UNIVERSITY of MARYLAND
SCHOOL OF MEDICINE

DEPARTMENT OF SURGERY

SERVING OUR REGION, LEADING THE WORLD

CHANGING THE WORLD, ONE SURGERY AT A TIME

Over the past five years, the University of Maryland School of Medicine Department of Surgery has met with enormous challenges—and has grown through them. Despite the disruptions of the COVID-19 pandemic, and the economic headwinds changing the delivery of healthcare everywhere, at the University of Maryland, we are driven to develop excellence in clinical care, research, innovation, and education as we strive to care for our local community, the State of Maryland, and beyond.

We realize we have lofty ambitions for the Department of Surgery, but feel they are attainable thanks to the depth and diversity of experience and strengths in our department. For example, we are ranked at the top nationally in patient volume and have the second lowest mortality index (less than 1%) for Extracorporeal Membrane Oxygenation (ECMO).

We continue to offer excellent care at the University of Maryland Medical Center (UMMC) in Baltimore, while expanding our footprint to make this same quality of care available in communities from Western Maryland to the Eastern Shore, into southern Pennsylvania and northern Virginia. We meet patients where they live and provide the best care from world-class surgeons—whether they are seen at the downtown campus or at a community hospital near their homes.

Clinical Care: Expanding Our Impact

As we deliver care in new settings, the traditional role of an academic surgeon is evolving. In the future, it may look very different than it does today. Many of our highly skilled surgeons are spending more time providing excellent care outside of our main campus, and we are adapting our system to ensure our top physicians can move up the career ladder regardless of whether they practice on the main campus or elsewhere.

Education: The Future of Surgery

We consider mentoring and educating the surgeons of the future to be a cornerstone of who we are, and a huge driver of our success in the department. While our downtown campus remains at the center of surgical education, we are expanding residency rotations outside of the main campus so our residents can experience delivery of care across a variety of settings. As models of care evolve, surgeons must be able to deliver appropriate, patient-centered care in a variety of settings.

Research: At the Cutting Edge

Research is another pillar of our department. Throughout our history, the physician-scientists in all our divisions have conducted cutting-edge research and shaped the practice of surgery. In 2020, we added a new Division of Surgical Sciences to foster the advancement of our field by training residents in basic and translational research and aiding our researchers in seeking National Institutes of Health (NIH) and other avenues of funding for their work. Our department's bedside-to-bench and back again research strategy ensures that clinical need drives basic and translational research, and that research ultimately leads to solutions in clinical settings.

Innovation: Putting Research into Practice

As a department, we have built a formal infrastructure to fund and assist our physicians in creating innovative surgical devices and developing new and improved procedures—both for use in our operating rooms and for entry to the marketplace. Multiple companies have spun out of work begun by Department of Surgery physicians. We have started an innovative scholarship track for residents, and support our attending surgeons in bringing innovation to our ORs and to the world.

The Impact of Philanthropy

Generous gifts from our community have a direct impact on our clinical, educational, research, and innovation missions. Philanthropic support has helped us increase the number of endowed chairs, divisions, and programs substantially over the last four years, helping attract top surgeons to Maryland. The support of our donors and community are critical in making possible fiscally responsible initiatives to generate novel therapies such as our groundbreaking heart xenotransplantation program.

> Each surgery can save or improve a patient's quality of life. Your support of the Department of Surgery makes possible innovations that can change the world for the better, while ensuring access to the best surgical care for all in our communities.

Our Mission

To provide the best surgical services and patient care to our patients while providing equal access to the most innovative and progressive medical services available, led by basic, clinical, and translational discoveries, and to train physicians and other healthcare providers.

Our Values

+ **Excellence** in all our endeavors
+ **Leadership** in issues of importance to Maryland, the region, the nation, and the world
+ **Diversity** in our faculty, trainees, staff, and students
+ **Social and Public Health Responsibility** as a significant resource for addressing local, state, national, and international health and public policy issues
+ **Collaboration and Communication** to support our mission and vision
+ **Respect, Ethical Behavior, and Professionalism** through mutual respect in all our interactions and the highest standards of ethical and professional conduct
+ **Fiscal Responsibility and Accountability** in management of our resources

Our Divisions

Thoracic Surgery
Transplant Surgery
Pediatric Surgery
General Surgery & Surgical Oncology
Vascular Surgery
Cardiac Surgery
Urology
Plastic Surgery
Surgical Sciences

"Congenital heart disease is the most common birth defect requiring surgery in the first year of life. It's gratifying to help families during an extremely stressful time in their lives, and to have a long-term impact on a person. I often get thank-you notes from patients as they reach college age and beyond."

Joseph Forbes, MD, MBA
Professor of Surgery
Director of Pediatric Heart Surgery

CLINICAL CARE: EXPANDING OUR IMPACT

The Department of Surgery offers the most innovative surgical treatment options for patients with cases ranging from minor procedures to the most medically complex cases through our eight specialized divisions: cardiac, general & oncologic, pediatric, plastic, thoracic, transplant, urology, and vascular. Our surgical and research expertise, multidisciplinary approach to treatment, and the broad resources of an outstanding academic medical center all combine to attract leading surgeon-scientists and distinguish our department as a center of excellence.

We provide access to the highest level of care for all who need it. Our patient population includes a wide range of backgrounds and is geographically expansive, reflecting the communities we serve. We provide service in all regions of the state and in locations in Pennsylvania and Virginia.

We believe in collaboration. Our aortic program brings together the expertise of cardiac, vascular, and thoracic surgeons, with other colleagues including radiology, anesthesiology, and nursing. It provides cutting-edge surgical options to patients in need.

Expanding Thoracic Care in the Community

Since 2020, the Division of Thoracic Surgery has expanded operations from UMMC, Upper Chesapeake Medical Center, Baltimore Washington Medical Center, and St. Agnes Hospital toward several other centers across the state. The division now offers state-of-the-art thoracic surgery at Capital Regional Medical Center, St. Joseph Medical Center, the Baltimore VA Medical Center, and Mercy Medical Center, and is pursuing partnerships with health systems outside of our network including Meritus Health. Such broad partnerships and expansion allow patients access to world-class University of Maryland thoracic surgeons close to home no matter where they live.

A Cancer Treatment Powerhouse

Collaborating with medical and radiation oncologists at the Marlene and Stewart Greenebaum Comprehensive Cancer Center (UMGCCC), our surgical oncologists are key to the team that has made the University of Maryland a national leader in the treatment of cancer. We recently expanded services into the University of Maryland Capital Region Medical Center, bringing high quality cancer care to populations lacking adequate resources in Prince George's County, and are expanding clinical care to Baltimore Washington Medical Center while maintaining a special focus on solid tumor surgeries at the UMMC's downtown Baltimore campus. The department's new surgical oncology lead for UMGCCC is Jeremy Davis, MD. Known for landmark research in hereditary stomach cancer, Dr. Davis previously held key roles at the National Cancer Institute and NIH.

International Leadership in Compression Disorders

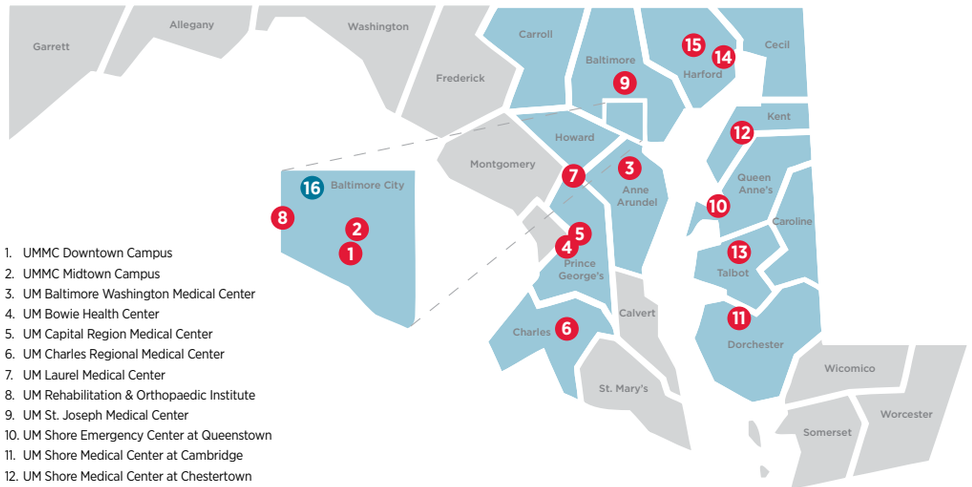
Since joining the department in 2018, vascular surgeon Khanjan Nagarsheth, MD, has created the world's most comprehensive compression disorders program at the University of Maryland. These rare and difficult to diagnose disorders occur when a blood vessel or organ becomes constricted between other structures. Often impacting young patients, they can cause debilitating, life-altering pain. Since 2020, Dr. Nagarsheth has performed 250 compression disorders surgeries and cared for 1,000 patients. "We are the only place in the world that treats all of these conditions," he said. "I get 10 new patients a week and have operated on people from Australia, Saudi Arabia, Israel, England, all over Europe, and South America."

Saving Lives and Improving Quality of Care for Children

Kimberly Lumpkins, MD, MBA, the Dr. J. Laurance Hill Endowed Professor in Pediatric Surgery, has focused her career on improving the lives of children through her own work in urology, and by advancing the field and developing the next generation of surgeons. Dr. Lumpkins designed a highly popular elective that teaches teamwork, emotional intelligence, negotiation, and effective leadership to medical students.

Our Service Area

UNIVERSITY of MARYLAND MEDICAL SYSTEM



1. UMMC Downtown Campus
2. UMMC Midtown Campus
3. UM Baltimore Washington Medical Center
4. UM Bowie Health Center
5. UM Capital Region Medical Center
6. UM Charles Regional Medical Center
7. UM Laurel Medical Center
8. UM Rehabilitation & Orthopaedic Institute
9. UM St. Joseph Medical Center
10. UM Shore Emergency Center at Queenstown
11. UM Shore Medical Center at Cambridge
12. UM Shore Medical Center at Chestertown
13. UM Shore Medical Center at Easton
14. UM Upper Chesapeake Medical Center Aberdeen
15. UM Upper Chesapeake Medical Center Bel Air

16. Mt. Washington Pediatric Hospital
Joint Venture by UMMS and JHHS

UMMS Primary Service Area · UMMS Facility · Joint Venture

Recent Clinical Highlights

#1 in Maryland
for number of heart surgeries, 5,541 from 2020–2023

5 Star Rating
United Network for Organ Sharing for kidney transplantation

The Only
pediatric surgical team caring for underserved patients on the Eastern Shore

10% Living Donors
5% higher than the national average for liver transplants

<1%
10-year observed to expected mortality rate for cardiac patients

11 Hospital Locations
Plus 3 new outpatient facilities for vascular surgery

Last 5 Years

- **1,732** transplant surgeries
- **115** heart transplants
- **53** multiple organ transplants

In 2022 Alone

- **21,373** outpatient surgical cases
- **151** ECMO cases (#1 in U.S.)
- **324** transplant surgeries
- **17** multiple-organ transplants

CLINICAL SPOTLIGHT

Aryn Porter

The University of Maryland's Children's Heart Program, led by nationally renowned pediatric and neonatal cardiovascular surgeon Joseph Forbess, MD, MBA, ranks among the nation's top 50 pediatric heart centers.

Summer Porter was still pregnant when she learned her son had Tetralogy of Fallot, in which the heart has four congenital defects at once. "We were just checking a box getting a pre-natal screening. The diagnosis was terrifying. A friend whose baby had the same thing plugged me into UMMC, and it's been smooth sailing since. Aryn was born at 31 weeks, 2.5 pounds, when his heart was just the size of a strawberry. Dr. Forbess was able to do the surgery when he reached a little over 3 pounds in the NICU, and they will be following him throughout his life. We're lifelong people here," said Mrs. Porter.

DONOR SPOTLIGHT

You Only Live Twice Foundation

In August 2013, Gavin Class, a Towson University football player, collapsed at practice due to exertional heatstroke. Upon arrival at the R Adams Crowley Shock Trauma Center, his high body temperature led to a cascade of medical problems, including the need for a life-saving liver transplant. His parents, Jonny and Danielle, started the YOLT (You Only Live Twice) Foundation with a mission to positively impact the lives of those affected by heatstroke and solid organ transplant. In 2020, the YOLT Foundation launched a lodging fund to benefit transplant patients and their families during the transplant process at UMMC, a gift inspired when Danielle saw patients whose families' financial challenges prevented them from visiting. Most recently, the Foundation teamed up with transplant surgeon Daniel Maluf, MD, to fund the start of an artificial intelligence (AI) program at UMMC. Danielle remembers how long Gavin was in the hospital after his transplant and the monitoring that played a part in his recovery. The AI program hopes to provide technology devices so patients can go home faster while still accessing continuous monitoring, similar to what they would receive in the hospital. This allows patients to safely continue their recovery in a more comfortable environment and reunite sooner with loved ones.

"If you teach somebody how to do a procedure, and they then spend their career doing that procedure, you're taking care of the patient you'll never meet. And that is the true mission of academia."

Steven Kavic, MD

Campbell and Jeanette Plugge Endowed Professor in Surgery

Department of Surgery Vice Chair of Education

Program Director, UMMC General Surgery Residency

EDUCATION: THE FUTURE OF SURGERY

Education is at the heart of our mission, and all faculty have a strong commitment to training the next generation of leading surgeon-scientists. Each resident pursues a basic or clinical question for two full years at our hospital or a separate research institution such as the National Institutes of Health. Our 60 residents benefit from state-of-the-art surgical training both in traditional operating room settings and in the Maryland Advanced Simulation, Training, Research, and Innovation Center, where they practice the latest surgical techniques.

Our residencies attract the best students from around the nation, and we are proud to welcome outstanding graduates from the University of Maryland School of Medicine (UMSOM). For example, in 2023–2024, 11 UMSOM students applied in general surgery, all of whom matched into categorical positions. In that same cycle, general surgery received 1,973 applications (national average just under 1,200)—or 328 applicants for each of our available categorical positions.

The Department of Surgery offers fellowships in vascular surgery, abdominal transplantation, minimally invasive surgery, and thoracic surgery. We also partner with Johns Hopkins to support advanced training in plastic surgery and pediatric surgery.

Surgical Education Highlights

Cardiac surgery not only trains surgical residents and fellows, but also regularly brings in medical students, college students, and even high school students to shadow our surgeons with a goal of engaging students at a young age.

General Surgery & Surgical Oncology residents participate in two full years of research after the second clinical year and were authors on 58 peer-reviewed publications in one recent academic year.

Pediatric surgery is a core general surgery rotation for third-year clerkships, led by Eric Strauch, MD, the associate clerkship director. The division has also created a new first-year elective, Creating Leaders Integrating Medicine & Business (CLIMB), to give new physicians a framework for understanding what clinical leadership should look like, as models of delivering healthcare evolve in the future.

Plastic surgery residents are engaged with a study led by the division's research coordinator, Yvonne Rasko, MD, on the best solution for irrigating wounds. The residency program partners with Johns Hopkins to provide residents with practice opportunities in a variety of settings at 12 hospitals citywide.

Thoracic surgery expanded and reordered its residency program in 2023 to include rotations at UM Upper Chesapeake Medical Center and the Baltimore VA Medical Center. Residents presented at every major surgical meeting and obtained the coveted American Association for Thoracic Surgery Robotic Surgery fellowship two years in a row.

Transplant surgery at University of Maryland is one of the few transplant centers training fellows to perform surgeries using robotic platforms.

Urology residents train in the most advanced technologies available in this rapidly advancing field, including robotic surgery, nerve stimulators for urinary frequency, and lasers for treating kidney stones.

Vascular surgery residents see the future of surgical practice in a division that is rapidly expanding, now operating in 11 hospitals across the region, and three new outpatient facilities, to meet the challenge of providing timely and efficient services to match the rising needs due to the epidemic of diabetes and ongoing demographic changes in the country. This new Integrated Vascular Surgery Residency Program, the first in the state, will be led by Program Director Khanjan Nagarsheth, MD, starting in July 2026. Our current fellowship will continue alongside this new program.

Our surgery residency graduates match at premier fellowships. ►

A Leader in Medical Education

All University of Maryland School of Medicine residents have passed their written board exams on their first attempt for the past nine years—thanks in large part to the work of General Surgery Residency Program Director Dr. Steven Kavic, who assumed that role in 2011. In 2022, Dr. Kavic was awarded the Campbell and Jeanette Plugge Endowed Professorship in Surgery, the school's first endowed professorship tied to research and innovation in medical education.

Dr. Kavic's medical practice focuses on minimally invasive abdominal surgeries, but "I secretly always wanted to be a teacher as well," he said. One of the first changes he implemented as residency director was providing every surgery resident with a free essential textbook for each year of their residency. "There's no magic to passing the written board exams," Dr. Kavic said. "If you study, you do well, and we provide them the resources to do so."

Dr. Kavic recently was a student again himself. In the spring of 2024, he graduated in the first cohort of the new University of Maryland, Baltimore master's in health professions education—a unique program specifically for professionals interested in graduate-level education.

"You're never too old to learn. Now, north of 50, I got a degree in education," Dr. Kavic said. "My work became better, I learned more, and it improved how we view and run our residency program." He continued, "The future of medicine depends on passing knowledge on to the next generation of physicians so that they are prepared to meet the generational health challenges of the future."

RICHA KALSI, MD

earned her bachelor's and medical degrees from the University of Maryland, served as chief resident in general surgery, and has matched to a prestigious UMMC fellowship in vascular surgery.

"My journey to medicine really began when I was about 13. My sister became really sick and was hospitalized a lot. I wanted to be able to do something, and realized it's a privilege to use the knowledge of medicine to help someone to live their life. Baltimore is an area with lots of social determinants that affect the healthcare of our patients. We see every type of patient with every kind of issues, and that is invaluable for our training. My colleagues here are wonderful people who genuinely want to be in medicine for the right reasons."

"I feel so blessed to be a pediatric surgeon…to see these children grow up and turn into remarkable and successful young persons."

To honor Dr. Hill's dedication as an influential mentor and leader in Pediatric Surgery, the Dr. J. Laurance Hill Endowed Professorship in Pediatric Surgery was established to ensure leadership and growth in the Division and to attract and retain the very finest faculty leaders. The professorship is currently held by Kimberly Lumpkins, MD.

J. LAURANCE (LARRY) HILL, MD

was a clinical surgeon, inspiring teacher, and founding leader of the University of Maryland School of Medicine's Division of Pediatric Surgery for 28 years. Dr. Hill was enormously influential both professionally and personally to generations of medical students, general surgery residents, and pediatric surgery fellows. Though he passed away on July 23, 2022, his accomplishments, guidance, and dedication to the field of pediatric surgery carry on forever.

WILLIAM BAKER HAGAN, MD '43

was a dedicated and highly regarded general surgeon and community physician with a deep passion for education. The William Baker Hagan, MD '43 General Surgery Resident Education and Research Endowment facilitates residents' participation in professional development programs, covers travel and registration expenses, and provides resources for acquiring essential supplies to enhance their surgical skills, knowledge, and clinical training.

"The historian Henry Adams wrote, 'A teacher affects eternity; he can never tell where his influence stops,'" said Dr. Kavic. "Dr. Hagan was a true educator, and by teaching the surgical craft, he was, in a way, taking care of patients that he never met. This incredibly generous gift from his daughter, Cheryl Hagan, both honors that legacy and extends it to another generation of surgical trainees. We are honored to be associated with the Hagan family."

"There has been an explosion in molecular biology advances, all of which are giving us all sorts of biomarkers for disease states. We're just scratching the surface of what that might be able to tell us. You could focus on just one thing and know everything about that one thing, but I think it's a lot of fun to do clinical work and then switch gears over to research work, and then back again."

Jonathan Bromberg, MD, PhD
Vice Chair for Research
Charles Reid Edwards, MD
Professor of Surgery

RESEARCH: AT THE CUTTING EDGE

A culture of research in every division is a hallmark of the Department of Surgery. The opportunity to work closely with world-class physician-scientists to advance the practice of surgery attracts the best and the brightest surgeons and surgeons-in-training to Maryland, as well as patients seeking access to the latest treatment options. We are proud to stand among the country's top NIH-funded research programs, receiving over $10 million in NIH funding in 2024. The excellence of our research program is also recognized by the funding we receive from generous donors, many whose lives have been impacted by our research.

Our commitment to fostering and supporting the research of our faculty and residents led to the creation of a new Division of Surgical Sciences within the department in 2020. Its distinctive mission is to expand and deepen the department's research portfolio and serve as a vital bridge between basic science research and practicing surgeons, fostering collaboration and innovation. The focus of the division is to train and promote surgeon-scientists who are equipped to both develop groundbreaking treatments in the lab—and implement them in clinical practice.

A Division to Advance Surgical Research

Formed in 2020, amid the disruptions of COVID-19, the Division of Surgical Sciences has helped to secure funding by federal and non-federal agency grants totaling more than $10 million in research initiatives in the department. Establishing connections between physicians and basic science researchers is crucially important to our mission of conducting basic and translational research that can make a difference in advancing surgical procedures.

Since 2020, the division has averaged the publication of 10–12 peer-reviewed manuscripts, maintained a continuous presence in national and international meetings, as speakers, and with mentees presenting their research—leading to Rising Star award recognition and Young Investigator and travel awards for research quality. In addition to conducting and publishing research, the division actively trains the next generation of physician-scientists. As part of the School of Medicine's Medical Scientist Training Program (MSTP), a joint MD/PhD degree program, two students spend a summer in our division learning about conducting biomedical research before returning to medical school. The division also welcomes as many as five medical students to spend three months with us during the school year, receiving training in basic research.

Research Highlights

Plastic Surgery residents are engaged with a study led by the division's research coordinator, Yvonne Rasko, MD, on the best solution for irrigating wounds—essential for the practice of plastic surgery, but with important applications in orthopedics, cardiothoracic, and vascular surgery to lower the risk of infections in artificial joints and grafts.

In Urology, the research of Mohummad Minhaj Siddiqui, MD, into the biology of urologic cancers is funded by a $1.5 million NIH RO1 grant and a $2 million Department of Defense Transitional Team Science award. By studying the behavior of mutated cancer genes, Dr. Siddiqui's lab is working to "give physicians early insight into whether cancer is being affected by a specific treatment," Dr. Siddiqui said.

In General Surgery & Surgical Oncology, UMMC was the first, and as of July 2024, the only medical center in Maryland to offer a newly approved Amtagvi cell-based immunotherapy treatment for metastatic or unresectable melanoma. Amtagvi, a Tumor Infiltrating Lymphocyte (TIL) therapy, was approved by the FDA in February 2024, and has the potential to revolutionize the treatment of advanced melanoma.

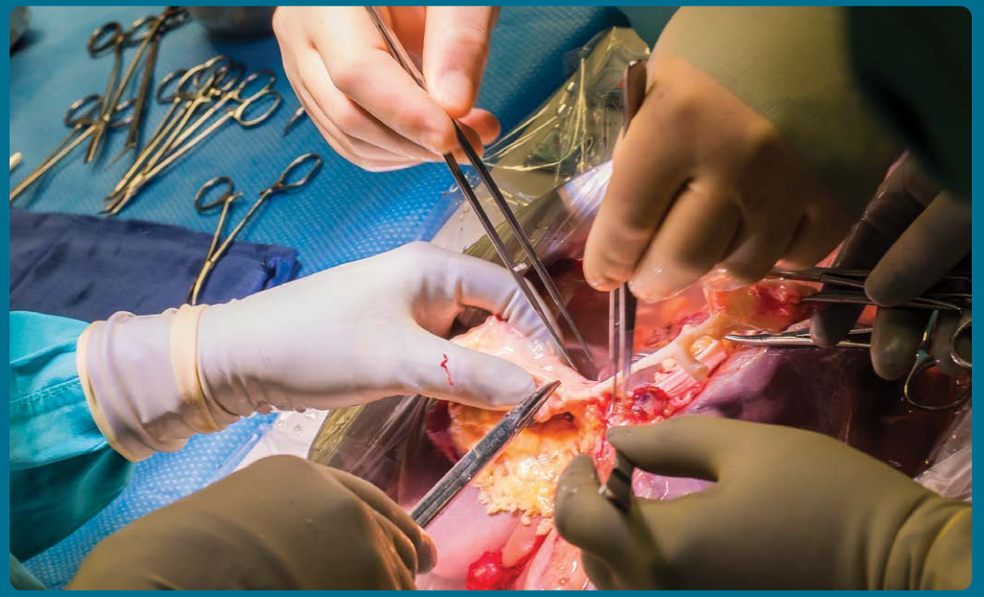
Thoracic surgeons are exploring multiple lines of research, including studies in lung transplantation tolerance and lung cancer immunotherapy. Alex Mei, MD, is actively exploring deleterious inflammation after lung resection, which may support the use of FDA-approved asthma medications in lung resection patients.

In Vascular Surgery, research from the lab of Brajesh Lal, MBBS, are using artificial intelligence to predict venous thromboembolisms, blood clots that form in the legs, using a database of 1.2 million patients. Mary Lin, PhD, a fourth-year resident and member of the Lal lab, received a highly competitive American Venous Forum-JOBST Clinical Research Grant for her work in this area. Rajabrata Sarkar, MD, PhD, has developed an automated vascular access device to provide a portable, usable tool for use in central artery and vein catheterization.

Dr. Jonathan Bromberg, head of transplant research, is the principal investigator for the APOLLO study, which examines the role of Apolipoprotein L1 (APOL1) gene polymorphisms in increasing the risk of developing kidney disease, primarily in people of African descent. The study, now in its seventh year, has enrolled more than 7,000 patients and living and deceased donors across 200 transplant centers, including UMMC. The NIH recently funded the study for another five years. The transplant program has significantly improved patient outcomes—now rated at 5 stars, making UMMC the #1 program in the country for patient outcomes.

RESEARCH SPOTLIGHT

Single-cell Kidney Transplant Outcomes



Valeria Mas, MS, PhD, The Joseph and Corinne Schwartz Professor of Surgical Sciences Research in Transplantation, collaborates with bioinformatics scientist Amol Shetty, PhD, and others in the Division of Surgical Sciences to study the genomic and cellular underpinnings of kidney transplant failure. Using new single-nuclei RNA-sequencing, researchers are studying the changes in gene expression in individual kidney cells as they progressed through chronic allograft dysfunction and the long-term scarring of transplanted kidneys that eventually leads to organ failure. Understanding that process at a cellular level could lead researchers to therapies to improve kidney transplant outcomes.

“Our goal of achieving a machine learning model to provide personalized medicine solutions for kidney and liver transplant patients will only be achievable due to the unique collaborative research ecosystem possible within the University of Maryland Medical System,” says Dr. Shetty.

DONOR SPOTLIGHT

Joseph M. Schwartz and Corinne “Peachy” Schwartz

Dr. Valeria Mas was invested as the inaugural Joseph and Corinne Schwartz Professor of Surgical Sciences Research in Transplantation on February 6, 2024. This $1.5 million endowment was given to the University of Maryland School of Medicine by the late Joseph M. Schwartz and Corinne “Peachy” Schwartz, to support discovery and advancement in transplantation science. Joseph and Corinne believed in philanthropy’s power to influence lasting social change. They made an impact by generously donating more than $6 million to the School of Medicine and the University of Maryland Medical Center during their lifetime, establishing the Joseph and Corinne Schwartz Division of Transplantation, the Joseph and Corinne Schwartz Professorship in General Surgery held by Jian-Ying Wang, MD, PhD, the Joseph and Corinne Schwartz Surgical Suite, and the Joseph and Corinne Schwartz Stroke and Brain Injury Center.

"A traditional Bentall procedure is one of the biggest surgeries that a cardiac surgeon can do on the heart. We can't operate on and suture the heart when it is pulsating. The Endo-Bentall is a groundbreaking step forward."

Shahab A. Toursavadkohi, MD

Professor of Surgery

Co-Director, Center for Aortic Disease

INNOVATIONS: PUTTING RESEARCH INTO PRACTICE

The Department of Surgery has a long history of innovation. The support available for developing new life-saving procedures and devices encourages physician-scientists to rise to the challenge of doing what has never been done before, and the University of Maryland's culture of innovation attracts surgeons who want to shape the future of surgery.

Multidisciplinary problem-solving is supported at every level in our department to facilitate the sharing of diverse perspectives and experiences in problem-solving from the 'bedside to the bench' and back to clinic. There is extensive support for the efficient progress from the lab bench to the operating room and the marketplace.

The University of Maryland is recognized for innovations that are shaping the practice of surgery—from the pioneering work of the Aortic Center in developing the Endo-Bentall procedure to provide a new, minimally invasive option for patients who cannot undergo open cardiovascular surgery to the first xenotransplantation, from the exploration of ways to apply artificial intelligence to improve outcomes in pediatric and vascular surgery to our leadership in minimally invasive robotic surgery.

Endo-Bentall: Breaking New Ground in Cardiac Surgery

University of Maryland surgeons are honing the bleeding edge of cardiac technology and surgical techniques with a new minimally invasive, endovascular approach to rescue patients deemed too sick to undergo open cardiovascular surgery. Dr. Toursavadkohi and his colleagues have developed a fully endovascular aortic valve repair procedure for aortic dissections and aneurysms. With the new procedures, no heart bypass is necessary. Instead, a self-expanding transcatheter aortic valve—developed in a collaboration between cardiac and vascular surgery faculty—can be inserted through the femoral artery in the groin. "The Endo-Bentall is a groundbreaking step forward in less invasive aortic root/ascending aortic repair and means that more people can survive these devastating Type A dissections," said Dr. Toursavadkohi.

Cutting-Edge, Minimally Invasive Robotic Surgery

Minimally invasive surgical technology and techniques have advanced dramatically since Michael Phelan, MD, joined the Department of Surgery's Division of Urology in 2003. As robotic surgery tools such as the da Vinci Surgical System became available, he and his colleague, Minaj Siddiqui, MD, quickly adopted their use alongside endoscopic and laparoscopic procedures. "Today, most of our kidney cancer cases and all of our kidney reconstruction cases are done by robotic surgery," Dr. Phelan said. The University of Maryland is one of the few institutions performing fully robotic cystectomies—complete removal of the bladder—that otherwise require large, open surgeries. "Today, the UMSOM continues to lead the way with early adaptation of the single-port robot platform to offer ultra minimally invasive procedures in the specialties of urology, transplant surgery, and ENT," said Dr. Siddiqui. The division is training the next generation of residents, able to perform fully robotic cystectomies as well as mastery of laparoscopic and endoscopic surgeries.

Bringing AI to Bear on Rare Pediatric Cancers

Since coming to the Division of Pediatric Surgery in 2019, Brian Englum, MD, MHS, has focused on research that could help ground the techniques of his surgical practice in solid data, even when that data is difficult to come by. Dr. Englum runs an active research program looking at using artificial intelligence and machine learning to more efficiently gather data on rare pediatric cancers from existing medical records. He received an NIH R21 grant to study how COVID-19 affected cancer screening rates in children and adults. The study's findings showed a persistent drop in rates of screenings following the pandemic, and further research will look into this trend that resulted in poorer outcomes for patients. Dr. Englum and his colleagues are currently investigating the use of artificial intelligence algorithms to search medical records and identify pediatric cancer cases that could be used to build statistical power for retrospective studies. They are testing an early prototype of the technology on electronic health records from the Baltimore Veterans Affairs hospital, but "my next step is to demonstrate that we can get it to work in oncology looking at things like recurrence or metastatic disease in imaging reports with University of Maryland data," Dr. Englum said.

A History of Innovation

- **1807** First public medical school in the United States
- **1809** First surgeon to remove an ovary by laparotomy
- **1812** First surgical ligation of the common iliac artery
- **1820** First surgical removal of upper jaw, first tracheotomy
- **1835** Second successful Cesarean Section
- **1845** First to catheterize the renal and hepatic veins
- **1878** First to perform a temporary depression of each maxilla for angiosarcoma of both nares
- **1928** Discovery and therapeutic application of transurethral prostatic resection
- **1967** First center in Maryland for the treatment of patients with serious traumatic injuries and shock
- **2009** Development and first to use a portable artificial lung
- **2012** Performed the most comprehensive total face transplant surgery
- **2019** Christine L. Lau, MD, MBA, nationally renowned thoracic surgeon, named the first female surgery department chair
- **2019** First in the world to use a drone to transport an organ for transplantation
- **2020** Building on the department's expertise in ECMO, became a world leader in its therapeutic use for COVID-19 patients
- **2022** First to successfully transplant a genetically modified pig heart to a patient
- **2023** First in world to perform the Endo-Bentall procedure
- **2025** First in world to remove a spinal tumor through the eye socket

"I couldn't be more proud to say the future is now. Our skilled team of UMMC and UMSOM physician-scientists will continue to advance and adapt medical discovery for patient care that could offer a lifeline for more patients in dire need."

Bert W. O'Malley, MD

President and CEO
University of Maryland
Medical Center

INNOVATION SPOTLIGHT

Revolutionizing Heart Transplant

The first two xenotransplantation heart surgeries captured global attention, nearly 9,000 news articles, marking a milestone in medical science. Surgeons Bartley Griffith, MD, and Muhammed Mohiuddin, MBBS, performed these two historic surgeries, in 2022 and 2023, by transplanting genetically modified pig hearts into patients with terminal heart disease.

"This procedure offers a dying patient a shot at a longer life, and we are incredibly grateful to our patients for their bravery and willingness to help advance our knowledge of this field," said Dr. Griffith, who performed both surgeries. He is the Thomas E. and Alice Marie Hales Distinguished Professor in Transplant Surgery and clinical director of the Cardiac Xenotransplantation Program.

The pioneering surgeries were extensively covered by national and international news media. Stories focused on the scientific journey from animal trials to human application, the ethical and logistical challenges, the profound implications for the future of transplant medicine, and the potential to address the global organ shortage crisis.

As you read this, about 110,000 Americans are waiting for organ transplants, and more than 6,000 die each year still waiting. Xenotransplantation—the process that uses animal organs—has the potential to save thousands of lives but carries a unique immune response risk.

The second xenotransplantation was FDA approved for patient Lawrence Faucette, who had end-stage heart disease and no other treatment options. He lived for nearly six weeks after surgery, making significant progress, engaging in physical therapy, and spending time with family members. Then his heart began to show signs of rejection. Rejection remains a major challenge for both xenotransplants and human organ transplants.

"We are continuing to pursue the pathway to clinical trials by providing important new data on pre-clinical research that has been requested by the FDA," said Dr. Mohiuddin, one of the world's foremost experts on xenotransplantation and the program's scientific director. "Xenotransplantation symbolizing both the promise and complexity of merging biotechnology with human healthcare."

THE IMPACT OF **PHILANTHROPY**

Each year, thousands of people entrust the University of Maryland School of Medicine Department of Surgery to provide them with excellent medical care. Many turn to us because of our long history of medical firsts and our reputation for attracting the finest surgeons and surgical trainees in the country.

One of the reasons we have been able to build such a strong program—and to establish new standards of surgical care—is because of philanthropic contributions from people like you.

Philanthropic support has never been more essential than it is at this critical moment. Your support allows us to achieve the best possible patient outcomes, helps us recruit the best surgeons, and sustains the pioneering research and innovation of our physician-scientists. Each gift to the Department of Surgery enables our medical team to provide the most advanced care and make a difference for every patient and family member we see.

DONOR SPOTLIGHT

Chuck and Mary Meyer

Philanthropy has always been a priority to Chuck and Mary Meyer. Giving back to healthcare institutions is embedded in their family's history—particularly Mary's family, the McCormicks, whose philanthropy extends throughout Baltimore and beyond. When they look back on the lifesaving double lung transplant Chuck received at UMMC after a diagnosis of idiopathic pulmonary fibrosis, they saw the dramatic progress in organ transplantation that made such complex procedures available today. "This is where our gift fits in—to make it possible for faculty physicians to advance their research and methods for new treatments and discoveries that will impact the next generation," Chuck explained.

Their significant philanthropic gift allowed UMMC to recruit Alexander Sasha Krupnick, MD, who now serves as the chief of thoracic surgery and surgical director of the Lung Transplant Program and is a professor of surgery for the University of Maryland School of Medicine.

"I am incredibly grateful to Chuck and Mary Meyer for their generosity and selfless commitment to the University of Maryland Lung Transplant Program. Their extraordinary gift gave me the opportunity to join this esteemed program that is at the leading-edge of research and clinical care for acute lung disease and respiratory failure," said Dr. Krupnick. "Their generosity has funded mechanistic research focusing on developing lung specific immunosuppression that will eventually help future transplant patients. Without their gift, none of this would be possible. Philanthropy plays a large role in all our pursuits, providing us with the necessary tools to expand our programs, pursue innovative research, and make groundbreaking discoveries that lead to better outcomes for our patients."

DONOR SPOTLIGHT

Steven L. Kreseski

When Steven L. Kreseski passed away in 2015 at the age of 58 from pulmonary fibrosis, he left behind more than just a distinguished career in public service and law—he left a legacy of mentorship, resilience, and a relentless drive to make a difference. Today, that legacy lives on through the Steven L. Kreseski Victory Endowment for Lung Healing Research in Surgery and The Kreseski Victory Fund, established by Steve's family and friends to support innovative research at the University of Maryland School of Medicine.

Born and raised in Baltimore, and a graduate of McDonogh School and the University of Baltimore School of Law, Steve was an avid cyclist, riding more than 3,000 miles the year before receiving a lung transplant. In the wake of his passing, Steve's community united to create a fund that not only honors his memory but also embodies his enduring spirit. The Kreseski Victory Fund, held by the University of Maryland Baltimore Foundation, supports cutting-edge lung research and transplant programs in the Department of Surgery.

Led by renowned clinician Alexander Krupnick, MD, the Peter Angelos Distinguished Professor of Surgery, chief of thoracic surgery, and director of the Lung Transplant Program, the Kreseski Victory Fund has made it possible to achieve groundbreaking advancements in developing immune-based therapies to fight pulmonary diseases, cancer, and rejection prevention of transplanted lungs. The Kreseski Fund has raised more than $116,000, fueled by the generosity of the hundreds of donors who make up "Team Kreseski."

These contributions have helped propel lung healing research forward, including the development of new drugs that have the potential to cure lung disease. Steve often said, "If you can help even one other person, then you have done your job." Through the Kreseski Victory Fund, he continues to do just that—helping others to breathe easier and live longer, healthier lives.

"I am immensely proud of the groundbreaking innovations our faculty, residents, fellows, and staff have achieved in clinical care, research, and education. Their dedication and ingenuity have positioned us at the forefront of medical advancements in the surgical sciences. With strong leadership and cutting-edge tools, we are well-equipped to tackle the most complex surgical challenges, ensuring the highest standards of patient care and medical excellence."

Mark T. Gladwin, MD

Dean, University of Maryland School of Medicine

Vice President for Medical Affairs, University of Maryland, Baltimore

John Z. and Akiko K. Bowers Distinguished Professor and Dean

YOU CAN MAKE A **DIFFERENCE**

The secret of our success and the key to our future growth comes, in part, from the internationally recognized faculty and the best and brightest medical students in the nation. Perhaps even more important are people like you—the generous donors and friends who make discovery and advancement possible.

For more information about making a gift to the University of Maryland School of Medicine Department of Surgery or to a specific physician or scientist, please contact:

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