Cath Lab Digest

A product, news & clinical update for the cardiac catheterization laboratory specialist

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CATH LAB SPOTLIGHT

Rhode Island Hospital Cardiac Catheterization Lab

Caitlyn Nichols, BSN, RN, CCRN-CMC, Providence, Rhode Island

Tell us about your cath lab and facility.

Located in Providence, RI, Rhode Island Hospital (RIH), part of The Brown University Health system, is the state's largest hospital and the only level I trauma center in southern New England. RIH's emergency department is one of the busiest in the Northeast with, on average, over 120,000 patient visits annually, according to the hospital's 2022 fiscal report. It is the principal research and teaching hospital for The Warren Alpert Medical School of Brown University.

Our two main cardiac catheterization labs are located on the 8th floor of the Ambulatory Patient Center (APC) building, and our third lab is conveniently located next to our emergency department's critical care unit.

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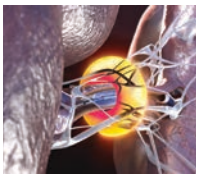
RENAL DENERVATION

Use of the Paradise™ Ultrasound Renal Denervation (uRDN) System for Treatment of Uncontrolled Hypertension



CMS Transitional Pass-Through Payment Effective January 1, 2025

CLD talks with Amir Kaki, MD.

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STROKE RESEARCH: ANATOMY

Role of Left Atrial Septal Pouch in Cryptogenic Strokes: An Anatomical Entity We Need to Become Familiar With

Subramaniam C. Krishnan, MD, FACC, FHRS

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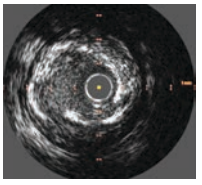
CASE AND INTERVIEW

Complex High-Risk PCI and a Unique Heart Team Approach



Aaron Ali Shaikh, MD; Bernardo Cortese, MD, FESC, FSCAI

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HMP Global

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Rhode Island Hospital Cardiac Catheterization Lab

Caitlyn Nichols, BSN, RN, CCRN-CMC, Providence, Rhode Island

Rhode Island Hospital is a hub for high-risk, complex coronary and structural interventions with one of the busiest chronic total occlusion (CTO) and structural intervention programs in the region.

What is the size of your cath lab department and number of staff members?

We have 3 cardiac catheterization labs, 2 hybrid operating rooms for structural cases, 3 cardiac electrophysiology(EP) labs, and a 13-bed procedural care unit (PCU). Although we share our department with EP, it is separate from the cath lab (we have some technologists who are cross-trained in both cath and EP). We have 11 full-time cardiac cath lab procedural nurses, 8 cardiovascular technologists, 9 interventional cardiologists, 4 interventional fellows, 1 structural fellow, 1 peripheral vascular fellow, and 3 advanced practice providers. Cath lab staff credentials include a mix of critical care nurses (CCRN), registered cardiovascular invasive specialists (RCIS), and registered radiologic technologists (RT[R]). J. Dawn Abbott, MD, FACC, FSCAI, is the Medical Director of Interventional Cardiology at the Brown University Health Cardiovascular Institute and the Cardiac Catheterization Laboratories at Rhode Island and The Miriam Hospitals. Brown University offers a one-year interventional cardiology fellowship program. Interventional cardiology fellows scrub in for both diagnostic and interventional cases and, although supervised by an attending, are the primary operators for procedures.

What is unique or innovative about your cath lab and staff?

Rhode Island Hospital's interventional cardiologists performed the first outpatient cardiac catheterization in New England and were among the first in the United States to perform percutaneous coronary intervention (PCI). We have a cath lab that is located just adjacent to the emergency department's critical care unit; it was designed to reduce door-to-balloon time and to improve the coordination of care between the emergency department, cardiac cath lab, operating rooms, and the coronary care unit (CCU). It was newly renovated in March 2024 with state-of-the-art technology that reduces radiation exposure and the need for intravenous (IV) contrast dye, thereby improving patient safety. RNs are responsible for preparing the sterile table, prepping and draping the patient, priming the manifold, circulating, medicating, and monitoring the patient. Nurses do not rotate between the procedure lab and the cath lab's holding unit.

What procedures are performed at your cath lab?

We perform a variety of cardiac procedures including, but not limited to, the following: left and right heart catheterizations, PCI, high-risk/left main interventions, chronic total occlusions (CTO), coronary atherectomy including orbital (CSI), rotational (RotaPro, Boston Scientific), and laser (Philips), intravascular lithotripsy (IVL; Shockwave), intravascular imaging (intravascular ultrasound and optical coherence tomography [IVUS/OCT]), mechanical circulatory support devices (intra-aortic balloon pumps, ECMO cannulations, Impella CP and RP Flex [Abiomed]), mechanical thrombectomy (Penumbra), endomyocardial biopsies, pericardiocentesis, transvenous pacemakers, balloon pulmonary angioplasty (BPA), mechanical thrombectomy with the FlowTriever system (Inari Medical) for pulmonary embolism, alcohol septal ablations for hypertrophic obstructive cardiomyopathy, implantable pulmonary artery pressure monitoring devices (CardioMEMS [Abbott]), and, far less frequently, peripheral interventions. On average, we perform 850 to 1,000 PCIs annually. Although our volume of ST-elevation myocardial infarctions (STEMI) patients has declined, we treat approximately 300 STEMI patients each year. In 2023, we inserted 21 Impella devices and 65 intra-aortic balloon

Figure 1. Members of the Cath Lab Team. Left to right: Michaela Phillips, RN; Lisa Demars, RN; J. Dawn Abbott, MD; Sam Moylan, RN; Jose Morgado, CVT; Robin Allgood, CVT; Tony Rodrigues, CVT; Marwan Saad, MD, PhD; Lynn Soito, RN; and Renee Bernard, NP.

Figure 2. (Left to right): J. Dawn Abbott, MD, FACC, FSCAI, and Medical Director of Interventional Cardiology at the Brown University Health Cardiovascular Institute and the Cardiac Catheterization Laboratories at Rhode Island and The Miriam Hospitals, and author Caitlyn Nichols, BSN, RN, CCRN-CMC.

Figure 3. Rhode Island Hospital, Providence, Rhode Island.

pumps (Teleflex). We also perform a number of structural heart interventions.

Can you describe your structural heart program?

Our facility has a strong structural heart program that has grown in volume and complexity over the years. We perform various structural heart interventions including transcatheter aortic valve replacement (TAVR), balloon valvuloplasty (aortic, mitral, pulmonary), transcatheter edge-to-edge repair (TEER) of the mitral and tricuspid valves, percutaneous closure of patent foramen ovale (PFO), atrial septal defects (ASD), and ventricular septal defects (VSD), left atrial appendage occlusion, and paravalvular leak closures.

We have 3 cardiac interventionalists who perform structural heart procedures in our lab. We recently starting using the Amplatzer Amulet (Abbott) for left atrial appendage occlusion and the Pascal Precision Transcatheter Repair System (Edwards Lifesciences) for the treatment of mitral regurgitation. Our TAVR program began in April 2012, but it took a few years before TAVRs were performed in the cath lab as opposed to the operating room. In 2023, we performed 70 transcatheter aortic valve replacements (TAVRs), 188 Watchman implants (Boston Scientific), and 41 MitraClips (Abbott). We anticipate continued growth and success in our structural heart program over the next few years.

What are some of the new equipment, devices and products recently introduced at your lab?

In addition to the Amplatzer Amulet LAA Occluder for patients with atrial fibrillation and the Pascal system for patients with severe mitral regurgitation mentioned above, the Agent drug-coated balloon (Boston Scientific) and the Impella RP Flex (Abiomed) are two new products that have been introduced to our lab within

Figure 4. Caitlyn Nichols, RN, setting up the procedure table before a left heart cath.

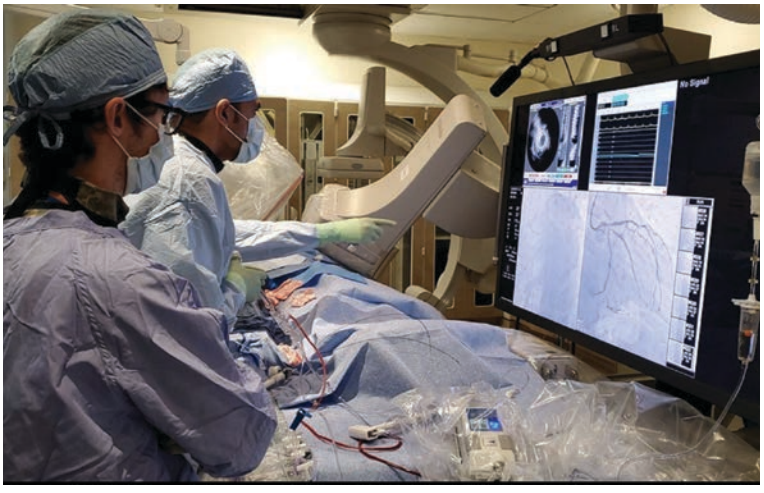


Figure 5. Omar N. Hyder, MD, and Marwan S. Saad, MD, PhD.

Figure 6. Dr. J. Dawn Abbott performed our first drug-coated balloon (DCB) angioplasty on July 15, 2024, for a patient with severe instent restenosis. Left to right: Melvin Joyce, MD; Joe Morgado, CVT; Liz Labreche, Boston Scientific Representative; Jim Lincoln, CVT; Tanner Pulsifer, Boston Scientific Representative; Caitlyn Nichols, RN; J. Dawn Abbott, MD; Ronald Russo, MD; Kristin Beauregard, NP; Michaela Phillips, RN; Melissa Skoutas, RN, and Tony Thorman, RN.

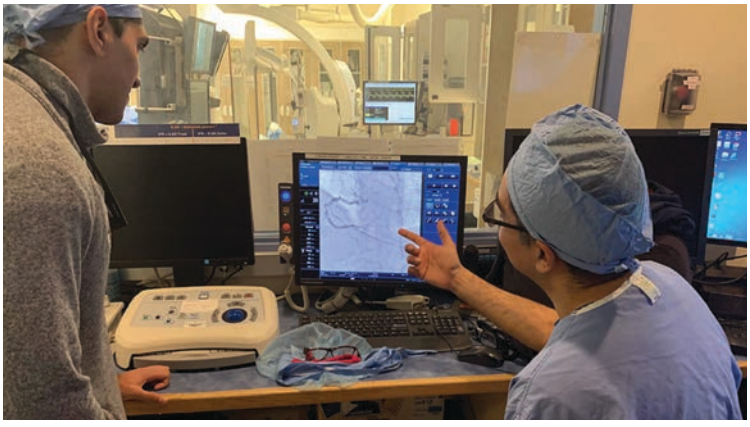


Figure 7. A Brown University fellow with Shafiq Mamdani, MD, FACC, FSCAI.

Figure 8. Caitlyn Nichols, RN; Nicole Chahine, MD; and Ahmed Elkaryoni, MD.

the last year. Dr. J. Dawn Abbott performed our first drug-coated balloon (DCB) angioplasty on July 15, 2024 for a patient with severe instent restenosis. Our lab has treated approximately 15 patients with DCBs. With the introduction of the Impella RP Flex, we are helping patients requiring right ventricular (RV) hemodynamic support. Our cath lab's first Impella RP Flex case was in December 2024 with Dr. Abbott.

What trends have you seen in your procedures and/or patient population?

Within the last few years, our lab has seen a considerable increase in the number of young patients requiring revascularization for coronary artery disease. Our high-risk PCI volume has also been on the rise; more patients are being deemed ineligible for surgical revascularization. An increasing number of coronary lesions are requiring calcium modification with intravascular lithotripsy (IVL) or atherectomy devices, leading to more complex and high-risk cases. We have also noticed an increase in the number of critically ill patients requiring mechanical circulatory support (MCS). Our structural team, too, has been performing more percutaneous valve interventions for both aortic and mitral valve conditions, and more left atrial appendage closures for patients with atrial fibrillation.

Can you share data regarding your lab's door-to-balloon (DTB) times and some of the ways employees at your facility have worked together in order to lower DTB times?

We achieve a DTB time of less than 90 minutes in over 95% of all STEMI cases. In an effort to continue reducing our DTB times, we have a DTB committee, consisting of staff members from the emergency department, cardiac catheterization lab, and quality improvement, that meets quarterly to review STEMI cases and our compliance with meeting the American College of Cardiology/American Heart Association's target metric of ≤90 minutes. Members review each element from STEMI team activation to procedure completion to look for areas of process improvement. As previously mentioned, we have a cath lab located just adjacent to the emergency department that was designed to reduce DTB times.

Figure 9. J. Dawn Abbott, MD, and Omar Hyder, MD.

Who transports the STEMI patient to the cath lab during regular and off hours?

An emergency room nurse and cardiology fellow typically transport a STEMI patient to the lab during regular and off hours; this allows the cath lab team to prepare the procedure room to expedite the patient's care. Post procedure, a cardiac cath lab nurse and interventional fellow transport the patient to our 10-bed coronary care unit (CCU).

What continuing education opportunities are provided to staff members?

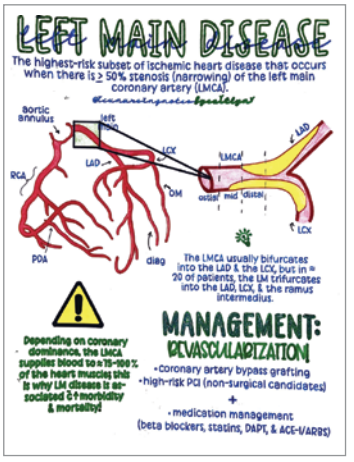
In a dynamic field like healthcare, continuing education is imperative. Cath lab staff is encouraged to attend monthly in-service sessions related to new products, procedures, and equipment introduced to our lab. We also have a weekly faculty/fellow educational conference that staff is encouraged to attend. Each year, members of our cath lab team have opportunities to attend off-site educational conferences, including the Society for Cardiovascular Angiography and Interventions (SCAI) and Transcatheter Cardiovascular Therapeutics (TCT) conferences. ■

Caitlyn Nichols, BSN, RN, CCRN-CMC
Rhode Island Hospital, Providence, Rhode Island

PROFESSIONAL DEVELOPMENT

Creating an Education Platform

When I first started working in the ICU as a new graduate nurse in 2021, I struggled with the overwhelming transition from nursing school to real-world practice. You are learning how to be a nurse and, at the same time, learning how to care for critically ill patients. I was eager to learn, so, being a visual learner with a passion for creativity, I picked up a pen and started to draw challenging concepts (ie, pathophysiologic mechanisms, pulmonary artery catheters, ventilators, etc.) so that I could visualize them in a way that I could understand. I slowly began to learn the "what" and the "why" behind what I was seeing and, with the right support system/mentors, I developed strategies that helped me thrive in the coming years. My passion for nursing education, advancing our profession, and striving to make a positive impact in the healthcare field led me to develop my own creative note-taking business, ICUnursingnotesbycaitlyn, LLC — an educational platform designed to fill a need for visual learning resources for critical care nurses.



I share my work on social media including Instagram (@icunursingnotesbycaitlyn) and Etsy (icunursingnotes.etsy.com). Most of my notes focus on cardiac critical care and the cath lab. Based on my own experience, I understand how challenging and intimidating the learning curve can feel as a new nurse, and our job is already hard enough. There is a lot of power and reward in looking back and helping others on the same path that you had to navigate. ■

Caitlyn Nichols, BSN, RN, CCRN-CMC, can be contacted at icunursingnotesbycaitlyn@gmail.com

See more educational images from Caitlyn Nichols, RN, on CathLabDigest.com: