

# The Beat

A publication of  
VCU Health  
Pauley Heart Center



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## Inside:

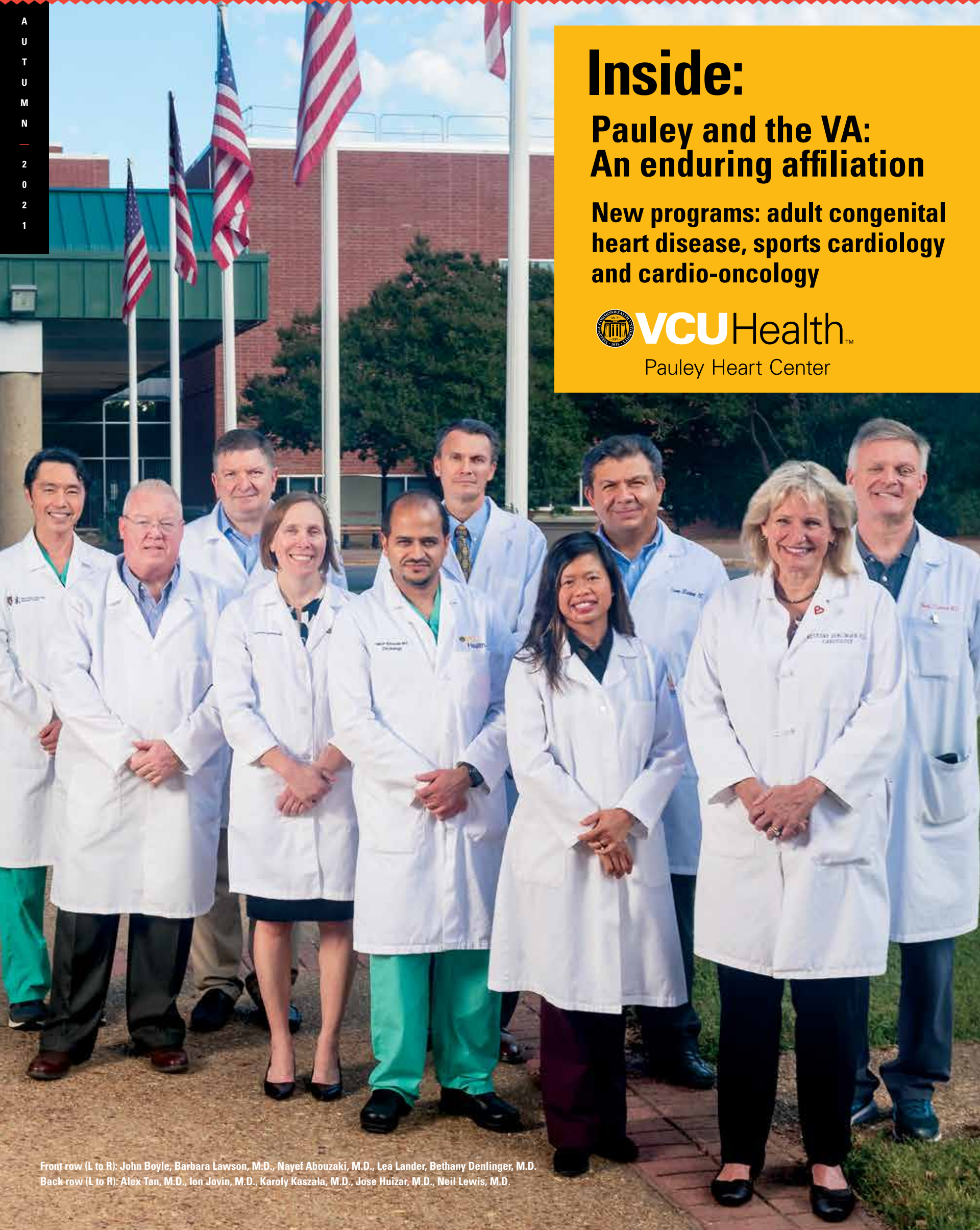
### Pauley and the VA: An enduring affiliation

**New programs: adult congenital  
heart disease, sports cardiology  
and cardio-oncology**



**VCU Health**<sup>™</sup>

Pauley Heart Center



Front row (L to R): John Boyle, Barbara Lawson, M.D., Nayef Abouzaki, M.D., Lea Lander, Bethany Denlinger, M.D.  
Back row (L to R): Alex Tan, M.D., Ion Jovin, M.D., Karoly Kaszala, M.D., Jose Huizar, M.D., Neil Lewis, M.D.

# An enduring affiliation

## Pauley physicians provide cardiovascular care to veterans at the VA

**Millions of Americans suffer from cardiovascular disease, and the risk of developing it may be even higher for our nation's veterans. The Department of Veterans Affairs reports that cardiovascular disease is the leading cause of death among veterans enrolled in the VA health care system.**



Dr. Edward Lesnfsky

A long-standing academic and medical partnership between Central Virginia VA Health Care System in Richmond and VCU Medical Center enables physicians affiliated with VCU Health Pauley Heart Center to provide veterans with the best available cardiovascular services. "As a result of our academic affiliation, the VA offers state-of-the-art referral care," said Edward Lesnfsky, M.D., chief of cardiology at CVHCS in Richmond since 2008 and interim associate chief of staff for research.

VA hospitals and affiliated academic medical centers work together for the benefit of patient care, research and education: The VA maintains and operates the facilities and sets the standards for clinical care, while the medical center co-recruits staff and educates early-career physicians. Affiliations with academic medical centers help VA hospitals attract the physicians necessary to provide high-quality, specialized health care services for a predominantly male veteran population having higher-than-average rates of diabetes and vascular disease.

Cardiovascular services available to veterans at CVHCS in Richmond run the gamut from noninvasive diagnostic tests to surgeries including heart transplants. In addition to clinical care, the affiliation includes teaching and research activities, with many staff physicians having faculty appointments at VCU Medical Center.

"I've worked for the VA full or part time since 1990," Lesnfsky said. "What attracted me were the academic opportunities and the research opportunities. What's kept me here are the service opportunities and the ability to provide care to a very appreciative patient population."

### Double duty

The following providers are co-affiliated with Pauley Heart Center and Central Virginia VA Health Care System:

Nayef Abouzaki, M.D.	Edward Lesnfsky, M.D.
Josue "Josh" Chery, M.D.	Jonah Pozen, M.D.
Bethany Denlinger, M.D.	Dipesh Shah, M.D.
Jose Huizar, M.D.	Mohammed Quader, M.D.
Barbara Lawson, M.D.	

### Clinical excellence

CVHCS in Richmond has a strong track record in cardiac surgery and cardiac transplantation. In 1980, it became the first hospital in the VA system to conduct heart transplant surgery. The transplant program thrived for decades under the vision and expertise of cardiothoracic surgeon Szabolcs Szentpetery, M.D.

Several physicians who became leaders in the field of cardiology at VCU Health started their careers at CVHCS in Richmond. Szentpetery mentored Vigneshwar Kasirajan, M.D., the Stuart McGuire Professor and Chair of the Department of Surgery at VCU Medical Center, and Kenneth Ellenbogen, M.D., the Martha M. and Harold W. Kimmerling Chair of Cardiology, VCU School of Medicine, and director of clinical cardiac electrophysiology and pacing at VCU Medical Center.

Today, under the direction of medical director Neil Lewis, M.D., the Heart Failure/Transplant Program continues to be on the cutting edge of transplant medicine. For example, CVHCS in Richmond was the first VA medical center in the country to offer a Left Ventricular Assist Device (LVAD) as a bridge to transplant and has implanted more than 200 LVADs since 1992. "This technology has allowed us to provide the sickest patients the opportunity to improve their overall state of health, thereby increasing the opportunity for a successful outcome following transplantation," Lesnfsky said.

CVHCS in Richmond is a member of the VA Mid-Atlantic Health Care Network, one of the VA's 18 regional networks of hospitals in the Veterans Integrated Services Network (VISN). The Richmond site, in VISN 6, works closely with centers in Hampton, southwestern Virginia and western North Carolina to provide and improve access to cardiovascular services. Patients are referred to CVHCS in Richmond from across the mid-Atlantic. "We truly have not only regional reach, but reach beyond that," Lesnfsky said.

CVHCS in Richmond employs full-time and part-time Pauley-affiliated cardiologists with years of expertise in the areas of advanced heart failure and heart transplant, electrophysiology, interventional cardiology and noninvasive cardiology. "We perform most procedures that are available at any university hospital," Lesnfsky said. What's more, CVHCS is the only VA hospital in the country to perform heart transplants on site.

"I want the community to know that we provide world-class care at the Central Virginia VA Health Care System," said Nayef Abouzaki, M.D., an interventional cardiologist and site director at CVHCS for the VCUHS cardiology fellowship. "Our goal is to provide our veterans with the best outcomes by decreasing the morbidity and mortality of very advanced cardiovascular conditions — whether that's peripheral arterial disease, where we're preventing amputations; whether that's significant coronary



Dr. Karoly Kaszala and EP team perform a procedure in the VA electrophysiology lab. Other team members pictured are Dr. Ajay Pillai, electrophysiology fellow at the operating table, Dr. Darrin Gould from anesthesiology and nurse Nathalie Tomety assisting at the recording system.

artery disease, that we can refer patients for bypass surgeries or do complex cases to regain blood flow and recover the heart; or whether that's patients with advanced heart failure who need LVAD devices to support their heart, or even heart transplant. All of this is done in partnership with the Pauley Heart Center."

Working with veterans can be profoundly moving and memorable. Abouzaki recalled helping a veteran who'd had a heart attack get back to doing what he loved: preaching to inmates at a correctional facility. Not a good candidate for heart surgery, the patient languished at home for weeks, sleeping in a chair and feeling dispirited. Abouzaki intervened and suggested stents to optimize blood flow to the heart. The procedure was high risk but successful.

Eight stents and two years later, the patient is doing well. His heart recovered. "He's sleeping back in his own bed, not in the recliner, and is back to preaching again," Abouzaki said. "He's very appreciative. It was the most rewarding, gratifying experience for me."

Complex cases and grateful patients keep Abouzaki and his colleagues energized.

"I'm proud of being at the VA," Abouzaki added. "It's really a privilege for me to work at the VA and to be part of the Pauley Heart Center as well."

"It is an honor to give back to those who have served our country," said Bethany Denlinger, M.D., medical director of the echocardiography lab and cardiac rehab at VCU Health Community Memorial Hospital in South Hill, Virginia. She splits her time between South Hill and Richmond, where she works two days a week in the echo lab at CVHCS.

## Research excellence

The VA is a significant source of funding for cardiovascular disease research. Its Merit Review Award program supports investigator-initiated research focused on veterans' needs and allows investigators to collaborate with academic institutions. Merit Review Award grants are highly competitive and on par with those offered by the National Institutes of Health. More than 60% of VA researchers are also clinicians who provide direct patient care.

Merit Review grant recipients at CVHCS in Richmond's division of cardiology and their respective areas of research include Lesnefsky (metabolic mechanisms of cardiac dysfunction with aging), electrophysiologist Jose Huizar, M.D. (premature ventricular contraction-induced cardiomyopathy) and electrophysiologist Alex Tan, M.D. (cardiac arrhythmias and cardiac neuro function). A Merit Review grant is also supporting cardiac surgeon Mohammed Quader, M.D., as he studies how to metabolically rehabilitate hearts after circulatory death, an investigation that could one day help further expand the number of hearts suitable for transplantation.

The VA also has a research grant program for nonclinician (Ph.D.) investigators to help expand its portfolio of science relative to cardiovascular disease. Pauley-affiliated investigator Ashley Cowart, Ph.D., a professor in the Department of Biochemistry and Molecular Biology in the VCU School of Medicine, is studying a specific class of lipids known as sphingolipids and the role that they play in obesity-related diseases such as diabetes. Veterans suffer from these diseases at a disproportionate rate relative to the general population and are strongly linked with post-traumatic stress disorder, which is considered predictive of diabetes, she



**Jonah Pozen, M.D., VCU Health Pauley Heart Center assistant professor of medicine and Central Virginia VA Health Care System staff cardiologist, speaks with fellows Kunal Kapoor, M.D., Anna Tomdio, M.D., and Pengyang Li, M.D., as they review patients in the VA Cardiology subspecialty clinic.**

said. Shobha Ghosh, Ph.D., a professor of medicine and physiology at the VCU School of Medicine, is funded to study the mechanisms of atherosclerosis.

Huizar, director of the Arrhythmia and Device Clinic at CVHCS in Richmond, provides patients with ablative therapies while leading research into PVC-induced cardiomyopathy. A research-dedicated 1.5 Tesla MRI scanner requested by Huizar and supported by a VA grant will arrive by 2023 and will be used by physician scientists across several fields to expand their research. The 1.5T-MRI also will open new opportunities for multiple investigators to participate and collaborate in national and international research studies.

**“It is an honor to give back to those who have served our country.”**

The VA has been a leader in multisite, randomized-control clinical trials going back five decades to the first randomized-control trial that showed coronary artery bypass grafting surgery works to improve survival in patients with a specific high-risk heart artery blockage. A soon-to-be-recruiting randomized clinical trial called RICH (remote ischemic preconditioning for renal and cardiac protection in congestive heart failure) will examine ischemic preconditioning in patients with heart failure, “something researchers have looked at mostly in the setting of myocardial infarction and stroke,” said Ion Jovin, M.D., director of the Cardiac Catheterization Laboratory and deputy chief of cardiology at CVHCS in Richmond.

A frequent multisite trial participant, Jovin is co-investigator with the VA Pittsburgh Healthcare System for RICH. “Ischemic preconditioning aims to protect the heart muscle or the brain from the damage that occurs during a myocardial infarction or a stroke, but the mechanisms of this protection are not well understood,” he said.

## Education excellence

Cardiology and interventional cardiology fellows at VCU Medical Center have a required rotation through CVHCS in Richmond. The VA funds a number of those positions, which provide early-career physicians significant cath lab, invasive cardiology and interventional cardiology training. “We have fellows in clinics, in the inpatient services, triaging patients from the emergency room and admitting them to the ICU or to the general ward to stabilize their heart condition,” said Abouzaki, who trained in the CVHCS cath lab in both coronary and leg artery interventions for patients at risk of amputation. “We have fellows on imaging rotations. We have them in the cath lab. They’re present 365 days.”

The veterans appreciate the fellows’ attentive care, Abouzaki said, and the fellows appreciate the veterans’ dogged determination. “They’re tough patients. They want to live longer, and they fight and fight — all the way to the end.”

## What’s next

CVHCS in Richmond’s cardiovascular services will continue to grow and evolve. On the clinical side, plans include expanding the advanced heart failure program, initiating a structural heart program and opening a hybrid operating room.

Barbara Lawson, M.D., a specialist in interventional and structural cardiology, is building the much anticipated transcatheter aortic valve replacement (TAVR) program. “For the past five years, I have brought the veterans to VCU for TAVR procedures performed by myself and Dr. Mohammed Quader,” she said. “Building a program at the VA will obviate the need to transition care between centers, streamlining the referral process and expediting their care.”

On the educational side, Lesnefsky envisions “continuing to improve the experience for our fellows by providing opportunities for them to demonstrate initiative and clinical ownership.”

These measures, and more, will ensure that those who served our country in the armed services have — and continue to have — the best possible chance at a long and healthy life. ❤️

# International researchers hone skills in fellowship

**A VCU Health Pauley Heart Center and Hospital Italiano de Buenos Aires collaboration produces promising young researchers in the field of cardiology.**

Horacio Medina de Chazal, M.D., said the year he spent as a Virginia Commonwealth University and Hospital Italiano de Buenos Aires (VCU-HIBA) fellow in interventional cardiology gave him invaluable clinical research experience and jump-started his voracious pursuit of excellence in cardiology.

Medina de Chazal is one of nearly a dozen physicians to participate in the VCU-HIBA cardiology research fellowship, a partnership that began over a decade ago. Postdoctoral fellows from HIBA in Buenos Aires, Argentina, are selected by VCU and HIBA partners for their exemplary clinical expertise to hone research skills at VCU under Antonio Abbate, Ph.D., M.D., the James C. Roberts, Esq. Professor of Cardiology in the VCU School of Medicine, and Fadi Salloum, Ph.D., the Congdon Chair in Cardiology and associate chair for research in the Department of Internal Medicine in the VCU School of Medicine.

“The main goal of the exchange program is to learn by doing research, and Dr. Abbate and his team have renowned expertise in the field. He is an amazing mentor,” Medina de Chazal said. “Working with him on clinical trials was life changing.”

The program’s first fellow, Ignacio Seropian, M.D., now oversees the operations of the VCU-HIBA partnership from Argentina and continues cardiology research at HIBA.

“Under Dr. Abbate’s mentorship, I jumped several steps higher in my career,” Seropian said. “The technology is amazing at VCU, and they are very open to new ideas and projects. I had an amazing year collaborating on basic science projects” with Abbate, Stefano Toldo, Ph.D., associate professor of cardiology in the VCU School of Medicine, and Benjamin Van Tassell, Pharm.D., vice chair for clinical research in the Department of Pharmacotherapy and Outcomes Science in the VCU School of Pharmacy.

VCU School of Medicine faculty benefit as much from the partnership as the interventional cardiology fellows from HIBA, Abbate said. “By the time they have arrived here, they are already doctors of medicine, and they are working on clinical training in cardiology,” he said. “They come here very



**Dr. Antonio Abbate**

skilled and highly motivated.” The fellows assisted Abbate or Salloum in studies on cardiac inflammation and how the condition impacts the heart after a cardiovascular event, such as a myocardial infarction, or over the course of diseases that can lead to heart failure.

“Pharmacologically, there are many new attempts to blunt this inflammatory cascade,” Salloum said. “To this end, fellows work with exploratory drugs that are designated as breakthrough therapies for heart failure.”

From 2017 to 2018, Medina de Chazal assisted Abbate, Toldo and Van Tassell on clinical trials that proved the efficacy of the drug anakinra in blunting inflammatory responses, which are driven by the protein Interleukin-1. Anakinra is typically used to block IL-1 in patients with rheumatoid arthritis. Fellows from HIBA have contributed their expertise to both the preclinical and clinical stages. The research team has been conducting clinical and translational research for more than 15 years, supported by millions of dollars in grants from the National Institutes of Health, the American Heart Association and other sources.

Van Tassell said Seropian’s work early on in the anakinra studies laid a strong foundation for the project.

“Much of our success the last 13 years stems from landmark preclinical investigations that we performed with Dr. Seropian,” Van Tassell said. “Those pivotal publications continue to serve as preliminary data for our grants and are among our most frequently cited publications.”

Nearly half of the fellows partnered with Salloum on additional studies of methods to blunt inflammatory responses leading to heart failure. During trials partially funded by



**Dr. Fadi Salloum**

the NIH, Salloum and his colleagues made significant contributions to uncovering novel pathways by which treatment with recombinant human relaxin-2 (Serelaxin) or sacubitril/valsartan (Entresto) can stem the progression of heart failure that often follows an acute myocardial infarction by suppressing inflammation and cell death. Three of the fellows, Juan Valle Raleigh, M.D., Juan Torrado, M.D., and Francisco Romeo, M.D., contributed immensely to this work and their studies were published in leading cardiovascular journals such as Cardiovascular Research and Journal of the American College of Cardiology.

**“[The fellows] come here very skilled and highly motivated.”**

“The purpose of the VCU and HIBA partnership is to expose fellows to research so that when they return to HIBA to complete their interventional cardiology fellowship, and when they become faculty, they can establish a research program of their own,” Salloum said.

Juan Damonte, M.D., a current VCU-HIBA cardiology research fellow, said that so far during the program, he has honed a better understanding of research protocols, study coordination, data analysis and how to obtain research funding. “Before coming to VCU, I was more of a clinician, and not a researcher,” he said.

Hopefully, the VCU-HIBA partnership will continue to promote excellence in research and clinical practice, Abbate said. “In my mind, the fellowship embodies the purpose of a university; to bring people together to collaborate and answer questions. In this sense, the partnership meets this definition.” ❤️

# Getting to the heart of diversity with Kevin Harris

**Residents of Richmond's Gilpin Court neighborhood have, at birth, an average life expectancy of 63 years. Residents of Westover Hills, little more than 5 miles southwest of Gilpin Court, are born with an average life expectancy of 83 years.**

As the senior associate dean for diversity, equity and inclusion, Kevin Harris, Ph.D., works to educate others about diversity in health care and to expand the spotlight in medicine's search for talent. A former Gilpin Court resident himself, Harris leverages an eclectic personal history to help provide better health care to those living in underserved communities. And his work is laying the foundation upon which the future of cardiology will be built.

Harris recently hosted an enlightening VCU Internal Medicine Cardiology Grand Rounds presentation on diversity within the field of cardiology. More than a discussion on the demographics of cardiology, the presentation explored how diversity within cardiology might play a role in health outcomes and heart-related health disparities.

"If you were to walk into a particular department," said Harris in his presentation, "and not see anyone, just at the surface level, that looks like you, that may have had the same experiences as you, you may have to make some decisions about what your experience will look like."

In 2016, just 3% of practicing adult cardiologists were Black, while more than 50% were white. As Harris asks: "Is there an appropriate sense of belonging, a sense of mattering, for all the individuals and stakeholders that might be in a given situation?"

Over the course of 20 years, one study followed 5,115 participants to analyze the onset and prognosis of heart failure. In 27 of those participants, researchers observed the development of heart failure before the age of 50. Of those 27 who developed heart failure, all but one were Black.

Heart disease is the wedge between life expectancies of Black Americans and their white neighbors, and scientists and physicians have long sought to uncover the biological mechanisms that may be driving this disparity.

But research results are now leading investigators to question whether the causes of these disparities are actually biological.



Dr. Kevin Harris

The answer to that question is clear: Black patients are subjected to lower rates of intervention, advanced therapies and even heart transplants.

These studies tell us that heart-related health disparities arise from a social origin, rather than a biological one. Greg Hundley, M.D., Pauley Heart Center director and chair of the Division of Cardiology, spoke to this during the discussion portion of Harris' presentation.

## **Providing Black Americans with more equitable health care requires more than mandatory diversity training and hiring the right demographic.**

"Many of us do research and we use race as a covariate," said Hundley, "but maybe what's going on are the environmental factors that are impacting a certain group of people because of their social situation, dictated by centuries of racism and suppression."

Providing Black Americans with more equitable health care requires more than mandatory diversity training and hiring the right demographic.

Greater access to health care and better health outcomes for Black Americans will only come from a movement which not only considers social determinants of health, but also actively understands them and incorporates them into treatment.

"That movement," said Harris, "has actually been codified in terms of shifting from what Dr. Dorothy Roberts calls race-based medicine — this idea that race has important relevance, has central relevance as a biological variable — towards a concept of race-conscious [medicine]." A practice of race-conscious medicine "emphasizes racism, as opposed to race, as a key determinant of health outcomes."

But the move from race-based to race-conscious medicine, from race to racism, demands an alternative understanding of race itself.

"99.9% of who we are is who we are," said Harris, in reference to the fact that all humans are 99.9% genetically similar.

The differences observed in humans are not enough to divide them into unique races within our species. The term race is not even used formally in the taxonomic hierarchy. Much like the factors motivating health disparities, the concept of race is of a social origin.

"There is very little debate about it," said Harris. "Race is a social construct and has its primary relevance in social and political contexts."

Despite this being well known, researchers have continued to look for physical characteristics that both determine a person's skin color and increase their risk of heart failure. Shifting the research and medicine perspective is necessary to repair the damage of health disparities, and that shift necessitates a thorough understanding of those cultures in need of better care.

If we are to eliminate health disparities and provide better health outcomes and greater quality of life to all people equally, we must understand how and why race was invented, how concepts of race perpetuate racism, and how the ideas of race and racism have historically been leveraged for the purposes of maintaining a specific power structure.

Troublesome as they are, the low number of Black cardiologists and the excessive rates of heart failure among Blacks are but symptomatic of their social causes. Improving cardiovascular care for all requires, in Harris' words, "looking at the underlying culture in cardiology and understanding how we build in the structures to sustain an inclusive culture, and a presence and a perspective of cardiology that actually does not repel, but draws in." ❤️

## In memoriam

### Dorothy Pauley was namesake of VCU Health Pauley Heart Center, along with her husband, Stan

**Philanthropist and VCU alum Dorothy Pauley, a long-time member of the Medical College of Virginia Foundation board, died in May. She was 91. The wife of the late Stanley Pauley, Dorothy Pauley served on the foundation board from 2005-14. She was known as someone who cared deeply about improving medical care and education. Her generosity through the Pauley Family Foundation helped create the VCU Health Pauley Heart Center.**

"Dorothy and Stan were the first people we met when we came to Richmond, and they warmly welcomed us with open arms and a clear desire to see us advance VCU Health Pauley Heart Center," said Michael Rao, Ph.D., president of VCU and VCU Health System. "Dorothy carried an air of happiness with her everywhere she went. We miss Stan and Dorothy and remain eternally grateful for their wisdom and generosity, which will leave a legacy of support for human heart health. Heart disease remains the No. 1 cause of death among people."

Alice Goodwin served on the MCV Foundation board with Pauley. She recalled her as a dedicated public servant who never missed a board meeting. "She was such a fine woman and very astute," Goodwin said. "She was so engaged in anything related to MCV and was devoted to the cause. Dorothy was a lovely person, and I always enjoyed serving with her and hoped to sit next to her during meetings."

Stan and Dorothy Pauley created the Pauley Family Foundation in 2006 to provide philanthropic giving in the areas of education, arts, health and human services. The foundation gave a \$5 million gift to VCU Health's heart center to support research initiatives and comprehensive educational programs. In recognition of the gift, the center was named VCU Health Pauley Heart Center.

"The Pauleys benevolently gave to Richmond and the community," said Greg Hundley, M.D., Pauley Heart Center director and chair of the Division of Cardiology. "Their support was critical to the launch of the heart center. Their gifts have funded research, education, clinical care and the



Stan and Dorothy Pauley

ability of the heart center to serve our community locally and beyond the commonwealth. We are most appreciative of this support and want to express our sincere condolences to Kathy Hickok and the entire Pauley family."

In 2012, the Pauley Family Foundation gave \$5 million to recruit Hundley and five new research faculty members, along with startup funds for research staff, lab costs and equipment. The funds also created new research programs in cardiovascular disease prevention, women's cardiovascular health and congenital heart disease. ❤️

## McCue Award to honor Mayo Clinic cardiologist

**The 2022 Dr. Carolyn McCue Award for Woman Cardiologist of the Year will be awarded to Sharonne Hayes, M.D., cardiologist and professor of cardiovascular medicine at the Mayo Clinic.**

Hayes' mentorship, career development of women, advancement of women in science, development of a multidisciplinary women's cardiovascular program, success in bringing sex- and gender-based cardiology to the forefront, development of a multi-disciplinary Women's Cardiovascular Clinic, orchestration and support of Women Heart, pioneering work in Spontaneous Coronary Artery Dissection (SCAD) and bringing the disease process to awareness, and more recently her work in diversity, equity, bias, and inclusion stood her apart.

The McCue Award program is made possible by a gift from the McCue family

and honors the late Carolyn Moore McCue, M.D., a national pioneer in pediatric cardiology. McCue (1916-1999) practiced at the Medical College of Virginia (now VCU Health) for 42 years and was the first woman elected president of the Richmond Academy of Medicine. She created and chaired MCV's Pediatric Cardiology Division for 20 years, during which time she was instrumental in establishing pediatric cardiology clinics in medically underserved communities throughout Virginia.

The award is given to a woman cardiologist who is recognized nationally and/or internationally for important contributions to the general field of adult or pediatric cardiology through clinical care, research, teaching and mentoring.

"We are delighted to welcome Dr. Hayes as the McCue Award winner," said Jordana Kron, M.D. "She is a pioneer in women's health, diversity and inclusion. She is a visionary who is leading health care into the future."

Presentation of the award and a monetary prize of \$7,500 will be made at the seventh annual VCU Health Pauley Heart Center Heart Health in Women Symposium in Richmond in February 2022.

Hayes will give the keynote presentation, "Climate Change: Addressing Biases and Other Barriers to Optimal Cardiovascular Care for Women." She will also meet with faculty, house staff, fellows and residents at a luncheon prior to the symposium. Meeting with an influential role model and mentor can be inspiring and career-defining to young health care providers at different stages in their careers. ❤️



Dr. Sharonne Hayes

# New locations

Pauley Heart Center is expanding across the region to better serve patients in need of cardiovascular services.

## VCU Health Pauley Heart Center opens clinic in Tappahannock

**Heart patients in Virginia's upper Middle Peninsula and Northern Neck can now access VCU Health Pauley Heart Center closer to home.**

VCU Health Pauley Heart Center at Tappahannock, located next to VCU Health Tappahannock Hospital, is now offering a full-time cardiology presence to treat patients with cardiovascular problems, including coronary artery disease, congestive heart failure, heart rhythm disorders and hypertension.

The new clinic opened March 29. Routine tests such as cardiac imaging and stress tests will be performed inside VCU Health Tappahannock Hospital, while complex procedures will be performed at the VCU Medical Center campus in downtown Richmond.

In addition to patient services, Pauley will work with emergency teams and primary care physicians already established in the Tappahannock community, providing them with 24/7 access to board-certified cardiologists.

Archer Baskerville, M.D., Stephen Hunley, M.D., Michael Kelly, M.D., Michael Lenhart, M.D., and Mohammed Makkiya, M.D., make up the Pauley Tappahannock

heart team, with Lenhart serving as medical director. Each has over 25 years of experience in cardiac care.

Greg Hundley, M.D., Pauley Heart Center director and chair of the Division of Cardiology, has led the development of innovative cardiology therapies and treatments for over 25 years. Having expanded the care and services of Pauley to regions throughout Virginia, Hundley is excited to share his team's expertise with patients in the Tappahannock community.

"Our desire is to build a consistent cardiac care presence in the upper Middle Peninsula and Northern Neck communities," he said. "With this, we can not only provide exceptional patient services, but assist local physicians in determining whether a cardiac emergency requires transfer to our Richmond facilities for more advanced care."

"This partnership [with Pauley] will allow us to skillfully meet the needs of patients who may be safely and effectively treated here, close to home," said Liz Martin, president of VCU Health Tappahannock Hospital. "Our work with Pauley Heart Center will enhance access and continuity for patients who may need a higher level of care due to the complexity of their condition." ❤️

## New clinic in Williamsburg

**Williamsburg, Virginia, residents and William & Mary students, faculty and staff have increased access to comprehensive health care services including cardiac care. A new medical office at 332 N. Henry St. in Williamsburg offers services previously found at VCU Health's 1162 Professional Drive location.**

Called VCU Health at William & Mary, the new clinic has 22 exam rooms and is part of a long-term, 10-year strategic partnership between W&M and VCU Health System. Cardiac care, including chronic disease management, heart health assessments and risk reduction, is being provided by VCU Health Pauley Heart Center physicians Kenneth Ellenbogen, M.D., Jayanthi N. Koneru, M.D., and Rachit D. Shah, M.D.

This is the most comprehensive collegiate partnership of its kind for VCU Health System. "Advancing the health, wellness and well-being of all people we serve is a commitment that VCU and William & Mary share," said Michael Rao, Ph.D., president of VCU and VCU Health System. "This partnership makes academic health care more accessible to everyone who calls Williamsburg home." ❤️





# Accolades

We're honored! In the news and making news — Pauley Heart Center is having an exceptional year.



## VCU Medical Center receives chest pain award Among top performing hospitals for treatment of heart attack patients

**VCU Medical Center has received the American College of Cardiology's NCDR Chest Pain – MI Registry Silver Performance Achievement Award for 2020. VCU Medical Center is one of only 132 hospitals nationwide to receive the honor.**

The award recognizes VCU Medical Center's commitment and success in implementing and achieving a sustained higher standard of care for heart attack (myocardial infarction, or MI) patients and signifies that VCU Medical Center has reached an aggressive goal of treating these patients to standard levels of care as outlined by the American College of Cardiology/American Heart Association clinical guidelines, recommendations and performance measures.

"VCU Medical Center's participation in the Chest Pain – MI Registry assures our organization is engaged in a robust quality

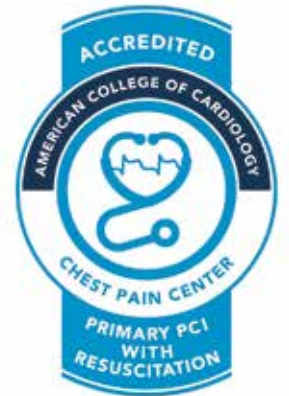
improvement process, using data to drive improvements that positively impact outcomes for heart attack patients," said Michelle Gossip, MSN, RN, CCRN, cardiology program manager at Pauley Heart Center.

To receive the Chest Pain – MI Registry Silver Performance Achievement Award, VCU Medical Center demonstrated sustained achievement in the Chest Pain – MI Registry for four consecutive quarters during 2020 and performed with distinction in specific performance measures. Full participation in the registry engages hospitals in a robust quality improvement process using data to drive improvements in adherence to guideline recommendations and overall quality of care provided to heart attack patients.

"This award is a culmination of hard work by our multidisciplinary teams," Gossip said. "The honor exemplifies teamwork and attention to clinical detail from our EMS partnerships, Emergency Department and

cardiology teams. Additionally, this work is supported by our One Call Center, Pathology, Performance Improvement Department and Cardiac Rehabilitative Services."

The Centers for Disease Control and Prevention estimates that 700,000 Americans suffer a heart attack each year. The Chest Pain – MI Registry empowers health care provider teams to treat heart attack patients according to the most current, science-based guidelines and establishes a national standard for improving the quality, safety and outcomes of care provided for patients with coronary artery disease. VCU Medical Center previously received the Platinum Award (highest honor) in 2019 and the Silver Award in 2018. ❤️



## The standard of care in Richmond VCU Health cardiac services recognized as 'high performing' specialty

**U.S. News & World Report has recognized VCU Medical Center as the No. 1 hospital in the Richmond metro area for the 11th year in a row, according to its newest Best Hospitals rankings. VCU Medical Center, central Virginia's only comprehensive academic medical center and largest safety net provider, also placed among the top three hospitals in Virginia for 2021-22.**

U.S. News recognized VCU Medical Center as having high-performing programs in cardiology and heart surgery, as well as cancer, gastroenterology and GI surgery, orthopedics and urology. U.S. News designates "high performing" adult specialty areas as close to ranking among the top 50 in the country.

"This recognition is a reflection of the unfailingly kind and extraordinary care we

provide as an academic medical center," said Art Kellermann, M.D., senior vice president for health sciences at VCU and CEO of VCU Health System. "It's an affirmation of our mission to serve everyone and use our clinical expertise, research and teaching efforts to make the highest-quality care and great patient experience accessible and affordable to everyone."

This year's expanded report from U.S. News includes new ratings for seven important procedures and conditions, expanding the list of rated services to 17 total. VCU Medical Center earned a "high performing" rating in nine areas in recognition of care that was significantly better than the national average, as measured by factors such as patient outcomes. Cardiac services receiving the highest rating U.S. News awards include heart attack, heart bypass surgery and heart failure.

For the 2021-22 ratings, U.S. News evaluated more than 4,750 medical centers

nationwide in 17 procedures and conditions. Less than a third of all hospitals received any "high performing" rating. Heart attack and stroke are among the newly rated services this year.

Recognized for distinguished physicians, excellence in nursing and state-of-the-art technology, VCU Medical Center was also named to Newsweek's list of World's Best Hospitals in 2021. Newsweek acknowledged VCU Medical Center for performing above the national average in infection prevention.

The U.S. News Best Hospitals methodologies are largely based on objective measures such as risk-adjusted survival and discharge-to-home rates, volume and quality of nursing, among other care-related indicators. ❤️





## The athlete's heart health and COVID-19

### Return-to-play guidelines and heart inflammation risks for athletes

**With running season ramping up this fall, marked by events such as the VCU Health Richmond Marathon, athletes should keep in mind the risks COVID-19 poses to cardiac health, said Naveed Naz, M.D., VCU Health Pauley Center cardiologist and assistant professor of internal medicine in the VCU School of Medicine.**

In athletes and non-athletes, COVID-19 infection can possibly cause inflammation of the heart and its lining — or myocarditis and pericarditis — respectively. The conditions occur when a viral infection, in this case COVID-19, has either invaded the heart, or caused an inflammatory and thrombotic cascade, which can lead to heart injury or arrhythmias.

Naz is building Pauley's sports cardiology program to diagnose and treat heart problems in athletes. Throughout the pandemic, the former military physician has investigated return-to-play decisions for athletes who have contracted COVID-19, and advises athletes training post infection to be mindful of symptoms such as chest tightness and pain, shortness of breath, palpitations and decreased exercise tolerance, which could indicate myocarditis or pericarditis. Athletes who had asymptomatic or minor cases of COVID-19 infection should still ease back into exercise, he added.

"I would say the bottom line is to pursue a staged, common sense escalation back into training," Naz said. "And if our athletes hit a wall anywhere in that escalation, that's where they should seek medical attention."

Though the fit cardio-respiratory systems of athletes may help insulate them from the effects of cardiac and respiratory injury, the condition is still a concern, regardless of the causative virus, Naz said.

"Sometimes that inflammatory piece of heart tissue can be an arrhythmogenic substrate, meaning it can cause arrhythmias in the heart, either atrial or ventricular arrhythmias. So, patients may have palpitations," he said. "They may even experience cardiogenic syncope; they go into a very fast arrhythmia and pass out."

### **Athletes who had asymptomatic or minor cases of COVID-19 infection should still ease back into exercise.**

Myocarditis has been linked to 10% to 20% of total sudden deaths in young athletes, and COVID-19 myocarditis has been linked to several sudden cardiac deaths in patients who only had mild COVID-19 symptoms. And the extent to which the delta strain and other COVID-19 variants impact the heart is still unknown. Additionally, reports of myocarditis have occurred in those receiving the newer mRNA vaccinations for the SARS-COV2 viruses, although this should not be a reason to avoid vaccines. The benefit of vaccination outweighs the potential risks.



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**Dr. Naveed Naz**

Naz said guidelines on safe return to play published in JAMA Cardiology are a sound reference for physicians and athletes. Individuals with asymptomatic COVID-19 infection are advised to avoid exercise for 14 days from a positive test. For those who experienced mild or moderate symptoms, no exercise 14 days after the complete resolution of symptoms and clinical evaluation is recommended prior to return to play where the doctor will check labs for heart injury, obtain an ECG and an ultrasound of the heart. In both cases, return to play should be gradual. More extensive testing and convalescence before return to play is required for individuals who experience severe COVID-19 symptoms.

A red flag physicians watch for in these athletes is the release of troponin — a protein found in cardiac muscle fibers — into the blood, which could indicate heart injury from heart muscle inflammation or injury. "Troponin is a marker that really exists only inside the heart muscle," Naz said. "When it is found in the blood, it means that some heart muscle cells have necrosed and released some of this troponin into the blood. So, troponin is a marker for heart muscle injury."

Overall, careful monitoring, assessment and gradual resumption of activity post COVID-19 infection can keep athletes safe, and the benefits of physical activity outweigh the risks. "In sports cardiology, we want to identify patients who may be at higher risk from certain types of exercise," Naz said. "We want athletes to return to play, but after COVID-19 infection, we want them to return to full play in a gradual, measured and monitored fashion." ❤️

# Team member spotlight: Clare Greene

Clare Greene, M.B.A., has been VCU Health's Pauley Heart Center administrator and Division of Cardiology administrator since 2001. She joined VCU Health System in 1998 as director of business development after serving in leadership roles at Columbia (HCA) Chippenham Medical Center/Johnston-Willis Hospitals and Columbia (HCA) Retreat Hospital. With accountability across the health system (hospital, practice and School of Medicine — clinical, research and education), her current role includes overseeing operations, strategic planning, business development, budgeting, financial analysis, marketing, outreach, billing and coding, faculty recruitment and academic physician practice management.

## What appeals to you about health care administration?

I like the patient care purpose of this work. At the end of the day, I see any administrative role as a collaborator with our clinical partners — I value being part of the team that is moving towards clinical excellence. The supportive nature of all my colleagues and respect shown to everyone's contribution is what has always been great about VCU Health in particular. Because my educational background is in finance and accounting, health care administration is satisfying in that it allows me to utilize all those skills as a foundation to everything else I do.

## Tell us about a favorite project at VCU Health System.

I have a few things I consider favorites. In the very distant past, I was part of the analytical work that led to the expanded helicopter service. It makes me smile to hear the helicopters flying knowing I had a little part in all that. More recently, though, I am celebrating my 20-year anniversary with the heart center and am most proud to have been a part of our exponential growth and prominence. Since that time, the heart center was named through the generosity of the Pauley Family Foundation; we've



Clare Greene

made the U.S. News & World Report top 50 ranking multiple times; and all of our clinical programs have grown tremendously, including heart transplant, electrophysiology, structural heart, cardio-oncology, cardiac, thoracic and vascular surgical programs. We are in multiple locations now throughout the region and commonwealth. And, there is more to come.

**"I am most proud of taking the Pauley brand and expanding it throughout the commonwealth."**

## How did you come to work for Pauley Heart Center?

VCU Health was moving toward service line models in 2001 for key clinical areas. My mentor at the time suggested that I apply for the heart role. The job involved not only hospital service line work but also would be responsible for the Division of Cardiology as well. This made me a little uneasy as I had always worked on the hospital side of health care. I knew nothing about running an academic physician practice. As the story goes, I interviewed with George Vetrovec, M.D., and he and others took a chance on me. ... I really do feel like I'm a better hospital leader because I'm embedded in the practice. It is a true partnership between the practice and the hospital. I can help the physician leaders understand what the hospital leaders are thinking and the hospital leaders understand where the physicians are coming from. We are just

all one team, and I love being associated with that. I love the Pauley Heart Center.

## What's a typical day for you?

On a daily basis, I move as many initiatives forward that I possibly can. On a typical day, I might have 20 going at one time, so I have to figure out: How do I prioritize? How do I use my influence? How do I collaborate? I am involved in things like physician recruitment, setting up outreach sites, numbers crunching, budgeting and billing. It is hard to describe an average day because each day is different.

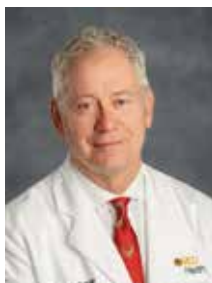
Many times, my job is to bring together the right people who can make something happen. My position partners with the director of nursing of the heart center, so, whereas she is running the clinical operation, I am responsible for anything related to finance, capital planning and resource requests. We collaborate on any kind of expansion of programs.

## What accomplishment of yours at Pauley are you most proud of?

I am most proud of taking the Pauley brand and expanding it throughout the commonwealth. We have expanded our presence at Stony Point, and we have clinics in Colonial Heights and select subspecialties in Williamsburg. Most recently, we opened clinics in Tappahannock and Fredericksburg. That is because of great leaders like George Vetrovec, M.D., Kenneth Ellenbogen, M.D., Vigneshwar Kasirajan, M.D., and Greg Hundley, M.D. ❤️

# Welcome!

## New faculty



**Michael Lenhart, M.D.**

Michael Lenhart, M.D., knows the key to cardiology is simple: “It’s about caring for your patients and doing great work.” While cardiology is an ever-changing field blending

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**Dr. Michael Lenhart**

preventative care and education, and noninvasive medicine, it is ultimately the focus on the patients that resonates with Lenhart.

“First and foremost, I am the advocate for my patients,” he said, “and I want them to feel confident I am doing the best job I can for them.”

At the Pauley Heart Center at Tappahannock, Lenhart provides care for patients with a range of cardiovascular conditions, including atrial fibrillation, congestive heart failure, coronary artery disease and high blood pressure. “Cardiology is one of the most dynamic areas in medicine, and staying abreast of changes in the field is crucial,” he said. “I was drawn to VCU Health because of the world-class academic medical center, the commitment to research, and the interest and ability of the teams here to perform state-of-the-art cardiovascular procedures.”

Part of Lenhart’s role at VCU Health is his involvement in outreach clinics, which serve as a bridge between VCU’s research center and smaller, community-focused hospitals. “By bringing our work at VCU Health into these smaller settings, it not only improves the overall health within the community, but it allows patients within that community to see the real-world value of health science research, without having to travel to a larger city,” he said. He advises patients: “A healthy diet and a regular exercise regimen are the key in preventing a number of cardiovascular diseases.”

As a cardiologist, Lenhart embraces the demands of an ever-changing area of medicine. “The depth of knowledge required is always growing,” he noted. “As is true in almost every profession, you must care about what you’re doing. You must be committed to learning. I want my patients to know that their care is my No. 1 priority.”



**Archer Baskerville, M.D.**

After 38 years in private cardiology practice, Archer Baskerville, M.D., retired in 2019, just a few weeks before the COVID-19 pandemic gripped the world. Perhaps it was the constant stream

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**Dr. Archer Baskerville**

of news about a global health crisis, or his stubborn steadfastness, or just his love for and pride in medicine, but the call to serve the community and public health was too strong. In early 2021, he “un-retired” and joined VCU Health Tappahannock Hospital to bring compassionate, expert heart care to the Northern Neck and Middle Peninsula.

Baskerville diagnoses, treats and cares for people’s cardiovascular needs — any condition that may impact the heart or blood vessels, such as hypertension, coronary artery disease, rhythm disorders and heart failure.

In his approach to care, Baskerville emphasizes “taking control” of one’s heart health. He preaches diagnosis and treatment based on science and facts and using this evidence to create personalized therapies to control blood pressure, cholesterol, diabetes and other heart and related chronic conditions. “I also encourage consistent exercise, appropriate diet, weight loss if needed, avoiding illicit substances, pursuit of good sleep habits, and taking care of your mental health,” he said. “My goal is to listen, make decisions together and take a holistic approach to care. I want to empower patients and their families to take care of their hearts and live a long, prosperous and healthy life.”

Being one of the health system’s senior-most physicians doesn’t mean Baskerville gets to rest on his laurels. Like all other physicians and specialists, he must work to ensure his knowledge remains relevant and current, especially in an area of medicine that is constantly putting out new research and data. “We owe it to our patients and ourselves to maintain this relevance if we are to continue to take care of people in an appropriate and responsible way with the best information in hand,” he said.



**Michael Kelly, M.D.**

At VCU Health Pauley Heart Center at Tappahannock, Michael Kelly, M.D., offers compassionate, expert health care for Northern Neck and Middle Peninsula patients with coronary artery disease,

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**Dr. Michael Kelly**

congestive heart failure, hypertension and heart rhythm disorders.

Cardiac imaging is his passion. The insight gleaned through ultrasound, magnetic resonance (MRI) and other imaging technologies offers a road map to a healthier heart for his patients using procedures that cause no more discomfort than having an IV placed in their arm.

He knows the cardiology clinic, which opened in early 2021, is the ideal home for the noninvasive cardiology he practices. “VCU has so many diverse experts in one health system,” Kelly said. “I haven’t even begun to unwrap all those gifts.”

One advanced form of imaging he practices is nuclear imaging. Using tiny doses of radioactive tracers that light up the heart, the procedure offers doctors a more in-depth look at the health of a person’s heart, its muscles, its valves and its blood supply. While many patients may be confused by the various types of imaging technologies available — ultrasounds vs. MRI vs. nuclear imaging — Kelly notes that each has a different and complementary strength.

“Nuclear imaging and MRI can offer precision identification of heart muscle areas that, in the past, would have been regarded as permanently damaged. Now, thanks to science and technology and our own talents, we recognize these parts of the heart as capable of improved function if blood supply can be returned,” he said.

In the past, the only other option was cardiac catheterization, a more invasive testing method that is not entirely risk-free, is uncomfortable, and may still produce normal findings.

“Noninvasive cardiology in general has eliminated invasive testing as a means of identifying people with normal hearts who do not need any form of intervention,” he says. “The overall result is shorter invasive

procedures, less radiation and avoidance of invasive diagnostic procedures as often as possible.”

Kelly views each patient as an individual with their own set of circumstances impacting their health. “Each person has their own history, risk factors, life influences, strengths, and weaknesses,” he added. “Each unique story calls for a unique approach for providing their care.”



**Mohammed Makkiya, M.D.**

For Mohammed Makkiya, M.D., the key to great cardiac care lies at the intersection of clinical research, a patient-centered focus and collaboration. Every heart patient brings

with them their own unique history, and Makkiya delivers to them an individualized plan that is developed in tandem with a multidisciplinary team of physicians.

“We always want to be focused on improving our patients’ quality of life,” he said, “and VCU Health’s commitment to excellence means that we have access to the latest innovations in the field to help our patients.”

Makkiya specializes in hypertrophic cardiomyopathy, a condition in which the muscle of the heart is abnormally thick. “It’s a condition that has been widely underdiagnosed,” he said. “There are over a half a million people in the United States living with it, and they are often asymptomatic and unaware.”

When a person is living with HCM, the thickened muscle of their heart can make it difficult for the heart to pump blood efficiently. The heart, he noted, essentially strangles itself, and has to work harder to supply more flow. By utilizing state-of-the-art cardiac imaging, Makkiya can make an early diagnosis and help prevent more severe complications in the future. In addition, the field is advancing, and new treatments are under study that can help in the management of patients with the condition.

One of his goals at VCU Health, Makkiya said, is to become a leader in his own work and turn the health system into

a national leader for treatment of those with hypertrophic cardiomyopathy.

“Everything that we do at VCU Health is focused on providing the best quality, comfort, safety and patient care,” he said. “We want our patients to come here knowing that they are getting the best treatment, guided by the latest in clinical research.”



**Dipesh Shah, M.D.**

No matter the type of heart surgery you may require, Dipesh Shah, M.D., can do it, has done it and will perform it with confidence and compassion.

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**Dr. Dipesh Shah**

“Right from my medical college days, I was fascinated by the anatomy of the human heart,” said Shah, chief of cardiothoracic surgery and surgical director of cardiac transplantation at the Central Virginia VA Health Care System (CVHCS). VCU Health has a long-standing academic and medical partnership with CVHCS in Richmond. During medical school in India, he shadowed cardiothoracic (heart and chest) surgeons during clinical rotations, fueling his interest in cardiac surgery. “I have always been fascinated and inspired by the history of cardiac transplantation and medical research in heart failure. Today, I can handle the entire spectrum of heart surgeries, but it is as important for me to go above and beyond to provide you and your family with the most compassionate care in and out of the operating room.”

Shah completed his fellowship in cardiothoracic surgery at the renowned Mayo Clinic in Rochester, Minnesota, and gained additional fellowship training in heart failure and thoracic transplantation at the University of Pittsburgh Medical Center. He also has an appreciation for teaching the new generation of heart surgeons, fellows and residents, and mentors his younger peers in his role as an assistant professor at the VCU School of Medicine. Prior to joining VCU Health in early 2021, he was an assistant professor of surgery in the cardiothoracic surgery division at Washington University School of Medicine in St. Louis.

In addition to heart surgeries, Shah performs heart transplants at the CVHCS. He also has additional training in surgical treatment of heart and lung failure through mechanical circulatory support devices. He is trained in advanced transcatheter aortic valve replacement, off-pump coronary artery bypass graft, minimally invasive cardiac valve surgery, and aortic root and aortic arch surgeries.



**Josue “Josh” Chery, M.D.**

It was the rich history of innovation and a reputation for pushing the bounds of treatment for complex heart conditions that drew Josue “Josh” Chery,

M.D., to VCU Health. He should know: VCU Medical Center is where he held a fellowship in cardiothoracic surgery, a time that inspired him to stay in Richmond and build his career here.

“I want to add to that legacy through excellent clinical care, education and research,” said Chery, who today treats veterans at the Central Virginia VA Health Care System (CVHCS). VCU Health has a long-standing academic and medical partnership with CVHCS in Richmond.

Chery has a passion for caring for adults with congenital heart disease and completed a fellowship at the Emory University School of Medicine focused on treatment of those born with heart defects. As a surgeon, he has expertise in coronary artery bypass grafting (or CABG, a procedure to restore flow to blocked arteries that supply blood to the heart), along with treatment of various valve diseases.

Chery was initially attracted to the fine techniques of performing cardiac surgery — “it’s what I imagined Michelangelo must have felt when he was painting the Sistine Chapel,” he said. “But as my experience and knowledge of the field has evolved, I’ve found I am drawn to the humanity side of this work just as much. I love seeing patients after surgery living a better life than they had before VCU Health care teams got to them.” ❤️

# Faculty spotlight: Wendy Bottinor, M.D.

**Cancer and its treatment appear to exacerbate heart disease in cancer patients. Pauley Heart Center and VCU Massey Cancer Center are working together to address the problem through a new cardio-oncology program that includes cardio-oncologist Wendy Bottinor, M.D., who joined the Pauley faculty in 2020. In her role, Bottinor ensures a patient's heart is healthy for cancer treatment and helps minimize cardiovascular problems both during and after cancer care.**

**You earned your M.D. at VCU Medical School and did your residency here. After being away for several years, what drew you back?**

What drew me back was Greg Hundley, M.D., the Pauley Heart Center and my really strong belief in the incredibly robust cardio-oncology program that we are establishing, both clinically and in the research arena. To be able to come back to an institution that provides excellent clinical care and is developing a unique and strong research program as well — naturally, I am proud of that.

**What makes VCU Health's cardio-oncology program stand out?**

Our program has a highly collaborative and multidisciplinary approach that you do not find in many places, even other academic centers. For example, our team includes experts in cardio-oncology, innovative cardiovascular imaging, biomedical engineering, exercise physiology, and nutrition and metabolism. We are a highly collaborative team and are all working together to understand the link between cancer and cardiovascular disease. We're also one of a handful of institutions with the ability to perform high-level physiological exercise testing and pair this with state-of-the-art cardiovascular magnetic resonance imaging. This is important because when we're thinking about individuals with cancer, or survivors, and how we can promote cardiovascular health, exercise limitations are common.

**What clinical trials at Pauley Heart Center are you most excited about?**

We have several exciting trials here. One is the PALS study, led by Alexander Lucas, Ph.D., which is determining how physical activity during cancer treatment impacts



Dr. Wendy Bottinor

outcomes. The study's team members are testing whether participating in physical activity classes or educational classes will help lymphoma or breast cancer patients preserve their exercise capability, heart function, brain-based activities (like memory) and quality of life during their

**“Our program has a highly collaborative and multidisciplinary approach that you do not find in many places.”**

treatment. Another study currently enrolling is the CASTOR-2 study, which is working to identify how thoracic radiotherapy for lung cancer impacts the heart. As for me, I am working to start a clinical trial using novel, innovative cardiac magnetic resonance imaging techniques to identify factors that contribute to the development of heart failure among survivors of cancer diagnosed in childhood, adolescence or young adulthood. As part of this study, I am also hoping to trial a medical intervention.

**Describe your research interests.**

I'm really interested in understanding factors that contribute to cardiovascular disease among survivors and how we can

improve cardiovascular health. For example, we are starting to understand that hypertension significantly increases the risk for heart disease among survivors. Another layer of complexity to this is, in general, people of African American ancestry are at risk for developing hypertension at a younger age when compared with their Caucasian counterparts. African Americans may also develop more severe hypertension and require more medications for blood pressure control. There are many questions to be answered in cardio-oncology and a lot that needs to be done to improve our understanding of the underlying processes leading to these disparities.

**When should cancer patients see a cardiologist?**

If a patient has a history of heart disease or medical issues that put them at higher risk of cardiovascular disease, we will often meet before they start cancer therapy to make sure their cardiovascular health is as optimal as possible. We will also follow them during therapy and into survivorship. Of course, there are also patients who are relatively healthy and lower risk for the development of cardiovascular issues. In this situation, we may not see the patient before they start cancer therapy, but we are always available if needed. ❤️

# Focus on adult congenital heart disease

## Sangeeta Shah, M.D., is working toward Virginia's first accredited adult congenital heart disease program

Adults born with structural defects in the heart must continue to manage their health throughout their lives. Sangeeta Shah, M.D., has dedicated her medical training and career caring for grown-ups who have previously undergone childhood heart surgery or other cardiac procedures and those born with syndromes associated with heart defects. Shah is the newest director of Pauley's Adult Congenital Heart Disease program, established in 2020. Her vision is to create the first accredited congenital heart disease program in Virginia to meet the needs of the growing ACHD population. We asked her for details.

### What are you trying to accomplish with the adult congenital heart program at Pauley Heart Center?

I am organizing a program to be the medical home for adult congenital heart disease patients, in collaboration with Children's Hospital of Richmond at VCU. I want to assist in their care so these patients can live long, healthy lives. Patients need three strong processes: (1) a transition program with a strong relationship between peds cardiology and ACHD providers, (2) high-risk obstetrics care and collaboration with maternal fetal medicine and (3) advanced cardiovascular care in cardiac interventions such as cardiac catheterizations, electrophysiology, mechanical circulatory support/transplantation and surgery.

### What is congenital heart disease, and what are examples of some diseases you treat?

Congenital heart disease is classified as simple, moderate or complex. Simple is something you were born with that needs to be followed systematically throughout your life that may or may not need an intervention. Moderate to complex could be something where you got an intervention as a child, and that intervention needs to be followed in a specific manner. Congenital heart diseases include D-transposition of the heart, which means that your heart vessels are reversed; single ventricles — somebody who's born with only a left side of the heart



Dr. Sangeeta Shah (right) meets with a patient.

or the right side of the heart; syndromes, such as Marfan or Turner, which are often associated with congenital heart abnormalities; outer maladies of the aorta or of the valves; AV canal defects; Ebstein's Anomaly, which is a malformation of the tricuspid valve; and Tetralogy of Fallot, a complex heart defect.

**"I'm always looking at what I can do to improve the patient's quality of life."**

### Why is there a need for a congenital heart disease specialty?

There are more adults with congenital heart disease living in the United States and the world than there are children with congenital heart disease. The population is increasing by 5% every year, and patients are now living into their 60s and even 70s. The specialty is needed because of the spectrum of abnormalities of your heart that can occur, the spectrum of different surgeries that occur in childhood and the need for understanding the complications that can occur in adulthood.

### Describe your research interests.

We know exercise is an important nonpharmacological tool, capable of

improving exercise capacity and associated with a reduction in cardiovascular morbidity and improved quality of life. Exercise has pleiotrophic effects and acts on multiple systems such as the CV, immune, skeletal muscle and nervous system. I want to understand how to optimize hemodynamics with the patient's known physiology.

### How will you conduct your research?

Once I have a more established CHD program, I would like to use a combination of cardiopulmonary exercise testing (CPET) with cardiac MRI pre- and post-exercise training. CPET is able to measure peak VO<sub>2</sub> and VE/CO<sub>2</sub> parameters of exercise efficiency and cardiac MRI is able to evaluate for hemodynamics and inflammation with mapping and delayed hyperenhancement. The research starts with the individual patient. For example, the single-ventricle patients fascinate me. They're 25 to 30 years old, and they have a single ventricle with a Glenn and Fontan procedure, generally. What do we need to do for this population so that when they're 40, 50 or 60, they're still doing well? What kind of exercise training program can we prescribe to improve their outcome? Is there a difference between aerobic versus strength training? ❤️

# Patient testimonial

## How a rare aortic aneurysm repair saved Latarsia

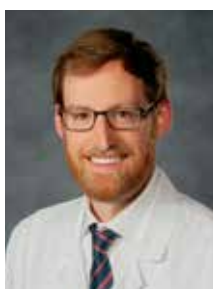
**Throughout her life, Latarsia Greene terrifyingly believed she would die young. Now, the 43-year-old is optimistic about the coming decades after receiving a lifesaving thoracoabdominal aortic aneurysm repair at VCU Health Pauley Heart Center.**

At the root of her fear was an extensive history of female first- and second-degree maternal relatives dying from complications related to brain and aortic aneurysms. At the age of 9, Greene's childhood was shaped by the loss her mother, age 36, due to a ruptured aneurysm.

"The year I turned 36, I didn't do much of anything because I was convinced I was going to die," she said.

When her sister died from a brain aneurysm at 43, the same age Greene received her surgery, "all that did was exacerbate my fears," she said.

Greene's nightmare caught up with her six years ago when she felt a "searing, burning pain" in her back near the kidneys. She was later seen at a Fredericksburg, Virginia, emergency room and was immediately transferred by helicopter to VCU Medical Center to receive specialized care, where physicians confirmed she suffered a tear, or dissection, in the inner layer of her aorta.



Dr. Daniel Newton

Dissections put aneurysms at greater risk of rupture, said VCU Health vascular surgeon Daniel Newton, M.D. "The wall of the aorta has multiple layers, and if it acutely stretches, there can be a partial tear," Newton said. "Blood flow is supposed to be contained within the inner layer. When it tears, you get blood flow in between the layers, and that weakens the vessel."

After close monitoring of the aneurysm for months, on March 30 Greene was operated on by Newton and VCU Health cardiothoracic surgeon Katherine Klein, M.D., with assistance from a VCU Health cardiac anesthesiologist, and specialists in neuromonitoring and blood perfusion. For

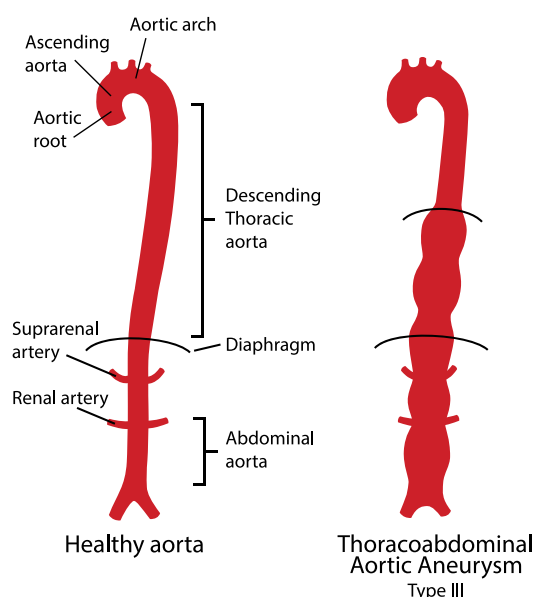


Latarsia Greene

eight hours, the team undertook the maximally invasive repair of the aortic aneurysm, which had a diameter roughly the size of a peach and spanned the length of Greene's abdomen into her chest.

"It's one of the biggest operations you can have," Newton said. "We lay the patient on their side so we can work behind the heart and abdominal organs. The incision goes from the tip of the shoulder blade, around to the front of the body and down to the hip."

Newton added that full open repairs are increasingly rare because stents, which can often be inserted through tiny incisions, are a minimally invasive solution. But because VCU Health geneticists say Greene's family history indicates she may have inherited a disorder that causes weak arterial tissue, stents were not an option because the devices can tear weak tissue.



Open surgery better ensured a lasting aortic repair for Greene, but risked damage to her brain, spinal cord and vital organs. The operating team preventatively monitored blood perfusion and electrical activity in the brain and spinal cord, and maintained blood pressure and blood flow to all vital organs. If changes had occurred, the team would have notified Newton and Klein, so they could change their approach, said Sam Ingram, a certified neuro-physio interoperative monitor on Greene's surgical team. Ingram monitored Greene's brain function.

"Surgery is a really big day. My job is to help protect everything after that day," Ingram said. "Are you a piano player? Do you have grandchildren to pick up? No one wants to come back from surgery not being themselves."

### Greene had a remarkably fast recovery from surgery.

The surgeons sewed a graft to the small portion of healthy aorta that remained in Greene's chest above the aneurysm, reinforced the device with felt and connected each branch to vital organs to the new graft. In all, eight reconnections were made to arteries from her chest down to the iliac arteries, located in the front of Greene's hips. In patients with normal aortic tissue, groups of vessels can sometimes be attached to the graft simultaneously, but Greene's weak tissue required surgeons to painstakingly attach the vessels one by one, Newton said. VCU Health Pauley Heart Center is one of the only facilities in Virginia with the expertise and equipment necessary for an open thoracoabdominal aortic aneurysm repair.

"She's not the only one of our patients going back to work after this type of surgery," Newton said. "I think that is from our technical choices and strong collaboration between vascular, cardiac, the intensive care unit and anesthesia that have given us some really good outcomes."

Greene had a remarkably fast recovery from surgery. "It saved my life," she said. "I feel that as long as I keep up with my after care and checkups and keep my blood pressure under control, I will be fine." ❤️





## Recruiting is underway for ADVENT clinical trial

**More than a year ago, Kenneth Ellenbogen, M.D., tested Farapulse Inc.'s new pulse-field ablation (PFA) device in its pre-clinical trial phase. Impressed by its safety and effectiveness, Ellenbogen, director of clinical cardiac electrophysiology and pacing at VCU Medical Center, knew the device would forever change the practice of ablation.**

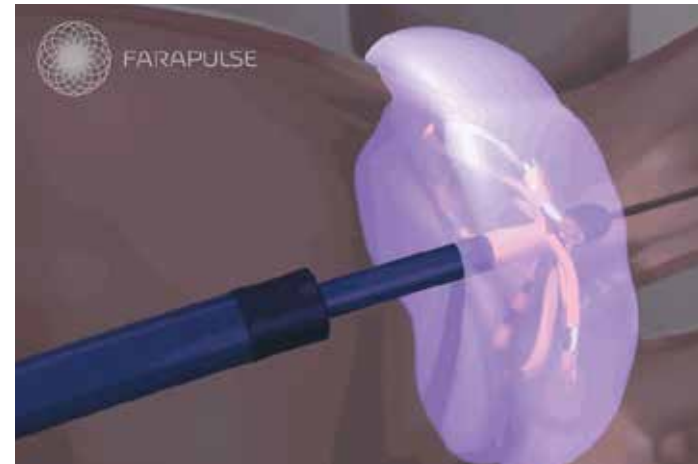
Today, Ellenbogen is a principal investigator for the ADVENT clinical trial to test the PFA against standard ablation methods. VCU Medical Center is one of 37 participating locations for the trial, which started this spring and will include about 350 patients.

Atrial fibrillation is a heart rhythm disorder that affects nearly 6 million Americans and makes them five times more likely to have a stroke than individuals with a regular heartbeat. When an abnormal heartbeat is not responsive to medication, doctors often recommend ablation to restore the heart to its normal rhythm. To stop the transmission of erratic electrical impulses, doctors apply extreme cold or

heat to the spasming heart tissue using a catheter guided into the heart through various blood vessels. This scars the tissue and prevents it from transmitting electrical impulses to the rest of the heart, returning the heart to its normal rhythm and function.

But applying extreme cold or heat to tissue inside the heart can sometimes damage healthy tissue in surrounding areas, such as the esophagus or major nerves. To address this need for a more accurate ablation technique, Farapulse created a new pulse-field ablation device that uses a localized electrical field to scar the spasming heart tissue. Based on consistent early data, PFA does not cause collateral damage to the surrounding tissue.

While traditional ablation methods including radiofrequency or cryoballoon cannot be focused enough to eliminate risk to normally functioning tissue, Farapulse's PFA reduces the treatment area in such a way that providers can treat very specific areas of cardiac tissue, leaving surrounding tissue unchanged. This is accomplished by conducting electricity through a specialized attachment at the end of a catheter. After



Farapulse Inc.'s new pulse-field ablation device

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the catheter is inserted into the heart, the strands of the attached conductor can be pushed out to form a bulb, and then flattened in the shape of a flower to better contact the tissue being treated.

With traditional methods of ablation, treatment of the affected tissue can take up to 30 minutes. But with Farapulse's PFA, tissue can be treated in a matter of seconds. A provider can ablate the left atrium and pulmonary veins in 15 minutes, and recovery times remain unchanged. ❤️

## Transplant surgeons to benefit from surgical suite

**The Department of Surgery in the School of Medicine has completed a 10-year planning and construction project that will consolidate their surgical lab spaces into a newly renovated 9,000-square-foot, multifunctional facility on the ninth floor of Sanger Hall.**

A leadership gift from Christine and David Cottrell of over \$1 million was donated to the Department of Surgery to advance the university's infrastructure for improvements in surgical innovation, research and education. More than \$3.2 million has been raised from philanthropy. In addition to the Cottrells' lead gift, the Pauley Family Foundation, Children's Hospital of Richmond Foundation, Richard and Dianne Nelms, Betty Ann and Lee Griffin, Thomas Brown and several other donors have provided significant support.

Pauley Heart Center transplant surgeons Vigneshwar Kasirajan, M.D., and Mohammed Quader, M.D., will use the Organ Reanimation Lab, a clinical/research laboratory designed to reanimate organs after circulatory death. Their goal is to sustainably recondition currently unusable hearts to a point where they can be used for transplant. Quader has a grant from the Department of Veterans Affairs to study reanimation of organs in patients who have expired in the emergency department. The Cottrell Surgical Innovation Suite is critical to his research. ❤️



# Faculty spotlight:

## Deepak Thomas, M.D.

**Deepak Thomas, M.D., MPhil, FSCAI, joined the Pauley Heart Center in 2015 as an assistant professor, specializing in interventional cardiology. He serves as medical director at VCU Health Colonial Square. He works downtown at the VCU Medical Center campus as well as serves patients in Petersburg, Hopewell and Colonial Heights, conducting peripheral vascular and percutaneous coronary interventions. He is board certified in interventional cardiology, general cardiology, echocardiography, vascular ultrasound and internal medicine.**

### **Why did you pick the field of cardiology, and specifically, interventional cardiology?**

There's something attractive about studying when things are quiet and then using that knowledge in hyperacute situations. If somebody's ECG shows that I'm needed, I'm glad I have the training to win the day.

### **How did your relationship with VCU Health Colonial Square start? What drew you to the Tri-Cities?**

My father-in-law, George Eapen, M.D., had trained under George Vetrovec, M.D., and was one of the founders of a private group in Colonial Heights. My wife and I had trained in medicine all over the U.S., and with two of our three children born during our medical fellowships at Barnes-Jewish Hospital in St. Louis, we thought best to come home to Virginia. I knew that mentorship was important, and who better than Dr. Eapen?

### **As medical director, what are your goals for Colonial Square?**

We strive to bring high-quality care to an area that remains disenfranchised. My personal mission is to bring patients from the Interstate 95 South corridor into the university for more evidence-based practice.

### **What's a typical week like for you? Describe your duties/routine.**

Work life is busy with both general call and STEMI (interventional) call, but I'm committed to our office practice for two full days a week in Colonial Square, with



Dr. Deepak Thomas with patient

the rest of my time usually best spent within the catheterization suite at VCU Medical Center. I make myself easily available to primary care within the Tri-Cities area and beyond, answering questions via phone and seeing patients whenever I can in both the inpatient/outpatient settings.

**“A successful day is when patients understand that I am listening — that I am a joint partner in their own success.”**

### **Do you have any research interests in the field of cardiology? If so, please describe them.**

While not a researcher, last year I was asked to join core faculty within the interventional section of cardiology at VCU. I study and listen attentively, eager for ways to integrate the latest in medicine into the nitty-gritty of real-world clinical practice and teaching. I train both interventional and general cardiology fellows within the apprenticeship model of modern medical education.

### **Do you have a personal philosophy or mantra that guides your work? If so, what is it and why?**

My practice philosophy within interventional cardiology is a little conservative — I would not call myself an “early adopter.” My hope is that my daily attention to labor shines through via the various metrics used to judge a cardiologist's career success. If a cardiologist is judged by volume of practice and outreach, then I think I succeed.

### **What does “a good day at the office” look like for you? What will you have done or achieved?**

A successful day is when patients understand that I am listening — that I am a joint partner in their own success. Even if I sometimes don't agree or have advice that is hard to hear, many patients know that I have their best interest in mind. Most of the people I see understand that I am not trying to be their friend, but a good doctor. Certainly, this isn't an argument-free path forward, but it helps me sleep at night.

### **Describe a patient encounter that made you say, “Here's why I keep doing this. Here's why my work matters.”**

It's still amazing to me that attention to detail can make all the difference. I remember recently working with a primary care doctor in the community to switch antidepressants owing to a potential side effect of hypertension. Sure enough, rather than adding more drugs, the change in antidepressant brought the patient to normotensive blood pressure values. This is one example how a not-so-exciting adjustment can have real implications.

### **How do you like to spend your free time?**

I run like I'm going for the ice cream truck. I wake up at 4 a.m. and run 10-15 miles daily, averaging 70-80 per week with long runs on weekends. I joined our Pauley cath lab book club recently and enjoy the exposure to different perspectives I would never appreciate otherwise. The rest of my time, I try to put my phone away and listen to my children as they learn and adapt to the world around them. ❤️



# Leadership transition

## Ellenbogen steps down as chair of Division of Cardiology after more than a decade in the role

**Kenneth Ellenbogen, M.D., has stepped down as chair of the Division of Cardiology. He served as chair for 11 years and vice chair for seven years. He will continue to serve as the director of clinical cardiac electrophysiology and pacing at VCU Medical Center.**

Ellenbogen was integral in the foundation and development of Pauley Heart Center. He has been an inspirational and influential leader, gaining Pauley’s Division of Cardiology international recognition for its excellence and contribution to cardiovascular health, publishing over 600 manuscripts and 10 textbooks. He has mentored hundreds of professionals while also attracting significant donor support, leading numerous clinical trials and lecturing all over the world.

As a researcher, he is responsible for the largest international ongoing clinical trial of the WATCHMAN device and serves as principal investigator on more than 100 grants and contracts. He serves on the Board of Trustees for the Heart Rhythm Society and numerous editorial boards.

In recognition of his outstanding achievements in clinical cardiology, Ellenbogen was named the VCU Health MCV Campus Clinician of the Year for 2001.

“Ken has been my closest mentor and has challenged us to rethink how we practice cardiovascular medicine and cardiac surgery,” said Vigneshwar Kasirajan, M.D., professor and chair of the Department of Surgery. “His impact goes far beyond cardiovascular sciences in this institution with global impact across research, education and clinical care for more than 20 years. He is also tremendously kind and caring. Truly one of the immortals.”

Ellenbogen joined the VCU faculty in 1986 and earned the rank of full professor of medicine in 1997. In 2015, the Heart Rhythm Society awarded him the Distinguished Teacher Award, and in 2018 he was awarded the American College of Cardiology Simon Dack Award for Outstanding Scholarship. In 2020, he received the VCU School of Medicine Distinguished Mentor Award.

“When I think about my tenure as chair, the best part for me has been the opportunity to be surrounded by so many talented and spectacular individuals, from faculty to fellows, nurse practitioners, nurses, researchers, administrators/support staff and all the personnel who support our mission on a daily basis,” Ellenbogen wrote in a letter to his peers. “I am looking forward to focusing on clinical care and clinical research, and continuing to expand



.....  
**Dr. Kenneth Ellenbogen**

our electrophysiology program. I will continue to work hard and collaborate with the many talented amazing people we have in our division for many more years.”

Greg Hundley, M.D., has accepted the role of chair of cardiology and will continue to serve as director of Pauley Heart Center, a position he has held since 2018.

The transition was effective July 1. ❤️

# People on the move

## We’re excited to announce the following promotions:

**Hem Bhardwaj, M.D.**, has been appointed vice chair of operations and quality. Bhardwaj demonstrates an exceptional commitment to the quality and patient safety that we provide to our patients, which helps improve their overall experience while in our care. In her new role, she will serve as our team’s leader of all things related to operations and quality.

**Carrie Mills, M.S.**, has been named senior director of development. Since joining Pauley in January 2017, Mills and her team have helped raise more than \$22.5 million to fund new research, equipment, faculty endowments and more. This position collaborates closely with leadership and development colleagues at the MCV Foundation, Massey Cancer Center and central VCU Development and Alumni Relations.

**Congratulations to them both!** ❤️



.....  
**Dr. Hem Bhardwaj**



.....  
**Carrie Mills**

**Letter from the director**

**Veterans Day is Thursday, Nov. 11. Pauley Heart Center's decades-long relationship with the Department of Veterans Affairs is an immense source of pride, so we're excited in this issue of The Beat to showcase our affiliation with the Central Virginia VA Health Care System (CVHCS) in Richmond. In our cover story, you'll meet the dedicated providers and researchers bettering the lives of veterans, a population that has higher-than-average rates of diabetes and heart disease. What's more, you'll hear straight from our CVHCS team members about what makes this affiliation so personally and professionally meaningful.**

On Page 6, we introduce you to Kevin Harris, Ph.D., the VCU School of Medicine's inaugural senior associate dean for diversity, equity and inclusion. His recent Internal Medicine Cardiology Grand Rounds presentation on diversity within the field of cardiology gave us a lot to think about. More than a discussion on the demographics of cardiology, the presentation explored how diversity within cardiology might play a role in health outcomes and heart-related health disparities. We'll continue to talk about these ideas in the coming months and be guided by Dr. Harris' wisdom as we develop policies and programs that promote diversity, equity, access and inclusion in our division.

This issue, we also spotlight three new service areas for Pauley: cardio-oncology, sports cardiology and adult congenital heart disease. Cardio-oncologist Wendy Bottinor, M.D., discusses the relationship between cardiac health and cancer treatment, while sports cardiologist Naveed Naz, M.D., shares tips for athletes navigating COVID-19 during physical training. You'll also hear from Sangeeta Shah, M.D., whose vision to create the first accredited congenital heart disease program in Virginia will help meet the needs of the growing ACHD population.

We're always looking for ways to improve access to cardiac care. Outside of Richmond, we're expanding our reach with new clinics and new providers. Read about our Tappahannock and Williamsburg locations on Page 8 and the physicians immersed in those communities on Pages 12-13. Two of them whom we profile came out of retirement to join our team. That's dedication!

Of course, none of our work would be possible without the support of donors. We were deeply saddened to learn of the recent passing of Dorothy Pauley, wife of the late Stan Pauley. The Pauley Family Foundation's exceptional generosity over the past 15 years has helped elevate the VCU Health Pauley Heart Center to national prominence. Today, we're a leader in so many areas of cardiac care because of Dorothy and Stan's foresight and generosity. A lovely tribute to Dorothy can be found on Page 7.

I hope you'll enjoy these stories and more in this issue of The Beat.

Sincerely yours,  
Greg Hundley, M.D.



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**HOW TO MAKE A GIFT**

Gifts to VCU Health Pauley Heart Center allow us to invest resources in transforming patient care, education and research. For more information on how to honor a loved one or a caregiver, please contact Carrie Mills at (804) 828-0453 or [carrie.r.mills@vcuhealth.org](mailto:carrie.r.mills@vcuhealth.org).

