The Beat

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PAULEY HEART CENTER

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Celebrating 50 Years of Heart Transplantation

On the afternoon of May 25, 1968, something mysterious was taking place on the 11th floor of MCV's West Hospital.

An elevator operator was prohibited from taking visitors to the floor, which was secured by guards.

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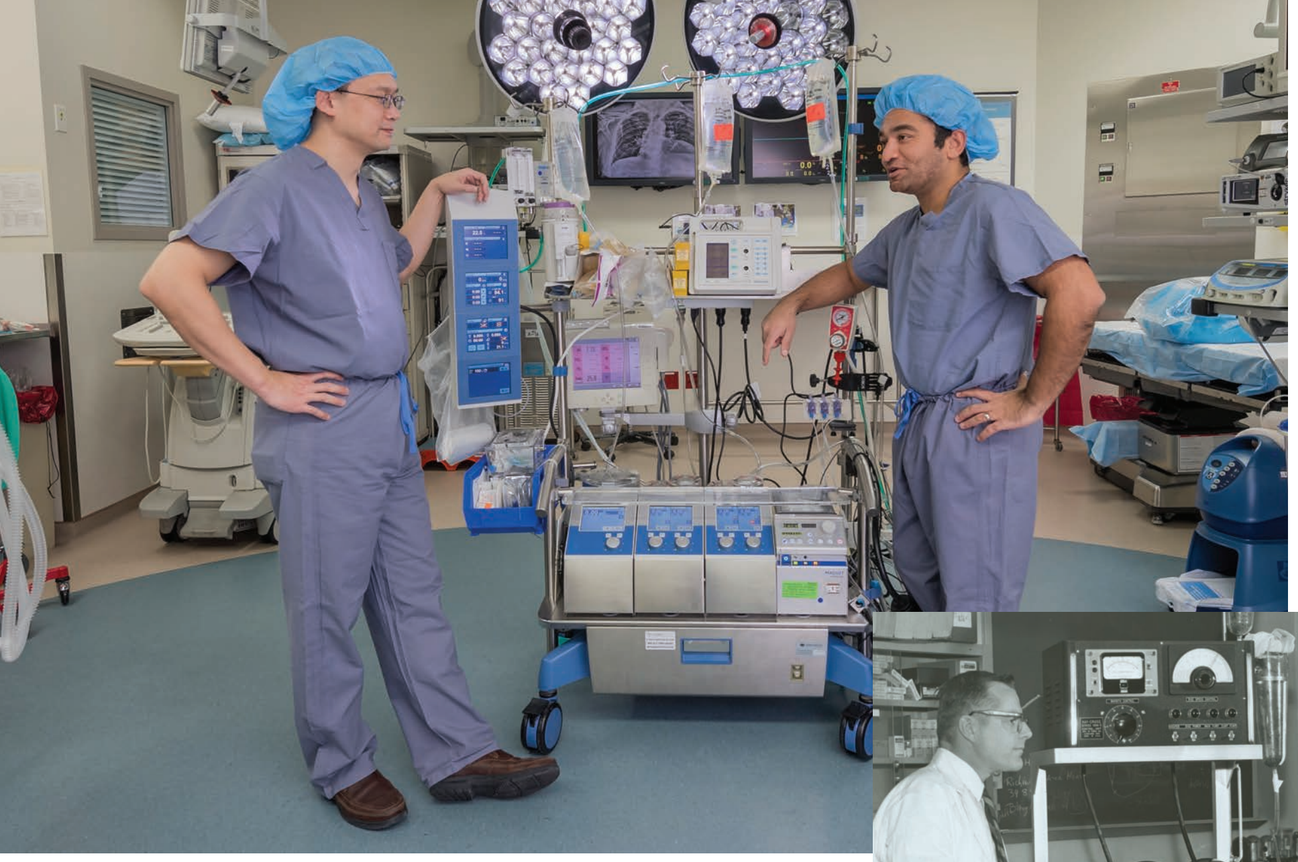
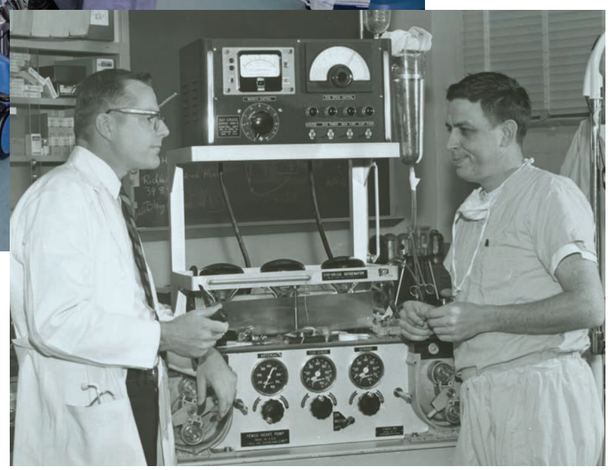




From a landing on the stairwell outside the 11th floor, reporters caught glimpses of doctors in nurses in blue surgical scrubs moving rapidly down the corridors when the guards would briefly open the stairwell doors to let in interns and other hospital personnel. Later, they would learn that pioneering surgeon Richard Lower, M.D., had performed the first cardiac transplant in Virginia—just the 16th in the world.

Fifty years later, Lower's legacy continues in the innovative work of the VCU Health Pauley Heart Center, where 581 cardiac transplants have since taken place. While today the procedure is more commonplace—no reporters hunkering down in the stairwells—the event of human cardiac transplantation remains no less extraordinary.

"If you look at the trajectory, transplants are up 50% in just three to four years. Three-fold from eight years ago. It's a growing program with excellent outcomes," said Keyur Shah, M.D., Director of the Advanced Heart Failure and Transplantation Program.

Chairman of the Department of Surgery Vigneshwar Kasirajan, M.D., maintains his office on the 16th floor of the storied West Hospital. A cardiothoracic surgeon, he holds great respect for the physicians who developed MCV into one of the first and foremost centers for organ transplantation—Lower, as well as David Hume, M.D., H.M. Lee, M.D., and others.

"They were giants in the field," he said, sitting at a conference table in an alcove off his office. At the same time, he is excited about recent developments. "I want to talk about what's been going on at VCU over the past few years and what's ahead in the future for heart transplantation."

The VCU program is experiencing a time of significant growth. In 2016, the hospital's surgical teams performed 30 heart transplants, and were anticipated to complete between 25 and 30 of the operations in 2017. The numbers include heart-kidney and heart-liver transplants.

"If you look at the trajectory, transplants are up 50% in just three to four years. Three-fold from eight years ago. It's a growing program with excellent outcomes," said Keyur Shah, M.D., Director of the Advanced Heart Failure and Transplantation Program.

According to Kasirajan, "about 60-70% of VCU transplant patients are still alive and fully functional after 10 years."

At the same time, the transplant program is limited in its growth by the inadequate supply of donor hearts. On any given day, about 4,000 people in the U.S. are on the wait list for a human heart, but only 2,300 donor hearts are available each year. The wait time can range from 6 months to one year. Despite the greater public awareness of the need for organ donors, the shortage has remained constant for some time. But Kasirajan, Shah and others are not satisfied with the status quo—instead they keep pushing for new solutions to improve and extend the lives of patients in need of cardiac transplantation.

"The biggest thing that has happened with transplantation at VCU over the last few years is the development of a comprehensive advanced heart failure and mechanical assist device program unde the leadership of Drs. Keyur Shah, Richard Cooke and Daniel Tang," said Kasirajan.

ABOVE: DANIEL TANG, M.D. (LEFT) AND KEYUR SHAH, M.D., WITH A MODERN HEART-LUNG BYPASS MACHINE; BELOW RIGHT: RICHARD LOWER, M.D. (LEFT) WITH RICHARD CLEVELAND, M.D., WITH ITS PREDECESSOR: THE PEMCO HEART PUMP.

"The biggest thing that has happened with transplantation at VCU over the last few years is the development of a comprehensive advanced heart failure and mechanical assist device program under the leadership of Drs. Keyur Shah, Richard Cooke and Daniel Tang," said Kasirajan.

Mechanical assist devices such as heart pumps and total artificial hearts are "bridge-to-transplants" that can buy time for patients with advanced heart failure until a donor heart becomes available.

The 1990's saw the boom of the left ventricular assist device. In 1994, Heart Mate I became the first such device approved by the FDA; VCU implanted one that same year.

"Older LVADs were large, noisy and were only available to larger-sized people with large thoracic cavities," said Shah. Today, LVADs can fit in the palm of the hand, and can be implanted in those of a slighter stature. "They're smaller, quieter and they've become more durable and longer lasting."

Another game-changer was the total artificial heart. In 2006, a surgical team led by Kasirajan implanted the first total artificial heart on the East Coast at VCU. Today, the program is the third largest in the country.

About 50 LVADs and total artificial hearts are implanted in patients at VCU each year. "The introduction of contemporary LVADs and the total artificial heart has been nothing short of revolutionary," said Shah. "Prior to their development, patients would often die while waiting for the heart transplant list. Now, these patients who are critically ill can live for a long period of time, with a good quality of life, on these mechanical devices."

Six clinical researchers take part in the busy heart failure program that prides itself on remaining at the cutting edge of device and pharmaceutical research.

"We have participated in clinical trials to implant devices through smaller incisions and are looking forward to participating in a study, hopefully this year, that will evaluate the smallest LVAD we've ever implanted in a person," said Shah. "It's been studied in Europe, but this would be the first U.S. trial."

Another study soon to come is that of the Carmat heart, which was designed by noted French cardiologist and valve designer Alain Carpentier, M.D., Ph.D., in conjunction with EADS, the company behind aerospace leader Aerobus. Dubbed the world's first self-regulating total artificial heart, the device uses embedded sensors and microprocessors to attune the rate of blood flow to patient needs—beating faster during exercise, for instance. It's also designed to be more biocompatible, with bovine pericardium tissue on all surface areas that contact blood. This pump is electrically powered and has a quiet operation.

According to cardiothoracic surgeon Daniel Tang, M.D., "this would be the first U.S. trial for the device. They've done seven patients so far but none in the U.S. Our successful trials with SynCardia [another TAH manufacturer] is why Carmat reached out to us."

Is it possible to stop or even reverse heart failure before it progresses? That's a question that will be explored via a new trial that will soon begin in the cardiac catheterization lab. Zachary Gertz, M.D., director of the Structural Heart Disease Program, is investigating a therapy that may repair tissue damaged by heart attacks.

"We are about to be involved the first real pivotal trial of interventional stem cell therapy," said Gertz. Now in its third phase, the trial involves the injection of stem cells, a class of undifferentiated cells that can morph into other cell types and renew indefinitely.

"When you have a heart attack, a piece of heart muscle dies and it scars. There's also this rim around it called the peri-infarction zone, which is also not getting good blood supply or working that well," he explained. "The idea is that by injecting stem cells directly into this peri-infarct area, you might encourage that heart muscle to work better and improve the patient's outcomes."

Known as CardiAmp Therapy, the process begins by taking bone marrow out of a patient's hip and placing it in a spinning device called a centrifuge. "This will give us back just the best cells, the ones we want to use," he said. Those healthy cells will be transported to the heart by way of a catheter placed in the upper thigh. "There's a second catheter that screws into 10 spots in that region encircling the area where the heart attack occurred. You can then inject the cells into each of those spots."

The trial covers some potentially groundbreaking territory. "We're going to encourage the reinvigoration of nearly dead heart muscle. No one's been able to ever really do that before," he said. "If it works, it will be pretty amazing."

"Dr. Lower's research and clinical efforts, before the first transplant, during the early days, and for decades afterwards, shaped the field of heart transplantation. It affected things from surgical techniques to early immunosuppression, and he defined how to detect rejection and address complications after transplant. He and Dr. Szabolcs Szentpetery were involved in the first long-distance procurement of the heart—and the list goes on and on," said Keyur Shah, M.D.

Sadly, since Lower's time, little progress has been made in heart preservation, said Kasirajan. A heart can still only be stored for three to four hours. "There are 30 hearts that are discarded every year in Puerto Rico because they're never used for transplantation. I can't transfer a heart from Hawaii to the U.S., even if it's the best match for a patient," he said.

VCU's new Christine B. and David E. Cottrell Surgical Innovation Laboratory will be created with the intent of not only improving heart preservation but also expanding the available donor pool. A $1 million donation by the Cottrells provided the lead gift as the Department of Surgery aspires to raise $4 million for the modernization and expansion of the 9th floor of Sanger Hall, to include sophisticated labs and operating rooms for training, as well as space ideal for testing and implementation of new devices developed by private industry. An additional $4 million is being raised for an endowment to fund such research in perpetuity.

"The Cottrells' gift is allowing us to continue to develop our space as a center for excellence for innovation in surgery and help our physicians really bring from the research arena into the clinical practice exciting new innovations in preservation and heart transplantations," said Kasirajan.

The new lab will support the work of researchers like cardiothoracic surgeon Mohammed Quader, M.D. who is focusing on Donation after Circulatory Death—or "DCD"—hearts. "These are the hearts donated by individuals whose life support has been withdrawn due to futile outcome; they sustain cardiac arrest during this process," said Quader. Currently, these hearts are not used for transplantation, "other than in maybe two or three centers in the world, that too on a very small scale."

Brain death donors, who are the current standard heart donors for transplantation, continue to have blood flow to the heart even after pronouncement of brain death. They are the current standard heart donors for transplantation. When blood flow ceases to the heart and cardiac arrest ensues, as it does in the DCD process, the heart sustains cellular damage.

Researchers at VCU hope to halt that process. Quader is the principal investigator of three different research grants and leading teams focused on mitigating the ill effects of DCD heart injury. In collaboration with Stephano Toldo, Ph.D., he has successfully developed an animal DCD heart model and gathered fundamental data to further the study of DCD outside of the body. Through a Pauley Pilot Grant, he is comparing three different preservation solutions to determine which one will protect the DCD heart the best. Finally, with Edward Lesnefsky, M.D., he received a four-year Merit Review Grant through the Hunter Holmes McGuire VA Hospital to study a drug that temporarily paralyzes the mitochondria of DCD cells in an animal model to prevent cellular damage.

His passion for finding alternative sources of heart donors is driven by the patients he sees every day, especially those who awaiting donor hearts. "I take care of these patients. Not being able to use a DCD donor heart, which I feel has the potential to be used successfully, bothers me," said Quader. "If I can make these hearts available for transplantation, the future will be better for our patients."

Medical Team Helps Patients, Trains Physicians in India

PHOTOGRAPHY BY KELLY KINSEY PHOTOGRAPHY

CLOCKWISE FROM LEFT: 1) IN AUGUST, DR. JAY KONERU AND NURSE PRACTITIONER CHARLOTTE ROBERTS WERE HONORED AT THE SILVER JUBILEE CELEBRATION OF THE SRI VENKATESWARA INSTITUTE OF MEDICAL SCIENCES IN TIRUPATI, INDIA. 2) KONERU AND ROBERTS CONSULT WITH THE LOCAL MEDICAL STAFF. 3) THE VCU STAFF OFTEN WORKED 14-HOUR DAYS ATTENDING TO EP AND ICU PATIENTS OF THE WEEKLONG CLINIC. 4) ROBERTS ENJOYED PARTICIPATING IN ROUNDS AND TRAINING WITH THE SVIMS NURSES.

Jay Koneru, M.D., and Nurse Practitioner Charlotte "Cha" Roberts recently traveled to Tirupati, India, to help patients and provide training to local doctors and nurses. Here, they provide an account of the trip.

After traveling for the better part of a day and a half, our team from VCU arrived in the bustling town of Tirupati, Andhra Pradesh, India–home to the Tirumala Venkateswara Temple, and one of the holiest Hindu sites in all of India. The Eastern Ghats and the Tirupati Seshadri Hills are an Eparchaean Unconformity, representing a geologically remarkable epoch of serenity in the tectonic movements and orogeny of the Asian subcontinent. When our small plane landed in these peaceful hills, we had little inkling of what was in store for us over the next week.

The Vice Chancellor of the Sri Venkateswara Institute of Medical Sciences (SVIMS), Dr. Ravi Kumar, and Chair of the Division of Cardiology Dr. Durgaprasad Rajasekhar had brought us here as part of a celebration of the university's 25th anniversary. We were to lead an intensive workshop for cardiac EP and cardiac ICU care geared towards advanced heart failure and resuscitation therapies. The Pauley Heart Center and the leadership of Dr. Vigneshwar Kasirajan and Dr. Kenneth Ellenbogen enthusiastically supported the idea of collaboration with the institute. The planning was initiated six months in advance.

The day after our arrival, we attended the Silver Jubilee. The Vice President of India inaugurated three state-of-the art facilities specifically built for the advancement of women in medicine. We were humbled when he conferred to us visiting Professorships in Nursing and Medicine.

The week was filled with EP procedures and rounds with the medical and nursing teams in the hospital. ICU rounds, educational lectures, numerous ablations including Ventricular Tachycardia ablations, and pacer and defibrillator implantation with rudimentary tools constituted our daily routine. Every working day seemed short for us, despite 14-hour work days.

We were impressed with the quality of care that was being delivered. While the resources, especially technological resources are significantly less than those in the U.S., the patient care outcomes are excellent. The nurses and physicians were eager to learn that the care they were delivering was consistent with the standards in the U.S.

As Coronary ICU practitioners, we were particularly interested in the care of patients with acute myocardial infarctions. SVIMS performs over 300 primary PCIs a year. While we were in the cath lab, we had the opportunity to see one of these cases. With far different tools, the average door-to-balloon time is 56 minutes, a metric that would make any hospital in the U.S. proud.

Our visit also gave us a glimpse of the expanding role of Indian women in healthcare. From the Women's School of Medicine and its wall dedicated to all the female Nobel prize winners to the joy and serenity of the Child Care Center which is free for all the staff, there is a new and critical focus on empowering women. We also witnessed the ever-present spirituality, humility and charity of this institution. Each day in the main hospital courtyard, there is a "soup line" that serves a hot meal to all of those in need.

Despite Tirupati being a serene zone for seismic activity, this mission has generated tectonic thoughts and emotions for all of us who participated. The VCU/SVIMS collaboration is still in its infancy, but more trips are being planned. The next focus will be the advancement of advanced heart failure services and the development of a cardiac transplant program. We are hopeful that in the future some of the SVIMS staff will also be able to spend time with us at VCU.

Welcome, New Faculty!

Nayef Abouzaki, M.D., has joined the faculty of VCU Health Medical Center as an interventional cardiologist. He is board certified in Internal Medicine, Cardiovascular Disease, Echocardiography and Nuclear Cardiology. His areas of interest include coronary artery disease, chronic total coronary occlusions, acute cardiogenic shock, peripheral artery disease, and inflammation and the heart.

"The culture of innovation and research, along with partnership with great faculty, are some of the characteristics that attracted me here," he said.

He received his M.D. from Eastern Virginia Medical School, where he was elected to the Alpha Omega Alpha Honor Society, then completed his residency and fellowships in both Cardiovascular Disease and Interventional Cardiology at VCU.

"I knew Nayef was special from the first day I met him on rounds in the Coronary ICU. He was very knowledgeable and always prepared, and most importantly, the best patient advocate one could be," said Antonio Abbate, M.D., Ph.D. "We are very lucky to have him on faculty now."

Santosh Padala, M.D., joins the faculty of VCU as a cardiac electrophysiologist. He is board certified in Internal Medicine, Cardiology, Echocardiography, Nuclear Cardiology and Cardiac Electrophysiology.

"Dr. Padala's clinical interests are wide ranging and focus on advanced ablation and trying to measure the outcome of catheter ablation. He is an amazingly talented electrophysiologist and we look forward to seeing him make important contributions to patients with cardiac arrhythmias," said Dr. Kenneth Ellenbogen

Padala completed his medical degree and internship at Kamineni Institute of Medical Sciences in Telangana, India, and his residency at University of Connecticut Health Center. He completed a fellowship in Cardiovascular Disease at Albany Medical Center, then in Clinical Cardiac Electrophysiology at VCU. He received the 2017 Outstanding Fellow Award.

"I would, without any reservations, say that VCU is one of the best places in the nation for Cardiac Electrophysiology training and patient care," he said. "I am very fortunate to be a part of this wonderful team."

Jeremy Turlington, M.D., has joined VCU Health Medical Center as a non-invasive cardiologist, with a special interest in Critical Care Cardiology. He primarily attends to patients in Coronary Intensive Care Unit, reads echocardiograms and electrocardiograms, and sees outpatients. He is board certified in Cardiovascular Disease and Internal Medicine.

"Dr. Turlington's training and experience make him one-of-a-kind here at VCU. I have watched Jeremy excel in his fellowships and I am excited to work alongside him as a colleague," said Hem Bhardwaj, M.D.

Turlington received his M.P.H. and his M.D. from Eastern Virginia Medical School then completed his residency and two fellowships (Cardiology and Critical Care) at VCU. He was named Chief Resident and Chief Cardiology Fellow and received the Ohran Muhren Award for Outstanding Fellow.

"I have done all of my training here, and because of this, I feel a real bond to VCU," he said. "I was given a unique opportunity to train in critical care as an extension from cardiology, and skills like this I think are best utilized in a large, academic, tertiary care facility. So, what better place than VCU?"

2017 Best Bedside Manner Award

Congratulations, Dr. Kasirajan!

OurHealth Richmond and CBS 6 recently honored Vigneshwar Kasirajan, M.D., Chair of VCU Department of Surgery, with a "2017 Best Bedside Manner Award." He received 1st place in the category of Cardiac Surgery. This is the third year that readers of the publication selected Kasirajan for the top award, which recognizes medical providers for their kindness, empathy and attentiveness. Winners were announced in the December 2017 issue of the magazine.

"Good bedside manners are a reflection of the compassion and care for our patients and is an essential part of being a physician. We must make patients feel comfortable at their most vulnerable time with an illness," Kasirajan told *OurHealth Richmond*.

3rd Annual Heart Health in Women Symposium

Exploring Women's Heart Health

VCU Pauley Heart Center will host the third annual "Heart Health in Women Symposium" at the Virginia Historic Society on Saturday, Feb. 3, from 7 a.m. to 12:15 a.m. The event is co-chaired by cardiologists Phoebe Ashley, M.D., and Jordana Kron, M.D., and is targeted to medical professionals. Participants will receive Continuing Medical Education credits.

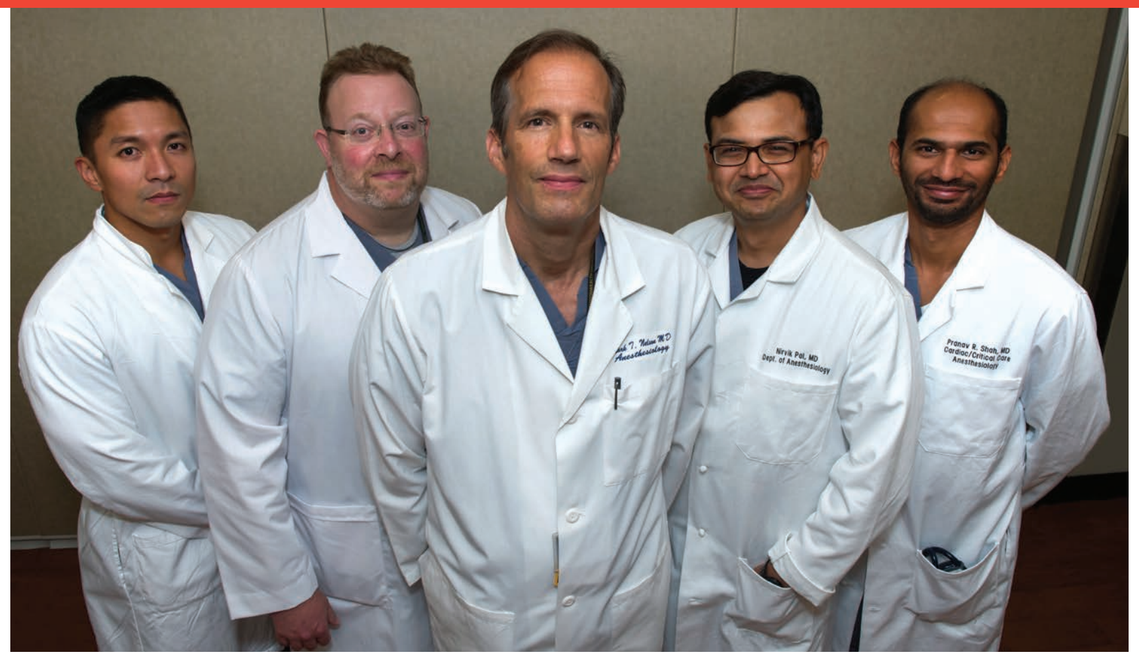
At the event, VCU faculty and community experts will present the latest findings for women with heart disease. Topics include diabetes, valvular heart disease, peripheral arterial disease, carotid artery disease, obstructive sleep apnea, and a presentation of cases from the Cardiovascular Genetics Clinic.

Last year's symposium drew an audience of 70 physicians, nurse practitioners, physician assistants and nurses.

"Past participants have been very pleased with the highlight of women's cardiovascular health and the nuances therein," said Ashley. "We have had wonderful, very positive feedback about the conference, with some participants even suggesting we move it to a full-day event."

Read more online at vcuphc-thebeat.org.

Beyond the Red Lines: Meet the Cardiac Anesthesia and Perfusion Teams



LEFT TO RIGHT: AARON LIM, M.D., JEFFREY GREEN, M.D., MARK NELSON, M.D., NIRVIK PAL, M.D., PRANAV SHAH, M.D.

Mark Nelson, M.D., and Harry "Mac" McCarthy, CCP, work in a carefully protected world, separate from the rest of the hospital. The public elevator to the Critical Care Hospital of the VCU Medical Center jumps from the 4th to the 6th floor. To get to the 5th floor—the surgical suite—visitors must take a separate elevator, tucked away behind a locked door that requires special accessibility.

Upon arrival to the floor, visitors are asked to wear sterile coverings–a white "bunny suit," along with slippers and a cap. Once they are zipped up and ready, they can step over the red lines that designate the surgical areas. It is here that Nelson and McCarthy direct the cardiac anesthesia and perfusion teams.

Normally the 5th floor lunch room is quiet, but today a large group of co-workers are gathered to celebrate someone's last day. VCU Pauley Heart Center's Chief of Cardiothoracic Anesthesiology **Mark Nelson, M.D.** is sitting at a nearby table. Dressed in blue scrubs, Nelson is friendly and patient. Although the room grows a little noisy, he smiles, appreciating the camaraderie. Amidst the busyness of the room, he stays focused on the interview questions. When he talks, he sometimes pauses to find the exact, precise word.

Precision and focus are integral parts of Nelson's job. He and his seven-member team carefully measure and control the anesthesia that they give to 800 cardiac patients each year. Some have rhythm problems or blockages, others have structural defects or advanced heart failure. Almost all require general anesthesia.

Working in a tertiary medical center, he sees many high-risk patients. "Our surgeries often involve complex procedures including partial and total artificial hearts and other forms of artificial circulation to stabilize the patient," he said. "The margin of error in care provided is narrow as the patients are already severely compromised by their cardiac disease at the time of surgery."

Nelson's work begins with a review of the patient's medical records and surgical plan. Sometimes allergies are noted in the history. Reactions are rare, he says, but when they happen, they can be controlled with other medications. Nelson enjoys meeting the patients and calming any anxiety they may have.

During surgeries, Nelson carefully monitors the patient's respiratory and cardiac status, tweaking the dose or adding supplemental medications if problems arise.

"Anesthesia, in general, depresses cardiac function, and so these patients require additional efforts by the anesthesiologist to create good outcomes," he says.

Nelson also makes expert evaluation of the heart both before and after the repair procedure, using transesophageal echocardiography. This involves inserting an ultrasound transducer endoscopically—that is, via a long, thin tube—through the esophagus.

"It was anesthesiologists who pioneered this technique in the 1980s, which is now standard of care for many cardiac procedures," he said. All faculty members in his division have advanced certification in this area.

Patients sometimes require blood and/or blood component transfusions. In addition to the anticoagulation necessary for cardiopulmonary bypass, the obligatory inflammatory response can result in substantial bleeding post-op.

"These blood issues are managed with advanced methods of assessing clotting status and administration of clotting factors following cardiopulmonary bypass. The heart is often stunned or sluggish and will require additional medications to restart appropriately," he explains. "This is often very challenging."

"Dr. Mark Nelson has brought a world class level of expertise, clinical experience, knowledge and rigor to cardiac anesthesia. He is an immensely talented individual who is a master at working with different teams of cardiology professionals. He has given VCU a top-tier cardiac anesthesia team."
— Kenneth Ellenbogen, M.D., chair of the Division of Cardiology

"Probably the most common question we encounter as cardiac anesthesiologists is, `Are you going to put me to sleep?' Well, the cardiac anesthesiologist is going to do that, but much, much more."

"Harry McCarthy – `Mac' as he is known to the team—is the Man. When I joined the program 17 years ago, I knew this was going to be a great program with the outstanding perfusion group led by Mac. With his help, we went to modern blood conservation, novel methods of cardioplegia, switching to vacuum assist, expanded the extracorporeal membrane oxygenation program, developed the total heart program and many other innovations…The perfusion team is the key to cardiac surgery."
—Vigneshwar Kasirajan, M.D., chair of VCU Department of Surgery

LEFT TO RIGHT: GEOFF HALL CCP, ADAM BLAKEY CCP, HOLLY WILSON-LETTS CCP, MAC MCCARTHY, CCP, LISA ALTOMONTE CCP

Though the job is intense, he wouldn't have it any other way. "Being a team member in this endeavor is very rewarding and seeing the patient complete the operation, leave the ICU, and ultimately leave the hospital with a repaired, mechanical or new heart is an extraordinary experience."

"Heart surgery would not be possible without the help of Dr. Nelson and his team. They are an integral part of every cardiac operation, and by far, some of the best physicians in the health system. I would let any one of them care for me or my family."
-Anthony Cassano, M.D., chair of the Division of Cardiothoracic Surgery

Chief Perfusionist **Harry "Mac" McCarthy, CCP,** walks briskly down the 5th floor hallway. He is a slim man dressed in scrubs and a patterned surgical cap that ties in the back. He slips on a mask before he pushes open a door to an operating room, which is between surgeries. A few team members mill about, setting things up. It's down time, and MGMT plays on the radio. Rolled against a wall, underneath a thick, plastic cover, is a stainless-steel console with tubing and pumps. On this surgical floor, one heart-lung bypass machine is kept powered up, 24 hours a day.

"Your blood perfuses your tissues and your organs, so your blood right now is perfusing your brain, your kidneys, your heart and lungs," he says. "When your heart is stopped, you need something to take over the perfusion."

He explains that when a patient requires cardioplegia—a solution given to cause the intentional stopping of the heart for surgery, using a high potassium solution—a cardiopulmonary bypass machine fills that need. The machine draws the patient's blood out of a body to a reservoir, then to a pump, then into an oxygenator where oxygen is added into the blood, and carbon dioxide is removed. Then, it's returned to the patient.

He says the blood leaves the body by special tubing—known as a cannula–that connects to the right atrium; the blood returns to the body by a cannula that connects to the aorta. The direct connections allow the blood circulation to bypass the heart, creating as bloodless a surgical field as possible.

"The surgeon can then operate on a relatively motionless heart and can open the chambers of the heart to repair the structures within," he says.

McCarthy points out a rolling console with a canister, which stores blood collected during and after surgery in cases where a lot of blood loss is anticipated. The collected blood is rinsed and filtered prior to being reinfused back to the patient. He also operates various cardiac assist devices that the patient may require during surgery.

"What we do, in essence, is operate a number of pieces of mechanical equipment to approximate what the patient's heart does to continue the circulation while the heart is stopped."

In addition to tending to surgical patients, McCarthy also operates extracorporeal membrane oxygenation (ECMO) pumps for those who need life support because their heart and lungs are not able to sustain them. The work brings him to the bedsides of patients across the state, who are brought to VCU by a special helicopter or MOBI, a mobile intensive care transportation rig.

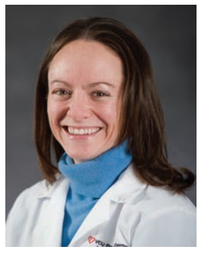
VCU Health has six heart-lung bypass machines. About 80-90% of the cases are scheduled, while 10-20% are emergencies. Ten perfusionists handle the 800 adult and pediatric cases each year, of which 420 involve cardiopulmonary bypass. They also help with an additional 60-90 ECMO cases each year.

A perfusionist since 1979, McCarthy has seen a variety of changes, including improvement of safety features, miniaturization, and more computerization. Additionally, "innovations in the cath lab have reduced the number of patients that come to the operating room with coronary artery blockages. So, the patients that we get tend to be sicker than those from previous years and have more co-existing problems."

He saw his first transplant in the early 1980s; even today, "there's always a feeling of accomplishment when the new heart starts to beat."

"You can't say enough about Mac as well as the entire perfusion team. They are always enthusiastically accommodating in their role with respect to providing support for the cardiac surgery team. Also, they are extremely involved and supportive in the growth of our in-house, as well as our Mobile ECMO and other outreach programs," said Patricia Nicolato, D.O., director of the Adult ECMO Program.

Kron Targets Cardiac Sarcoidosis



Sarcoidosis involves the growth of granulomas—small clumps of inflammatory cells. The granulomas most commonly appear in the lungs but can form in almost any organ, including the heart. The inflammation can ultimately lead to fibrosis, or scar tissue, which can permanently damage the organ.

"Cardiac involvement is very important to diagnose and treat because it can lead to life-threatening rhythm problems," said cardiac electrophysiologist Jordana Kron, M.D.

Cardiac sarcoidosis is a rare, inflammatory disease that has no known cause or cure and can affect patients of all ages. Kron began studying the disease when she joined the VCU Health Pauley Heart Center faculty in 2008. Her first research project—a multi-center study–explored the safety and effectiveness of using implantable cardiac defibrillations to prevent cardiac arrest in these patients.

"We collected data on 235 patients with cardiac sarcoidosis and showed that ICDs helped to prevent the risk of sudden death," she said.

Kron, along with leaders from the University of Michigan and University of Colorado, founded the Cardiac Sarcoidosis Consortium, an international network of centers committed to collaborative research on cardiac sarcoidosis. Currently, there are 26 participating centers from the U.S., Europe, and Asia, who have more than 300 patients with the condition enrolled, who are tracked in a database.

Last May, the consortium presented two abstracts at the scientific sessions of the Heart Rhythm Society in Chicago. One study showed results that most patients with cardiac sarcoidosis often experience a significant delay in diagnosis. The second study explored the use of immunosuppression medications as a therapy. That study found that more than half of the patients receiving therapy were treated with a steroid-sparing agent—most commonly methotrexate—either alone or in conjunction with steroids.

"While steroids are the mainstay of treatment to suppress inflammation, steroids have many negative side effects, including diabetes, osteoporosis, increased risk of infection and weight gain," she said. "More research is needed to determine the best treatment strategies for these patients."

To better understand the disease and help patients, Kron, together with rheumatologist Huzaefah Syed, M.D. and pulmonologists Aamer Syed, M.D. and Thomas Iden, M.D., started the Multidisciplinary Sarcoidosis Clinic at VCU in 2015. The clinic, the only one of its kind in the mid-Atlantic region, allows patients to see as many as three specialists in the same visit.

"In most sarcoidosis clinics, patients are seen only by a pulmonologist," she said.

The clinic is offered an average of four times per week, drawing patients from all over Virginia. Its 1,600 patients have cardiac and/or other forms of sarcoidosis.

"Patients with sarcoidosis require close management, so we work together as a team to make sure we are looking at the whole picture and treating all the involved organ systems," she said.

Through the clinic, Kron and her colleagues "are developing a unified approach to this complex disease and we believe this will result in superior outcomes for patients," said Chairman of Cardiology Kenneth Ellenbogen, M.D.

Want more information? Meet the physicians of the Sarcoidosis Clinic at ***https://youtu.be/DMMaTjD-wh0***

Dr. Szentpetery Recalls First Long-distance Transplant

Forty years ago, on May 8, 1977, VCU Medical Center, then known as MCV, made history when doctors undertook the first long-distance transplantation of a human heart. The retired cardiothoracic surgeon who made the 600-mile flight to Indianapolis and back, and directed the transplant, recently sat down with *The Beat* to remember the day.

Two years into his career as a surgeon, Szabolcs Szentpetery, M.D., had an exciting assignment: To fly from Richmond to Indianapolis and bring back a donor heart. The trip had been arranged with the help of the South-Eastern Organ Procurement Foundation, a predecessor to UNOS. SEOPF established the first computerized database to match donors and recipients from different hospitals earlier that year.

The organization chartered a Lear jet, which awaited him at the Richmond airport. There was just one problem: "We didn't have an ice chest," said Szentpetery. "Before we went to the airport, I had to buy one and that's what we ended up putting the heart in."

When asked if he was nervous about the day, he said, "Yes and no. It was unusual but we [he and Richard Lower, M.D.] had already done experiments where we had kept a heart on ice for up to eight hours." He noted that three to four hours is the ideal. "You don't want to go to the limit."

At the hospital in Indianapolis, Szentpetery removed the heart from the donor and put it on ice. He then flew back to Richmond. The plane had left Richmond at 7:07 p.m. and returned from Indianapolis at 12:05 a.m. With time of the essence, the transplant coordinator, who usually handled kidney transplants, picked up the young doctor at this airport.

"He had this old car that wouldn't go much over 60, but he would drive at 80. So, we were kind of shaky by the time we got back to VCU," he recalled with a laugh.

Back at VCU, Szentpetery took part in the transplant with Lower. "There's always a risk, `Is the heart was going to work or not?' We didn't really know. But it worked fine."

The transplant was one of 300 that Szentpetery estimates that he completed in his 30 years as a cardiothoracic surgeon. Before the early 1980s, transplants were undertaken without the benefit of cyclosporine, a key anti-rejection drug. Once cyclosporine began being used, "That made a tremendous difference" in mortality rates, he said.

Szentpetery started the heart transplant program at the Hunter Holmes McGuire VA Medical Center in 1981, one of only five in the country, and the only one serving veterans on the East Coast from Virginia to Maine. He also started the heart transplant program at Sentara Norfolk General Hospital in 1989.

From working in the lab and hospital with Lower—"a great teacher and excellent surgeon and scientist"–to starting the various programs and his first long distance transplant, "It was a fascinating period of my life."

VCU Offers Comprehensive Treatment Program for Amyloidosis

AT VCU, PATIENTS WITH AMYLOIDOSIS BENEFIT FROM THE EXPERTISE OF A MULTIDISCIPLINARY TEAM: TOP: KEYUR B. SHAH, M.D.; BEATA HOLKOVA, M.D.; JOHN MCCARTY, M.D.; R. TODD STRAVITZ, M.D./ BOTTOM: EGIDIO DEL FABBRO, M.D.; DANIEL E. CARL, M.D., JASON M. KIDD, M.D.; AND KATHLEEN PEARSON, M.D.

Amyloidosis is a rare, but serious, disease that is often hard to diagnose.

"The symptoms are sometimes vague and they often mimic other conditions like cancer, neuropathic conditions and heart disease," says Keyur Shah, M.D., a cardiologist who is the medical director of the Mechanical Circulatory Support Program at VCU Health Pauley Heart Center.

Abnormal proteins can clump together to form amyloid, which can build up in the body's organs. When the build-up involves the heart, it is called cardiac amyloidosis. Over time, the condition can impair the function of the heart and lead to abnormal heart rhythms and congestive heart failure.

Common symptoms for cardiac amyloidosis include weakness, fatigue, shortness of breath, weight loss, and an irregular heart rhythm. To separate it from other cardiac conditions, "diagnosis of amyloidosis often requires an additional clinical clue, such as low voltage on the EKG, an abnormal MRI, or diagnosis of other conditions, such as carpal tunnel syndrome, which many patients develop," he said.

Shah, who has treated these patients for years, became part of multidisciplinary amyloidosis team two years ago. The team, which is dedicated to seeking the latest in research and evolving therapies for the condition, and assuring the best outcomes and quality of life for patients, also includes physicians who specialize in hematology, gastroenterology and hepatology, nephrology, neurology and palliative care.

"Over the years, as care became more complex, and multiple treatments and clinical trials were evolving, we realized our common interest and started working together," he said. "I believe we have one of the most comprehensive amyloidosis programs in the region."

Over time, the condition can impair the function of the heart and lead to abnormal heart rhythms and congestive heart failure.

Diagnosis can include blood and urine testing, to help identify the presence of abnormal proteins; genetic testing; and MRI, echocardiogram and nuclear imaging. "Ultimately, the diagnosis is confirmed with a biopsy to identify amyloidosis in the tissue," said Shah.

Although the disease is rare, VCU Health physicians have seen hundreds of patients with the condition, which comes in three forms:

Light-chain amyloidosis, which begins with excessive production of a protein in the bone marrow and can mimic the symptoms of heart disease. Early identification is important for this rare but aggressive condition.

The more slowly progressing **age-related amyloidosis** occurs from a protein developed in the liver called transthyretin (TTR). The condition affects up to one in four people over age 80, and primarily men.

Familial amyloidosis is caused by an inherited mutation of the TTR protein. The condition can affect the heart but more often the central nervous system causing motor weakness, sensitivity to temperature, and in later stages, dysfunction of the gastrointestinal system. In the U.S., familial amyloidosis is especially prevalent in African-Americans, where patients develop heart disease that is often misattributed to hypertension or diabetes.

VCU Health offers a broad spectrum of therapies for all forms of amyloidosis, including clinical trials, contemporary chemotherapy protocols, and bone marrow and solid organ transplants. For select patients with hereditary amyloidosis, a combined heart and liver transplantation may also be an option.

"New imaging technologies have helped identify more and more patients, and have led to earlier diagnosis and treatment," said Shah. "Amyloidosis has now become a disease that is manageable over a long period of time, with many long-term survivors—whereas, it used to be a terminal disease only a decade ago."

New Pilot Program Supports Innovative Cardiac Research; First Four Grants Selected

L TO R: SALVATORE CARBONE, M.S.; LEI XI, M.D.; MOHAMMED QUADER, M.D.; AND STEFANO TOLDO, PH.D. SPOKE TO GUESTS AND SHARED DISPLAYS ABOUT THEIR PAULEY PILOT RESEARCH GRANTS AT THE AHA HEART BALL KICKOFF RECEPTION, HELD ON NOV. 30.

VCU Health Pauley Heart Center physicians and scientists have long sought novel solutions to improving cardiovascular health. Now, VCU is helping to fund exciting early stage research by its faculty through the Pauley Pilot Grants Program.

"Despite the global realization that cardiovascular disease remains the leading cause of death worldwide, efforts to increase research funding to improve awareness, clinical outcomes and quality of life in patients with cardiovascular disease continue to fall short of meeting the demands," said Pauley researcher Fadi Salloum, Ph.D. "With continuous budget cuts to major funding sources including the NIH, promising new and mid-career investigators are particularly facing major challenges to secure grant funding for innovative research."

The pilot grants provide funding for successful grants that meet three criteria: an innovative idea to improve cardiovascular health, a project that is feasible in 12-18 months, and the potential to attract additional funding.

The first grant applications were due on September 19th (in honor of the birthday of heart center benefactor Stan Pauley). An internal review committee led by Antonio Abbate, M.D., Ph.D., assembled an external review committee composed of alumni and retired faculty of the heart center as well as international experts to carefully review the applications.

In November, the following four grants were awarded a total of $112,229:

- **Integrated in vitro-in silico-in vivo modeling of engineered tissue vascular growth, development, and function,** by Stefano Toldo, Ph.D., and Joao Soares, Ph.D. (School of Engineering), $37,229.
- **Unsaturated Fatty Acids Enriched-diet to Improve Metabolic Flexibility and Glucose Tolerance in Obese Patients**, by Salvatore Carbone, M.S., and Francesco Celi, M.D. (Division of Endocrinology), $25,000.
- **Nutraceutical therapy for alleviating cardiotoxicty of cancer chemotherapy,** by Lei Xi, M.D., $25,000.
- **Optimal preservation condition for the donation after cardiac death heart (transplant),** by Mohamed Quader, M.D., and Stefano Toldo, Ph.D., $25,000.

"We are interested in this research which advances knowledge in fighting heart disease and prolonging life."
—Roger Boevé, who with his wife, Anne, helped fund the pilot grant program

"The four projects are diverse in nature, ranging from a partnership between tissue engineering and small animal surgery to enhance coronary artery bypass graft surgery, dietary modifications to enhance cardiorespiratory fitness, nutraceutical therapy to alleviate cardiotoxicity of chemotherapy and attempts to increase the pool of potential donor hearts for transplantation," said Salloum, who served on the internal review committee.

The projects began December 1st. The grants will allow the investigators to pursue their ideas and possibly glean important data that will make them more competitive for future research funding.

"Excellent ideas submitted to the NIH and other federal funding organizations fall short of funding if not substantiated with strong feasibility and preliminary data," explained Salloum.

Annual fund donations to the Pauley Heart Center were critical to the funding of the new program. An additional $115,000 has also been donated to the program by several individuals.

"The generosity of our donors is greatly appreciated," said Salloum. "Numerous meritorious grant proposals often go unfunded due to the lack of sufficient funds."

In the future, "we hope to further grow this program. Our goal would be to make sure that every meritorious proposal from a Pauley Heart researcher gets funded by a pilot grant."

If you would like to inquire about making a donation to the Pauley Pilot Grants Program, please contact Carrie Mills, Senior Major Gift Officer, at cmills@vcuhealth.org or (804) 828-0423.

VCU Offers Myriad of Options for Patients with Aortic Aneurysms

An aortic aneurysm is an abnormal bulge due to weakening of the wall of the aorta, the body's main artery, which runs from the heart to the abdomen. These aneurysms can tear or rupture, causing a life-threatening emergency.

For many years, aortic aneurysms were treated exclusively with open surgery. However, patients are increasingly offered endovascular procedures, in which stent grafts are deployed to the aneurysm site via catheter. The catheter is inserted through the groin. Benefits of endovascular aortic repair (EVAR) include shorter procedural times, reduced hospital stays and faster recoveries.

"I started my practice at the dawn of the endovascular era in 2001, and since then the technology for minimally invasive repair of aortic aneurysms has advanced several fold," said VCU Health Pauley Heart Center vascular surgeon Robert Larson, M.D. "Endovascular repair is the standard for most patients and new devices are on the horizon that will allow even more patients to choose this option."

According to cardiothoracic surgeon Vigneshwar Kasirajan, M.D., one of the most common of these types of surgeries performed at VCU is for an aortic dissection. This life-threatening condition occurs when an injury allows blood to flow between the layers of the aortic wall, forcing them apart. This injury, which requires emergency surgery, can be handled through open surgery or endovascularly.

"Our access to the latest technology, endovascular devices, and surgical techniques allows us to provide the widest possible array of treatment options."

While many patients can be treated via catheterization, some aortic aneurysm patients still require traditional—usually open heart—surgery. This can include patients with a thoracic aneurysm who may also have heart valve disease, disease of the aorta next to the heart, or extensive aorta disease, leading into the abdomen or other major arteries.

"For those with thoracic aneurysms that are extensive or more complex, heart surgery is sometimes performed at the same time as an open-chest aneurysm repair," said Kasirajan. "In addition, thoracic surgeons may work alongside vascular surgeons to complete a complex procedure involving the entire aorta or peripheral blood vessels."

ROBERT LAWSON, M.D.

Other patients, such as those with arch and descending thoracic aortic aneurysms, can be managed in the hybrid operating room with endovascular interventions. In these cases, a cardiac surgeon may take part in the procedures or stand by scrubbed in, should surgical intervention be required.

"I predict sooner rather than later that most of the aortic diseases will be managed in the hybrid OR with minimally invasive techniques," said Kasirajan.

In 2016, VCU physicians performed over 100 open aneurysm repairs and about 100 endovascular repairs of various types. Many innovative procedures are conducted. For instance, VCU is also the only hospital in the Richmond area to use fenestrated aortic endografts to repair aneurysms involving the renal arteries, said Larson.

"VCU offers expertise in all aspects of complex aortic surgery from both the CT surgery and vascular surgery side, with a team approach to surgical management. We also have world class preoperative care with dedicated cardiac anesthesiologists and intensive care specialists," said Larson. "Our access to the latest technology, endovascular devices, and surgical techniques allows us to provide the widest possible array of treatment options."

Want to learn more? Visit *http://www.pauleyheart.vcu.edu/clinical/aortic/index5.html*, or watch a video at *https://www.youtube.com/watch?v=mdogNvxKH3k*.

Did you know…

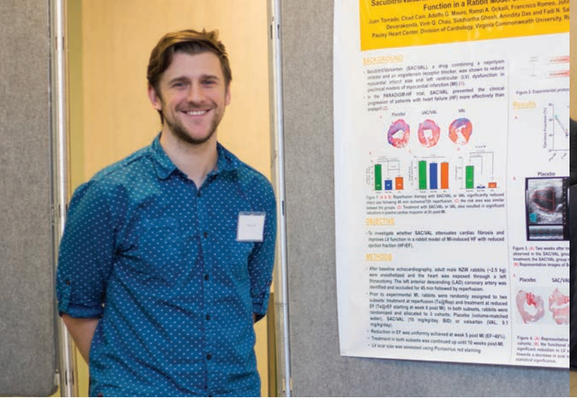
VCU offers genetic testing for patients with a family history of a collagen vascular disease such as Marfan Syndrome, a condition that affects the connective tissue of the body and causes damage to the heart, aorta and other parts of the body.

Aortic Practice to Debut at Stony Point

The VCU Health Pauley Heart Center at Stony Point—a large, multidisciplinary practice--will open in early 2018. Almost all of Pauley's cardiologists and cardiothoracic and vascular surgeons will offer office hours at the new site, located at 9000 Stony Point Parkway, Richmond, Va. 23235. Patients can have echocardiograms and vascular testing performed there, with stress tests available in the future.

The surgeons are new to Stony Point; in cardiology "we're probably quadrupling our capacity there. We're also getting a dedicated space, which will allow us to grow," said Zachary Gertz, M.D., who is serving as the medical director. "Cardiology is outgrowing the space downtown."

In addition, "multidisciplinary care is great for patients. You don't just get one point of view, you get the input of the whole heart team." Other benefits, he said, include "easy parking and better patient access."



Research Highlighted at Heart Ball Reception

In anticipation of the upcoming 26th Annual Richmond Heart Ball, VCU Health hosted a reception that raised awareness of the critical research made possible by the American Heart Association and the Pauley Heart Center. Over 60 guests attended the event, which took place at the McGlothlin Medical Education Center on Thursday, Nov. 30, from 6–8 p.m.

"The VCU Health Pauley Heart Center has a long history of partnership with the AHA," said Chair of Cardiology Kenneth Ellenbogen, M.D., one of the evening's speakers. He noted that AHA's first grant to VCU was awarded in 1972 to Dr. Richard Lower, to study how to more successfully reanimate the heart during a transplant. "Since that study, 138 Pauley Heart Center researchers have been funded by the AHA. Just this year, we received $7 million from the AHA for specific innovative research."

In addition to the AHA grants, he said, VCU researchers would also have access to a new source of funding: The Pauley Pilot Grant program. "Pilot grants may sound like something every academic medical center is doing, but as healthcare budgets get tighter across the country, we are extremely fortunate to rely on the philanthropic support of our Pauley Heart Center donors. The Pauley Pilot Grants program is completely funded by gifts from grateful patients, alumni and faculty and staff."

Other speakers that evening included Patti Jackson, AHA Executive Director; Larry Little, VP of Support Services and Planning and 2018 AHA Heart Ball Chair; Deborah Davis, CEO of VCU Hospitals and Clinics and AHA Board President.

Following the short speeches, the guests enjoyed a dinner catered by Mosaic. They then had the opportunity to mingle with Pauley researchers, who had set up posters about their studies.

"The evening was an opportunity for those who support the American Heart Association to see the commitment and discoveries that are being made at Virginia Commonwealth University to cure heart disease," said Ellenbogen. "It is exciting to receive recognition for all the great work going on in Richmond."

Prescription for Living: Dr. Patricia Uber Assists Heart Failure and Transplant Patients

Each year that passes is a celebration for the patients of Patricia Uber, PharmD.

"My youngest patient was 13 days old. He's now 15 years old," she said. "He plays tennis and runs track and field for the Transplant Games of America."

The patient was one of many she met while working for Mandeep Mehra, M.D., at the Ochsner Clinic's busy Cardiomyopathy and Heart Transplantation Center in New Orleans, from 1997 to 2005. Surgical teams performed 50 to 60 heart transplants each year at the hospital, which was also involved in trials for the early heart pumps.

At the Ochsner Clinic, she was concerned by the mortality rates of African-American transplant patients; few survived more than 2-3 years. "A lot of them died by what we call antibody mediated rejection," she said. "It was very difficult to watch." Seeking answers, she was involved in pivotal studies exploring a new drug. "We changed our immunosuppression therapy from cyclosporine [a groundbreaking, highly effective drug for other groups] to tacrolimus and we saw a dramatic improvement in the survival rates of African Americans."

She and a colleague left Ochsner to help Mehra build the heart transplant and pulmonary arterial hypertension programs at University of Maryland. In 2009, Mehra became editor of the prestigious Journal of Heart-Lung Transplantation, and Uber the executive editor—a position she has held ever since.

"Patricia Uber is an expert in the field of transplant pharmacotherapies and world-renowned in her work with the journal," said Shah.

Keyur Shah, M.D., who had met Uber when he was a fellow at Maryland, successfully recruited her to come to VCU in 2015. "Patricia Uber is an expert in the field of transplant pharmacotherapies and world-renowned in her work with the journal," said Shah. "When the opportunity arose to recruit her to VCU, we thought it was a perfect match with her expertise and our intent on having a world-class advanced heart failure program."

At VCU, Uber enjoys working with other team members to tackle the challenges of these complex patient populations. With transplant patients, "their immune systems are not normal and their medications are very specialized, so the interactions with other medications can have severe consequences," she said.

Even a virus can wreak havoc on their systems. "What I explain to the patient is that they live the rest of their life walking a fine line between rejection and infection," she said. The risk of rejection is highest in the first year. During this time, the patient is closely monitored through regular visits and biopsies. "That's where we're doing the most adjustments of their anti-rejection meds. If they can make it through the first six months to one year without any major rejection episode, then things are looking pretty good for what's going to happen over the next 5,10, 15 years."

Uber has celebrated birthdays and weddings with patients and likes to follow them through the years. "I think what I like the most about it is, you know them the whole way through their journey—the good and the bad," she said. "It's longitudinal care."

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VCU LifeEvac Provides Critical Care

When lives are on the line, VCU Health's black, white and yellow helicopters are a welcome sight.

"We have two helicopters, and a 35-member team that responds to about 1,200 to 1,300 calls each year," said Jay Lovelady, RN, MSN, operations manager and flight nurse. Often, VCU LifeEvac crews transport patients from smaller hospitals, car wrecks and other emergency scenes around the state to VCU, the only Level 1 trauma center in Central Virginia.

Each aircraft is staffed by three people. "They're on duty 24/7, 365. There's one pilot, one flight nurse and one flight paramedic available at all times." The crew is supported by Medical Director Harinda Dhindsa, M.D., MBA, and Clinical Manager Katie Rodman.

The fleet includes the new LifeEvac 1, an Airbus H145, and LifeEvac 3, an Airbus H135. "They're very similar but the 145 is a larger aircraft. It will fly a little bit further, it carries more weight," he said.

The 145's larger size allows for transports of heavier patients or an additional person—such as the parent of injured child. Specialty transports, such as ECMO patients, who require a heart perfusionist and additional equipment, are now possible.

LifeEvac 1 is based in Dinwiddie County Airport, and often serves cities in southern Virginia, such as South Hill, Emporia and Farmville. West Point is the hub for LifeEvac 3, reaching patients in Williamsburg, Northern Neck, the Peninsula and Tidewater. The team also supports the Virginia State Police's MedFlight program with flight nurses as well as staffs a ground critical care transport ambulance based at VCU.

Lovelady, who has worked as a flight nurse for 13 years, previously served as a firefighter, paramedic, and ER and ICU nurse. "The critical care transport setting is really a blend of a lot of that," he said. "I always enjoy the fact that no two days are alike."

LifeEvac crew members wear specialized gear, including helmets with integrated communications to protect their ears from the thundering sound of blades.

"Safety is really paramount to everything that we do," said Lovelady. Once it gets dark, crew members wear night goggles so that they can better identify power lines and other dangers as they fly over the state.

Cardiac patients make up about one-third of LifeEvac patients; trauma and pediatric cases compose the remaining two-thirds. The on-board medical equipment includes a specialized cardiac monitor, a pacemaker defibrillator, a ventilator, a video laryngoscope for intubating patients, and various ICU medications.

"Every week, we pick up patients having STEMIs or other heart attacks. We will fly to a remote part of the state to pick up a patient who's having chest pain and we'll start their treatment. At that point, we become the eyes, ears, and hands of Pauley until we can get here and transfer care."

Such patients often have faster recoveries than some trauma patients, who may take months to recover. "That's why I think taking care of cardiac patients is one of the more rewarding things that we do," he said. "Often, in the short time that we're with them, we get to see some improvements."

Pauley Hosts 2nd Annual Heart Walk

On Oct. 7, crowds gathered for the American Heart Association Richmond Heart Walk at West Creek Parkway. That same day, a group of heart and stroke patients and their supporters strolled through hospital hallways as part of VCU Pauley Heart Center's second annual "internal" heart walk. The event took place in Main 10, the cardiovascular thoracic surgical step-down unit and Main 11, where stroke patients reside.

"All patients and family members were invited to participate. Cumulatively, we had 2,786 laps, which totaled 253 miles. One patient did 62 laps throughout the day," said Kimberly Nelson, DNP, clinical nurse specialist for Main 10. Last year, she and transplant patient Craig Trowbridge launched Pauley's first internal heart walk.

New to the Pauley event this year were vendors, such as Zoll Medical Corporation, which demonstrated its LifeVest defibrillator and sponsored the lunch, as well as Hands Only CPR, Mended Hearts and Life Evac.

This year's participants raised $5,140 for the AHA. Including both walks, VCU teams brought in $54,000 for the organization.

Channel 6 was on hand. The opening ceremony featured speeches by Nelson as well as Deborah Davis, CEO of VCU Health System; Melinda Hancock, VCU CFO; and a patient. "We encouraged everyone to participate in fighting heart disease and stroke by being active," said Nelson.

Mended Hearts: Fellow Patients Share Lessons in Recovery

Joe Shocket knows a lot about recovering from heart surgery. For one thing, patients' feet tend to swell. That's why he recommends they bring sandals, slippers or other loose-fitting shoes to change into when they leave hospital.

Shocket, who underwent a quadruple heart bypass in 2009, "imparts tidbits of information" like this to patients of the VCU Health Pauley Heart Center. He's the Visiting Chairman and Treasurer of Richmond Chapter 28 of Mended Hearts, which runs a hospital visitor's program and presents speakers at its monthly meetings. Mended Hearts has approximately 200 chapters in the U.S., with over 20,000 members.

"It's the largest peer-to-peer support group in the country for heart patients and their family members," he said.

Locally, there are 14 active, Accredited Visitors who have gone through the organization's training program. In 2016, those visitors met with 1,879 individual patients at five hospitals–the majority at VCU because of the size of the program. In terms of cardiac care, "I don't think you could find a better place than VCU," he said.

Wearing a red vest accented by a heart symbol, Shocket is a familiar face around VCU's Main 10 on Mondays. He usually stops back on Wednesday "to catch any patients that I might have missed." Another volunteer, Sharon Feldman, comes by on Fridays.

His routine begins with a knock on the patient's door. He asks for permission to come in, then introduces himself. "I tell them, `I'm a former heart patient. I was in a bed like you are about eight years ago and I know how it feels.'"

In August 2009, Shocket went in for a pre-employment health screening at Chippenham Hospital. "Everything was fine, and then I went on a treadmill to take a stress test. I was able to complete it, but there were obvious issues for my heart." He went in for an angiogram and discovered he had 95% blockage. Surgery followed at the hospital.

"I think that when a person's sick, the ability to talk to other people with heart disease makes a huge impact on their health and recovery," said VCU Cardiology Chairman Kenneth Ellenbogen, M.D.

"Open heart surgery knocks you for a loop," he said. "You're really stiff, really sore." He remembers standing, then gradually beginning to walk down the halls of the hospital. "It's like scaling a mountain. You begin in very small increments. Each time you walk, you try to go a little further."

While he was in the hospital, someone from Mended Hearts stopped by. "I really appreciated the visit," he said. "You know, you can feel kind of down after heart surgery." He attended his first Mended Hearts meeting that December.

"I think that when a person's sick, the ability to talk to other people with heart disease makes a huge impact on their health and recovery," said VCU Cardiology Chairman Kenneth Ellenbogen, M.D.

The visitors help patients understand what to expect before, during and after surgery, and discuss the importance of good nutrition and cardiac rehabilitation. They also leave behind the *Mended Hearts HeartGuide* with information on heart disease.

Sometimes patients just enjoy having someone to talk with. Shocket recalled one patient from the Northern Neck who loved to talk about fishing and seafood. "We might start talking about heart failure, but it would always end up, `how was that oyster roast you went to the other night?' Or: `This is the way you make oyster stuffing.'

"Part of visiting is to engage the patient and get them to a positive, happy place."

Mended Hearts Chapter 28 meets the first Tuesday of each month and usually features a speaker in the cardiac field. To learn more about the organization, visit MendedHeartsRichmondVa.org and MendedHearts.org.

Join Us for Heart Month Events

February is the American Heart Association's Heart Month. To raise awareness about cardiovascular health and disease, VCU Health will participate in numerous events throughout the community.

On Feb. 2, our staff will be taking free blood pressure readings and calculating body mass indexes (BMIs) in the lobby of the VCU Medical Center's Gateway Building. Last year, we provided this service to more than 800 individuals.

A myriad of speakers will appear at the 3rd Annual Women's Heart Health Symposium. The event will take place Feb. 3 at the Virginia Historical Society. (See p. X for more details).

VCU Health will also present three seminars at Lewis Ginter Botanical Garden. On Feb. 1, Vigneshwar Kasirajan, M.D., Keyur Shah M.D., Daniel Tang M.D., will present "The Future of Heart Replacement Therapies." Interventional cardiologist Luis Guzman, M.D., and vascular surgeon Mark Levy, M.D., will present "Peripheral Artery Disease- Know Your Risk and Your Options," on Feb. 8; then on Feb. 22 cardiologist Phoebe Ashley, M.D., will present "Are you doing your part to maintain a healthy heart?" The seminars will be held from 5:30-6:30 p.m. at Lewis Ginter's Kelly Education Center, 1800 Lakeside Avenue in Richmond. All seminars are free and open to the public, but registration is recommended. Register online at vcuhealth.org/events or call (804) 628-0041 for more information.

VCU Health Hospital Debuts in South Hill

Picture of CMH

In November 2017, the **VCU Health Community Memorial Hospital** opened in South Hill. The new hospital offers 99 acute care and 161 long-term beds, along with a cardiac catheterization lab, an emergency department, three operating rooms, an obstetrics suite and other facilities. The hospital encompasses nearly 167,000 square feet. VCU Health has committed at least $75 million in funding to the hospital, formerly known as Community Memorial Healthcenter. The new hospital is located at 1755 North Mecklenburg Ave., South Hill, Va. Phone: (434) 447-3151.

On Nov. 11, 28 patients were moved from the old hospital to the new one, with the support of several rescue squads. "We ushered in a new era of health care today with this patient move. It's a culmination of years of hard work by the CMH board, our partners with VCU Health and, of course, our staff and volunteers," said hospital CEO Scott Burnette on the day of the move. "There were more than a few misty eyes when we announced at 10:42 that the old CMH was officially closed. A lot of fantastic work was done over the past 63 years inside those walls."

Did you know...

The Virginia Medical Group in Colonial Heights joined the VCU Health System in June 2016. The outpatient cardiology and neurology practice, now known as **MCV Physicians at Colonial Square**, is located at 2905 Boulevard, Colonial Heights, Va. 23834. Phone: (804) 526-0682.

In Memoriam

The Pauley Heart Center has lost several beloved friends of the Consortium.

Robert Huntington Cropp of Williamsburg passed away on Sunday, Aug. 27, 2017, at the age of 79. He enjoyed a 35-year career with the IBM Corporation, which took him from San Francisco to Honolulu, Sacramento, Calif., White Plains, N.Y., Los Angeles, and Washington, D.C. He was active in many organizations, including the Kiwanis Club of the Colonial Capital, the Boy Scouts of America and the American Bible Society. With his wife, Gloria, Bob was a devoted member of the Consortium, who gave generously to support the work of the Pauley Heart Center.

"Bob Cropp was a great family man, a business leader and an inspiration to so many others. He will be missed by all," said Charles Crone, MCV Foundation board member

Jeanette Lipman passed away Jan. 10, 2017, at the age of 102. "She was an extremely caring, generous woman and devoted Richmond philanthropist. She made an incredible impact," said Chair of Cardiology Kenneth Ellenbogen, M.D.

At VCU, Jeanette and her late husband, Eric, established several endowed faculty positions, including the Eric Lipman Research Professorship in Cardiology, the Hermes A. Kontos, M.D. Professorship in Cardiology, the George W. Vetrovec Chair, and the Jeanette and Eric Lipman Chair in Oncology. The family also created several research funds including the Aubrey Sage MacFarlane Lung Injury Research Fund and the Carol Jean Lipman MacFarlane and Ann Debra Lipman Cancer Research Fund.

H. Merrill Plaisted, III, died on Nov. 30, 2016, at the age of 81. "Although H. Merrill Plaisted, III, was born in Maine to a family of governors, we were fortunate to call him a dedicated Richmonder since 1960," said Ellenbogen.

A prominent member of the real estate industry, "Mr. Plaisted was committed to many community organizations, serving as president of Big Brothers and Big Sisters of Richmond and giving generously to the Pauley Heart Center."

Cardiac Arrest vs. Heart Attack?

Many people confuse heart attacks with cardiac arrests, but they are very different.

A **heart attack** is a circulatory problem that results when blood flow to the heart is suddenly stopped due to a blocked artery, usually causing symptoms like chest discomfort, sweating, and shortness of breath. **A cardiac arrest** arises when an electrical malfunction in the heart leads to an arrhythmia that causes the heart to suddenly stop beating.

While a heart attack victim may experience immediate discomfort, generally their symptoms will worsen over hours and the vast majority of these people to not die. A victim of cardiac arrest will become unresponsive within seconds, and die within minutes if they do not receive treatment. A very small percentage of heart attack victims—10-20%–may secondarily go into cardiac arrest. For either situation, call 911 right away.

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HOW TO MAKE A GIFT. Gifts to the Pauley Heart Center allow us to invest resources in transforming patient care, education and research at VCU Health. For more information on how to honor a loved one or a caregiver, please contact Carrie Mills at (804) 828-0453 or cmills@vcuhealth.org

Friends and Supporters,

Welcome to the winter edition of *The Beat*. As you may be aware, February is designated as AHA Heart Month, a special time when we work to raise awareness in the community on the prevention and treatment of cardiovascular disease. In this issue, you can learn about the special events we have in store for heart month, and some of the research and programs we are undertaking to improve the lives of our patients.

Our cover story is especially fitting, as it provides a glimpse of our long and storied history in heart transplantation—from the days of Dr. Richard Lower, to the outstanding physicians and scientists who are carrying on his pioneering legacy today. Heart transplantation is an incredible gift of life for many patients, truly one of the miracles in medicine.

One of my favorite stories in this newsletter concerns the trip to India made by Dr. Jay Koneru and nurse practitioner Cha Roberts. These two concerned providers worked long hours caring for the needs of some very ill patients with complex cardiac conditions. At the same time, they provided training to local doctors and nurses to ensure their impact would be lasting.

Sarcoidosis and amyloidosis are two rare, but often life-threatening diseases that are often underreported by health care providers. In this issue, you'll learn how Dr. Jordana Kron and Dr. Keyur Shah are working to help identify these patients earlier and connect them with some very impressive treatments and therapies through their comprehensive, multidisciplinary clinics.

Finally, I want to thank the incredible members of our Pauley Heart Center community. The gifts made to support innovative research through the new Pauley Heart Pilot Grants and the Christine B. & David E. Cottrell Surgical Innovation Laboratory are truly transformative. Thank you for allowing us to stay at the forefront in the fight against heart disease.

SINCERELY,
Kenneth A. Ellenbogen, M.D.
Chairman, Division of Cardiology

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