MUSC
Medical University of South Carolina

SurgeOn

MUSC DEPARTMENT OF SURGERY | SUMMER 2020

IN THIS ISSUE

MESSAGE **FROM THE CHAIR**

In this summer newsletter, the Department of Surgery has several opportunities to highlight and celebrate our outstanding faculty, innovative research and accomplished trainees over the past few extraordinary months.

The COVID-19 pandemic has affected — directly or indirectly — the lives of people all around the globe. At MUSC, we are adapting to the pandemic with a focus on the health and wellness of our patients, care team members, and our community. As the department pivoted to prepare for our "new normal," we continued to provide surgical care using best-practices to protect the health of our patients and care teams and transitioned to telehealth visits when possible. Our faculty members with extensive expertise in public and global health assisted leadership with disaster management, infectious disease policies, and operationalizing the many aspects of the new COVID-19 world in the operating rooms, ICU, and clinics.

In our feature articles, we highlight a heart transplant patient and lung transplant patient during the early phase of the pandemic. Their journeys highlight how MUSC care teams were ready and willing to go that extra mile to provide compassionate care for these seriously ill transplant patients whose families could not be by their bedside due to the COVID-19 visitor restrictions.

In this issue, we also highlight the MUSC Children's Health ECMO program, which received the Platinum Level ELSO Award for Excellence in Life Support from the Extracorporeal Life Support Organization (ELSO). This award is the highest attainable level as an ELSO Center of Excellence and recognizes select programs worldwide who have demonstrated the highest level of performance, innovation and quality in the delivery of extracorporeal life support.

On the education front, our programs adapted to our new normal with virtual classrooms and simulation trainings. And, even though our world changed dramatically this year, that didn't stop us from celebrating our graduates' significant accomplishments virtually.

In the research arena, our special section Responding to the Pandemic highlights how the Department of Surgery and the Center for Cellular Therapy led the charge to develop a COVID antibody test and how a team of innovators created 3D mask and cartridge system plans to answer the urgent need of the N-95 mask shortage. The newsletter also highlights new NIH awards and recognitions, and an STTR grant to develop a novel cancer immunotherapy technology.

And lastly, the Department of Surgery is delighted to recognize and honor two pediatric cardiothoracic surgeons: Robert M. Sade, M.D., whose vision and remarkable generosity provided the ability to establish the Robert M. Sade, M.D. Endowed Chair in Pediatric Cardiac Surgery, and Scott Bradley, M.D., a gifted surgeon and inaugural chair holder of the Robert M. Sade, M.D. Endowed Chair in Pediatric Cardiac Surgery.

This is a transformational time for the country and American medicine. Holding on to our true north and our mission of providing exceptional patient care, education and innovation, I am confident the MUSC Department of Surgery will emerge in unison and stronger than ever.

Prabhakar Baliga, M.D. FACS
Professor and Chair
Department of Surgery
Medical University of South Carolina

SAVE THE **DATES**

Convocation
August 18, 4:30 p.m.
Virtual

ACS Clinical Congress
October 4-7
Virtual

Smithy Lecture
October 13

Surgery Research Recognition Day
October 30

COVER: *Allison Annis and her sister, Ashley Wargula, reunite with Ben Thomas, Heart Transplant Nurse Coordinator.*


A. Abbott


M. Armstrong

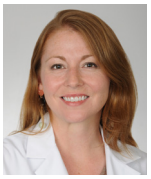

E. Camp


N. DeMore

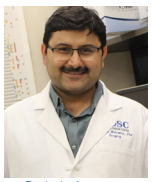

H. Evans

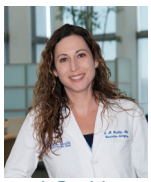

E. Eriksson


E. Genovese


A. Hink


S. Kahn

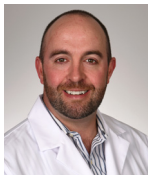

S. Mehrotra


J. Ruddy


R. Sade


D. Taber


C. Talley


J. White


T.K. Byrne


S. Nadig


M. Rubinstein

NEWS **AND ANNOUNCEMENTS**

- **Andrea Abbott, M.D., MSCR** elected Faculty Council Chair-Elect for 2020/2021 and will serve as Faculty Council Chair 2021/2022.

- **Milton Armstrong, M.D.** appointed Director to the American Board of Plastic Surgery.

- **E. Ramsay Camp, M.D., MSCR** elected a Fellow in the American Surgical Association.

- **Nancy DeMore, M.D.** appointed to serve as a member of the Scientific Program Committee for the Society of Surgical Oncology.

- **Heather Evans, M.D., MS** appointed to serve as a member of the Surviving Sepsis Campaign Steering Committee for the Society of Critical Care Medicine.

- **Evert Erkisson, M.D.** named Chair of the Lowcountry Regional Trauma Advisory Council (LC-RTAC).

- **Elizabeth Genovese, M.D., MS** appointed as the Arterial Research Advisory Committee Chair of the Carolinas Vascular Quality Group.

- **Ashley Hink, M.D., MPH** accepted to the 2020 EAST INVEST-C Research Hackathon workshop.

- **Steve Kahn, M.D.** named Co-Chair of the Lowcountry Regional Trauma Advisory Council (LC-RTAC).

- **Shikhar Mehrotra, Ph.D.** named Co-Leader of Hollings Cancer Center.

- **Jean Marie Ruddy, M.D.** named to the Editorial Board for the Annals of Vascular Surgery.

- **Robert M. Sade, M.D.** recognized as an Expert Institute World Expert in Professional Ethics.

- **David Taber, Pharm.D., MS, BCPS** awarded the 2020 ACCP Clinical Practice Award by the Board of Regents and members of the American College of Clinical Pharmacy.

- **Cynthia Talley, M.D.** selected to join the Board of Directors for the Eastern Association for the Surgery of Trauma (EAST).

- **Jared White, M.D.** named General Surgery Associate Program Director of Curriculum.

- **T. Karl Byrne, M.D., Satish Nadig, M.D., D.Phil., and Mark Rubinstein, Ph.D.** named to MUSC chapter of the National Academy of Inventors.

AWARDS AND RECOGNITION

E. Douglas Norcross, M.D. awarded the 2020 MUSC Foundation Distinguished Faculty Service Award. The other winners of this award include Drs. Cassandra Salgado and Karen Wager.

Evert Eriksson, M.D. awarded the 2020 MUSC Foundation Outstanding Clinician Award. The other winners of this award include Drs. Andrew Eisemen and Nagraj Kasi.


D. Norcross


E. Eriksson

NEW **FACULTY**

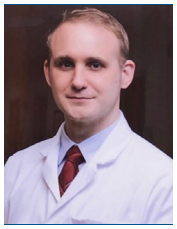

C. Edgerton


L. McDuffie


N. Pope


K. Rajab


I. Scomacao


L. Witer

- **Colston Edgerton, M.D.** joins the division of GI and Laparoscopic Surgery. Dr. Edgerton completed his general surgery residency at MUSC and served as the administrative chief resident. He then pursued a fellowship in advanced minimally invasive GI and bariatric surgery at the Brigham and Women's Hospital and Harvard Medical School. He returns to the division of GI Surgery with a clinical focus in laparoscopic and robotic bariatric, foregut, and hernia surgery

- **Lucas McDuffie, M.D.** joins the division of Pediatric Surgery. Dr. McDuffie completed his internship and residency training in General Surgery at Indiana University in Indianapolis, Indiana. He spent an additional two years training in oncologic surgery and research at the National Cancer Institute at the National Institutes of Health in Bethesda, Maryland. Dr. McDuffie completed his fellowship in pediatric surgery at Riley Hospital for Children at Indiana University.

- **Nicolas Pope, M.D.** joins the division of Cardiothoracic Surgery. Dr. Pope completed his General surgery training at the University of Virginia, during which time he spent two years of dedicated basic science research into the treatment of aortic aneurysms and therapies to improve lung preservation for transplantation. Dr. Pope completed a Surgical Critical Care fellowship, also at the University of Virginia focusing on the care of patients after cardiac surgery. He remained at the University of Virginia for his Cardiothoracic Surgical Fellowship.

- **Konrad Rajab, M.D.** joins the division of Cardiothoracic Surgery as a pediatric cardiothoracic surgeon. Dr. Rajab completed his general surgery training at the Brigham and Women's Hospital and spent time dedicated to translational research at Harvard University. Dr. Rajab remained at the Brigham for a Cardiothoracic Surgery Fellowship. Subsequently, he completed a Congenital Cardiac Surgery Fellowship at Children's Hospital Colorado.

- **Isis Scomacao, M.D.** joins the division of Plastic and Reconstructive Surgery. Dr. Scomacao is a Brazilian plastic surgeon, earning her medical degree in Brazil, followed by a general surgery residency and then a plastic surgery residency that she completed at the Clinics Hospital, Curitiba, Brazil in 2012. She received a prestigious award for placing second in the Brazilian plastic surgery board examination and was also awarded the ASAPS North American Plastic Surgery Fellowship. Dr. Scomacao pursued further training in the US with a focus on microsurgery reconstruction and surgical treatment of lymphedema at the Cleveland Clinic, Cleveland, OH, where she completed fellowships in advanced microsurgery, surgical wound care, and craniofacial surgery.

- **Lucas Witer, M.D.** joins the division of Cardiothoracic Surgery. Dr. Witer completed residency in general surgery at the Oakland University – William Beaumont Hospital, a cardiothoracic surgery fellowship at the New York Presbyterian – Weill Cornell Medical Center and the Memorial Sloan Kettering Cancer Center. He continued advanced subspecialty training for two years at the New York Presbyterian – Columbia University Medical Center in heart failure, advanced mechanical circulatory support, ventricular assist device implantation and cardiac transplantation.

PROMOTION AND TENURE


A. Abbott


E. Eriksson


A. Privette


M. Lance Tavana


J. Ulm

- **Andrea Abbott, M.D., MSCR** promoted to associate professor
- **Evert Eriksson, M.D.** promoted to professor
- **Alicia Renee Privette, M.D.** promoted to associate professor
- **M. Lance Tavana, M.D.** promoted to associate professor
- **Jason Ulm, M.D.** promoted to associate professor

HEART TRANSPLANT TEAM

Doesn't skip a beat during COVID

Allison Addis updates transplant coordinators on how she's feeling post-transplant before traveling home to Abbeville, SC. With the new transplant clinic in Greenville, Allison won't need to travel three hours to Charleston for her follow-up visits.

Leslie Cantu, writer, photo by Lauren Hooker

The call came at 3 a.m. Allison Addis was getting a new heart. The rest of South Carolina had spent the month of March using its best hurricane prep know-how, attempting to prepare for something that hadn't occurred in generations – a global pandemic.

Addis had spent the month following the advice of the MUSC Health Heart Transplant team in anticipation of one day getting a new heart, as well as spending time with her ailing father, who died March 14. She never expected the call to come so soon. In three weeks, the 55-year-old Addis went from being listed for a heart transplant to receiving news she was about to have a new heart.

But the novel coronavirus pandemic meant things were a little different than usual at hospitals across the state. Newly implemented visitor restrictions meant that Addis would be alone. No one from her large, close-knit family would be allowed at her bedside. Instead, family members waited out the surgery at a nearby hotel.

Heart transplant coordinator Benjamin Thomas, R.N., recognized the burden these restrictions placed on both patients and families. He went to the hotel to explain the entire process to the family and answer their questions.

"Imagine our surprise when Ben Thomas, the nurse coordinator, visited us at the hotel," said Addis's sister, Ashley Wargula. "He sat with us in the lobby for two hours and walked us through everything. It really impressed us with how he went that extra mile to make us feel comfortable."

That was just the start of the many ways the doctors, nurses and therapists stepped in to make this transplant journey as stress-free as possible.

Addis first met with Ryan Tedford, M.D., in October 2019. Tedford is an advanced heart failure and transplant cardiologist and medical director of cardiac transplantation at MUSC Health. He's one of eight such specialized cardiologists, with a ninth slated to join the team in August, who work with three heart surgeons, with two more set to join in late summer.

Despite the pandemic, the transplant team has remained busy. "Symptomatic cardiac disease doesn't wait," said Marc R. Katz, M.D., MPH, chief of cardiothoracic surgery. "In Fiscal Year 2020, the team performed 40 adult heart transplants, compared to 26 in FY2019."

Katz said there have been a few patients who have been low risk enough that procedures could be postponed, but for the most part, it's been business as usual for the heart team.

The team has plenty of precautions in place, including rapid testing of patients for coronavirus before surgery and testing of all donor hearts before transplantation. These are in addition to the precautions that MUSC Health as a whole has implemented, like increased telehealth visits and a universal masking policy.

They were all so remarkable," Addis said. "Not only did they help me heal medically, they helped me heal emotionally."

"They understood the added stress of not having family by my side and did so many things on a daily basis to help get me through the recovery," Addis said.

TRANSPLANT PATIENT SUPPORT FUND

To contribute to the Transplant Patient Support Fund visit **connect2.musc.edu/surgery**

A TRANSPLANT

in isolation

May 1 was the first time John McDonald was able to see his wife Lisa Gabriel since 18 days after he was first transferred to MUSC. He was diagnosed with pulmonary fibrosis in January after a CT of his abdomen fortuitously showed something of concern in the lower lobe of his lungs.

By April, his lungs were failing.

Rapidly.

Lisa Gabriel is reunited with her husband, John McDonald, after his double lung transplant.
Celia Spell, writer, photo by Lauren Hooker

On April 11, McDonald was started at 40% oxygen. Two days later, he required 100% oxygen and was brought to MUSC.

But with the prevalence of COVID-19, hospitals across the country have had to limit the number of visitors inside their facilities. "When he was transferred, a nurse called me and asked me if I could come to the hospital," said Gabriel. "I was excited to be able to visit him – and kind of surprised, too – since hospitals weren't allowing visitors."

It wasn't until she was driving down to Charleston from their home in Myrtle Beach that she received the second call asking how quickly she could get there. "That's when I realized how serious it was," she said.

"We were really lucky to get here when we did," Gabriel said. "If it had been a day later, it would have been a different scenario."

They met with the transplant team to discuss his options just before his breathing became so labored that he was placed on a ventilator.

Thoracic Surgeon Chadrick Denlinger, M.D., performed McDonald's transplantation. He said McDonald was a transplant candidate because, even with fibrosis, he was living a relatively normal life until just a few weeks ago.

"He's very strong, both physically and mentally. And even though he was requiring significant support and 100% supplemental oxygen when I first met him, he was still able to understand the risks and benefits of surgery. We luckily had the opportunity to discuss multiple potential outcomes if he required intubation even before we were able to complete the transplant evaluation," he said.

However, once the couple decided to move forward with the procedure, McDonald was moved to a different unit, and his wife was no longer able to be with him in the hospital.

Rather quickly, a donor became available, and Denlinger performed the transplant on April 21. One day later, McDonald no longer required the support of ECMO, the machine that circulated his blood through an artificial lung and back into his bloodstream. Three days later, he was breathing on his own – without the help of a ventilator. Throughout the ordeal, he never saw his family.

The first thing McDonald did after being taken off the ventilator was to ask to FaceTime his wife. "It was so important to me to stay in touch with my family," he said.

"At 6:30 a.m., he called me via FaceTime, and I heard his voice again. It was a miracle. I was so excited, thankful and overwhelmed with relief," adding that it was the FaceTime sessions that made the situation bearable.

Gabriel said she won't soon forget the constant support and encouragement they both received. "I cannot tell this story enough and give enough praise and thanks to the team of doctors, nurses and support staff who saved John's life. There are a lot of doctors in the world, but it takes a special team of people to have compassion and show the true love for what they do."

"They saved his life. And we are so grateful."

FIRST IN STATE

MUSC Vascular Surgery offers device to improve outcomes for complex below-the-knee arteries.

Dr. Elizabeth Genovese performed the first implant of the 4F TACK system at MUSC; Dr. Mathew Wooster was the first to implant the 6F TACK system.

Most South Carolinians realize that with heart or vascular disease, you can have a heart attack or stroke, especially in a state where heart disease is the No. 1 killer and stroke No. 3, according to the American Heart Association and the S.C. Department of Health and Environmental Control, respectively. But fewer realize that blockages, which are caused by buildups of plaque and cholesterol, affect more than just the arteries of the heart. Blockages can occur in arteries throughout the body – and with serious effects.

Take for instance, peripheral arterial disease (PAD), which occurs when atherosclerosis, or hardening of the arteries, causes a buildup of plaque in the blood vessels that carry oxygen and nutrients to the body's tissues. As plaque builds, it can narrow the arteries, reducing critical blood flow to the limbs, or cause complete blockages of the arteries. Early on, people with PAD may experience only difficulty and pain with walking. But, in its most severe forms, PAD can cause infections, painful foot ulcers, even gangrene, which could lead to amputation. Worse still, people with PAD are three times more likely to die of heart attacks or strokes.

Dr. Elizabeth Genovese, a vascular surgeon at MUSC and assistant professor in the Department of Surgery notes that "South Carolina has some of the highest rates of limb loss in the entire country, especially in more rural areas of the state, due to underdiagnosed and undertreated peripheral vascular disease."

MUSC Health is a state leader in treating vascular disease, like PAD, and the first hospital in the state to offer the Tack Endovascular System (4F), a minimal metal implant used to repair dissections following balloon angioplasty in complex below-the-knee arteries. MUSC Health has adopted this innovative new technology as part of its commitment to improving care for critical limb ischemia patients.

Critical limb ischemia (CLI) is the most severe form of PAD, occurring when an obstruction in an artery severely reduces blood flow, causing painful wounds, debilitating reset pain, recurring ulcers and life-threatening infection. Historically, vascular surgeons have had limited treatment options available for these extremely sick patients.

According to vascular surgeon Mathew Wooster, M.D., an assistant professor in the Department of Surgery, CLI is an enormous burden on the health care system, and MUSC is dedicated to advancing the treatment of CLI with technologies such as the Tack System.

Balloon angioplasty is a minimally invasive, first-line intervention for CLI; however, the procedure can create dissections, or tears, in the vessel wall that inhibit blood flow and promote thrombus formation.

"While we have seen the benefits of drug elution and stenting in the superficial femoral artery and the coronary arteries," explained Wooster, "for CLI patients, where the tibial vessels are prone to spasm and dissection like coronary vessels, yet too long for total stenting, we have not had any options other than balloon angioplasty – until now."

The novel Tack implant has been rigorously studied as part of the robust TOBA (Tack optimized balloon angioplasty) clinical program, notably the only clinical trials to investigate 100% dissected vessels. The global, multicenter pivotal study verified that the Tack Endovascular System (4F) is a safe and effective therapeutic option, demonstrating post-angioplasty improvement in blood flow, wound healing and amputation prevention in a complex CLI patient population.

"Incorporating this first-of-its-kind implant into our treatment algorithms provides an innovative solution for our CLI patients," said Wooster. "We are excited to be able to finally have something more to offer CLI patients before resorting to major amputation."

BOTOX DEPLOYED

to repair a hernia

Botox may be most famous for helping celebrities maintain an illusion of youthfulness, but the drug is increasingly used by doctors far from the cosmetic realm – including MUSC Health trauma surgeon Evert Eriksson, M.D., and physiatrist Emily Darr, M.D. who used the toxin to prepare a patient for an otherwise unfeasible hernia repair. "When he came up with the Botox, I thought ohhhh-kayyy," recalled patient Jacqueline Goff. But, she added, she trusts Eriksson with her life.

Jackie Goff (center) with Evert Eriksson, M.D. and Amanda Waite, NP

writer Leslie Cantu, photo provided

That's because Eriksson, Trauma medical director in the Division of General and Acute Care Surgery, was on call the night of June 22, 2018. That's the night that a wrong-way driver crashed into a car that Goff and her best friend, then-Congressional candidate Katie Arrington, were in. The pair suffered severe traumatic injuries. The other driver died at the scene.

"Jackie's injury is considerably more complex than Katie's. Katie's is a more typical car wreck injury that we see. Her injuries are something we deal with every day. Jackie's injury is a whole different ball game and much harder to get a good outcome from," he said.

The seatbelt had sliced through Goff's abdomen like a taut nylon cord through wet clay. The injury required multiple surgeries during Goff's initial hospital stay just for basic repairs to internal organs. While Arrington went home after two weeks, Goff remained in the hospital for 62 days before transferring out for rehab.

"This is the worst seatbelt injury I've ever seen," Eriksson said. "Among all the attending doctors as well, no one's seen this bad of an injury from a seatbelt." Goff needed an entire reconstruction of the left side of her abdominal wall after all the muscle was pulled off of the pelvis bones.

Goff left the hospital with a bridging biologic mesh acting as a stand-in for her abdominal wall – the muscles that normally "keep all her insides inside," according to Eriksson. Because of the injury, her right and left abdominal muscles no longer met in the middle. Even with the mesh and the stiffest Spanx she could find, she still had a visible hernia.

Finally, in the summer of 2019, it was time to plan the hernia repair surgery. Eriksson knew he wouldn't be able to pull the muscles back into place manually.

But he'd heard about cases where Botox was used to relax muscles enough that they could be pulled and stretched back into position. He didn't know of anyone at MUSC Health who had used such a technique, so he spoke to hernia experts around the country and came to the conclusion that Botox was Goff's best chance for recovery. Without it, he said, she'd likely have a bridging repair – a surgical fix that could lead to ongoing issues with mobility and strength and had a high chance of hernia recurrence.

Eriksson then reached out to Darr, a physical medicine and rehabilitation doctor who uses Botox in her practice. Darr, relying on her experience and the latest research, calculated that 300 units would be an appropriate dose for Goff. She used ultrasound to guide her with precision as she injected the neurotoxin into the muscle.

Eriksson and Goff returned to the operating room in August for the final hernia repair. With Goff's muscles now relaxed from the Botox, Eriksson could pull them from their shortened and thickened state – rather like Silly Putty, he explained – to a longer, thinner position where they met in the middle. He sewed the muscles together, giving her a functional abdominal wall. Once the Botox wore off, he explained, the muscles began to adapt to their new stretched position.

She remains amazed that she and Arrington survived the crash. And she thinks constantly about Eriksson and his team. "When I wake up in the morning, he's in my prayers," she said.

Virtual crossmatching improves quality of life for kidney transplant patients

American College of Surgeons article (abridged version), photo by Emma Vought

Virtual antibody crossmatching is a safe and efficient way of selecting kidney transplant recipients. Two years after implementing the process, the Medical University of South Carolina division of transplant surgery concluded that the technique was just as accurate and sensitive as physical crossmatch, the current gold standard, and much quicker.

Virtual crossmatching reduced the time kidneys were kept on ice while awaiting identification of a suitable recipient, improved scheduling for surgeons and operating room staff, and alleviated emotional and logistical stress on patients who were called to the hospital only to be sent home hours later after a more suitable recipient was identified. A study of the process and its effects on clinical and surgical practice outcomes appears on the Journal of the American College of Surgeons website in advance of print publication.

A physical crossmatch is highly sensitive, but it eats up valuable time. Donor lymph nodes are shipped to the transplant center, cells are mixed with serum from the potential recipient, and surgeons, recipient, and the transplant center then must wait six hours to learn whether there is an antibody reaction before scheduling the operation.

Because of the concern about potential immune system incompatibility, transplant centers typically call in three possible recipients for every donated organ. "We ask three patients who are next on the transplantation list to come into the hospital just in case there are problems with incompatibility. Think about the time, effort, and stress that puts on a patient. It's not uncommon for a patient to be called in two, three, or four times before they actually go forward with transplantation," said David Taber, PharmD, senior author of the study and a professor of surgery in the division of transplant surgery at MUSC.

Delays are particularly problematic since the Kidney Allocation System was revised in 2014 and now allows transplantations to patients who are highly sensitized. "Previously, donor organs were obtained locally, so transplant centers could afford to wait six hours for the physical crossmatch results. Now, in South Carolina, we are getting organs from California. Shipping them takes long enough. If you cannot predict what is going to happen for six more hours, you may not be able to give the organ to the intended recipient and do a disservice to the purpose of the allocation system," said Vinayak Rohan, M.D., lead author of the study and an assistant professor of surgery in the division of transplant surgery at MUSC.

The study is a before-and-after comparison of patient outcomes two years after the transplant surgery team implemented virtual crossmatching. Of 825 patients who received a kidney transplant between 2014 and 2018, 505 underwent surgery before — and 227 after — virtual crossmatching was instituted.

Standard measures of clinical quality were the same in both groups. The incidence of delayed graft function was 19% before and 17% after implementation; graft failure within a year was 4% before and 3% after; mortality within a year was 2% before and 1% after.

CIT for long-distance donor organs decreased by 2.4 hours, and delayed graft function declined by 26%.

"Because we don't need to do physical crossmatching for the majority of patients, we also can improve surgeons' quality of life by being able to schedule the operation even before an organ arrives," Rohan said.

TRANSPLANT SURGERY SUPPORT FUND

To contribute to the Transplant Surgery Support Fund visit **connect2.musc.edu/surgery**

PEDIATRIC ECMO PROGRAM ACHIEVES PLATINUM STATUS

ranks among the best in the U.S.

The Pediatric ECMO Program at the MUSC Shawn Jenkins Children's Hospital received the platinum-level Award for Excellence in Life Support from the Extracorporeal Life Support Organization (ELSO), an international consortium of centers offering ECMO (extracorporeal membrane oxygenation) for support of failing organ systems in infants, children and adults. This award is the highest attainable level of achievement an ELSO Center of Excellence can receive and recognizes select programs worldwide that have demonstrated the highest level of performance, innovation and quality in the delivery of extracorporeal life support.

The pediatric ECMO program is one of eight children's hospitals in the U.S. to achieve this recognition in 2020. It is one of only two pediatric programs in the Southeast and shares the honor with Children's Healthcare of Atlanta at Egleston. The MUSC pediatric ECMO program was previously designated an ELSO Center of Excellence, gold level, in 2017.

The ELSO Award for Excellence in Life Support signifies a commitment to exceptional patient care and an assurance of high-quality standards, specialized equipment and supplies, defined patient protocols and advanced education of all staff members.

"It is an exceptional honor to receive this recognition," said pediatric surgeon Laura Hollinger, M.D., medical director of the MUSC Pediatric ECMO Program. "It is a testament to the level of excellence of the multidisciplinary team of experts who provide ECMO support to our infants and children."

The program's team is comprised of pediatric surgeons, pediatric heart surgeons, pediatric cardiologists, neonatologists, pediatric critical care physicians, perfusionists, specially trained nurses and respiratory therapists. "The hallmark of this program is that we have this amazing pediatric service line complement that allows us to provide total care for our most critically ill children," said Hollinger. "Our pediatric ECMO program is the epitome of multidisciplinary collaboration and speaks to the distinct advantage of having a designated children's hospital with a team of specialists."

The goal of the pediatric ECMO program is to ensure outcomes remain excellent for these particularly vulnerable children, which the team strives to achieve through rigorous benchmarking, collegial support and unification through monthly case review conferences.

L to R: Elise Emrath, M.D., Monika Cardona, R.N., MSN, Aaron Henderson, R.N., Elise Wainwright, R.N., Alicha Gibbs, R.N., Erin Glikes, R.N., Charles Garred, R.N., Laura Hollinger, M.D.

Hollinger credits this award to the years of hard work by many pediatric specialists who care for these patients and to program manager Monika Cardona, R.N., MSN, who joined the team in 2014, for spearheading the program. Recognized as an expert in her field, Cardona has more than 20 years of experience in caring for patients requiring ECMO support and programmatic development.

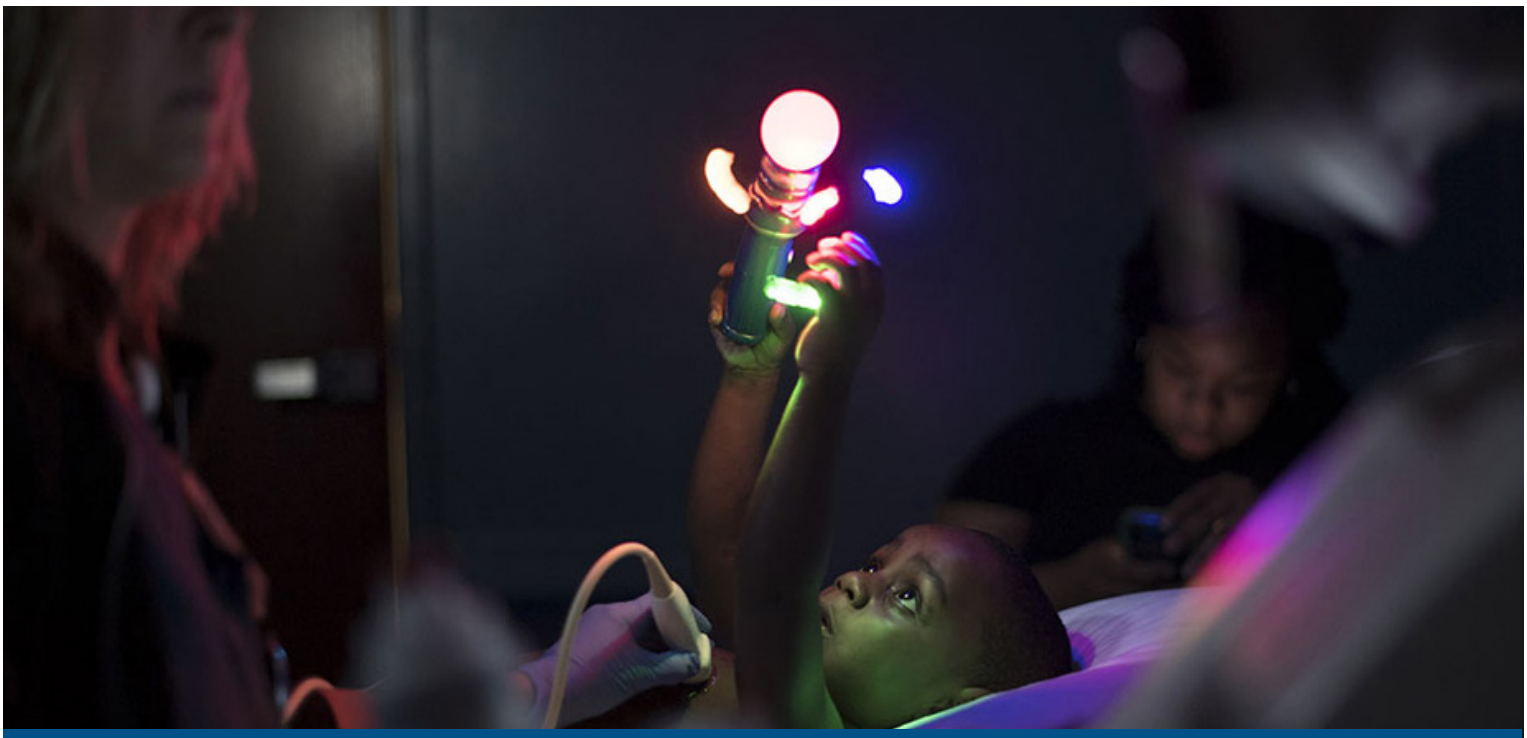
"Platinum designation by ELSO is an incredible honor that has been bestowed upon our program. With only 23 international ECMO programs receiving this elite designation, the work being done here at MUSC Shawn Jenkins Children's Hospital in extracorporeal life support is now showcased worldwide," said Cardona. "I am both humbled and honored to provide the programmatic oversight for our ECMO center and to be a part of this extraordinary team of clinicians as we care for these exceptional patients and their families."

"At MUSC, we have always had exceptional pediatric providers as evidenced by our surgical critical care program designations, including an ACS-designated Level 1 pediatric trauma center, a gold-level ECMO Center of Excellence and the Pediatric Burn Program" said pediatric surgeon Chris Streck, M.D., chief of the Division of Pediatric Surgery. "With the opening of the Shawn Jenkins Children's Hospital this year, we have a brand new state-of-the-art facility to match the excellent quality of patient care and platinum-level ELSO award."

According to pediatric oncologist Michelle Hudspeth, M.D., director of the Division of Pediatric Hematology and Oncology, ECMO is a resource you hope never to have to utilize. "However," she added, "I am enormously grateful for the expertise of our team when our pediatric oncology patients need it."

Hudspeth shared her utmost praise for the team's level of dedication and skill. "There really aren't words to express my respect and gratitude when you watch Monika and her team, the pediatric surgeons and the pediatric intensive care physicians and nurses successfully place a patient on ECMO. This is as life and death as it gets – their work as a team is beautifully orchestrated when every second counts," she explained.

"Their expertise shines, as our ECMO outcomes for pediatric oncology are far better than the national average, with 100% survival to discharge for the last seven years."



E.J. Wright was born with a rare heart defect. The pediatric cardiology team has been taking care of him for his entire life. Photo by Brennan Wesley writer Helen Adams

MUSC SHAWN JENKINS CHILDREN'S HOSPITAL

top-ranked children's hospital in South Carolina

In what has been a memorable year on many fronts for MUSC Children's Health, new rankings from U.S. News & World Report place the MUSC Shawn Jenkins Children's Hospital in the No. 1 position for the state. The rankings come just four months after the hospital opened, and as South Carolina deals with the ongoing coronavirus pandemic.

Four specialty programs within the hospital have been singled out by U.S. News & World Report for national recognition: cardiology and heart surgery, nephrology (kidney), gastroenterology and gastrointestinal (GI) surgery and cancer.

U.S. News & World Report issues the annual rankings "to help families with complex and rare conditions find the best medical care for their children," according to the publication's website. They're designed to steer children and their parents to the hospitals that are best equipped to treat them.

The cardiology program maintains its spot among the top 10 children's heart programs in the United States. Criteria include children's survival rate after complex heart surgery, along with the level of specialized staff, services and technologies and the ability to prevent infections.

The nephrology program at the MUSC Shawn Jenkins Children's Hospital ranks No. 30 in the U.S. That means it excels when it comes to the survival rate of children who have kidney transplants, the management of dialysis and infection prevention and other factors. It maintains its status as the highest ranked children's kidney program in South Carolina.

The GI and GI surgery program is no stranger to the U.S. News rankings, either. For the 13th year in a row, it made the grade, coming in at No. 43. The rankings factor in the survival rate for children who have liver transplants, the effectiveness of the hospital's treatment of children who have inflammatory bowel issues and other key measures.

Finally, the MUSC Shawn Jenkins Children's Hospital's cancer program ranks No. 44 on the list of "Best Children's Hospitals for Cancer." That's based in part on the five-year survival rate for children with leukemia-related cancer, bone marrow transplant services, programs for brain tumors and sarcomas, and infection prevention.

All of the ranked programs now have more space for their young patients thanks to the new children's hospital, which has 20% more licensed beds than the old one. Entire floors are dedicated to heart and cancer care.

> ***"I feel very fortunate to have the opportunity to be supported by Dr. Baliga and have the endorsement of the Department of Surgery at MUSC, where innovation and clinical research are highly valued. It's exciting to see how we can change the paradigm for patient care."***
>
> *- Aaron Lesher, M.D. MSCR*

Young pediatric surgeon receives prestigious NIH award

Aaron Lesher, M.D., MSCR, a promising young surgeon-scientist at the Medical University of South Carolina, has received a prestigious Mentored Patient - Oriented Research Career Development Award, also known as a K23, from the National Institutes of Health (NIH). It will give the pediatric surgeon more time to pursue an innovative approach that will change the paradigm of how clinicians treat burn patients.

The K23 provides $680,928 in funding over a four-year period. The idea is to cover a lot of costs so young clinical researchers have the freedom to focus their research endeavors on patient-oriented research. The K23 includes protected time for individuals considered to be on the path to a productive, independent clinical research career.

Lesher's study, A novel telemedicine optimized burn intervention (TOBI) for pediatric burn-injured patients and their caregivers, expands on a pilot study funded through a $200,000 Blue Cross Blue Shield of South Carolina Foundation Grant to build a first-of-its kind burn care app.

MUSC is the only pediatric burn center in the state, but geographically far away from many pediatric burn patients, which creates a barrier to access to care. After a child is treated for a burn, he or she typically has to see a doctor multiple times to make sure the wound is healing correctly.

According to Lesher, treating burns is well-suited to telemedicine because it largely relies on visual examination and can be done through video conferencing or image transfer. Over 94% of people have the ability to communicate through a smart phone and the use of the app was shown to be extremely effective in his pilot study treating partial thickness burns in children.

"Using the app in the pilot study allowed caregivers to access the expert burn team through smart phone technology," said Lesher. "Clinicians can be there virtually while patients are at home changing the dressing, helping them along the way."

The NIH funding will allow Lesher and his team to expand and optimize the BurnApp created in the pilot study and it's model of care provision. They will utilize feedback from both the patients and physicians currently in the pilot study to make sure it has the all of the functionality that they want and need.

"Once this phase is completed, we will conduct a feasibility study, using a small randomized control clinical trial at MUSC, to determine whether or not we can proceed to a larger multicenter trial," Lesher said. "Additionally, we can rollout the app in other hospital settings to better understand the barriers to implementation in different hospital environments, providing a new model of patient care that may be as good or better than face-to-face interaction."

Prabhakar Baliga, M.D., chair of the Department of Surgery, said Lesher's innovative approach to treating pediatric burns is a model that can be expanded to other disciplines. "What this study really does is show how we can change the way we deliver healthcare," he said. "It's really changing the way physicians and patients interact with each other and it can be applied to many other clinical scenarios."

Lesher said he's honored to receive the award. "I feel very fortunate to have the opportunity to be supported by Dr. Baliga and have the endorsement of the Department of Surgery at MUSC, where innovation and clinical research are highly valued," said Lesher. "It's exciting to see how we can change the paradigm for patient care."

Lesher has received other awards and recognition. Most recently, he was named IDeA Fellow 2019. Dr. Lesher attended an NIH symposium in Park City, Utah on pediatric trauma and critical care disease with other promising investigators. The symposium was sponsored by the NIH Pediatric Critical Care and Trauma Scientist Development Program (PCCTSDP) and provided an opportunity to meet other young investigators in pediatric critical care.

Photo by Jonathan Boncek/Charleston City Paper

Ashley Hink, M.D., MPH

leads national collaborative research study on gun violence

Firearm injury is one of the leading causes of death in the U.S. for youth and young adults, and those who survive their injuries may suffer long-term poor physical, mental health and social outcomes. Ashley Hink, M.D., MPH, is a key member of a research team with the American College of Surgeons Committee on Trauma who secured a grant from the National Collaborative on Gun Violence Research to prospectively study risk factors and outcomes of firearm injuries treated at over 70 trauma centers across the U.S.

Dr. Hink and Dr. Anne Andrews from the Department of Pediatrics are also laying the groundwork to initiate an MUSC Hospital and Community Violence Prevention & Intervention Program for our patients and community members.

Hongjun Wang, Ph.D.

named to prestigious NIH Study Section

Dr. Hongjun Wang has been invited by the NIH to serve as a permanent member of the Cellular Aspects of Diabetes and Obesity Study Section, Center for Scientific Review, for the term beginning July 01, 2020 and ending June 30, 2024. They will meet three times a year and review 70-80 submissions per meeting.

Wang has been a temporary reviewer for the NIH since 2016. She had been invited to participate in more than 20 NIH study sections sessions and has served as chair of two NIH special emphasis panels. A highly rigorous process, members are selected on the basis of their demonstrated competence and achievement in their scientific discipline.

"It is a great honor to serve the NIH as a permanent member of this Study Section," said Wang.

CLINICAL TRIAL

to test immunotherapy combination in surgical pancreatic cancer patients

Hollings Cancer Center researchers at the Medical University of South Carolina received $900,000 in funding for a three-year oncology translational studies program concept from Merck to do a Phase II study that potentially can offer a new treatment for pancreatic cancer patients, a population in desperate need of new treatment options, said one of the leading researchers and surgeon E. Ramsay Camp, M.D.

Camp, who joins forces with Mark Rubinstein, Ph.D., on this study, said it capitalizes on the innovative immunotherapy research happening in Rubinstein's lab.

LIPO-IMMUNOTECH RECEIVES GRANT

to develop a novel cancer immunotherapy technology

Lipo-ImmunoTech, LLC, a startup based in Charleston, South Carolina, recently received a Phase I Small Business Technology Transfer (STTR) grant of just over $224,000 to continue to develop its novel adoptive cell therapy technology for cancer. The startup is a joint venture involving Shikhar Mehrotra, Ph.D., an immunologist, and Besim Ogretmen, Ph.D., a sphingolipid expert, both of whom are Hollings Cancer Center researchers at the Medical University of South Carolina.

Lipo-ImmunoTech also executed an option agreement with the MUSC Foundation for Research Development, which gives it the rights to evaluate the technology further with an eye toward eventually licensing it for commercialization.

Read full stories in The Catalyst News

SPECIAL SECTION: RESPONDING TO THE PANDEMIC

Left to right: Colleen Cloud , Philip Heidt and Cindy Wang, the core team of lab technicians that worked tirelessly to validate the antibody tests.

DEPARTMENT OF SURGERY AND CENTER FOR CELLULAR THERAPY

lead the charge to develop a COVID antibody test

The Center for Cellular Therapy (CCT) is an FDA registered cGMP level facility that meets the most rigorous standards in the aspect of processing of cells. When MUSC leadership reached out to Satish Nadig, M.D., D.Phil., medical director for the CCT, and asked him to lead a task force to develop a diagnostic antibody test as a response to the COVID pandemic, he organized an interdisciplinary group of MUSC researchers.

The team, led by Nadig and Shikhar Mehrotra, Ph.D., co-scientific director of the CCT, developed an antibody test in less than a month using plasmid from Mount Sinai Laboratory.

According to Tara Duke, MLS, Quality Assurance Director of the CCT, developing this type of protocol could typically take up to six months, if not longer. "What this team did was quite impressive," she said. "And it's a testament to their dedication and hard work - especially our lab technicians, who worked around the clock."

Colleen Cloud, Program Manager, concurs. "It was amazing to see so many people working together on all the different aspects to get the antibody test up and running as quickly as possible."

Cloud adds that the core CCT lab technicians Philip Heidt and Cindy Wang are trained to work under pressure and tight timelines when working with cellular therapies. "Working in a clean cell facility, our team is accustomed to a rigorous level of intensity," said Cloud. "The same high standards we apply to cellular products helped as we pivoted to diagnostic studies." One week after the test was validated, the team notified the FDA.

Nadig said MUSC is highly confident in the testing done here because of the two-step process and because of the extensive validation done before it began offering the tests.

The lab started receiving requests for antibody testing from organizations outside of MUSC. As demand for the test grew, the lab needed more staffing. Many members of existing Department of Surgery labs volunteered while new personnel were recruited to join the effort.

During the first week that MUSC began offering this service, The Blood Connection sent between 1,000 and 1,400 samples each day. The lab is now processing up to 3000 antibody tests a day.

The test is useful at the population level to show how much COVID-19 is circulating in the community. And as tests continue to improve and scientists learn more about the novel coronavirus, individuals will be better able to make informed decisions about work and community events.

THE TRANSPLANT RESEARCH AND IMMUNOBIOLOGY INSTITUTE FUND To contribute to the Transplant Research and Immunobiology Institute Fund, visit **connect2.musc.edu/surgery**

FROM CONCEPT TO DESIGN:

How a team of innovators created 3D mask and cartridge system plans in record time

For human centered designers, there's always a story behind the innovation. That's because Human Centered Design begins with the people you are designing for and finding a solution that fits their needs. The human-centered design methodology uses empathy as a core value and creates an innovative solution.

"Once you empathize with your user group, you start defining the problem, narrowing it down from something really big to something smaller and more measurable," explained Joshua Kim, MS, Senior Designer.

The next step is the ideation process where the designers create new ideas. "One of the favorite brainstorming exercises some designers use is what we call a 'magic wand idea,'" said Kim. "Where we basically say if we have a magic wand and finances weren't an obstacle and technology was limitless what kind of solution could we create." Moving into the next phase of design – prototyping and testing – it's critical to design without the fear of failure in order to discover the best possible prototype for the end user.

Using this design process, Kim and a team of innovators at MUSC were able to find a solution to the N95 mask shortage in less than a week, understand what the N95 filter does, set the bar to replicate a filter that is equal to or better than the 95% filtration rate and fit it to an easy-to-produce, comfortable 3D mask with a proper seal and airflow.

Although the cartridge system can be retrofitted onto an aerosol mask, they were in short supply. As with any good design process, Kim set his sights on prototyping the filtration system from his home while a collaboration was occurring concurrently in the lab where dentists Walter Rene, DMD, Christian Brenes Vega, DDS and John Yost, a student and independent contractor, were developing the 3D mask prototype to resolve the shortage of aerosol masks.

As a result of the iteration process, Kim and his team broke down the global N95 mask shortage into a simplified concept that focuses on creating major design requirements for a project to be considered a success: Create a filtration system that can not only be retrofitted to an aerosol mask but also fitted to a 3D printed mask.

"This was an incredibly accelerated process," Kim said, "in large part due to collaboration, where a lot of credit goes towards our interdisciplinary team that was able to tackle this project from multiple angles simultaneously."

Within four days and with the guidance and support from Michael Yost, Ph.D., vice chairman of Research in the Department of Surgery and David Mahvi, M.D., chief of Surgical Oncology, the team was able to go from concept design to completion.

From left to right: Dave Mahvi, M.D., Mike Yost, Ph.D., Josh Kim, MS, present Prabhakar Baliga, M.D. with the 3D mask and S.A.F.E. cartridge system prototype.

The 3D mask and S.A.F.E. cartridge system project was awarded an MUSC Innovator Award during Innovation Week.

The presentation: *If you want to become famous overnight, talk to this team* featuring Michael Yost, Ph.D., Joshua Kim, Wally Renne, D.M.D., Christian Brenes Vega, D.M.D., and John Yost is viewable online.

HEALTH AND WELLNESS ADDS RESILIENCY

Daily wellness routines help manage stress during COVID-19

As part of the Department's Health and Wellness initiative, Colleen Cloud, program manager in the Center for Cellular Therapy, offered to make it easy for faculty, staff and residents stay active even in times of high stress, anxiety and isolation by sending an early morning email with a new and invigorating workout. Feedback was very positive. Cloud says every day she receives emails from people telling her how much they appreciate her workouts.

In addition to Cloud's exercise workouts to reduce stress and anxiety, Katherine Morgan, M.D., chief of GI Surgery, provided some calm through weekly reflection emails to faculty and staff covering topics of community, stress reduction and how to even enjoy this pause or reset in the world. "Don't be hard on yourself to maximize this time for accomplishment or to clean every closet (unless you want to). Choose opportunities that feel good to you in this time," she writes.

IN THE COMMUNITY

Department-organized blood drives answer urgent need

The Red Cross faces a severe blood shortage due to an unprecedented number of blood drive cancellations during the coronavirus outbreak.

Prabhakar Baliga, M.D., chair of the Department of Surgery, sent an email to the department to help raise awareness to the urgent need, noting that in the week of March 16 over 40 drives were cancelled in SC and the Red Cross was expecting cancellations to continue to increase. Dr. Baliga asked anyone who can donate blood to consider giving at any of the local donation sites.

Rupak Mukherjee, Ph.D., associate professor in the division of cardiothoracic surgery, regularly helps coordinate and recruit blood donors for the Hindu Temple of Charleston-sponsored American Red Cross blood drives. Dr. Mukherjee encouraged members of the MUSC-community to participate in the March 20 and May 30 blood drives at the Temple, or any other on-campus and community-based drives.

Their calls for action were answered.

"We had very successful blood drives," said Mukherjee. "Most of the donors were MUSC faculty, staff and students from the College of Medicine." In fact, the March 20 drive at the Temple collected 36 units of blood, exceeding the target of 28 set by the American Red Cross. During the drives at the Hindu Temple, donors are treated to home-cooked Indian Food, which Mukherjee also helps coordinate to further incentivize donations. "Members from MUSC who donated – either at the Temple, on campus, or at their community donation center, contributed immeasurably to the public health of our community," said Mukherjee. "If you haven't donated yet, please consider donation as the need is great."

Virtual TEDxCharleston: **PANDEMIC IN THE LOWCOUNTRY**

MUSC experts discuss the latest on the coronavirus

As COVID-19 cases in South Carolina spike in June, two Medical University of South Carolina researchers urged residents to do their part in fighting the virus.

"In this pandemic, it's paramount that we take care of each other. It's very important to set our own comfort aside sometimes – wearing a mask makes it hard to breathe – but it's important that we take care of each other so we can all get through this," said Satish Nadig, M.D., D.Phil., an immunology researcher and transplant surgeon who spends a good amount of his work hours wearing a mask.

"Mask wearing, hand hygiene and physical distancing – those three steps will greatly help contain this pandemic," said Michael Schmidt, Ph.D., a professor in the Department of Microbiology and Immunology.

The two participated in a virtual TEDxCharleston moderated by *The Post and Courier* investigative reporter Tony Bartelme. They covered a range of questions about the novel coronavirus, from progress toward a vaccine to doubts about whether there is truly a spike in local cases.

As cases are anticipated to climb through the summer months, they asked people to make wise choices for the greater good when celebrating summer holidays like the fourth of July.

While the world waits for a vaccine, some scientists have suggested that giving everyone the polio vaccine – which is plentiful, inexpensive and safe – would jump start an immune response to the novel coronavirus. There is some evidence that live attenuated vaccines can improve responses even to diseases they don't specifically target, Nadig explained.

In closing, the scientists asked everyone to remember to wear masks, wash hands and keep physical distance between themselves and others outside their households. Nadig also asked people to consider donating blood, as hospitals continue to need blood for lifesaving procedures.

IN THE COMMUNITY: HEROES NEED MASKS

Grassroots effort gains momentum

A grassroots campaign to collect personal protective equipment to medical professionals started on March 17 with a post on NextDoor, by MUSC cardiothoracic surgeon Sanford Zeigler, M.D. explaining to his neighbors the urgent need for personal protective equipment. A few days later, Dr. Zeigler partnered with his brother, a marketing strategist, to develop a crowdsourcing platform with a blog and social media campaign #HeroesNeedMasks, asking the public's support to collect and deliver protective gear to drop-off sites across the Lowcountry. Within a week, Heroes Need Masks' efforts have added more than 1000 N95 masks, 2500 surgical masks, 8000 gloves, hundreds of face shields and much more to MUSC's PPE supply.

Heroes Need Masks continues to distribute masks to essential workers and high risk individuals who may not have access to them, and are collecting halyard wrap to create reusable, washable high efficiency masks. As COVID-19 cases in the lowcountry increased, Zeigler and his team are building awareness campaigns to help stop the spread of COVID.

If you would like to learn more or volunteer, please visit www.heroesneedmasks.com or contact Dr. Zeigler at zeigle@musc.edu.

SPOTLIGHT ON:

Milton Armstrong, M.D.

Milton Armstrong, M.D. joined MUSC in 2009 as Chief of Plastic and Reconstructive Surgery.

Dr. Armstrong is board certified by the American Board of Plastic Surgery and earned a Certificate of Added Qualifications in Hand Surgery.

An accomplished clinician, leader and educator, Dr. Armstrong was appointed Director to the American Board of Plastic Surgery in 2020. He also holds national positions including Senior Director at Large for the American Association for Surgery of the Hand and Oral Examiner for the American Board of Plastic Surgery.

Prior to joining MUSC, Dr. Armstrong's first faculty position was at Ohio State University, College of Medicine in the Division of Plastic Surgery. In addition to his clinical practice, he served the University as Associate Dean for Student Affairs and Associate Dean for Minority Affairs.

He then moved to the University of Miami Health System, where he was Chief of the Division of Plastic Surgery at the Veteran's Hospital. During his tenure at Miami, he started a microsurgery and a hand surgery fellowship. At both of these academic medical centers, he was the only Black surgeon. He notes of all places he has worked or trained, MUSC has the most racial diversity.

An educator at heart, Dr. Armstrong is deeply committed to providing strong leadership and guidance to the residents in the Plastic and Reconstructive Surgery training programs at MUSC. Under his leadership, the plastic and reconstructive surgery residents have a 100% board pass rate.

Throughout his career, he has trained more than 100 surgeons. He keeps in touch with many of his graduates and is gratified to see they are successful, caring clinicians and advocates for diversity and inclusion.

Dr. Armstrong was the first surgeon highlighted in the Arthur L. Garnes Society's "Surgeon Spotlight." The Society is named after Arthur Garnes, M.D., the first board-certified Black plastic surgeon. It is committed to fostering mentorship, collaboration, and fellowship among Black, African-American, and other under-represented minorities in Plastic Surgery.

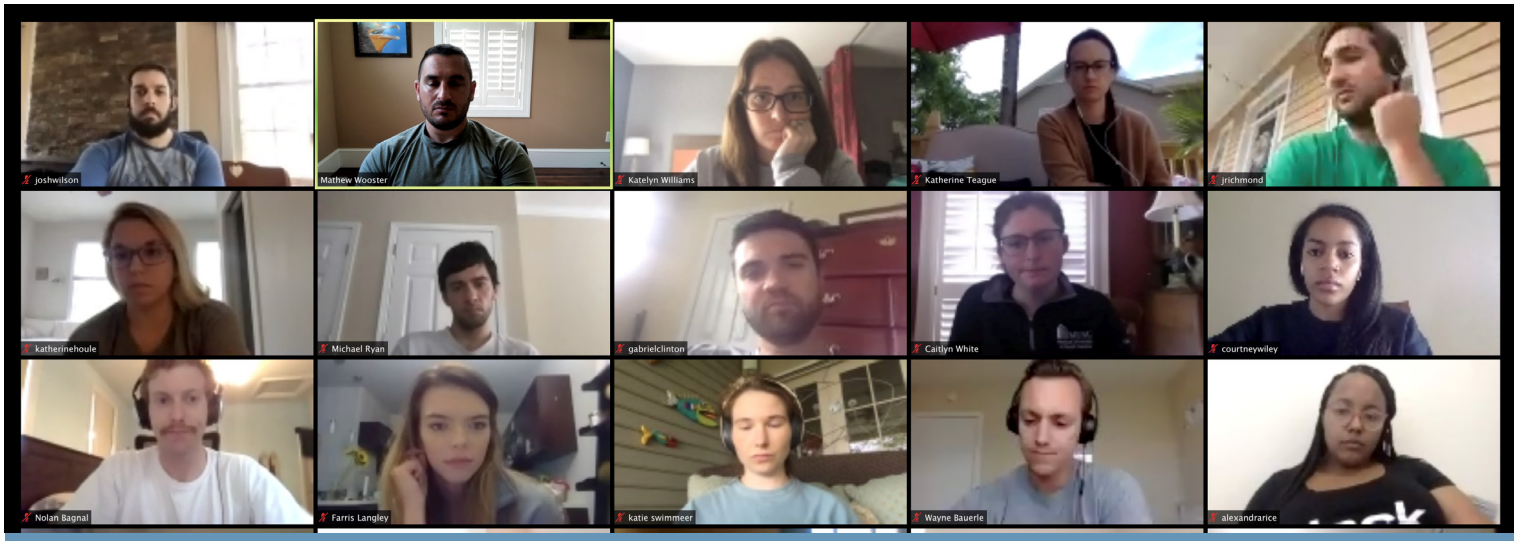
FOSTERING WELLNESS

Resident burnout is associated with increased adverse patient events and increased incidence of depression and suicide when compared to the general population. In an effort to address burnout, a wellness initiative team led by Andrea Abbott, M.D., MSCR developed a resident-driven wellness study.

Denise Garcia, M.D., PGY-3 is the primary author of the research manuscript that was accepted for publication in *Journal of Surgical Research.* The initial step was to survey the general surgery residents to assess their wellness. Upon review of the results, they developed an implementation plan supported with department and philanthropic funds to meet the desired changes. Those changes included providing two protected weekday personal days per year, modernization of the resident workspace, and additional meal funds.

The team then did two post-follow up surveys at 6 months and 15 months to assess resident wellness and found significant changes in perceptions of wellness opportunities, time for wellness, and improved quality of life.

RESIDENT EDUCATION SUPPORT FUND To make a difference in resident education, visit **connect2.musc.edu/surgery**



ADAPTIVE LEARNING: Zoom in to connect and learn

With social distancing guidelines in place at the start of a new clerkship rotation, the education division needed to develop a curriculum that would cover various topics medical students would come across during the first two weeks of their clerkship.

Mathew Wooster, M.D., general surgery clerkship director, reached out to each surgical sub-specialty inquiring as to whether any of them would be willing to provide the students in Block 7 (March 30-May 8) with virtual classroom instruction, including lectures covering their specialty along with additional modules from various training data banks.

Many attendings offered to provide virtual learning experiences. On Monday, March 30, Rana Pullatt, M.D. provided the inaugural Zoom video session with the surgery clerkship students.

Dr. Pullatt provided an interactive zoom session that included videos of a cholecystectomy, gastric bypass, and sleeve gastrectomy. He provided a live narration, pointing out anatomy as well as discussing indications, perioperative care, and post operative complications. According to Wooster, the clerskship students were as engaged and interactive as they are in a live session.

ADAPTIVE LEARNING: Virtual Simulator Training

Vascular surgeon Mathew Wooster, M.D., developed a virtual simulator training for the vascular surgery integrated residents with the help of his colleague, Elizabeth Genovese, M.D., who joined the effort by formalizing the survey and investigating potential research publication opportunities.

According to Wooster, this is a pilot trial of virtual endovascular simulation training utilizing benchtop simulation model and one-on-one mentoring with a Zoom interface. The trainees will first film themselves attempting a variety of arterial cannulations by selecting the appropriate wire and catheter combinations.

They will then have one-hour Zoom based instructional sessions to review/train their skills with faculty. This will be followed by independent replication of those cannulations.

"Using a telephone camera (with Zoom) to display the benchtop model as "live virtual fluoroscopy" and the laptop camera (with Zoom) to watch the trainee's hands on the catheter, we can give real time feedback and instruction from an appropriate social distance," said Wooster.

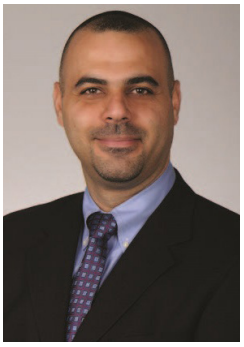
Wooster and Genovese will then compare metrics including subjective analysis of the usability of the model, the benefit of virtual mentoring, perceived improvement in skills and importance to training, number of catheter exchanges required, and time to successful cannulation. They plan to move to the more advanced 3D Systems Simbionix electronic simulators, also with remote instruction. "Drs. Wooster and Genovese have consistently leveraged technology to create new educational and clinical opportunities.

This is a novel program that demonstrates how MUSC Vascular is leading the way and changing what's possible," said Ravi Veeraswamy, M.D., chief of Vascular Surgery. "Kudos to them for once again putting MUSC Vascular Surgery at the forefront of innovation and education."

VASCULAR SURGERY SUPPORT FUND

To contribute to the Vascular Surgery Support Fund, visit **connect2.musc.edu/surgery**

CONGRATULATIONS TO OUR GRADUATES



Ahmed Allawi, M.D.
General Surgery

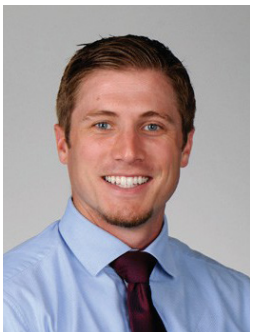
Shelby Allen, M.D.
Administrative Chief
General Surgery

Kate Engelhardt, M.D.
General Surgery

Doris Kim, M.D.
General Surgery

David Moffat, M.D.
General Surgery

Benjamin White, M.D.
General Surgery



Bradley LeNoir, M.D.
Cardiothoracic
Surgery

Allen Bui, M.D.
Vascular Integrated
Surgery

Sean Dieffenbaugher, M.D.
Surgical Critical Care

Daniel Crane, M.D.
Independent Plastic
Surgery

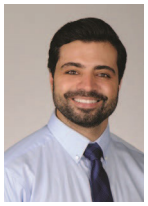
Zachary Young, M.D.
Independent Plastic
Surgery

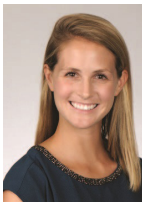
Our graduates worked tirelessly to hone their skills that will prepare them well for their future. During their training, each found their path and passion. Our world changed dramatically this year, but that didn't stop us from celebrating their significant accomplishments. Read all about our graduates in a special section on a website: https://medicine.musc.edu/departments/surgery/education/graduates

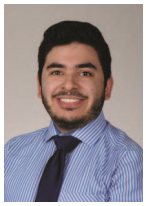
- **Ahmed Allawi, M.D.** starts a one-year fellowship in Colon and Rectal Surgery at the Mayo Clinic in Rochester, MN.
- **Shelby Allen, M.D.** enters Indiana University for an HPB fellowship in Indianapolis, IN.
- **Kate Engelhardt, M.D.** continues her training in a cardiothoracic surgery fellowship at Washington University in St. Louis, MO.
- **Doris Kim, M.D.** starts an advanced minimally invasive and robotic surgery fellowship at UC Davis in Sacramento, CA.
- **Dave Moffat, M.D.** enters a fellowship in minimally invasive and bariatric surgery at Duke University, in Durham, NC
- **Ben White, M.D.** begins a fellowship in minimally invasive surgery at the University of Virginia in Charlottesville, VA.
- **Bradley LeNoir, M.D., MBA** joins Sanger Heart and Vascular Institute at Atrium Health in Charlotte, NC.
- **Allen Bui, M.D.** joins Acadiana Vascular Clinic in Lafayette, LA.
- **Sean Dieffenbaugher, M.D.** joins Atrium Health at Carolinas Medical Center in Charlotte, NC.
- **Dan Crane, M.D.** starts a one-year fellowship in Aesthetic Plastic Surgery in Sacramento, CA.
- **Zach Young, M.D.** joins Arkansas Plastic Surgery in Little Rock, Arkansas.

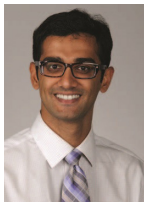

L. Booth


D. Garcia

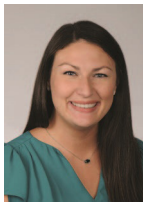

S. Hermiz

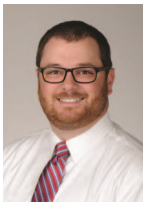

M. Hite

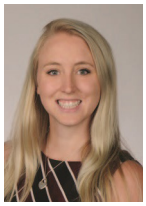

R. Parrado


K. Patel


L. Plumblee


K. Quinn


C. Thomas


H. Zlomke

RESIDENT **AWARDS** AND RECOGNITIONS

- **Lex Booth, M.D.** awarded a 2-year post-doctoral fellowship through the VA Quality Scholars Program for his work in Defining Healthcare Disparities in the Management of Inflammatory Bowel Disease.
- **Denise Garcia, M.D.** manuscript: Resident-Driven Wellness Initiatives Improve Resident Wellness and Perception of Work Environment accepted for publication in the Journal of Surgical Research; presentations at the Academic Surgical Congress "Surgical Resident Wellness Scores Improved Long-term Following Implementation of Wellness Measures" with Dr. Abbott as the PI and "High Fat-Induced Obese Conditions Drive an Aggressive Pancreatic Cancer Phenotype" with Dr. Camp as the PI.
- **Steve Hermiz, M.D.** passed the certifying Examination for the American College of Surgeons.
- **Melissa Hite, M.D.** manuscript: A Multi-Faceted Approach to Opioid Education, Prescribing, and Disposal for Breast Cancer Patients accepted for publication in the Journal of Surgical Research.
- **Raphael Parrado, M.D.** received the 2020 Resident of the Year award from the National Hispanic Medical Association.
- **Kunal Patel, M.D.** matched into the Cardiothoracic Fellowship at UVA.
- **Leah Plumblee, M.D.** awarded second place in the Western Trauma Association Resident Paper competition.
- **Kristen Quinn, M.D.** awarded a T-32 Cardiovascular Fellowship at MUSC.
- **Chris Thomas, M.D.** selected to serve on the ACS FSC Resident Advisory Council.
- **Haley Zlomke, M.D.** awarded a T-32 Fellowship at Johns Hopkins.

RESIDENTS SCORE RECORD HIGH ON ABSITE

Sixteen general surgery residents scored greater than 70th percentile on the American Board of Surgery In-Training Examination (ABSITE), given annually to measure the progress residents have made in their knowledge of applied science and management of clinical problems related to surgery. Five of these residents scored greater than 90th percentile.

"The ABSITE is basically an annual measuring stick to let residents know where they are in their preparation for the written boards," said Christian Streck, M.D., General Surgery Residency Program Director. Streck reports this year's results were the best in his 12 years at MUSC.

"A lot of credit goes to Aaron Lesher, M.D., MSCR, who was the 2019-20 Basic Science Program Coordinator, the residents who consistently put in the hard work, and the faculty who are committed to resident education," said Streck.

Congratulations to this year's "Top Guns" for scoring greater than 70%ile on the ABSITE! (Note: * indicates greater than 90%ile; + indicates research year):

- Ahmed Allawi, M.D., PGY5
- Shelby Allen, M.D., PGY5 *
- Monther Altiti, M.D., PGY4
- Lex Booth, M.D., PGY2*
- Cathy Chung, M.D., PGY 3+
- Denise Garcia, M.D., PGY2+*
- Bryce Lambert, M.D., PGY 1*
- John Lucas, M.D., PGY1
- David Mann, M.D., PGY1
- Anna Matrachisia, M.D., PGY4
- Graham Mercier, M.D., PGY2
- David Moffatt, M.D., PGY5
- Taofeek Olajire-Aro, M.D., PGY3 *
- Michael O' Laughlin, M.D., PGY3
- Julie Siegel, M.D., PGY2+
- Chris Thomas, M.D., PGY1

"The Department of Surgery is delighted to recognize and honor two pediatric cardiothoracic surgeons: Robert M. Sade, M.D., whose vision and remarkable generosity provided the ability to establish the Robert M. Sade, M.D. Endowed Chair in Pediatric Cardiac Surgery, and Scott Bradley, M.D., a gifted surgeon and inaugural chair-holder of the Robert M. Sade, M.D. Endowed Chair in Pediatric Cardiac Surgery."

- Prabhakar Baliga, M.D.

CELEBRATING ROBERT M. SADE, M.D.

Robert M. Sade, M.D. holds the position of Distinguished University Professor at the Medical University of South Carolina. A native of Newton, MA, Dr. Sade graduated from Columbia University College of Physicians and Surgeons nearly 60 years ago. Upon graduating, he began his general surgery training on the Harvard Surgical Service, Boston City Hospital. Toward the end of his general surgery training he was offered a position in the Boston Children's Hospital (BCH) general pediatric surgery training program, which provided the opportunity to blend his two passions: surgery and caring for children. Before he started at BCH, however, he fulfilled a two-year obligation to serve in the U.S. Navy during the Vietnam War, including a year on the aircraft carrier USS Constellation (CVA-64) in the Gulf of Tonkin.

Upon completion of his military service, Dr. Sade had the opportunity to work in the cancer research laboratory of world-renowned cancer researcher, Judah Folkman, M.D., at the Dana Farber Cancer Research Center. Dr. Sade acknowledges Dr. Folkman's contributions to his present-day ethical philosophy, and describes him as one of the most brilliant, kind, and honest human beings he's known.

During his training at BCH, Dr. Sade also had the opportunity to work with Dr. Robert Gross, a pioneer of children's surgery, and Dr. Aldo Castaneda, a world-renowned cardiac surgeon. Dr. Sade was Dr. Castaneda's first chief resident at BCH, and together they embarked on creating a range of innovative approaches to children's heart surgery, including developing a method of deep hypothermic circulatory arrest to allow access to the interior of a baby's non-beating heart in a bloodless field.

During his time at BCH Dr. Sade realized his life's work: surgical correction of heart disease in children. After finishing his training, he remained on the Harvard faculty and BCH surgical staff; then in 1975, he was recruited to MUSC where he had the opportunity to create and lead the pediatric cardiac surgery program at MUSC, the only such program in South Carolina.

During Dr. Sade's two decades of clinical work, research, and teaching at MUSC, he also served in many administrative roles including President of the Faculty Senate, Medical Director of MUH, Assistant Dean (Admissions) and Associate Dean (Clinical Affairs) of the College of Medicine, among others. His current positions include Professor of Surgery and Director of the Institute of Human Values in Health Care at MUSC.

Dr. Sade has served in many roles at the national level, including as President of the Southern Thoracic Surgical Association, Associate Editor of the Annals of Thoracic Surgery, and Chair of the ethics committees of the Society of Thoracic Surgeons, the American Association for Thoracic Surgery, and the American Medical Association.

His long list of honors includes the Society of Thoracic Surgeons Distinguished Service Award, among many others. Dr. Sade has enjoyed two substantial professional careers over nearly 60 years: first, pediatric cardiac surgery and later, bioethics. While he continues to teach, lecture, and write in the fields of bioethics and surgical ethics, his most prized legacy will be the surgical correction of heart disease in children — a legacy that continues through the Pediatric Heart Surgery Program at MUSC, led by Dr. Scott Bradley.

"My first professional love, pediatric cardiac surgery, remains my greatest and I feel fortunate to have been in a position to make a positive contribution to MUSC and to the field of pediatric cardiac surgery by establishing an endowment in the MUSC Foundation," said Dr. Sade.

"MUSC has become one of the leading centers in the country for the treatment of congenital heart disease under the leadership of Scott Bradley, who is now recognized as one of the nation's top children's heart surgeons. He and his colleagues, including surgeon Minoo Kavarana, have elevated MUSC's children's heart program far above the level of excellence I was able to achieve over the two decades I headed the program," said Dr. Sade. "Needless to say, I'm thrilled that Scott is the first to hold the Sade Endowed Chair. "

> ***Throughout their careers, both Bob and Scott have garnered international recognition for their contributions to the field of surgery and their patients have expressed their deepest appreciation over the years. MUSC and our department are so fortunate to have both on our faculty.***
>
> *- Prabhakar Baliga, M.D.*

HONORING SCOTT M. BRADLEY, M.D.

Scott M. Bradley, M.D. holds the position of Professor of Surgery at the Medical University of South Carolina. Dr. Bradley was born in Palo Alto, California, the oldest of three brothers.

Dr. Bradley grew up in California, England and Northern Virginia. He received his bachelor's degree from Harvard University in 1980, and spent a year doing cellular immunology research at the NIH.

He graduated from Harvard Medical School in 1985. He received postgraduate training in general surgery at Massachusetts General Hospital and spent two additional years as a research fellow in fetal and cardiovascular surgery at the University of California, San Francisco.

Dr. Bradley received cardiothoracic surgical training at the University of Michigan, Ann Arbor. He then completed a fellowship in pediatric cardiac surgery with Dr. Edward Bove at the University of Michigan.

In 1995, Dr. Bradley was recruited by Dr. Fred A. Crawford Jr. to join the Division of Cardiothoracic Surgery as a pediatric and congenital heart surgeon. Dr. Bradley carries out the full range of pediatric and congenital heart operations, specializing in staged surgical palliation for single ventricle heart defects, aortic valve repair, the Ross procedure, and pulmonary artery unifocalization.

He is a member of the American Association for Thoracic Surgery, the Congenital Heart Surgeons Society, the Society of Thoracic Surgeons, the Southern Thoracic Surgical Association, and the American Surgical Association. He is an associate editor for Congenital Heart Surgery of the Journal of Thoracic and Cardiovascular Surgery.

Dr. Bradley's primary professional goal has been to develop a collegial team which provides the population of South Carolina with pediatric cardiac surgical outcomes which are equivalent to, or better than anywhere in the world. For the last 5 years, MUSC Children's Hospital has consistently received a 3-star rating from the Society of Thoracic Surgeons (STS) Congenital Heart Surgery Database. The 3-star rating denotes excellent outcomes with low operative mortality, and is achieved by less than 10% of pediatric cardiac programs. In the *US News and World Report* annual ranking of pediatric cardiac programs, the MUSC Children's Heart Program most recently ranked #7 nationally.

These recognitions are amazing tributes to our gifted and talented surgeons, Dr. Scott Bradley, his associate, Dr. Minoo Kavarana, and to the entire MUSC Pediatric Cardiac Program Team.

The MUSC Pediatric Cardiac Team is truly multidisciplinary: it consists of a close-knit group of pediatric cardiac care providers in the areas of surgery, cardiology, anesthesia, nursing, perfusion, pharmacy, respiratory therapy, dietary, play therapy, and others.

MUSC belongs to the Children's Heart Center of South Carolina, a statewide network of pediatric cardiologists providing coordinated care for all congenital heart patients in South Carolina. The support of the pediatric cardiology groups around the state has been critical to our program's ongoing success.

This team compassionately cares for children and their families who find themselves in the most dire of situations. Any family hopes for the best possible quality of life for its children. Families seek out MUSC knowing that they are in the right place at the right time.

"It is both a pleasure and a privilege to be a member of such an outstanding team, and to be able to provide top notch care to the pediatric cardiac patients of our state," said Dr. Bradley.

The program's care also transcends the state of South Carolina and the nation's borders to include more than 50 children from across the globe. By participating in the Gift of Life program, we have operated on children from around the world, including Mongolia, Bosnia, Nigeria and Vietnam, to offer children with heart defects a second chance at life.

Gratitude

Your generous support is changing what's possible in pediatric cardiac surgery.

While the March 28 dinner honoring Robert M. Sade, M.D. and Scott Bradley, M.D. was postponed due to COVID-19 social distancing restrictions, the recognition of their noteworthy achievements and contributions to the field of pediatric cardiac surgery extend well beyond an evening of tributes and recognitions.

MUSC is deeply appreciative of our benevolent donor, Robert M. Sade, M.D., whose vision and remarkable generosity provided the ability to establish this endowed chair. His commitment changes the trajectory and level of care we provide at MUSC. We would like to also recognize our leadership within the MUSC Department of Surgery and the MUSC Shawn Jenkins Children's Hospital and Pearl Tourville Women's pavilion who have come together to ensure a steadfast commitment to honor our promise to "Change What's Possible."

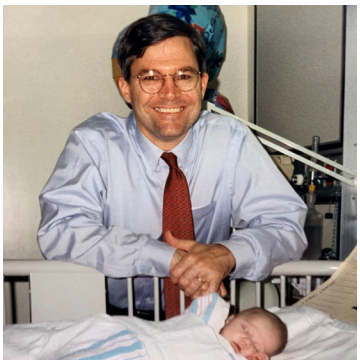
Endowed chairs, while paying tribute to those for whom they are named, provide a lasting homage to exceptional individuals. An endowed chair is a named faculty position that recognizes one's lifelong professional contributions or can honor the legacy of a loved one. This significant donation inspires innovation and confers a level of prestige to faculty, giving the University a competitive edge in the recruitment of stellar students and scholars, such as the inaugural chair-holder Scott Bradley, M.D.

By way of self-sustained funding with generated revenue from investments, endowed chairs promote growth, giving universities a critical advantage in faculty recruitment and retention of top scholars in the field.

An endowed chair can promise financial support for research, in addition to other opportunities that will make a difference in the lives of future patients. Faculty members who hold the position of an endowed chair have attained the highest rank an MUSC professor can achieve and are held to a high standard of providing exceptional patient care.

Finally, and perhaps most importantly of all, there are the countless individuals whose lives are transformed because of the existence of an endowed chair: students, residents, staff, community members, volunteers – and our patients – all lives forever touched because of the innovative research and clinical care this endowed chair helps fund.

For more information on how you can support the MUSC Department of Surgery, contact Vera Ford, Director of Development, at 843-792-1840.



Scott Bradley, M.D. by Jacob's bedside after one of his surgeries.

"Without Dr. Bradley's surgical expertise in the Norwood procedure, a series of three surgeries that rebuilt Jacob's heart, he wouldn't have survived. We are eternally grateful."

Freddie Gault, Jacob's father.

Scott Bradley, M.D. and Jacob during a recent check-up.

"Doctor Bradley's devotion to children with heart defects has given me the opportunity to succeed in life."

Jacob Gault, Age 22