dr. Safi notes, "With the Philips lab, these procedures are so comfortable, so efficient—and the imaging is beautiful. To be able to overlay echo on top of fluoroscopy and really get that 3D assessment of where you are in the heart, it helps everyone—the fellows that are learning, the anesthesiologist, the echocardiographer, the interventionalist, the whole structural heart team—to know exactly what's going on because it's so much more visual."

Results from case studies are not predictive of results in other cases. Results in other cases may vary.

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