



Department of Surgery 2020 Annual Report

TABLE OF CONTENTS

- 04** From the Chair
- 05** Clinical Highlights
- 07** By the Numbers
- 08** Awards and Distinctions
- 10** Response to COVID
- 12** Research Highlights
- 14** Research Funding Highlights
- 16** Updates in the Labs
- 20** Education Highlights
- 24** Alumni News
- 26** Philanthropy News

ACKNOWLEDGMENTS:

The Department of Surgery would like to thank the many individuals, especially our leadership, for their collective efforts in helping to complete this year's annual progress report. Additionally, we would like to thank those who are featured within these pages for their continued service to MUSC and contributions to this publication.

COVER:

Top Image: Alicia Stafford, M.D., vascular surgery integrated resident, assisting vascular surgeon Mathew Wooster, M.D.

Middle Image: A DNA molecule consists of two strands that wind around each other like a twisted ladder.

Bottom Image: Milton Armstrong, M.D. meeting with staff in his clinic.

Editor, Creative and Production Manager: Lauren Hooker

Photographers: Elizabeth Ann Thompson, Sarah Pack, Brennan Wesley, Lauren Hooker

ADMINISTRATION

Prabhakar Baliga M.D.
Chair, Department of Surgery

Jamie Meyer
Vice Chair, Finance and Administration

Cynthia Talley, M.D.
Vice Chair, Education

Michael Yost, Ph.D.
Vice Chair, Research

Mark Lockett, M.D.
Vice Chair, Veteran's Affairs

CLINICAL LEADERSHIP

Marc R. Katz, M.D., MPH
Chief, Division of Cardiothoracic Surgery

Virgilio George, M.D.
Chief, Division of Colorectal Surgery

Bruce Crookes, M.D.
Chief, Division of General and Acute Care Surgery

Katherine Morgan, M.D.
Chief, Division of GI and Laparoscopic Surgery

David Mahvi, M.D.
Chief, Division of Oncologic and Endocrine Surgery

Christian Streck, M.D.
Chief, Division of Pediatric Surgery

Milton Armstrong, M.D.
Chief, Division of Plastic and Reconstructive Surgery

Derek DuBay, M.D., MSPH
Chief, Division of Transplant Surgery

Ravi Veeraswamy, M.D.
Chief, Division of Vascular Surgery

MESSAGE FROM THE CHAIR

The Department of Surgery has continued to flourish this past year.

In fact, in spite of the many challenges COVID-19 presented in academic medicine, we continued to provide surgical care using best-practices to protect the health of our patients and care teams.

The clinical care team 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.

Despite the many challenges the past few months have presented, members of the department have never wavered in their resolution to provide the best, most innovative care.

Some particularly noteworthy departmental highlights from this past year include:

- Clinical growth prior to COVID-19 was up significantly. Once elective surgeries resumed after being halted for one month, the department quickly rebounded to meet the needs of South Carolinians as you will see in the pages that follow.
- The research division had one of our most impressive years with all of our basic science investigators receiving extramural funding. Our investigators are nationally recognized in studying the causes and consequences of healthcare disparities in vulnerable patient populations with the goal of reducing the impact of race and socioeconomic status on health outcomes.
- The clean cell facility experienced significant growth. It has established strong extramural funding from the NIH and VA. In addition to sustaining the Islet Cell Transplant Program, it has now started supporting the Blood and Marrow Transplant Program.
- We completed funding for five new endowed chairs - our philanthropic donors and colleagues coming together to invest in the recruitment and retention of the best surgical leaders in the nation.
- Our resident match was extremely successful. For general surgery, we matched 5 of 6 candidates within our top 10. All the integrated programs performed equally as well, matching their top number 1 or 2 candidates.
- A resident wellness program was established with significant improvement in addressing burnout.

During these unprecedented times, I am in awe of what we have achieved and extend my deepest appreciation to the dedicated faculty, fellows, residents, staff and generous donors who have contributed to our success.



A handwritten signature in blue ink that reads "Baliga". The signature is stylized with a long, sweeping underline that extends to the right.

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



CLINICAL HIGHLIGHTS

Delivering surgical excellence through innovation and discovery.

Expansive Growth

The Division of Cardiothoracic Surgery experienced record growth this year, performing more cardiothoracic and thoracic surgeries than had ever been done before at MUSC. This year, prior to March 23 when Governor McMaster placed a COVID-19 moratorium on elective surgery, adult cardiac cases were up 32%, thoracic cases were up 12%. And, by the end of the fiscal year, the number of adult heart transplants nearly doubled from last year.

Nationally-renowned surgeon and a pioneer in minimally invasive and robotic heart surgery, **Marc R. Katz, M.D., MPH**, joined the division nearly four years ago with the goal to expand the program by providing new, innovative, and collaborative procedures at MUSC.

Within a year, the clinical staff grew to include three more cardiothoracic surgeons and the breadth of the program expanded to include an array of options: medical therapy, traditional open heart surgery, robotic surgery and transcatheter procedures.

He credits the strong foundation of the program, built by Dr. Fred Crawford, for creating the infrastructure that allowed for rapid progress in a short period of time. But it's more than being an innovator and leader – it's also being a collaborator with other leaders in the field.

At MUSC, he's teamed up with Dr. Daniel Steinberg, a renowned interventional cardiologist, and Dr. Ravi Veeraswamy, a national leader in vascular surgery. Together they are developing hybrid approaches at MUSC.

With growth comes new opportunities and two new adult cardiothoracic surgeons and one pediatric cardiac surgeon have been hired with two more leadership positions currently in the recruitment phase.

The Pediatric Cardiac Surgery team, led by **Scott Bradley, M.D.**, achieves excellent outcomes year after year. The latest *U.S. News and World Report* ranked the MUSC Children's Heart Network of South Carolina among the top 10 children's heart programs in the country and the MUSC Children's Heart Center has once again earned a distinguished three-star rating from The Society of Thoracic Surgeons (STS) for its patient care and outcomes in congenital heart surgery.

Outward Bound New Outreach Clinics Established



Vascular surgery started a new outreach clinic with coverage at Beaufort Memorial Hospital, in addition to outreach at Murrells Inlet.

Transplant surgery recruited an Outreach Director (**Dr. Carlos Zayas**) and placed APPs in Columbia, Florence and Greenville for the kidney transplant program. In addition, the liver transplant program started an outreach clinic this year at Columbia and Murrells Inlet.

Thoracic surgery continues their outreach clinics in Beaufort and Murrells Inlet.

Pediatric Surgery started an outreach clinic and performing ambulatory surgery at Beaufort Memorial Hospital.

Concierge Center for Hernia and Gallbladder Surgery

Abdominal Wall Reconstruction Center

New concierge services are offered for hernia and gall bladder surgery and for abdominal wall reconstruction with an assurance that patients will be seen within 48 hours. In addition, an ER to OR program has been established for patients presenting to the ER with an emergent situation.



Nationally-Accredited Adolescent Bariatric Surgery Program

Severe obesity affects 4.4 million children and adolescents in the U.S., yet surgery is underutilized with only about 2000 having surgery annually. According to [Aaron Lesher, M.D.](#), a pediatric surgeon leading MUSC's adolescent bariatric program, adolescents can achieve significant weight loss - approximately a 30 percent decrease in BMI - and experience tremendous improvements in health and quality of life.

MUSC is the only adolescent bariatric surgery program in the Lowcountry and one of a few in the Southeastern U.S., meeting the highest standards for patient safety and quality of care.



Taylor went through a life transformation when she had gastric bypass at age 17.

New Colorectal Division Reflects Expertise

The Division of Colorectal Surgery, led by [Virgilio George, M.D.](#), was created to reflect its expert capacity to provide comprehensive care for benign and malignant diseases of the lower gastrointestinal tract. The division is nationally and internationally recognized for their pioneering efforts and extensive experience in state-of-the-art minimally invasive surgeries including robotic surgery and laparoscopic surgery for colorectal cancer, Crohn's Disease and other inflammatory bowel diseases. The surgeons specialize in robotic, laparoscopic, and transanal minimally invasive surgical techniques offering benefits including decreased post-operative pain, shorter post-operative recovery time, and less noticeable scarring.



Dr. Virgilio George meets with his patient, Bernadette Mouzon.

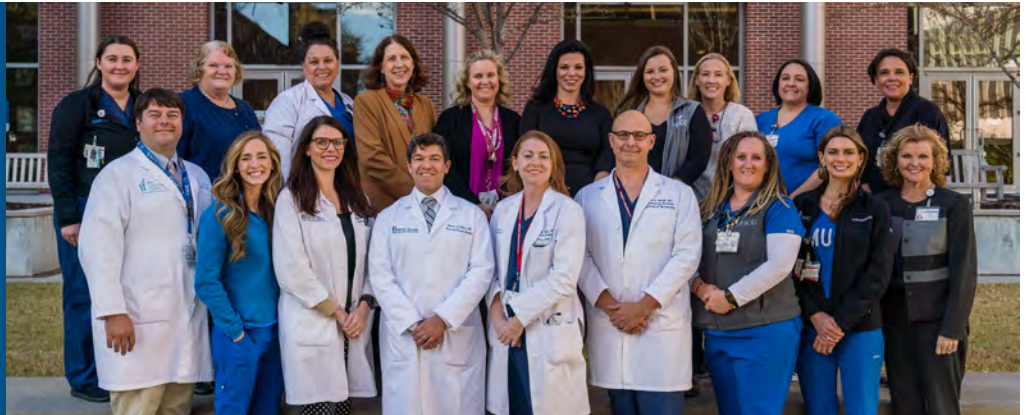
New Interventions for Rib Fractures

Trauma surgeon [Evert Eriksson, M.D.](#) is utilizing a new rib fixation technology that enables rib stabilization in patients with flail chest, leading to better respiration and lower rates of ventilator usage. "We're changing how we manage rib fractures," says Eriksson. "We can now put in specially designed plates to fix the ribs and get these patients out of the hospital faster, decrease their pain and get them back to their lives sooner. Their ICU length of stay and their risk of pneumonia go down."



Evert Eriksson, M.D. surgically implants a rib stabilization device.

New MUSC Burn Center Offers Comprehensive Treatment



Members of the comprehensive multidisciplinary burn team, which include, nurses, physicians, APP's, pharmacists, and administrators.

Steven A. Kahn, M.D. joined the MUSC Department of Surgery as the director of the Burn Program and chief of Burn Surgery on July 1, 2019. As the newly appointed burn director, Kahn was charged with establishing the MUSC Burn Center to provide comprehensive care for adults and children in both the inpatient and outpatient settings, with the vision of establishing an American Burn Association (ABA) certified burn center. Prior to opening, most adults in South Carolina would have to travel to Georgia for burn care.

The Burn Center recently hired an expert specialty team that includes [Katie Hollowed, R.N.](#), a leader in burn nursing care. The burn team focuses on more than just survival after burn injury, striving for complete functional recovery and reintegration back into society. Patients treated at the Burn Center have access to more than 50 specialists and programs. Since it opened in May, the Burn Center has met the projections established for the 3 - 5 year mark. It recently performed the first reported successful minimally invasive skin graft in the U.S.

Pediatric ECMO Program 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.



The Pediatric ECMO team, led by [Laura Hollinger, M.D.](#) (far right.)

Human Centered Design

The Department of Surgery created a Human Centered Design (HCD) Program to focus on utilizing design-thinking principles to create innovative solutions to unmet medical needs at MUSC and beyond. HCD is a user-centered approach to design where the process begins and ends with the impacted users at the center of the work. The HCD program currently consists of [Joshua Kim, MS](#), senior designer, and three surgical residents who are leading medical innovation and entrepreneurship projects in a collaborative setting. The residents are innovators who are trained to identify unmet medical needs and then generate solutions to solve those needs.



(left to right) Medical student, [Kayla Drayton](#), [Leah Plumlee, M.D.](#), PGY-3 (Research), [Julie Siegel, M.D.](#), PGY-3 (Research), [Michael Yost, Ph.D.](#), and [Josh Kim, MS](#).

BY THE NUMBERS

Our commitment to provide the highest level of compassionate patient care, best-in-class training for the next generation of surgical leaders, and cutting-edge clinical, basic science and translational research are *Changing What's Possible* for our patients.



FY20 Clinical
Activity



14,639

NEW
PATIENTS



10,237

SURGICAL
CASES



57,729

OUTPATIENT
ENCOUNTERS



FY20 Research
Activity



38

NEW
AWARDS



\$6

MILLION
extramural funding

50

Clinical Trials

39

Federal Awards

34

Funded Faculty



FY20 Faculty, Staff,
and Trainees



77

Faculty



64 Residents

8 Fellows

15 Post Docs



30 Research Staff



47 Management &
Support Staff



31 APPs



FY20 Philanthropic
Gifts



\$160K

Philanthropic contributions in
support of Surgical Resident
Education and Research



\$2.1

MILLION
Gifts and Pledges



5

Endowed Chairs
Created

AWARDS AND DISTINCTIONS



A. Abbott



S. Fann



M. Armstrong



E. Genovese



S. Bradley



A. Hink



T. K. Byrne



S. Kahn



E. R. Camp



M. Katz



D. Carneiro-Pla



L. Hollinger



C. Denlinger



A. Leshner



N. DeMore



M. Lockett



H. Evans



L. Lozonschi



E. Eriksson



S. Mehrotra

■ **Andrea Abbott, M.D., MSCR** named State Chair to the Commission on Cancer Liaison Program for the American College of Surgeons; named the MUSC Faculty Council Chair-Elect for 2020/2021.

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

■ **Scott Bradley, M.D.** named to the Robert M. Sade M.D. Endowed Chair in Pediatric Cardiac Surgery.

■ **T. Karl Byrne, M.D.** named to MUSC chapter of the National Academy of Inventors.

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

■ **Denise Carneiro-Pla, M.D.** nominated by the American College of Radiology (ACR) Committee on Appropriateness Criteria (AC) to represent the American Thyroid Association as an expert member to participate on the ACR AC Parathyroid Adenoma Committee.

■ **Chadrick Denlinger, M.D.** named to the Flora McLeod Edwards Distinguished Endowed Chair in Cancer Research.

■ **Nancy DeMore, M.D.** appointed to the Society of Surgical Oncology Program Committee, received the HCC Senior Clinical Scholars Award, elected to the Board of Directors of the Make-A-Wish Foundation, SC Chapter, and elected to serve as a Senator for the 2019-2021 term on the MUSC Faculty Senate.

■ **Heather Evans, M.D., MS** invited to join the *Annals of Surgery* Editorial Board; appointed to serve as a member of the Surviving Sepsis Campaign Steering Committee for the Society of Critical Care Medicine.

■ **Evert Eriksson, M.D.** awarded the 2020 MUSC Foundation Outstanding Clinician Award;

named Chair of the Lowcountry Regional Trauma Advisory Council.

■ **Stephen Fann, M.D.** served as President of the South Carolina Chapter of the American College of Surgeons.

■ **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.

■ **Marc R. Katz, M.D., MPH** named to the Fred A. Crawford, Jr. M.D. Endowed Chair in Cardiothoracic Surgery.

■ **Aaron Leshner, M.D., MSCR** named IDeA Fellow, Pediatric Critical Care and Trauma Scientist Development Program, Eunice Kennedy Shriver National Institute of Child Health and Human Development.

■ **Laura Hollinger, M.D.** elected to serve as Senator for the 2019-2021 term on the MUSC Faculty Senate.

■ **Mark Lockett, M.D.** received the 2019 Outstanding Federal Manager of the Year Award from the Federal Executive Association of the Greater Charleston Area.

■ **Lucian Lozonschi, M.D.** named to the John M. Kratz, M.D. Endowed Chair in Cardiac Surgery and Research.

■ **Shikhar Mehrotra, Ph.D.** named Co-Leader of Cancer Immunology Program at Hollings Cancer Center; appointed to the Cecilia and Vincent Peng Endowed Chair in Melanoma and Cutaneous Oncology.

AWARDS (continued)



K. Morgan

■ **Katherine Morgan, M.D.** confirmed by the American College of Surgeons as the SESC Representative to the ACS Advisory Council for General Surgery.



S. Nadig

■ **Satish Nadig M.D., Ph.D.** named to MUSC chapter of the National Academy of Inventors; named to the P.K. Baliga, M.D. Endowed Chair in Solid Organ Transplantation.



D. Norcross

■ **E. Douglas Norcross, M.D.** awarded the 2020 MUSC Foundation Distinguished Faculty Service Award.



M. Rubinstein

■ **Mark Rubinstein, Ph.D.** named to MUSC chapter of the National Academy of Inventors.



J. Ruddy

■ **Jean Marie Ruddy, M.D.** selected to participate in the inaugural cohort of the Leadership Development Program, a collaborative effort between the Society for Vascular Surgery, Society for Clinical Vascular Surgery, and the Vascular and Endovascular Surgery Society.



R. Sade

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



C. Streck

■ **Christian Streck, M.D.** appointed to the national ACS Committee on Trauma; named as the APSA Trauma Committee Vice Chair and member of the Southern Surgical Association.



D. Taber

■ **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.



C. Talley

■ **Cynthia Talley, M.D.** selected to the Board of Directors for the Eastern Association for the Surgery of Trauma, appointed Chair of the Members Services Committee of Young Fellows Association of the ACS. Selected to the ACS Certificate in Applied Surgical Education Leadership Program.

HONORING JOHN M. KRATZ, M.D.



John M. Kratz, M.D.
Professor
Cardiothoracic Surgery

The Department of Surgery recognized Dr. John Kratz' many contributions to MUSC, the Department of Surgery and the field of Cardiothoracic Surgery with the naming of an endowed chair in his honor: The John M. Kratz, M.D. Endowed Chair in Cardiac Surgery and Research.

NEW FACULTY



Ashley Hink, M.D. MPH
Assistant Professor
General and Acute Care
Surgery



Director of the Burn
Program
Chief, Burn Surgery



Carlos Zayas, M.D.
Clinical Professor
Transplant Surgery

NEW FACULTY RECRUITS



Colston Edgerton, M.D.
Assistant Professor
GI Surgery



Lucas McDuffie, M.D.
Assistant Professor
Pediatric Surgery



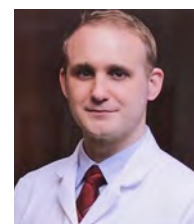
Nicolas Pope, M.D.
Assistant Professor
Cardiothoracic Surgery



Konrad Rajab, M.D.
Assistant Professor
Pediatric Cardiothoracic
Surgery



Isis Scomacao, M.D.
Assistant Professor
Plastic and Reconstructive
Surgery



Lucas Witer, M.D.
Assistant Professor
Cardiothoracic Surgery

RESPONSE TO COVID



Heather Evans, M.D., MS established the MUSC protocol for donning and doffing sterile surgical attire with a multidisciplinary group from surgery, anesthesiology and infectious disease. *Development of a Sterile Personal Protective Equipment Donning and Doffing Procedure to Protect Surgical Teams from SARS-CoV-2 Exposure during the COVID-19 Pandemic* was published in *Surgical Infections*, July 2020.

As the department pivoted to our “new normal,” we continued to provide surgical care using best-practices to protect the health of our patients and care teams while transitioning 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. Emergent and urgent surgeries, including urgent trauma and transplant surgery, continued as well as coverage of OB/GYN and pediatric surgery.

When Governor McMaster placed a COVID-19 moratorium on elective surgery, effective March 23, the department experienced the much-anticipated decrease in clinical work productivity.

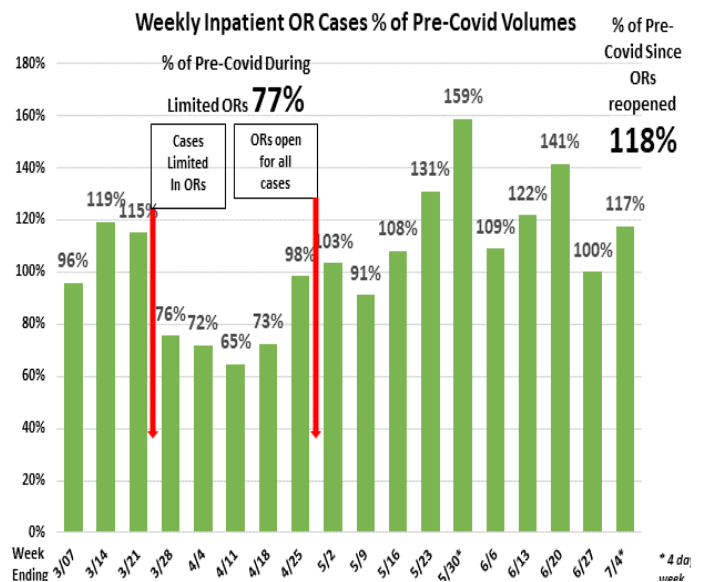
Our faculty and administrative staff were quick to pivot into a new telehealth model for clinic visits whenever possible. At all times, we continued to provide surgical care using best practices to protect the health of our patients and care teams.

During the one month period when elective surgeries were stopped, our non-elective cases, including

transplant, cardiac and emergent cases, continued and surgical cases never dropped below 60%, with a monthly average over 75%.

Once elective surgeries resumed on May 1, the department quickly rebounded to meet the needs of South Carolinians. By mid-May, surgical cases rapidly increased and the fiscal year ended within 98% of our budgeted RVUs.

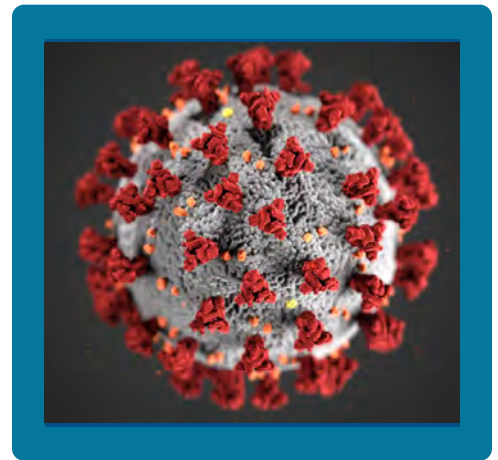
FY20 INPATIENT OR CASES



ON THE FOREFRONT OF DISCOVERY

Satish Nadig, M.D., Ph.D., medical director for the Center for Cellular Therapy (CCT), and Shikhar Mehrotra, Ph.D., co-scientific director of the CCT, led a task force to develop a diagnostic antibody test as a response to the COVID pandemic.

The interdisciplinary team developed the antibody test in less than a month using plasmid from Mount Sinai Laboratory. The lab is now processing up to 2000 antibody tests a day, with the capacity to process 3000 tests per day. The test is useful at the population level to show how much COVID-19 is circulating in the community. The team has also developed and validated saliva tests to provide for a better patient experience.



3D MASK AND CARTRIDGE SYSTEM

With the threat of a shortage of protective masks looming as the novel coronavirus pandemic grew, a team of MUSC biomedical engineers and tinkerers, led by Joshua Kim, MS, senior designer for the MUSC Department of Surgery, came together and developed plans for 3D printed masks and the Self-Assembly Filter for Emergencies Cartridge System (S.A.F.E.), a modular HEPA filtration system that can be fitted onto the mask. Within four days and with guidance and support from Michael Yost, Ph.D., vice chair of Research in the Department of Surgery, and David Mahvi, M.D., chief of Surgical Oncology and head of the Human Centered Design Program, the team was able to go from concept design to completion.



The 3D mask and S.A.F.E. Cartridge System project was awarded an MUSC Innovator Award during Innovation Week. The mask and cartridge system are currently in an innovation exhibit at the South Carolina State Museum in Columbia, SC. The exhibit highlights how different sectors around the state have pivoted to meet the need for critical supplies and PPE during the pandemic.

Research Productivity March 23-May 1



The Research Council developed guidelines and protocols in advance of the MUSC stay at home orders to ensure research efforts remained active while keeping faculty and staff safe.

Beginning March 23 through early May, our investigators recorded a record number of research papers and grant submissions as well as embarked on special projects, twelve of which were COVID-related.

NOTE: *This report is not a complete accounting of all research productivity during this time frame.*



13 Investigators
59 Papers
12 Abstracts



13 Investigators
21 Grants written



13 Investigators
31 Projects
12 COVID-related

FOSTERING INNOVATION THROUGH RESEARCH

The Department of Surgery had a very productive year in both clinical and basic science research. The Faculty Mentoring Program is operational with established teams or “research pods.”

Each division has clear visions for health services research and translational science or innovation arms and inter-institutional resources have been identified in many cases to help support these pods.



Sarah Grace Dennis-Little, Ph.D. operating the Palmetto Bioprinter.

MESSAGE FROM THE VICE CHAIR OF RESEARCH

Our research mission is to create a bedside to bench and back again culture of discovery and innovation at MUSC.

As I look back over the year, I am humbled at the way everyone in the department has taken this mission on as their own and created a palpable shift in our culture toward academic productivity and innovation while maintaining high clinical productivity and excellent patient care.

The research roadmap that the research council rolled out in 2018 highlighted several areas of growth opportunities in clinical research, human centered design and basic science collaborations.

Here is the impact since the roadmap's inception:

- Dave Taber, Pharm.D. and Heather Evans, M.D., MS have expanded clinical research within the department.
- The Human Centered Design program launched with an immediate impact: responding to the N-95

mask shortage with a 3D mask and cartridge system with printing plans. The mask and cartridge system received national and international attention, won the MUSC Innovator Award, and is currently on display in the South Carolina State Museum.

- Every Department of Surgery Ph.D. researcher is extramurally funded at the national level.
- Jean Marie Ruddy, M.D. has transformed resident research into a high-functioning enterprise creating a meaningful and productive experience for each resident in the program.

I invite you to read through the highlights in this report and know that this is just a few high points in a program that has a deep commitment in translating the latest developments, understanding and technology into improved surgical patient care.



Michael J. Yost, Ph.D., FAIMBE, FNAI
Professor of Surgery and Bioengineering
Vice Chair, Research
Department of Surgery

IMPROVING SURGICAL OUTCOMES DISPARITIES THROUGH RESEARCH

Investigators within the Department of Surgery are nationally recognized in studying the causes and consequences of healthcare disparities in vulnerable patient populations; most notably African Americans. Our researchers are conducting pioneering interventional studies with the goal of reducing the impact of race and socioeconomic status on health outcomes.

Within our clinical trials, we have a strong track record of enrolling patients that are underrepresented in research. Often these patient populations are missing in clinical trials and inclusion is of paramount importance to providing the best clinical outcomes to all populations.

We strive to include a highly diverse patient population in all of our clinical trials in transplantation. Many of our other clinical trials, including oncology, cardiac surgery and acute care surgery clinical trials, have similarly diverse populations.

VASCULAR SURGERY ACTIVE IN CLINICAL TRIALS

Vascular Surgery had an active FY20.

- Assessment of the GORE® EXCLUDER® Conformable AAA Endoprosthesis (CEXC Device) in the Treatment of Abdominal Aortic Aneurysms
Sponsor: Gore

- Aneurysm Treatment Using the Heli-FX™ EndoAnchor System Global Registry (ANCHOR)
Sponsor: Medtronic

- A Randomized Double Blind Placebo Controlled Clinical Study to Assess Blood-Derived Autologous Angiogenic Cell Precursor Therapy in Patients with Critical Limb Ischemia
Sponsor: Hemostemix

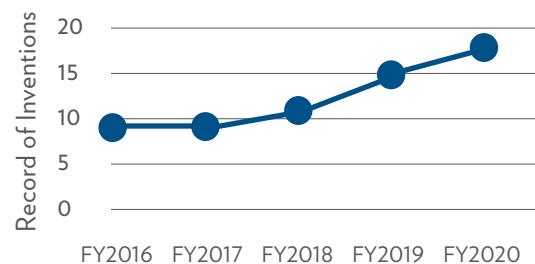
- A Prospective, observational, global, multi-center, post-market registry of the Valiant Navion™ Thoracic Stent Graft System (DISSECT-N)
Sponsor: Medtronic

BY THE NUMBERS: MUSC Kidney Transplant

- 3rd** MUSC has the third largest African American kidney transplant population in the U.S.
- 66%** of MUSC kidney transplant recipients are African American.
- 45%** of MUSC kidney transplant recipients have a high school education or lower.
- 66%** of MUSC kidney transplant patients have a family household income less than \$30,000.

INNOVATION AND ENTREPRENEURSHIP

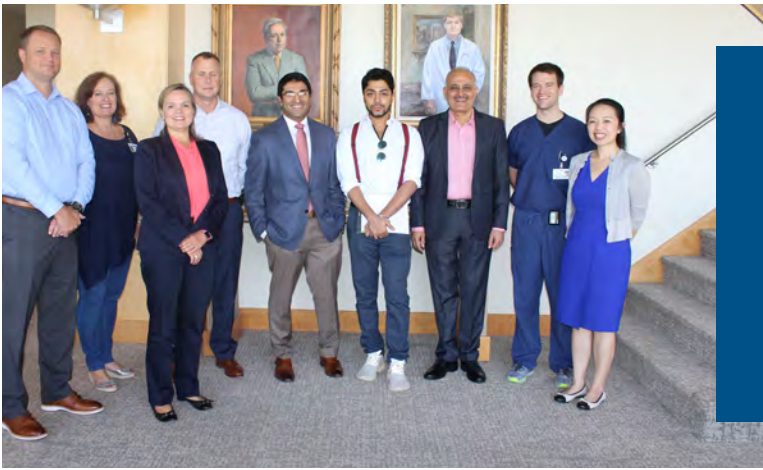
The MUSC Department of Surgery is a leader in innovation and discovery that allows us to transform technology into improved surgical patient care. Our teams of physicians, scientists and engineers have developed new technologies and devices to advance surgical science.



FY 20 Records of Inventions: 17
Patent Applications: 5 US, 2 Foreign
Options/Licenses: 1

FY 20 Two Products on Market:

- Solid Respirator Mask
- S.A.F.E. Cartridge System



INTERNATIONAL PARTNERSHIP

Pandorum Technologies, Pvt. Ltd. and the Transplant Research and ImmunoBiology Institute (TRII) along with the Center for Cellular Therapy (CCT) have partnered to push forward bioengineered tissues and cellular therapies in the treatment of diseases spanning corneal wound healing and COVID-related lung disease. These translational activities have utilized the strengths of MUSC’s Department of Surgery bench-to-bedside culture.

The TRII along with the CCT at MUSC have been a ‘one stop shop’ for an aspiring start-up like Pandorum Technologies, operating in the field of tissue engineering and regenerative medicine, in the journey to clinical translation of its novel therapies

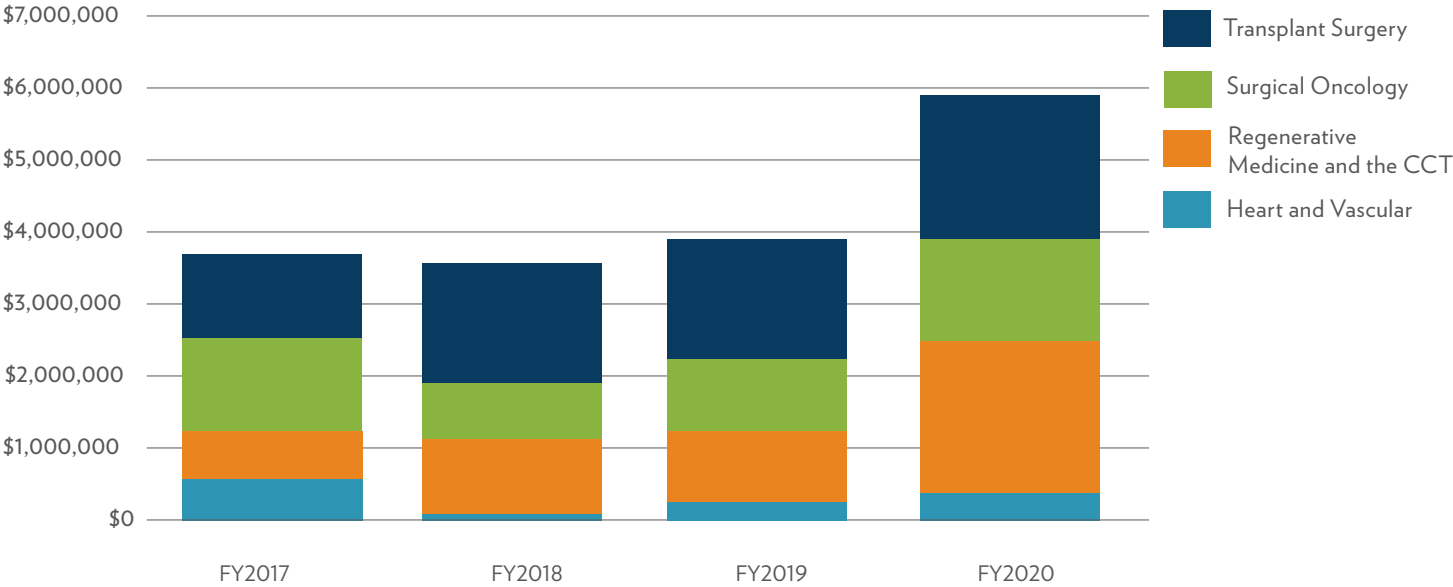
developed to serve patients with unmet clinical needs. The team and the infrastructure at MUSC have been critical for the formulation optimization, cGMP grade material production, clinician study design, execution, and guidance through clinical regulatory approval- maintaining global standards with ‘patients first’ in mind - driven by precise decision making and fast execution at an affordable cost.

We are looking forward to an exciting journey ahead.

Tuhin Bhowmick, Ph.D.
 Co-founder, CEO
 Pandorum Technologies Pvt. Ltd.
www.pandorumtechnologies.in

RESEARCH FUNDING

FY20 was an outstanding year for research with our portfolio reaching nearly \$6 million in extramural funding, a 49% increase from the previous year.



FY20 EXTRAMURAL RESEARCH FUNDING HIGHLIGHTS

RESEARCH GRANT TITLE	PRINCIPAL INVESTIGATORS	EXTRAMURAL SPONSORS
Cell survival in engineered skeletal muscle: The role of complement	Michael Yost, Ph.D.	NIH/NIBIB
A Murine Model of Intimal Hyperplasia and Its Treatment With Vepoloxamer	Michael Yost, Ph.D.	Hirodika Bioscience Inc.
Development and pilot implementation of a novel mobile health app for postoperative wound triage	Heather Evans, M.D., MS	SCTR
A Prospective Multicenter Randomized Controlled Clinical Study to Investigate the Safety and Effectiveness of RES	Steven Kahn, M.D.	Avita Medical Americas, LLC
APOL1 Long-term Kidney Transplantation Outcomes Network (APOLLO) Clinical Center	Derek DuBay, M.D.	University of Alabama, Birmingham/NIDDK
A 12-month, open-label, multicenter, randomized, safety, efficacy, pharmacokinetic (PK) and pharmacodynamics (PD) study of two regimens of anti-CD40 monoclonal antibody, CFZ533 vs. standard of care control, in adult de novo liver transplant recipients with a 12-month additional follow-up (CONTRAIL I)	Derek DuBay, M.D.	Novartis Corp
The Effects of Conversion to Once-Daily Envarsus on the Neurologic Toxicity Burden in Liver Transplant Recipients	Derek DuBay, M.D.	Veloxis Pharmaceuticals, Inc
A pivotal phase 3 trial to evaluate the safety and efficacy of Clazakizumab for the treatment of chronic active antibody-mediated rejection in the kidney transplant recipients	Vinaya Rao, M.D.	Icon Clinical Research Inc.
Evaluation of Patient Outcomes From the Kidney Allograft Outcomes AlloSure Registry (KOAR) sub-study: Outcomes of Kidney Care on Renal Allografts (OKRA)	Vinaya Rao, M.D.	CareDx Inc
A single center randomized open-label Controlled Clinical Trial assessing the impact on Exparel on decreasing opioid utilization in kidney transplant recipients	Vinayak Rohan, M.D.	Pacira Pharmaceuticals Inc.
Programming Metabolically Fit TILs for Immunotherapy	Shikhar Mehrotra, Ph.D.	NIH/NCI
Anti-Oxidant and Metabolic Phenotype in Regulating Tumor Specific T cell Memory Response	Shikhar Mehrotra, Ph.D.	NIH/NCI
Understanding Metabolic and Epigenetic Cross Talk in Potent Anti-tumor T cells	Shikhar Mehrotra, Ph.D.	NIH/NCI
Improving adoptive cellular therapy with the transfer of the IL-2Ra gene	Mark Rubinstein, Ph.D.	SCTR
Macrocyclic Inhibitors of NRP2b dependent metastasis and drug resistance	Patrick Nasarre, Ph.D.	FRD
Creon® (pancrelipase) therapy for subjects with exocrine pancreatic insufficiency (EPI) due to pancreatic cancer: A double-blind, randomized, parallel design with 2 dose cohorts of pancrelipase in resected pancreatic cancer subjects and an open-label single dose cohort in non-resected pancreatic cancer subjects	Katherine Morgan, M.D.	AbbVie
Enhancing Recovery in Children Undergoing Surgery (ENRICH-US) for Inflammatory Bowel Disease	Robert Cina, M.D.	Northwestern University/ NICHD
Optimal resuscitation in pediatric trauma - an EAST multicenter study	Christian Streck, M.D.	Cincinnati Children's Hospital Medical Center
A novel telemedicine optimized burn intervention (TOBI) for pediatric burn-injured patients and their caregivers	Aaron Leshner, M.D., MSCR	NIH/NICHD
A multicenter, multinational, randomized, controlled, open label study, performed in children with thermal burns, to evaluate the efficacy and safety of NexoBrid as compared to standard of care (SOC) treatment	Aaron Leshner, M.D., MSCR	Mediound
A Multicenter, Prospective, Randomized, Subject and Evaluator Blinded Comparative Study of Nerve Cuffs and Advance Nerve Graft Evaluation Recovery Outcomes for the Repair of Nerve Discontinuities (RECON)	Milton Armstrong, M.D.	AxoGen Corporation
Breast Reconstruction Outcomes Studies Using a Prospective Recorded Breast Database of Patients	Fernando Herrera, M.D.	Allergan Foundation
Prevena Restro Bellaform	Kevin Delaney, M.D.	KCI US, Inc.
A Pilot Study Examining Conscious Awareness and Cognitive Experiences During Deep Hypothermic Circulatory Arrest	Sanford Zeigler, M.D.	New York Univ. School of Medicine/John Templeton Foundation

RESEARCH PODS CREATE ENERGY AND SYNERGY



The Surgical Outcomes Research and Innovation Nucleus (**SORIN**) was formalized in 2019 and serves to foster the development, testing and implementation of innovative therapeutic and health services interventions aimed at improving outcomes in patients undergoing surgery at MUSC.

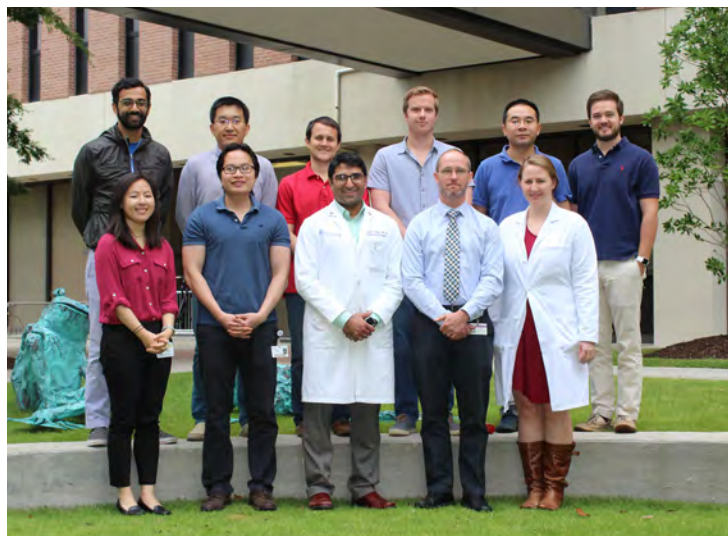
■ **SORIN** has a diverse and active portfolio of clinical research endeavors, including nearly 50 ongoing clinical trials across all surgical disciplines housed within the Department of Surgery. We actively follow nearly 600 patients enrolled in our trials. We are currently testing new drug therapies, devices and cellular-based interventions designed to improve and extend the lives of South Carolinians seeking surgical care within our institution.

■ Embedded within **SORIN** and an arm of the Transplant Research and ImmunoBiology Institute (TRII) is the **Transplant Clinical Research Core (TCRC)**. The main function of the TCRC is to facilitate the benchtop-to-bedside concept within organ transplantation by streamlining the process of innovative therapies moving from the laboratory to clinical trials and use within usual care.

■ The TCRC currently oversees 15 clinical trials, of which nine are actively enrolling and six are in the follow-up phase. Within these 15 trials, we actively follow 262 transplant recipients.

■ These clinical trials are testing novel therapies and innovations designed to improve outcomes in transplantation.

“We are assessing new antiviral therapies, new methods and therapies to diagnose, prevent and treat rejection and innovative methods to care for our patients using mobile health, remote monitoring and telehealth services,” said **Dave Taber, Pharm.D.**, who leads the surgical outcomes nucleus. “This is particularly salient given the current COVID 19 pandemic; allowing our patients to receive optimal care while safely residing in their homes and local communities. Our ultimate goal is to be at the forefront of the science of transplantation and improve the lives of transplant recipients.”



TRANSPLANT RESEARCH AND IMMUNOBIOLOGY INSTITUTE

The Transplant Research and ImmunoBiology Institute (TRII) was formalized in 2019 and encompasses both clinical research in the Transplant Clinical Research Core (TCRC) and basic/translational research in both the Lee Patterson Allen Transplant ImmunoBiology Laboratory (TIBL) and the ImmunoEngineering Core.

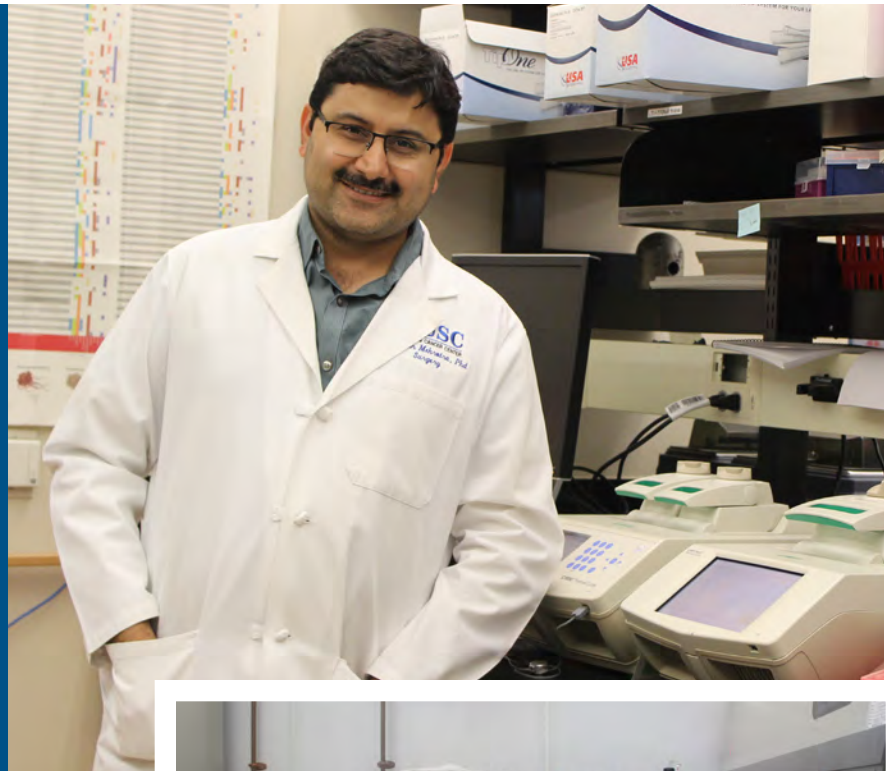
Additionally, the TRII is a comprehensive federally and privately funded institute that also engages the Center for Cellular Therapy and the Foundation for Research and Development for all aspects of transition of therapeutics to patient care.

The **Patterson Barclay Memorial Foundation** was instrumental in the development of the TIBL and formalization of the entire institute. **Dr. Satish Nadig** serves as the institute scientific director and **Drs. David Taber, Carl Atkinson, and Michael Yost** serve as directors to the TCRC, TIBL and the ImmunoEngineering Cores respectively. The TRII has partnered with various industries (both domestic and international) to move transplant-related therapeutics closer to the bedside. Recently, these industry ties have led to the TRII focusing on COVID-related therapeutics as well.

In 2019, the Patterson Allen Family members gifted \$1.5M through the Patterson Barclay Memorial Foundation to the Transplant Research and ImmunoBiology Institute Fund with the desire for community partners and patients to match their gift to reach the needed \$3M goal.

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.

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.



Wang Laboratory Active in Clinical Trials

The Wang Lab, led by Hongjun Wang, Ph.D. has had an active FY20.

- **Type 1 diabetes (T1D) NIH R01 clinical trial:**

With the joint efforts from the Wang Laboratory, the clinical team led by Dr. Charlie Strange, the Center for Cellular Therapy, the OB/GYN Department, and the strong support from the Department of Surgery, the multidisciplinary team has met their Year 1 patient enrollment goal in this trial.

- **Chronic pancreatitis trial:** They have enrolled 46 of the 48 chronic pancreatitis patients for their AAT trial and are now transitioning to the data analysis phase.

- **Novel cell and gene therapy for the treatment of diabetes and chronic pancreatitis:** Their first paper on this topic was accepted for publication in the journal *Stem Cell Translational Medicine* (IF: 6.4).



Center for Cellular Therapy Expands Scope

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. FY20 saw a significant increase in the scope of work the CCT performs:

- In addition to sustaining the Islet Cell Transplant program, the CCT now supports the MUSC Blood and Marrow Transplant Program.

- A new clinical research infrastructure has now been established with clinical trial coordinators, IRB and analytic support.

- As part of MUSC's response to COVID, the CCT rapidly developed an in-house seroassay and facilitated the establishment of the COVID-19 antibody testing, with the capacity to perform thousands of tests a day.

- Additionally, this year the CCT has established strong extramural funding from the NIH and VA.



RESEARCH INVESTIGATORS

Acute Care Surgery

Evert Eriksson, M.D. focuses his research on improving the care of the injured patient particularly with respect to broken ribs. Dr. Eriksson has presented several projects at international conferences on improvements in operative and non-operative management of traumatic rib fractures. Additionally, he published a prospective multi-center trial comparing the operative and non-operative management of patients with three or more rib fractures that affected the management of these patients worldwide.

Heather Evans, M.D., MS is a national leader in surgical infections research, focusing on the implementation of mobile health to impact the post-discharge care of surgical patients. She is currently leading a SCTR-funded pilot study of a nurse-led remote patient monitoring intervention to facilitate post-operative wound surveillance for surgical site infection.

Ashley Hink, M.D., MPH, focuses her research on the epidemiology of violent injury, prevention and interventions to reduce violence, and the outcomes after violent injury. Dr. Hink is currently working on a study utilizing local firearm assaults and homicides in the Charleston area to create a geo-spatial map of where they occur, and to assess if the density of these events in neighborhoods is correlated with specific community risk factors and indices of community disparity and unmet needs.

Cardiothoracic Surgery

Barry Gibney, D.O. focuses his research on better understanding T cell biology in relation to outcomes for lung cancer, with an interest in gender-specific differences. Dr. Gibney works in a collaborative immuno-oncology laboratory headed by **Mark Rubinstein, Ph.D.** and **John Wrangle, M.D.**

Jeffery Jones, Ph.D. conducts his research on understanding the underlying mechanisms that contribute to the development of thoracic aortic aneurysms (TAAs).

There are currently no medical treatments for TAA, leaving only the options of surgical or endovascular intervention, both of which carry significant risk and never directly treat the underlying condition. Dr. Jones' studies focus on how the cells within the aortic wall, as well as resident and circulating inflammatory cells, function and respond to seemingly innocuous changes in physiology, for example, changes in systemic blood pressure.

Rupak Mukherjee, Ph.D. researches the structural and electrogenic aspects of cardiac disease progression as these events relate to remodeling the heart's chambers. Dr. Mukherjee has, in addition, recently been exploring the effects of light as a means to improve wound healing.

Colorectal Surgery

Thomas Curran, M.D., MPH, is currently working on defining the impact of delayed and fragmented care on postoperative outcomes in patients with inflammatory bowel disease in the state of South Carolina.

Plastic and Reconstructive Surgery

Fernando Herrera, M.D. focuses his research on clinical outcomes in upper extremity surgery, including traumatic injuries and peripheral nerve surgery. Dr. Herrera is currently working on implementing a clinical trial investigating the use of several neurotoxins on the management of intractable Raynaud's Phenomenon in the hands.

Pediatric Surgery

Aaron Leshner, M.D., MSCR, received a prestigious Mentored Patient - Oriented Research Career Development Award, also known as a K23, from the National Institutes of Health. Dr. Leshner's research is primarily aimed at increasing access to expert burn care for children (and their parents) around the state. He developed a smartphone-based solution that allows burned patients to connect to their surgeons with texts, videoconferencing, and images to help guide care on the spot, rather than make multiple trips to the burn clinic.

Christian Streck, M.D. focuses his research efforts on the development of evidence-based clinical practice guidelines for pediatric trauma. He has recently participated on several pediatric trauma guidelines committees including the development of new guidelines for VTE-prophylaxis, massive transfusion and resuscitation, and the evaluation and management of children following blunt abdominal trauma. His current research projects include management of low-grade solid organ injuries and trauma resilience and recovery. He is also involved in multi-institutional studies of pain



RESEARCH INVESTIGATORS

management strategies following repair of pectus excavatum and the impact of ingested magnets.

Oncologic and Endocrine Surgery

Andrea Abbott, M.D., MSCR was senior author on a presentation at Society of Surgical Oncology on breast cancer surgical margins, gave a presentation at AAS on opioid addiction in breast cancer patients; published a paper in *J Unexplored Med Data* on narcotics in breast cancer patients, and a paper in *Journal of Surgical Research* on opioid education in breast cancer patients.

E. Ramsay Camp, M.D., MSCR and **Mark Rubenstein, Ph.D.** received a grant from Merck for a Phase 2 neoadjuvant trial of FOLFIRINOX and PDL1 inhibitor for resectable pancreatic cancer.

Nancy Klauber-DeMore, M.D. is PI on an investigator initiated Phase 1a clinical trial this year entitled “Window of Opportunity Trial using Curcumin for Breast Cancer”. She reported the development of a novel humanized monoclonal antibody for triple negative breast cancer and angiosarcoma in the *Annals of Surgical Oncology*.

Shikhar Mehrotra, Ph.D. obtained two new NIH R01 grants this year and an R41 grant. He had two publications in *Cells and Trends Immunology*.

Denise Carneiro-Pla, M.D. is active in endocrine surgery clinical research. The main project is focused in the postoperative management of patients surgically treated for primary hyperparathyroidism with the purpose of potentially preventing operative recurrence. Additionally, other projects are directed to the clinical impact of thyroid and parathyroid ultrasonography in the management of these patients.

Mahsa Javid, M.D., Ph.D. is an academic endocrine surgeon whose research focuses on endocrine tumor growth. She is currently engaged in studies investigating the role of angiogenetic and diet-related factors in the development of thyroid cancer.

Transplant Surgery

Derek DuBay, M.D. MSPH focuses his research on organ donation, transplant analytics, and access to transplant.

Dr. DuBay has NIH and HRSA-funded grants to increase living donor kidney transplantation, and reduce racial and geographic disparities in access to transplant.

David Taber, Pharm. D., and **John McGillicuddy, M.D.,** focus their research efforts on improving medication adherence and reducing medication errors after solid organ transplantation. They both are presently conducting trials using mobile health technology (mHealth) to identify and address medication-related issues in real time.

They recently submitted a proposal to the NIH as Co-PIs proposing a pragmatic trial of a multi-pronged approach to improving medication-taking behavior after kidney transplantation.

Vinayak Rohan, M.D. focuses his research on quality improvement and outcome research with the goal of improving the long term outcomes of transplant patients. His research includes opioid minimization in kidney transplants and the effects of diabetes and obesity on kidney transplant outcomes.

Vascular Surgery

Elizabeth Genovese, M.D., MS, research focuses on delineating the multifaceted causes of vascular health care disparities in South Carolina and how diminished access to appropriate preventive management and vascular screening leads to increased rates of ruptured aortic aneurysms and limb loss secondary to atherosclerotic peripheral vascular disease.

Jean Marie Ruddy, M.D. is a scientific investigator with an NIH K08 Mentored Clinical Scientist Research Career Development Award who focuses on hypertensive aortic remodeling and the biomechanical link to infrarenal abdominal aortic aneurysm (AAA) development. As national initiatives increase screening guidelines for AAA, there is a growing population of patients with known small AAA but there are currently no directed medical therapies which can delay or prevent ongoing expansion.

By studying the changes in aortic wall cell signaling under elevated tension conditions, her laboratory team seeks to understand the key mediators triggering inflammatory infiltration, matrix degradation, and cell death, thereby identifying targets for pharmacotherapeutic engineering.

SOUTH CAROLINA SURGICAL QUALITY COLLABORATIVE



Mark Lockett, M.D.

The South Carolina Surgical Quality Collaborative (SCSQC) is comprised of a group of hospital systems dedicated to improving the quality and value of general surgical care in South Carolina. SCSQC is led by a leadership team representing the

South Carolina Hospital Association, Health Sciences South Carolina, MUSC, and Blue Cross Blue Shield of SC.

Mark Lockett, M.D., vice chair of Veterans Affairs and chief of Surgery at the Ralph H. Johnson VA Hospital, serves as the Surgeon Lead for the Collaborative.

The initial study, published in the June 2018 American Surgeon, was a retrospective observational analysis that showed outcome rates for select general surgery procedures across a group of hospitals involved in the SCSQC. The study found SCSQC member facilities improved outcomes in 15 of 16 quality measures over the two-year period of the initiative.

“SCSQC provides a mechanism by which we can obtain better outcomes by providing actionable and believable data and facilitating collaboration between surgical leaders across the state,” said Dr. Lockett.

SURGICAL EDUCATION

The mission of the Division of Education is to inspire, promote, and encourage current and future generations of surgeons with thoughtful professional development, tools for life-long learning, and skills for success as a surgical leader.



This past year’s challenges that COVID-19 presented were met with innovation and commitment to continue our mission for surgical education. We celebrate our 2019 successes and look forward to this year’s new innovative programs.

Cynthia Talley, M.D., FACS, vice chair of Education

2019 - 2020 Successes

- Virtual curriculum during COVID
- Backyard graduations
- Virtual intern orientation
- Hybrid ATLS course taught to all interns
- Vascular complement increase
- Education research team established
- Increased resident involvement in orientation and student teaching

New & Upcoming Initiatives

- Simulation: Robotics Trainer arrived! Laparoscopic Trainers coming. New space at Ashely River Tower
- Student Program: New lockers, 3+3 clerkship (general/specialty) created, honors scoring relaxed
- Virtual Interviews and Grand Rounds
- Virtual Vascular Surgery Visiting Student Rotation
- Tideland General Surgery Rotation
- Student/Resident Lounge at Main Hospital

ENHANCING STUDENT SUCCESS



ACGME ACCREDITATION

All residency and fellowship programs received full accreditation by ACGME.



EDUCATION RESEARCH GROUP

Representatives are comprised of students, residents, and faculty.
7 ongoing projects.



PROGRAM EXPANSION

I-6 Vascular Surgery:
Resident increase to 2 per year.
Upcoming request for I-6 CT Surgery and SCC increases.

RESIDENT WELLNESS ADDS RESILIENCY



Kunal Patel, M.D., Ph.D. and Kristen Quinn, M.D. find a few minutes to relax and catch up in the newly renovated medical student and resident space.

The Department of Surgery is committed to improving the wellness of residents and faculty. Over the last year an initiative was started to evaluate the current level of burnout among residents and faculty and then determine what improvements can be made. A survey of residents indicated improving personal time and food would contribute to making residency a little less stressful.

In response, the residents received two personal days to use throughout the year, improvements to the medical student and resident work space, and a monthly lottery for a \$100 food card. Along with paying for a state medical license, purchasing loupes during the second PG year, and quarterly social gatherings, the department, with the support of philanthropic donors, is making strides to foster a culture of wellness.

AWARDS AND DISTINCTIONS



C. Thomas

Christopher Thomas, M.D. was selected to serve on the ACS FSC Resident Advisory Council. The Council is comprised of 8-10 residents from ACGME-accredited general surgery programs who provide insights as to the accuracy, relevancy, and usability of curricular content.



R. Parrado

Rafael Parrado, M.D. received the 2020 Resident of the Year award from the National Hispanic Medical Association. This award is presented to individuals who have made significant contributions to Hispanic health through their continued work as residents or fellows of NHMA.

THE NEXT ERA OF SURGICAL LEADERS

Our graduates from our residency and fellowship programs are well prepared to enter the next level of their surgical journey, with 100% of our general surgery graduates entering the fellowship program at the academic medical center of their choice.



46% In-service Exam > 70%tile
Board Pass Rate: 100%
for all programs



2020 GRADUATING
GENERAL SURGERY
RESIDENTS
100% Entered Fellowships



2020 GRADUATING FELLOWS
AND I-6 PROGRAMS
80% Practice
50%Private/50%Academic
20% Additional Fellowships

VIRTUAL LEARNING

The use of technology in surgical education is rapidly evolving and the education team is leading the way with virtual simulation training and learning opportunities that could prove to be a model for training programs.

Virtual Simulation: 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., MS](#) 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 a benchtop simulation model and one-on-one mentoring with a Zoom interface.

“Using a telephone camera to display the benchtop model as “live virtual fluoroscopy” and the laptop camera to watch the trainee’s hands on the catheter, we can give real time feedback and instruction from an appropriate social distance,” said Wooster. The team 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.

Virtual Rotation: Visiting Student Learning Opportunities (VSLO) programs were canceled this year due to travel restrictions. In an effort to preserve some of the benefits of the visiting rotations (exposure to different practice patterns and patient populations, introduction to varied patient care, networking with a wider audience of residents and faculty), [Dr. Wooster](#) and the Division of Vascular Surgery have developed a virtual visiting student elective.

Leveraging videoconferencing technology already in place, visiting students will be able to round daily with the resident team (including writing notes/orders on patients), livestream operations from the new state of the art hybrid operating room, evaluate patients in telehealth clinic, and present during the weekly education conference just as they would if they could visit MUSC in person. While several other programs around the country have created virtual visiting rotations, MUSC will be the first and only to have traversed the legal hurdles to allow integration into direct patient care.

KREDEL-SPRINGS LECTURE

The department held a successful Virtual Kredel-Springs Lecture. Invited lecturer, [Karl Y. Bilimoria, M.D., MS](#), John B. Murphy Professor of Surgery, Northwestern University Feinberg School of Medicine, gave an enlightening presentation entitled *Fanning the Burnout Fire: How Our Misconceptions and Good Intentions Could Fail Tomorrow’s Surgeons*. Dr. Bilimoria is a lead author of the first and second trial that evaluates work hours and wellness impacts on patient safety.



Dr. Bilimoria

RESIDENT RESEARCH CONTINUES TO GROW



Dr. Doherty

During Surgery Research Recognition Day, visiting professor Gerard Doherty, M.D., Crowley Family Distinguished Chair in the Department of Surgery at Brigham and Women's Hospital, gave a well-received Eric R. Frykberg, M.D. Lecture entitled *Surgery* and also served as guest judge. Steven Kahn, M.D., chief of Burn Surgery and Shikhar Mehrotra, Ph.D., Cecilia and Vincent Peng Endowed Chair in Melanoma and Cutaneous Oncology, served as MUSC judges.

This year, Surgery Research Recognition Day had a record number of abstract submissions (26).

Congratulations to our winners (pictured from left to right with Jean Marie Ruddy, M.D. associate program director for Resident Research): Kunal Patel, M.D., Ph.D. achieved first place in Basic Science Podium and Poster Competitions. Ryan King M.D. won the Clinical Science Podium Competition and Shelby Allen M.D. won the Clinical Science Poster Competition.



STRIVING FOR EXCELLENCE

Motivation and hard work define the residents pursuing dedicated research initiatives in 2020. All residents completing their dedicated research year in 2020 earned prestigious funded positions. They are:

- Lex Booth, M.D. — postdoctoral fellowship through the VA Quality Scholars Program; concurrently completing the MUSC Masters of Science in Clinical Research Program. His research mentor is Thomas Curran, M.D., MPH
- Kristen Quinn, M.D. — T32 cardiovascular postdoctoral fellow at MUSC; her research mentors include Satish Nadig, M.D., Ph.D. and Carl Atkinson, Ph.D.
- Jennie Kwon, M.D. — T32 cardiovascular postdoctoral fellow at MUSC; her research mentor is Satish Nadig, M.D., Ph.D.
- Haley Zlomke, M.D. — T32 postdoctoral fellow at Johns Hopkins University with Dr. Christopher Wolfgang.



2019 RESIDENT RESEARCH SCHOLARS PRODUCTIVITY

In 2019, the resident research scholars had multi-disciplinary interests and were highly successful in their endeavors.



D. Garcia



L. Plumblee



J. Ricci



J. Siegel



RESEARCH AWARDS AND DISTINCTIONS



K. Patel

Kunal Patel, M.D., Ph.D. was a finalist for the American Heart Association Vivien Thomas Young Investigator Award, a national competition focused on emerging cardiovascular research from early career investigators.



R. King

Ryan King, M.D. received the Dabney Yarbrough Resident Research Award. Dr. King is the first member of an integrated residency program to win this award and it is notable that his research accomplishments were achieved concurrent to his clinical training.



Sharee Wright, M.D. (far right) catches up with (from left to right) Katy Morgan, M.D., Vivian Bea, M.D., and Jean Marie Ruddy, M.D. at the ACS reception in San Francisco.

SPOTLIGHT ON: SHAREE WRIGHT, M.D.

COM Class of 2007; Surgical Residency Class of 2013

After completing a surgical residency at MUSC in 2013 and a fellowship in Vascular and Endovascular Surgery in June 2015 at Temple University, [Sharee Wright, M.D.](#) is now a vascular surgeon with Surgical Associates of Richmond.

Her path to a career in vascular surgery was a long - and often challenging - journey.

Growing up in a single parent household in the quiet community of Bonneau, SC, surrounded by the Francis Marion Forest, her life was a good country life. By her junior year in high school, her horizon expanded when she was accepted to The SC Governors School, a two-year, in-residence program for academically advanced students in science and mathematics. There she met students from different backgrounds and cultures and developed a well-rounded perspective that provided the foundation for her future in academic medicine.

When the high school curriculum required a research project, she chose to research spinal cord injury at MUSC, and became interested in neurosurgery, which eventually led her down a path to vascular surgery.

Dr. Wright attended North Carolina State University. After graduating, she did not gain admission to



medical school; instead she was offered a spot in the MUSC Post- Baccalaureate Reapplication Education Program (PREP), a program that engages promising underrepresented minorities (URM), rural and disadvantaged students in post-baccalaureate courses to prepare them for medical school.

After completing PREP, she was admitted to the MUSC College of Medicine. As a black student, she felt that she frequently needed to prove herself. She found her way to Dr. Myra Singleton, associate dean for Student Affairs and Student Wellness. Dr. Singleton bonded with Wright and other URM students, inspiring them continue to work harder and be stronger. She embraced Singleton's advice and matched into MUSC's surgical residency.

New hurdles appeared. When Dr. Wright entered her surgical training, there were only a handful of URM students and she was the only black woman. Residency is a time during which trainees develop an understanding of how they fit into their work environment and solidify plans for their career. This concept is even more significant for URM and women trainees.

"There were many times I questioned if the faculty thought I deserved to be in the program," she said. "You

need people who believe in you, who lift you up.”

She found those people when she rotated on vascular surgery and developed a special bond with vascular surgeons [Jay Robison, M.D.](#), [Bruce Elliott, M.D.](#) and [Thomas Brothers, M.D.](#)

Dr. Robison became her mentor. “He believed in me even when I didn’t believe in myself, and made me a stronger, more confident surgeon,” she said. “Even now, when I have a particularly challenging case, I call him and we talk about it.”

“Sharee had to be smart, strong, determined, dedicated and hard working to fulfill her historic accomplishment of being the first black woman to finish MUSC’s surgery residency and go on to complete a 2-year fellowship in vascular surgery,” said Dr. Robison. “As administrative chief resident, she was respected and acknowledged by students as a very good teacher, with high - but fair- expectations.”

“I couldn’t be more proud of all she has accomplished,” he added.

She admires Dr. Brothers for his surgical skills. “He is the most technically-gifted surgeon I ever met,” Wright recalls. “I aspire to be like him, plus we have the same dry sense of humor.”

The feeling is mutual. “Dr. Wright is one of my most favorite people in the whole world,” said Dr. Brothers. “Not only do I have enormous respect for her accomplishments, her personal drive, and her exemplary humanity, we share the same quirky, extremely dry sense of humor that very few people seem to fully appreciate in its nuanced hilarity.”

She faced financial barriers as well.

When Dr. Wright found out all residents needed to purchase loupes in PGY-2, she didn’t know how she could ask her mother for the money. “She was a single mom and money was tight,” she said. The struggle stayed with her and during her final year, she and her fellow graduates asked that their graduation gift to be gifted towards loupes for the incoming PGY-2 class. Since then, the *Curtis P. Artz MUSC Surgical Society* has provided loupes to all second-year residents as a way to ease the financial burden.

Wright continues to give back to improve resident education. She hopes her gifts to the MUSC Surgical Resident Research and Education Fund will make the next generation of surgical trainees’ journey a little easier. “If it buys a new couch, or some extra food, or in any way makes for a better, more enjoyable training

environment, then I’ve achieved my goal.”

She gives back to the College of Medicine and the Elliott - Robison Endowed Chair in Vascular Surgery as a way to thank both the institution and the people who propelled her to a successful career in vascular surgery.

“It’s quite simple - MUSC made me the successful surgeon I am today,” she said. “And I’m very grateful.”

Patient education and advocacy are important in her career choice of vascular surgery. “African Americans have more severe vascular disease by the time they seek care,” she explained. “And, black patients are more likely to have chronic diseases, like diabetes, hypertension, congestive heart failure and end-stage renal disease. Yet, vascular surgery is comprised of only 10% black vascular surgeons, a disparity that creates a barrier to care for the African American population.”

Research shows that patients’ comfort level is better if there is racial concordance with their doctor. African American patients feel more comfortable discussing health related concerns and are more open to advice if the physician looks like them.

“By educating and advocating for my URM patients, I know I can improve their outcomes,” she said. “It is rewarding to know I am making a difference.”

CURTIS P. ARTZ MUSC SURGICAL SOCIETY CELEBRATES ITS 10TH YEAR “REVIVAL”

Exciting plans were underway to celebrate the 10th year of the *Curtis P. Artz MUSC Surgical Society’s* revitalization with surgical alumni gatherings in Charleston and at the ACS meeting in Chicago when our lives suddenly changed. Stay tuned for alternative “virtual” gatherings to bring us all together.

Many of our alumni, like Dr. Wright, value their MUSC education and want to give back to the institution and program that made them the successful surgeons they are today.

There are many philanthropic opportunities and each gift makes an impact on our residents’ daily lives. We hope that you will partner with us to advance education and help pave the path for the next generation of surgical leaders.

Please contact Vera Ford, Director of Development, at 843-792-1840 or fordva@musc.edu or visit musc.edu/surgery/give.

Journey of a Lifetime Leads to \$1M Planned Gift



Vinny Martucci and Arlene Petty have traveled around the world – seven continents and 48 states, to be exact – experiencing the wonder, discoveries, and challenges touring the world offers. Of all their travels, perhaps their longest, most challenging – and most rewarding – was Vinny’s journey through kidney transplantation.

Professionally, Vinny was a communications engineer and Arlene owned her own professional liability insurance business. When not working, the couple spent time traveling, golfing, and kayaking. It was in 2001 when Vinny was 58, that he learned he had polycystic kidney disease (PKD), an inherited disorder in which clusters of cysts develop primarily within the kidneys, causing them to enlarge and lose function over time. The couple soon learned that eventually Vinny would need a kidney transplant or face dialysis, but at the time, he was in excellent health.

While enjoying retirement at their homes in Mahwah, NJ, Bluffton, SC and Lake Placid, NY, they realized by 2014 Vinny’s PKD was taking its toll and it was time to address having a transplant. It was pre-planned for that to take place at St. Barnabas Hospital, Livingston New Jersey using Vinny’s sister’s ‘perfect match’ kidney. During the medical review, it was discovered Vinny had aggressive and invasive prostate cancer. While radiation was the recommended treatment, they knew radiation could compromise abdominal surgery which Vinny would need for the now elusive transplantation and so they sought surgical options. They were referred to MUSC Health in Charleston where Vinny had a perineal prostatectomy to avoid an incision in the abdominal wall. The surgery was a success.

Vinny was now 72 and a cancer survivor. But his kidneys were failing. His creatine levels were climbing, he was losing strength and it was becoming obvious he would soon need a transplant or go on dialysis.

He had some hurdles to get through since once a person has cancer and is reaching an advanced age, transplantation is not always considered an option. Most transplant centers require at least a two-year waiting period after a cancer diagnosis, and by then Vinny would have been 74 and less likely to be considered for transplantation due to age. In fact, things were looking grim and they decided to have a fistula put in just in case he needed to go on dialysis.

Based on Vinny’s overall good health and active lifestyle, Dr. Thomas Keane, his urologic oncologist, advocated for Vinny to be considered for transplantation with the MUSC transplant team, a national leader in solid organ transplantation. The transplant team agreed Vinny was indeed a good candidate.

Still the couple didn’t get their hopes up – they learned that in light of Vinny’s cancer, his sister’s kidney would no longer be considered for Vinny’s transplant because she, too, had a prior cancer diagnosis. They needed a living donor. Many family and friends offered to be a donor, but for a variety of health-related reasons, no one was able to donate. “It was like being on a roller coaster,” said Arlene. “We didn’t know what to do so I put out an email to all of our friends.”

She wrote: I never thought I would have to ask, but I can’t give Vinny a kidney, because I’m a breast cancer survivor. I can’t help him, but I can ask for you to consider helping him. We have run out of options.

“Is anyone willing to give Vinny a kidney?” she asked.

Within fifteen minutes from hitting “send,” Chris Bidelsbach, a friend they had recently met in Lake Placid, responded that he would donate his kidney. “We were beside ourselves with joy,” said Arlene.

“Chris is a remarkable person,” said Vinny. “We couldn’t believe he was willing to give me his kidney – he was literally willing to give me the gift of life.”

Chris was a match, but there was a catch. Chris had high

blood pressure. After a few months of being on blood pressure medicine, his health improved and the surgery was scheduled. Nine months from his prostate surgery, Vinny was going to get his new kidney. The couple gladly made the arrangements for Chris and his family to travel to Charleston, covering all of their expenses during their extended stay. After the successful transplant, Vinny was back on the road to good health.

“Vinny represents one of our highest risk patients and the success is dependent on an entire team,” said Vinny’s transplant surgeon **Prabhakar Baliga, M.D.** “I am grateful and proud that we have such a great team that enabled us to facilitate a successful transplant outcome for the Martucci family.”

With all great journeys, new discoveries are made.

After Vinny recuperated, the couple started volunteering with the non-profit Staying Connected near their home in Bluffton, providing rides to medical appointments and grocery stores. It was there that they met a woman in need of a kidney transplant and on dialysis. They watched her decline and saw the financial barriers she faced to getting well. Vinny and Arlene realized again how lucky they were and that they needed to give back in some meaningful way.

The couple learned that South Carolinians suffer a higher rate of end-stage renal disease than in other areas of the country, which disproportionately affects the African American population. Sixty-six percent of MUSC’s kidney transplant recipients are African American, with nearly two-thirds having a household income of less than \$30,000 per year.

Vinny and Arlene realized they could help remove these financial barriers to transplantation by providing annual contributions to the MUSC Living Donor Institute (LDI) Patient Support Fund. Through their contributions, along with other grateful patients and donors, the LDI Patient Support Fund is able to cover lodging, lost wages, airfare, travel and household bills for qualifying living donors.

This year, Vinny and Arlene made a bequest of \$1M from their estate to the MUSC Living Donor Institute. The gift will serve as a match to the Allen Family’s \$1.5M Patterson Barclay Memorial Foundation gift in memory of their brother, Fred Allen, who also suffered from PKD. “It seemed the perfect way to give back in a personal way, to ease some of the burden,” said Arlene.

Vinny and Arlene are back in Lake Placid. Their bond with Chris and Becky has grown so strong they think of themselves as one family.

Vinny and Arlene’s bond with MUSC continues, as well. When Vinny’s prostate cancer recurred, Dr. Baliga heard Vinny was at the University of Vermont (UVM) for

treatment and called the hospital to make sure the UVM team knew to protect Vinny’s kidney during treatments. “Dr. Baliga really cares personally about Vinny,” said Arlene. “That means the world to us.”

“Getting to know the family has been a blessing,” said Dr. Baliga. “They are a family that believes in paying it forward and supporting the advancement of the field so others may share the benefits of transplant. They belong to the category of those who give selflessly and have my highest respect!”

Changing What’s Possible for Transplantation through Living Donation



Vinny Martucci and Chris Bidelsbach during one of their annual golf outings.

Living donation is a profound way to help a loved one—or even a stranger—in need. That said, someone who wants to give the gift of life often has financial obstacles. Perhaps they can’t afford to be out of work for weeks without pay, or they can’t cover childcare expenses during the recovery process.

The **Living Donor Institute Patient Support Fund** provides patients and donors the needed resources and staff support. With contributions from generous donors and grateful patients like Vinny and Arlene, we have changed what’s possible for many patients and donors who otherwise would not have been able to have their transplant due to financial obstacles.

Learn more about supporting the Living Donor Institute by visiting giving.musc.edu/living-donor-institute. To read Vinny and Arlene’s full journey, visit muscedu/surgery/news/annual-report/philanthropy-news.



Changing what's possible

Department of Surgery
96 Jonathan Lucas Street
Charleston, SC 29425-5500

musc.edu/surgery