



 Washington
University in St. Louis
SCHOOL OF MEDICINE

DEPARTMENT OF SURGERY

2019 Annual Report

**Education.
Discovery.
Innovation.
Treatment.**

Building leaders in academic surgery and research

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Letter from the Chair



Developing leaders in academic surgery is a critical task in any era.

C. Barber Mueller, MD, who wrote a biography of our first surgery chair, Evarts Graham, MD, listed 20 of his protégés who went on to become department chairs. Over the last 20 years, we have developed surgeons at many levels to be leaders whether they advance our field’s mission as department chairs or division chiefs, presidents of surgical organizations, or have major leadership roles in the hospital or medical school. A number of these are outside the operating room.

Our department began a journey to improve leadership skills in the early 2000s. We started by performing 360° evaluations on every leader. Eventually, we did the same for every faculty member. Each faculty member met with a psychologist to go over their findings and develop a personal plan for improvement. We created workgroups, established career development/mentorship programs, had wellness events, and paid for faculty to undertake leadership training at our university and other distinguished institutions. In the 2019 academic year, we initiated a six month junior faculty training course. Seventeen faculty received peer evaluations and learned key skills from a spectrum of experts.

We have now grown faculty who are leaders in their field and also serve as leaders in our BJC HealthCare system hospitals, as well as Washington University School of Medicine and Siteman Cancer Center. Notably, Cardiac Surgery Chief Marc Moon, MD, is poised to become the seventh Washington University surgeon to be president of the American Association of Thoracic Surgery next April. Surgical oncologist Ryan Fields, MD, an exceptional physician-scientist who runs a National Institutes of Health (NIH)-funded translational lab, was named surgical oncology chief and co-leader of the Solid Tumor Therapeutic Program of Siteman Cancer Center. Trauma surgeon Laurie Punch, MD, has become a community leader responding to the gun violence epidemic and now serves as director of medical student community engagement in a medical school appointment. Educator Mary Klingensmith, MD, is the inaugural director of the Academy of Educators at Washington University School of Medicine. She and Michael Awad, MD, PhD, continue to be national leaders in developing surgical curriculum simulation training and flexibility in surgical training.

Our department has become a fertile ground for training leaders — leaders who will make our profession better and advance the care and outcomes for our patients.

Timothy Eberlein, MD

*William K. Bixby Professor & Chair, Department of Surgery
Spencer T. and Ann W. Olin Distinguished Professor
Washington University School of Medicine
Director, Alvin J. Siteman Cancer Center*

Building leaders in academic surgery and research

Academic surgeons have always pushed the boundaries of what is possible in treating disease and improving quality of life for patients. All fields of surgical research — basic science and translational, public health sciences, and clinical — have created the pathways for achieving these goals. The field continually renews itself, with each generation preparing the next to solve the persistent and emerging obstacles to better health and survival.



Urologic Surgery Division Chief Gerald Andriole, MD, second from left, quizzes resident Nicholas Pickersgill, MD, while resident Shellee Ogawa, MD, left, and urologic surgeon Eric Kim, MD, far right, look on.

The Department of Surgery has created multiple avenues for its faculty members to grow as leaders at the medical school and nationally in critical spheres.

OUR FACULTY MEMBERS HAVE EXCELLED AS:

National leaders

in their fields, patient safety, cancer research and education

Mentors within the department

helping others to gain a leadership foothold

Institutional leaders

at BJC HealthCare, Washington University Physicians, and the Alvin J. Siteman Cancer Center at Barnes-Jewish Hospital and Washington University School of Medicine in St. Louis

The groundwork for the career development and mentorship opportunities available in the department today began almost 20 years ago, when we developed a plan to improve behavior and leadership skills among our faculty leaders by seeking input from those working for and with our surgical chiefs.

Only with a complete and careful review of faculty leaders' strengths and weaknesses could we gain insight to lay the building blocks for improvement and a foundation for the development of career opportunities. The resulting structure of career

development initiatives in the Department of Surgery has grown exponentially both upward and outward, encompassing the linear trajectory of career path opportunities within our divisions and sections, as well as expansion of learning to leadership training at elite business school programs across the country. Among these opportunities is the 2018–2019 leadership series for junior faculty members, which included expert-led sessions and self-inventory in emotional and social competency to develop key skills.

Division of Cardiothoracic Surgery

The division is a national and regional center for adult and pediatric patients with complex cardiothoracic conditions. Its research has led to advancements in heart rhythm surgery, better understanding of lung transplant immunology, and new frontiers in less invasive surgery. Most fellowship trainees go on to academic positions, advancing treatment, research and education.

16,000

outpatient visits

14,460

total procedures

28

faculty

67

peer-reviewed
publications

135

clinical
research
studies

\$4.7

million
in research grants



Washington
University in St. Louis
Physicians

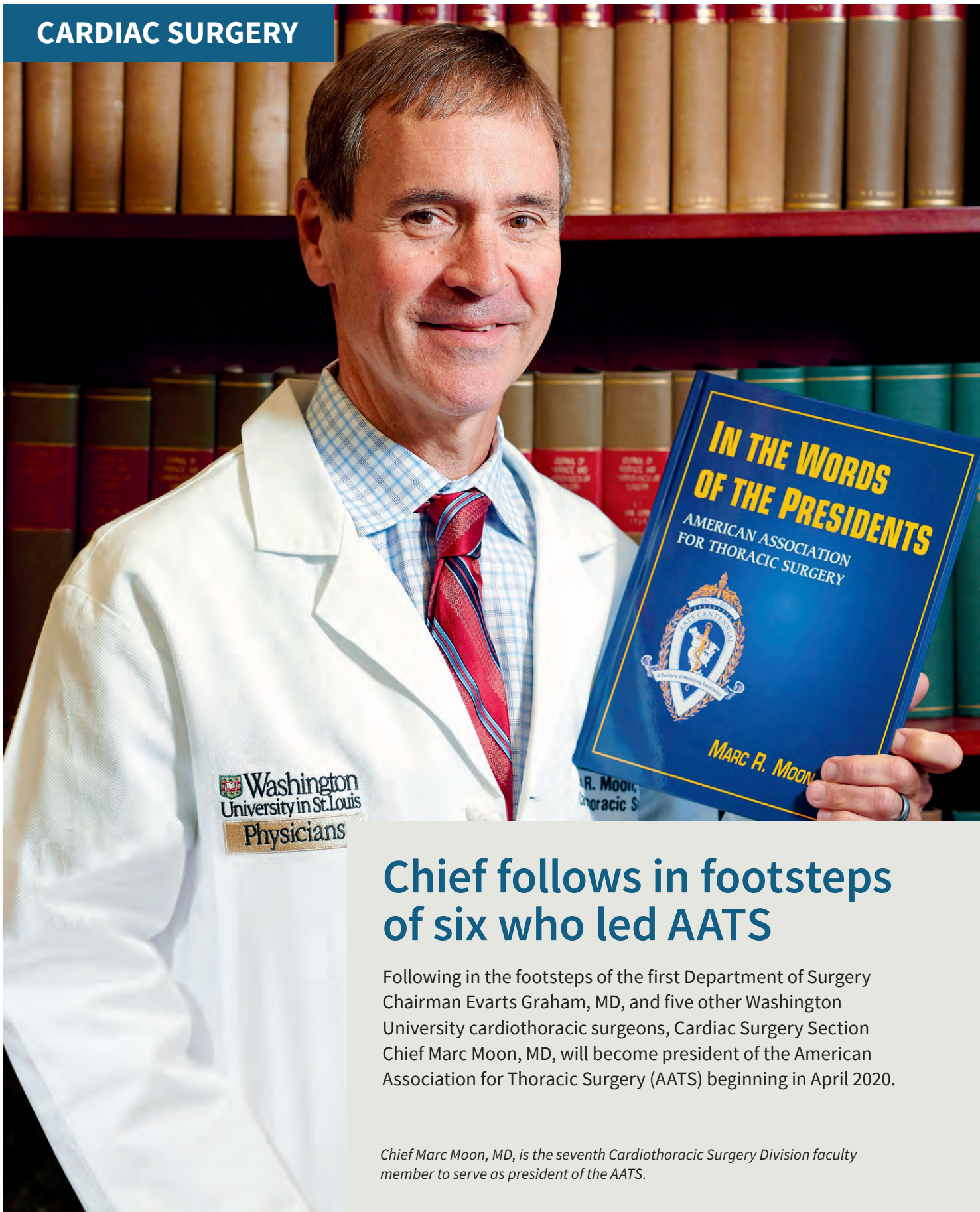
Spencer J. Melby, MD
Cardiothoracic Surgeon

*Cardiac surgeon
Spencer Melby, MD,
stops for a consultation.*

CARDIAC SURGERY

Division of Cardiothoracic Surgery

8



Chief follows in footsteps of six who led AATS

Following in the footsteps of the first Department of Surgery Chairman Evarts Graham, MD, and five other Washington University cardiothoracic surgeons, Cardiac Surgery Section Chief Marc Moon, MD, will become president of the American Association for Thoracic Surgery (AATS) beginning in April 2020.

Chief Marc Moon, MD, is the seventh Cardiothoracic Surgery Division faculty member to serve as president of the AATS.

The AATS is the oldest and most prestigious organization dedicated to treatment of patients with thoracic and cardiovascular disease. Moon, the John M. Shoenberg Professor of Surgery, is no stranger to the organization or its history. He has served as AATS historian, was chair of its Centennial Committee in 2017, and has authored “In the Words of the Presidents,” which included reflections by living past-presidents of the AATS.

At the 2019 AATS Annual Meeting in Toronto, Moon spoke to the AATS Leadership Academy and discussed key obstacles to career advancement for surgeons on the verge of becoming chiefs of service: too many competing interests, lack of mentorship, and taking on cases more complex than the surgeon’s experience level. He also addressed burnout, a key issue in the field of surgery and residency training which he plans to make part of his presidential mission.

“We’ve done a great job in educating the core competencies: technical skill and patient care, medical knowledge and practice-based learning,” says Moon. “But systems-based practice, interpersonal communication and professionalism have lagged behind.”

He also noted that “an important aspect of patient care and effective leadership for all surgeons is self-care, which is not selfish. You can’t serve from an empty vessel.”

The Department of Surgery has given Moon opportunities to learn through formal leadership programs. He attended the Program for Chiefs of Clinical Services at the Harvard School of Public Health. He also attended the Academic Medical Leadership Program at the Washington University Olin Business School, which focused on systems-based practice within BJC HealthCare. G. Alexander Patterson, MD, former division chief and Joseph Bancroft Professor of Surgery, has been a personal mentor. Patterson is also the most recent faculty member to serve as AATS president.



Puja Kachroo, MD, right, and Jacob Miller, MD, discussing strategies for aortic valve replacement.

HIGHLIGHTS

Cardiac surgeon **Puja Kachroo, MD**, will be expanding her minimally invasive coronary artery bypass surgery (CABG) and aortic surgery practice to include surgery to multiple vessels. A limited number of centers perform the single-vessel bypass, but expanding to multiple vessels is more complex and hasn’t become an established procedure. Since joining the faculty in 2016, Kachroo has performed off-pump minimally invasive surgery bypassing the left anterior descending (LAD) artery through a small incision on the left side. She also does minimally invasive aortic valve replacement through a small incision in the right upper chest, a procedure that is not widely offered in the region.

The Washington University Cardiothoracic National Institutes of Health (NIH) T32 Institutional Research Training Grant is one of only three cardiothoracic training grants in the country. Launched to train future research-oriented cardiothoracic surgeons and investigators, the grant has led almost two-thirds of its former trainees into academic medicine, many of them now leaders in their fields. The T32 grant started in 1994 when current research professor **Richard Schuessler, PhD**, collaborated with **James Cox, MD**, and **John Boineau, MD**, to develop surgical treatments for heart arrhythmias.

The Cardiothoracic Surgery Fellowship has a high percentage of graduates who establish themselves in academic surgery. Since 2003, 70 percent of graduates are in academic practice. The fellowship also has grown increasingly diverse. In the last five years, nine of 15 graduates were women or underrepresented minorities. Since 2003, 22 percent of graduates have been women, well above the 5 percent national average.

GENERAL THORACIC SURGERY



Surgeons break down lung allocation problems

Lung transplant surgeon Varun Puri, MD, MSCI, and surgical director Daniel Kreisel, MD, PhD, have found that a new national lung allocation policy has led to increased costs and potential access problems among patients. Their study was published in the *American Journal of Transplantation*.

Varun Puri, MD, MSCI, left, Daniel Kreisel, MD, PhD, right, and bilateral lung transplant recipient, Miranda Hutson, center, standing in front of a mural made and donated by a surgery lung transplant patient, which can be admired in front of the Barnes-Jewish hospital chapel.

Kreisel and Puri are closely involved in the clinical care of the majority of lung transplant patients in the Washington University Lung Transplant Program at Barnes–Jewish Hospital, which has been the site of more than 1,700 lung transplants since 1988. The United Network for Organ Sharing (UNOS) recently adopted a new lung allocation policy in response to a lawsuit by a patient on a waiting list in New York. The old policy gave priority to the sickest patients on the waiting list at regional organ procurement organizations. The new policy expands the geographical boundaries, offering lungs first to patients within a 250-nautical mile radius of the donor hospital and then, if the organ cannot be matched, to patients in a 575-nautical mile radius and then nationally.

It was hoped the new policy would lower chances of patients dying on the waiting list. Instead, the study showed a slight but not statistically significant increase. It also added costs related to traveling longer distances by air to retrieve organs.

Puri, associate surgical director of the lung transplant program and first author of the study, says, “We are concerned the new policy overlooks transplant patients in Missouri, Southern Illinois and the Midwestern region in favor of those farther away, in larger cities.”

In addition to his surgical practice, Puri is a nationally prominent clinical researcher in lung surgery outcomes. He maintains a database of lung transplant patients and has a grant from Mid-America Transplant to study which factors lead to better utilization of donor lungs. His study is the first to look at CT scans, which have a close correlation with utilization.

Puri utilized Washington University’s graduate programs to build research skills focused on clinical studies. He selected the Master of Science in Clinical Investigation Program and also completed the Washington University Academic Medical Leadership Development Program, which strengthened his research and clinical management expertise.



Resident Tara Semenkovich, MD, MPHS, presented her award-winning abstract remotely while at home with her newborn.

HIGHLIGHTS

General surgery resident **Tara Semenkovich, MD, MPHS**, received the President’s Award at the Society of Thoracic Surgeons 55th Annual Meeting this year. The award recognizes a resident or young investigator lead author for submitting the best scientific abstract to the Annual Meeting Program. Semenkovich spent the past two academic years studying clinical research in thoracic surgery. Her research presentation focused on best practices for treating patients with locally advanced esophageal cancer.

Surgeon **G. Alexander Patterson, MD**, and **Tiffany Osborn, MD, MPH**, were co-leaders of the Department of Surgery’s 2018–19 Leadership Learning Series. The series fosters emotional competency and social skills and provides new skills and insights as young faculty develop their research and practice areas and move toward national leadership positions in their fields. The series received positive reviews from the 17 young faculty members who participated.

Surgeons **Benjamin Kozower, MD, MPH**, and **Ruben Nava, MD**, are among those who engaged in postdoctoral research as participants in the division’s National Institutes of Health T32 Institutional Research Training Grant program. Surgical resident **Jason Gauthier, MD**, working in the lung transplant immunology lab of **Daniel Kreisel, MD, PhD**, recently won the American Association for Thoracic Surgery Lillehei Resident Forum Competition.

PEDIATRIC CARDIOTHORACIC SURGERY



Videos point way for continued improvement

Building a video library of congenital heart operations and reviewing them as a regular practice has improved both the quality of surgical education and the safety of complex pediatric heart surgery.

Pediatric Cardiothoracic Surgery Chief Pirooz Eghtesady, MD, PhD, right, and fellow Timothy Lancaster, MD, review videos to sharpen their operative techniques.

Pediatric Cardiothoracic Surgery Chief Pirooz Eghtesady, MD, PhD, and other pediatric cardiothoracic surgeons began recording procedures shortly after Eghtesady joined the faculty at St. Louis Children's Hospital in 2011. The current video library now has more than 100 videos used by surgeons to review their own technique or to study a segment of an operation. Fellows also review videos to enhance learning of complex surgeries such as the Norwood procedure, a three-stage operation to rebuild parts of the heart and redirect blood flow in patients with hypoplastic left heart syndrome.

“We are doing what folks in sports have done for a long time,” says Eghtesady, the Emerson Chair in Pediatric Cardiothoracic Surgery at St. Louis Children's Hospital. “These videos point out ways for us to do better or to train fellows to improve their skills.”

Rachel Lee, a marketing and communications consultant II at BJC HealthCare, edits the videos and maintains the library. She works with surgeons to add video annotations and CT angiograms or 3D renderings when available. When requested, she also produces videos of children for their families showing portions of their child's operation.

Eghtesady also has used videography to study adverse events in the operating room, even seemingly insignificant ones. He and other researchers review video recordings of procedures to capture a detailed report of events. The purpose is to apply the approach used in high-tech industries to look at microsystems and intervene when minor failures can lead to adverse outcomes. Their efforts found correlations between incidents and adverse effects. As a result, the operating room adopted specific quality improvement measures.



Anary Suazo, age 12, was the 500th heart transplant patient at St. Louis Children's Hospital.

HIGHLIGHTS

The Pediatric Cardiothoracic Surgery Section reached a milestone in January 2019 when it logged the **500th heart transplant** at the St. Louis Children's and Washington University Heart Center. Pediatric Cardiothoracic Surgery Section Chief **Pirooz Eghtesady, MD, PhD**, performed the surgery on 12-year-old Anary Suazo from Tulsa, Oklahoma, who was born with only half of her heart fully developed. She had undergone three open heart surgeries in her first two years of life and did well until experiencing medical problems in 2018. The first pediatric heart transplant was done at the center in January 1986, just 19 months after the world's first successful pediatric heart transplant was performed on the East Coast.

The Section of Pediatric Cardiothoracic Surgery has applied to the Accreditation Council for Graduate Medical Education (ACGME) to begin a congenital heart surgery fellowship. There are now only 12 such fellowships in the country. The ACGME is currently considering extending the congenital heart surgery fellowship training from one to two years. **The St. Louis Children's and Washington University Heart Center** is nationally recognized for its care of patients with some of the most complex congenital heart conditions.

Surgeon **Dilip Nath, MD**, who joined the section in April 2019, helps the hospital keep pace with cases in pediatric cardiothoracic surgery, heart and lung transplant, and mechanical assist devices. Nath came from Rush University Medical Center in Chicago, where he was the chief of pediatric cardiac surgery. In addition to postgraduate surgery and thoracic surgery training, he completed a congenital cardiac surgery fellowship at the University of Southern California/Children's Hospital in Los Angeles and a transplant immunology fellowship at Washington University under researcher **Thalachallour Mohanakumar, PhD**.

Division of General Surgery

The division spans seven surgical specialties with surgeon leaders developing and testing new treatments, taking research from bench to bedside, and leading national organizations. The general surgery residency is one of the country's top programs, and each specialty offers a rigorous fellowship.

72,048
outpatient visits

\$7.7 million
in research grants

39,317
total procedures

376
clinical
research
studies

82
faculty



Breast surgeon Julie Margenthaler, MD, left, and clinical fellow Diana Hook, MD, perform surgery.

ACUTE AND CRITICAL CARE SURGERY



Intensivist leads as sepsis expert, faculty mentor

Tiffany Osborn, MD, MPH, professor of surgery and surgical intensivist, says, “Identifying and treating sepsis is a team endeavor and requires expertise from colleagues across different specialties and staffing models.”

Surgical intensivist Tiffany Osborn, MD, MPH, left, and thoracic surgeon Alec Patterson, MD, co-lead the surgery department’s leadership series for young faculty.

Osborn is a national expert in combating sepsis, the massive immune response to bloodstream infection that is common, deadly and expensive to treat. Across the United States, estimates of sepsis cases range from 750,000 to over one million each year, resulting in an estimated 500 deaths daily and costing \$23.7 billion annually.* It is one of the top public health issues identified by the World Health Organization.

Osborn has served as a member of the National Sepsis Task Force of the Center for Disease Control and Prevention — and many other state, national and international sepsis initiatives. She also led a sepsis quality initiative that won a Barnes-Jewish Hospital Team Award for Quality Improvement. Team efforts led to a reduced observed sepsis mortality of 11 percent, reduced mortality index of 35 percent, and an improved Vizient® University Health System Consortium ranking of 65 percent.

As the critical care field developed, Osborn became an early leader in the combined field of emergency medicine/critical care (EM/CC) and was the nation’s first female EM/CC full professor. She has completed leadership training through the medical school’s Academic Medical Leadership Development Program, the university’s Women Faculty Leadership Institute, and the Olin Business School Women’s Leadership Forum.

As part of the department’s leadership and professional development initiative, Osborn and G. Alexander Patterson, MD, the Joseph Bancroft Professor of Surgery, worked with an outside consultant to design and initiate an innovative 2018–2019 leadership series for seventeen junior faculty from the Department of Surgery.

“Alec and I considered what would be of highest value for new surgeons in career development,” says Osborn.

“We brought in dynamic speakers with specific leadership expertise alongside surgical leaders and Barnes-Jewish Hospital collaborators with pragmatic leadership experience. It was an honor to be entrusted with Surgery Chairman Tim Eberlein’s vision for leadership development, and the participants were amazing.”

* Epstein L, Dantes RB. Combatting Sepsis: A Public Health Perspective. *Clinical Infectious Diseases*. 2018. October 15; 67(8):1300–1302.



Medical student Marina Perez-Plazola, left, talks after a “Stop the Bleed” class with Laurie Punch, MD.

HIGHLIGHTS

Trauma surgeon **Laurie Punch, MD**, has been selected to serve as the director of medical student community engagement at Washington University School of Medicine in St. Louis. Punch will help design and implement a longitudinal community engagement medical student curriculum. As an extension of her work, she will help promote and cultivate relationships and partnerships with appropriate community leaders and organizations. Her work will also encompass the completion of a gun violence curriculum within the scope of a previously awarded Loeb Teaching Fellowship. Punch is co-founder of the “Stop the Bleed” initiative, which instructs community members on how to stop someone from bleeding in a life-or-death situation. She also has built strong relationships with community residents, leaders and organizations.

Section Chief **Grant Bochicchio, MD, MPH**, is principal investigator at Washington University for the Linking Investigations in Trauma and Emergency Services (LITES) clinical research initiative. LITES is designed to develop and maintain a responsive and clinically relevant network to deliver injury care and outcomes research through comparative effectiveness studies. Information emerging from the study will be used as a platform for the care of U.S. service personnel serving in active war zones. The U.S. Department of Defense supports the initiative.

Washington University, BJC HealthCare and the Southern Illinois Hospital System have established a new Level II trauma center at Memorial Hospital in Carbondale, Illinois. The institutions hope to improve trauma care in southern Illinois and address the shortage of resources commonly experienced by rural hospitals. **Eduardo Singares, MD**, director of the center, previously was Surgical Intensive Care Unit director at University of Illinois Hospital & Health Sciences System and a surgeon at Advocate Christ Medical Center in Oak Lawn, Illinois.

COLON AND RECTAL SURGERY



Chief rose in rank, leads in safety initiatives

Colon and Rectal Surgery Chief Matthew Mutch, MD, the Solon and Bettie Gershman Professor of Surgery, rose through the ranks at Washington University School of Medicine in St. Louis from medical school to general surgery resident to starting out in the section he now leads. Additionally, he has recently been named the Chief of Surgery at Barnes-Jewish West County Hospital. In the Department of Surgery, this section has been an early adopter and leader in patient safety initiatives.

Chief Matthew Mutch, MD, left, and Barnes-Jewish Hospital Nurse Manager Angelia McBride, RN, discuss patient safety on the North Campus 6900 Unit.

“We started with quality improvement initiatives several years ago after looking at data from the American College of Surgeons National Surgical Quality Improvement Program on surgical site infections (SSIs) at Barnes-Jewish Hospital,” says Mutch. “It was clear we had room for improvement.”

Colorectal surgeons formed a workgroup of all OR and patient care team members. The group rolled out standardized protocols for colon and rectal resections starting in January 2013. In just one year, SSI rates dropped significantly. Next, surgeons incorporated best practices into a comprehensive early recovery after surgery (ERAS) protocol. The protocol begins with patient education in the office and extends through surgery and a patient’s discharge from the hospital. The effort, which involved surgeons and nursing leadership, led to a significantly reduced postoperative length of stay and earned the group a Team Award for Quality Improvement.

Other surgical divisions and sections now have incorporated similar ERAS procedures. Along with the latest focus on readmission rates and opioid use, teams are seeking to improve communications between the patient, hospital and clinical offices.

Mutch says the department’s support of his participation in the Washington University Olin Business School leadership development program for physicians and scientists and the Harvard T.H. Chan School of Public Health leadership program for academic physicians “was incredibly valuable” and helped him to strengthen interpersonal, management, programmatic development and financial skills. Mutch was recently named chief of surgery at Barnes–Jewish West County Hospital. At the national level, he recently was elected to the American Board of Colon and Rectal Surgery and named secretary of the American Society of Colon and Rectal Surgeons. He also was vice chair of the Residency Review Committee for Colon and Rectal Surgery and served on the Research Foundation of the American Society of Colon and Rectal Surgeons.



Rendering of the new Barnes-Jewish West County Hospital building, which opened in 2019.

HIGHLIGHTS

Washington University colorectal surgeons, who have 40 percent of their practice at **Barnes-Jewish West County Hospital**, welcomed the opening of the new 260,000-square-foot replacement hospital this year. The new hospital has operating rooms specifically for surgical specialties and three levels of patient rooms. Surgeons in the section worked closely with hospital nurses and administrators to implement safety practices and streamline the process for patients from initial office visit to 30 days after surgery. **Matthew Mutch, MD**, became the new chief of surgery at Barnes-Jewish West County Hospital.

Surgical resident **William Chapman Jr., MD, MPH**, along with Washington University biomedical engineer **Quing Zhu, PhD**, and pathologist **Deyali Chatterjee, MD**, have identified a way to potentially detect residual rectal tumors not visible on first-line MRI or endoscopy tests. Currently, routine surveillance is done to ensure no residual cancer is growing in rectal cancer surgery patients. While scans are helpful to determine if additional surgeries are needed, they are inconvenient and costly. The team will now determine if their method more accurately delineates whether medical management or surgery is the most appropriate care plan. The design will then be optimized and a clinical trial is planned, contingent on future funding.

Section Chief **Matthew Mutch, MD**, is site principal investigator at Washington University for a multi-institutional, national study that will examine the quality of life for patients with recurrent diverticulitis. Researchers will compare the results of patients who choose surgery to those who select nonsurgical treatment. All patients will be followed over a six-month period, and then long term. Institutions will use their own “toolbox” for nonsurgical treatment such as fiber, dietary restrictions and anticholinergic medications.



SPORE opens path for young researchers

The Washington University Pancreas Specialized Programs of Research Excellence (SPORE) grant, funded by the National Cancer Institute (NCI), is designed to speed up the translation of basic scientific findings into clinical settings.

Researcher Adetunji Toriola, MD, MPH, PhD, left, received a developmental research award from the Pancreas Cancer SPORE, led by HPB-GI Surgery Section Chief William Hawkins, MD. Toriola is now principal investigator of a seven-year NCI merit award.

The SPORE's work is critical because while new treatments for pancreatic cancer have improved outcomes, the five-year survival rate is still only 9 percent.* Survival is much higher if the cancer has not metastasized, but it typically spreads to other organs before symptoms are noticed. So progress has been slow, meaning both current and future research is critical.

“The grant fills a huge need: improving therapies to address a very difficult disease,” says William Hawkins, MD, principal investigator, chief of the Hepatobiliary-Pancreatic and GI Surgery Section and the Neidorff Family and Robert C. Packman Professor.

SPORE researchers from multiple institutions and departments within the medical school are working on four projects: developing personalized cancer vaccines, evaluating methods to overcome tumors' immune suppression, screening drug combinations inhibiting molecular pathways that foster tumor survival, and developing a delivery platform to send small-molecule drugs directly to tumors.

All projects are progressing. Among department researchers, surgical oncologist William Gillanders, MD, along with immunologist Robert Schreiber, PhD, initiated a Phase I clinical trial to test a neoantigen DNA vaccine strategy in pancreatic cancer patients after surgery and adjuvant chemotherapy. Hawkins has developed a drug to serve as the delivery platform for chemotherapeutic drugs and is seeking to manufacture it commercially.

The SPORE also gives awards for career enhancement and developmental research. Two department faculty members have received developmental research awards.

Public health sciences researcher Adetunji Toriola, MD, PhD, MPH, the 2018 awardee, studied use of the diabetic drug metformin and pancreatic cancer survival in African-American veterans. Surgical Oncology Chief Ryan Fields, MD, a 2017 awardee, is developing a mouse model that potentially could help cancer specialists customize treatments tailored to each patient.

* Pancreatic Cancer Action Network (pancan.org)



Chet Hammill, MD, MCR, left, and clinical research coordinator Marvin Petty, BS, MBA, developed an activity tracker for pancreatic surgery patients.

HIGHLIGHTS

HPB surgeon **Chet Hammill, MD, MCR**, is principal investigator of a new clinical trial that will evaluate the use of activity trackers to remotely monitor patients before and after pancreatic resections. Patient activity, sleep and heart rate will be tracked to see if use of the trackers reduces readmission rates and the severity of postoperative complications. A Foundation for Barnes-Jewish Hospital grant and a Big Ideas Award from the Healthcare Innovation Lab supports the study.

HPB Surgery Chief **William Hawkins, MD**, and his lab developed a targeted cancer therapeutic and licensed the technology through the university. Hawkins presented the technology at the invitation-only S2S Symposium in Boston, which featured innovative therapeutics startup ideas from the world's top research institutions. Other section innovators received patents this year. **Dirk Spitzer, PhD**, received patents on a small molecule platform based on the sigma-2 ligand and an extension of his lab's TRAIL-based TR3 platform, a redesigned protein therapeutic. **Chet Hammill MD, MCR**, received provisional patents on two surgical devices in the past year and accelerator funding for one of the devices.

The Washington University Hepatobiliary-Pancreatic Surgery (HPB) Fellowship expands to two years in 2020 in order to accommodate additional training needed in the growing field of robotic and laparoscopic HPB surgery. The program is widely recognized for graduating leaders in the academic HPB surgery field, including **Ismael Domínguez Rosado, MD ('16)**, and **Adnan Alseidi, MD ('10)**. Rosado practices at Nutrición Hospital, Mexico City, which has become a major center in the treatment of bile duct injuries. He trains other surgeons in this undertreated condition in addition to practicing at the nation's national cancer institute. Alseidi is program director of the HPB Surgical Fellowship at Virginia Mason Medical Center in Seattle and holds leadership positions in the national HPB field and surgical education.

MINIMALLY INVASIVE SURGERY



Learning opportunities lead to safety efforts

Bariatric surgeon Shaina Eckhouse, MD, has optimized leadership opportunities to shape patient safety initiatives and develop a new clinical program in the Minimally Invasive Surgery (MIS) Section.

Shaina Eckhouse, MD, left, and patient safety nurse coordinator Dee Dee Epstein, RN, MSN, use an app to check on care pathways.

After joining the faculty in 2016, Eckhouse was tasked with patient safety/quality improvement (PS/QI) projects and championed the use of Vizient data analysis as a baseline for measuring outcomes. One of her first efforts was launching an MIS section-specific morbidity and mortality conference to discuss patient safety events, which ultimately translated into better patient care.

“We focused on patient events and quality improvement discussions, and then did a needs assessment,” says Eckhouse.

The work spawned a study on readmissions, leading to increased perioperative education and establishment of same-day patient clinic appointments. The study earned her the PS/QI Faculty Leadership Award at the department’s 2018 Safety and Clinical Effectiveness Symposium and Poster Session.

In the past year, Eckhouse has led and coordinated efforts to start an adolescent bariatric surgery program for patients ages 15 to 18, the first adolescent program in Missouri to become accredited by the American Society for Metabolic and Bariatric Surgery (ASMBS). She received guidance by participating in the department’s 2018–2019 Leadership Learning Series, where she learned valuable soft skills such as how to approach difficult conversations. Eckhouse is joined in the bariatric surgery program by J. Chris Eagon, MD, and Francesca Dimou, MD, MS.

She now is one of only four faculty members participating in Cincinnati Children’s Hospital’s Intermediate Improvement Science Series (I²S²), a course designed for health care leaders who want to make an immediate impact in their institution. For her project, Eckhouse is trying to reduce incidences of nausea and vomiting in bariatric patients, which is a cause for readmissions. Anti-nausea medications given the day before surgery have helped some post-surgery patients, but Eckhouse is trying to identify more effective ways to reduce nausea that continues after a patient is discharged.

Eckhouse also has worked with Coordinator of Patient Safety and Quality Dee Dee Epstein, RN, BSN, to design an app for bariatric and MIS care pathways for residents, medical students and faculty. The app includes surgeon schedules, clinical pathways, educational resources and information on escalation of care.



Jeffrey Blatnik, MD, left, worked with new faculty member Sara Holden, MD, this past year to develop her minimally invasive surgery practice.

HIGHLIGHTS

MIS surgeon **Jeffrey Blatnik, MD**, helped develop the metrics of the Americas Hernia Society Quality Collaborative (AHSQC), which collects patient-centered data on hernia cases and offers ongoing performance feedback to clinicians. Blatnik worked on the collaborative in the lab of AHSQC medical director Michael Rosen, MD, while a fellow at University Hospitals Case Medical Center in Cleveland, Ohio. Joining Washington University, Blatnik became a champion of AHSQC, encouraging other surgeons to participate. He is currently building a multidisciplinary regional hernia treatment center and teaches robotic hernia repair surgery as part of a unique national course offered through robotic systems manufacturer Intuitive Surgical®.

Section Chief **Michael Brunt, MD**, is leading a study of opioid usage in minimally invasive surgery, surgical oncology and colorectal surgery patients. The study uses a research communications tool called Epharmix® that sends text and email messages to patients requesting feedback on medications used and pain level. The goal is to create an evidence-based approach for prescription of pain medication after surgery.

The establishment of the **Washington University Adolescent Weight Loss Surgery Program** comes as obesity rates in children and adolescents continue to rise. The Centers for Disease Control (CDC) reports that 13.9% of 2- to 5-year-olds, 18.4% of 6- to 11-year-olds, and 20.6% of 12- to 19-year olds in the United States are obese. Patients begin their assessments with the St. Louis Children’s Hospital Healthy Start Clinic. Qualifying patients undergo either sleeve gastrectomy or gastric bypass surgery performed by bariatric surgeons **Baddr Shakhsheer, MD**, (who leads the St. Louis Children’s Hospital component of the bariatric program for children/adolescents), **Shaina Eckhouse, MD**, and **J. Chris Eagon, MD**.



Physician-scientist Ryan Fields named chief

Ryan Fields, MD, a noted cancer surgeon and researcher who completed his general surgery residency at Washington University School of Medicine in St. Louis, is the new chief of the Section of Surgical Oncology, and co-leader of the largest program (Solid Tumor Program) at Siteman Cancer Center.

Ryan Fields, MD, new chief of the surgical oncology section.

Fields also co-leads the Melanoma and Cutaneous Oncology Program and the Solid Tumor Therapeutics Program at the Alvin J. Siteman Cancer Center at Barnes-Jewish Hospital and Washington University School of Medicine. His translational research lab, funded by the National Cancer Institute (NCI), focuses on the biology and genetics of cancer metastases and novel models to study cancer biology and immunobiology.

“Dr. Fields is a truly exceptional physician-scientist,” said Timothy Eberlein, MD, Bixby Professor and chair of the Department of Surgery. “He is an extraordinary leader, and we are thrilled to have his leadership in our department and our cancer center.”

The section, previously known as the Section of Endocrine and Oncologic Surgery, has surgeons widely recognized for their treatment of breast and thyroid cancer, melanoma and sarcoma, and other breast and endocrine diseases. Fields also treats pancreatic, gastrointestinal, liver and bile duct cancers, along with surgeons in the Section of Hepatobiliary-Pancreatic and Gastrointestinal Surgery. The section pioneered research and treatment in multiple endocrine neoplasia (MEN), an aggressive form of thyroid cancer. The late section chief Jeffrey Moley, MD, helped advance the research, which led to the widely-adopted practice of removing the thyroid glands in patients with MEN type 2. Two new assistant professors of surgery, T.K. Pandian, MD, MPH, and Taylor Brown, MD, will join surgeon William Gillanders, MD, in treating endocrine diseases.

Fields earned his medical degree at Duke University and completed a general surgery residency and research fellowship in surgery and immunology at Washington University. He then completed a surgical oncology fellowship at Memorial Sloan Kettering Cancer Center before returning as an assistant professor in 2011. At Washington University, he also has served an associate program director and director of resident research for the department’s General Surgery Residency Program.



T32 research fellow Jessie Davidson, MD, right, with mentor William Gillanders, MD.

HIGHLIGHTS

The Department of Surgery’s T32 Surgical Oncology Research Training Program is now in its 32nd year. It serves as a platform for young investigators to engage in pioneering cancer research and develop the skill sets to make significant contributions of their own. Twenty-one of 33 fellows (64 percent) who completed the program in the last 15 years remain in academic medicine, significantly better than published metrics. Adapting to the greater focus on outcomes in surgery, a translational and clinical outcomes track was added five years ago. Former department chair Samuel Wells Jr., MD, established the program in 1988. Current chair **Timothy Eberlein, MD**, is now a co-director along with Research Vice Chair **William Gillanders, MD**, and Public Health Sciences Chief **Graham Colditz, MD, DrPH**.

Breast surgeon **Julie Margenthaler, MD**, president-elect of the American Society of Breast Surgeons (ASBrS), is lead author of the organization’s new breast cancer screening guidelines, advising women at average risk to begin annual mammograms at age 40. The guidelines differ from advisories from the U.S. Preventive Services Task Force (USPSTF), which moved first mammogram screenings from 40 to 50 years of age. The ASBrS guidelines are based solely on demonstrated breast cancer survival benefits, not the statistical model of the USPSTF efficiency.

Oncologic surgeon **Rebecca Aft, MD, PhD**, the new Jeffrey F. Moley Professorship in Endocrine and Oncologic Surgery, is a nationally prominent, NIH-supported breast cancer researcher who focuses on characterizing disseminated tumor cells in breast cancer, the presumed intermediaries in the development of metastases. She and co-PIs pathologist Mark Watson, MD, PhD, and medical oncologist Leonel Hernandez-Aya, MD, received a Siteman Investment Program grant to discover novel therapeutic strategies to eliminate disseminated tumor cells. This could potentially improve long-term survival in patients with triple negative breast cancer.



Department charts course for young faculty

The leadership paradigm in surgery is historically based on gaining experience from the ground up. But while being a skillful surgeon is essential, the nuances of leadership skills were typically learned through on-the-job training and mentoring.

Majella Doyle, MD, MBA, right, has become a department leader in transplant surgery, through the mentoring of Chief William Chapman, MD.

The Department of Surgery is charting a course for young faculty that will develop and enhance skills needed to become surgical leaders. Called the Faculty Development and Mentoring Program, it includes formal curriculum, departmental mentors, and opportunities to connect with outside resources.

Hepatobiliary-Pancreatic and Gastrointestinal (HPB-GI) and transplant surgeon Majella Doyle, MD, MBA, co-directs the program along with public health sciences researcher Mary Politi, PhD.

Doyle says a pivotal time in her development as a surgeon was during her two-year fellowship at Washington University. Her goal was to become an HPB-GI surgeon, but in working with William Chapman, MD, transplant surgery chief and the Eugene M. Bricker Chair of Surgery, she also became interested in transplant surgery. Chapman, who received a prestigious American Society of Transplant Surgeons (ASTS) mentorship award, was a key mentor in surgery and explained how American medicine worked.

“We make choices because we like the surgery and also because the people we work with make it interesting,” Doyle says.

She went on to earn an MBA degree at Washington University and complete an ASTS leadership course that Chapman administered at Northwestern University’s Kellogg School of Business. She also took part in the Leadership Series OR training session for young faculty. All of this fueled her own desire to become a mentor. Doyle became director of the Transplant/HPB Fellowship Program in 2010. Now involved in the Faculty Development and Mentoring Program, she works with division and section chiefs on their mentoring and spends many hours working one-on-one with faculty themselves. Doyle is also director of liver transplant at Barnes–Jewish Hospital and St. Louis Children’s Hospital.

Chapman says Doyle has become a great advisor. “What do you need to be a successful academic surgeon? To get promoted? To promote your practice? She has been very successful helping others reach those goals.”



HIGHLIGHTS

The Washington University and Barnes-Jewish Transplant Center surgical and medical teams performed their **10,000th adult organ transplant** in January 2019 – a living-donor kidney transplant. The center is the 12th largest in the nation (by volume) and one of the few programs nationwide to have performed 10,000 transplants. The recipient had kidney failure and the donor was identified through the hospital’s internal paired exchange program.

Jason Wellen, MD, MBA, director of kidney transplantation at St. Louis Children’s Hospital, oversees one of the few programs in the country that performs pediatric kidney transplants in children under 1 year of age, a rare practice. Wellen also serves as surgical director of the adult Kidney Transplant and Kidney/Pancreas Transplant at Barnes-Jewish Hospital, where he oversees one of the highest volume programs in the United States, logging more than 250 transplants annually. He completed his fellowship in abdominal transplant surgery at Washington University School of Medicine and received a master of business administration degree from Washington University’s Olin Business School. He is also surgical representative of perioperative services at Barnes-Jewish Hospital.

Washington University School of Medicine is collaborating with Mid-America Transplant and OrganOx Ltd., to try to increase the supply of available donor livers in the United States. Transplant Surgery Chief **William Chapman, MD**, leads the trial, which uses normothermic machine perfusion (NMP) technology to improve the viability of livers and reduce the number of organs that are discarded. A new arm of the trial will use NMP on donor livers deemed not suitable for transplant to see whether they can be reconditioned.

VASCULAR SURGERY



Early support brings research goals closer

Vascular surgeon Mohamed Zayed, MD, PhD, FACS, joined the Vascular Surgery Section in 2014 with a research goal of identifying drug therapies that could slow the progression of peripheral arterial disease (PAD) in patients with diabetes.

Mohamed Zayed, MD, PhD, left, and staff scientist Xiaohua Jin, MD, examine a venous thrombectomy device developed in the Zayed lab.

These patients are more likely to develop PAD than those without diabetes, causing serious complications such as wounds and limb amputations.

Zayed specifically studies the role of lipid mediators in the progression of PAD in the setting of diabetes. To support his work Zayed has received multiple career development grants from the American Surgical Association and the Society for Vascular Surgery, as well as the Wylie Scholar Award from the Vascular Cures Foundation. In 2016 he also received an NIH K08 career development award. The funding has resulted in several published articles, including a cover story in the *Journal of Lipid Research* that reported the unique differences in arterial plaque phospholipids in patients with diabetes. Other significant articles were published in *Nature Communications* and *Atherosclerosis*.

“Through studies using human specimens obtained from our vascular biobank, we have been able to identify key biochemical pathways that influence PAD progression in patients with diabetes,” says Zayed. “Additional studies are underway to help tailor therapy targeting these pathways either pharmacologically or by targeted drug delivery to the peripheral arterial system.”

Zayed also is active in developing therapies and devices for other vascular conditions. He recently received two Washington University entrepreneurial research awards to support pre-FDA in vivo testing of a novel venous thrombectomy device, an arteriovenous graft that can produce insulin for glycemic control in the setting of diabetes.

Zayed was one of 17 young faculty members selected for the 2018–2019 Department of Surgery Leadership Learning Series. “What I learned has provided me with a framework for how to effectively manage my clinical and research teams, and lays the foundation for me for additional leadership opportunities in vascular surgery,” says Zayed.



J. Westley Ohman MD, right, reviews, discusses and demonstrates endovascular techniques with resident Momodou Jammeh, MD.

HIGHLIGHTS

Newly trained vascular surgeons are not entering the workforce in high enough numbers to meet the increased demands placed on the field by the nation’s aging population and sicker elderly Americans. Vascular Surgery Residency and Fellowship Program Director **Jeffrey Jim, MD, MPH**, published a study in 2011 on the increased workload and has since worked on helping to address the shortage. At Washington University, there are residency and fellowship training programs to draw both interested medical school graduates and general surgery residents into the field. Jim is actively involved on a national level in multiple committees to address graduate medical education in vascular surgery. He is also on a Society for Vascular Surgery taskforce seeking to address the physician shortage.

Vascular surgeon **Sean English, MD**, a 2017 Wylie Scholar Award recipient, is successfully developing theranostic approaches for the management of abdominal aortic aneurysms (AAAs). That is, the English lab works to noninvasively visualize inflammation associated with AAA development and rupture utilizing positron emission tomography (PET), while specifically targeting that inflammation therapeutically. The English lab has identified inflammation by microPET imaging predictive of rodent AAA rupture using a chemokine receptor-targeted radiotracer. The lab has also demonstrated an ability to prevent AAA rupture, and AAA development altogether, by inhibiting this particular chemokine. In addition, the English lab is studying gender differences associated with AAA rupture, with significantly higher rupture risk in women compared to men. Using an animal model, his lab has significantly decreased female AAA rupture compared to that of males by theranostically treating animals with another radiotracer.

Section Chief **Luis Sanchez, MD**, is institutional principal investigator of grafts for the treatment of thoracoabdominal aneurysms. There currently is no endovascular treatment available for this condition.

Division of Pediatric Surgery

The division offers comprehensive treatment for a full spectrum of pediatric conditions, burns and trauma. It is a regional center for open fetal surgery. Faculty provide leading research on short-gut syndrome and seek to improve treatment for the disabling condition. A top-tier fellowship draws 100 applicants for a spot.

6,193

outpatient visits

\$880,000

in research grants

3,096

total procedures

45

clinical
research
studies

7

faculty



Jesse Vrecenak, MD, left, and Baddr Shaksheer, MD, upcoming junior faculty, start their morning at St. Louis Children's Hospital.

PEDIATRIC SURGERY



Surgeon tasked with OR quality improvement

Perhaps the biggest obstacle to ensuring high quality in healthcare is overcoming challenges to implementing best practices. It's one thing to identify best practices; it's another to put them into action successfully in multiple departments or hospitals.

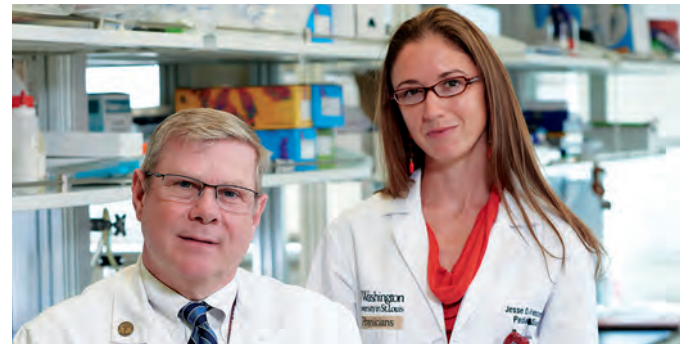
Jackie Saito, MD, MSCI, center, reviews a safety project with resident Cathleen Courtney, MD, right, and surgeon clinical reviewer Jeanne Cullen, RN, BA, RRT.

Washington University pediatric surgeon Jacqueline Saito, MD, MSCI, is at the helm of efforts to push the best quality standards into wider implementation. Saito, an outcomes physician in the Center for Clinical Excellence at BJC HealthCare, uses her knowledge of best practice development to assist each of 13 acute care hospitals within the BJC health system.

Working closely with Professor of Surgery Bruce Hall, MD, PhD, MBA, the chief quality officer and vice president for BJC HealthCare, Saito is bringing together multidisciplinary groups to address certain areas of care. At St. Louis Children's Hospital, she helped physicians, nurses and hospital leaders launch the American College of Surgeons National Surgical Quality Improvement Program Pediatric (ACS NSQIP-Pediatric), a national outcomes-based program geared specifically to evaluate pediatric surgical specialties. By using the program, Saito and Jeanne Cullen, RN, BA, RRT, surgical clinical reviewer of NSQIP-Pediatric data at St. Louis Children's Hospital, have demonstrated improvements for specific surgery patients, such as reduction in use of narcotics and in blood transfusions. As a result, Washington University physicians, nurses at St. Louis Children's Hospital, and other BJC hospitals have cooperated to establish pediatric guidelines applicable to all hospitals in the network.

Saito simultaneously has been involved at the national level of ACS NSQIP-Pediatric, which has grown to include more than 130 hospitals. She is chair of the Children's Surgery Data Committee, which helps determine focus areas for ongoing improvement, and works to ensure that ACS NSQIP-Pediatric data can drive hospital quality improvement, a key component of the ACS Children's Surgery Verification Program.

“There are hospitals that don't necessarily have the full complement of services to provide optimal care for complex surgical procedures in children,” she says. “The ACS Children's Surgery Verification Program sets the standards to match children's surgical needs with hospital resources.”



Chief Brad Warner, MD, left, provides key insights to surgeon-scientist Jesse Vrecenak, MD, on building a basic science lab.

HIGHLIGHTS

Jessie Vrecenak, MD, is investigating whether pre-natal therapy at earlier stages of gestation could prevent damage from lysosomal storage disease. The disease encompasses about 40 separate conditions, many of which are neurologically devastating. Lysosomal storage material is present as early as 20 weeks. Physicians use bone marrow transplant after birth as a palliative therapy, but it is not very effective in treating neurological effects. Vrecenak has a research interest in advancing fetal cell and gene therapy and became interested in lysosomal storage disease after treating a patient while a general surgery fellow at Children's Hospital of Philadelphia.

Baddr Shakhsheer, MD, is helping to establish a multidisciplinary program for children with gastrointestinal issues. The goal is to develop common algorithms for managing and treating gastrointestinal issues like constipation. Shakhsheer joined the faculty after completing a pediatric surgery fellowship at St. Louis Children's Hospital. He also will work alongside surgeons in the hospital's newly established adolescent bariatric surgery program.

General surgery lab residents continue to garner national and hospital research awards related to studies on the adverse effects of small bowel resection. In the lab of Pediatric Surgery Chief **Brad Warner, MD**, three residents recently were recognized. **Kristin Seiler, MD**, completed her two-year research time in the lab after winning multiple awards. **Cathleen Courtney, MD**, and **Emily Onufer, MD**, now in their second year, were co-authors of a *Journal of Pediatric Surgery* article reporting that lymphatic remodeling contributes to intestinal failure-associated liver disease.* Onufer also won the 2018 Rosenkrantz Research Award from the American Academy of Pediatrics for her work on lymphatic remodeling and its effect on liver disease in massive small bowel resection.

*Onufer EJ, Czepielewski R, Seiler KM, Erlich E, Courtney CM, Bustos A, Randolph GJ, Warner BW. Lymphatic network remodeling after small bowel resection. *J Pediatr Surg.* 2019 Jun;54(6):1239-1244.

Division of Plastic and Reconstructive Surgery

The division is a leading international center for nerve injury treatment. Its surgeons and researchers pioneered the development of peripheral nerve transfers and other innovative techniques. A residency and fellowship offer comprehensive training, outstanding mentorship and exposure to expert visiting professors.

In 2020, Justin Sacks, MD, now the director of oncologic reconstruction and vice chair of clinical operations at Johns Hopkins School of Medicine, will become the Schoenberg Professor and chief of plastic and reconstructive surgery. Susan Mackinnon, MD, who has built a strong plastic and reconstructive program, will assume the Minot Packer Fryer Chair of Plastic Surgery and will continue to conduct research and perform surgery.

10,579

outpatient visits

32,703

total procedures

13

faculty

82

peer-reviewed
publications

93

clinical
research
studies

\$690,000

in research grants



Marissa Tenenbaum, MD, right, performs a breast reconstruction surgery.



Training lays foundation for OR improvements

To enhance patient safety and quality of care, St. Louis Children's Hospital created two new leadership positions focused on improving processes and communication in the operating room.

Kamlesh Patel, MD, will lead patient safety/quality improvement initiatives as medical director of the St. Louis Children's Hospital Operating Room.

As medical director of the St. Louis Children's Hospital operating room, plastic and reconstructive surgeon Kamlesh Patel, MD, MSc, is tasked with helping implement and oversee many of the surgical patient safety initiatives trending nationally. He also co-directs OR operations with Kelly Chilson, MD, director of pediatric cardiothoracic anesthesia.

Patel's completion of the Washington University Master of Science in Clinical Investigation (MSCI) Program and Academic Medical Leadership Development Program for Physicians and Scientists laid the foundation for operational leadership and working with a team to improve processes. As an example, Patel and Chilson recently met with nurses to discuss OR communications — the basis of a presentation Patel developed with classmates in the medical leadership program.

“Having nurses and other OR staff be comfortable sharing observations and perspectives is important for patient safety and helps the operating room run more efficiently,” says Patel.

He also is using value stream analysis to identify possible causes of late starts and delays in the operating room. One contributing factor was not having the right instruments at the start of the case. Patel has empowered the nursing staff to contact him before an operation to provide clarification and would like other surgeons to adopt the practice. Says Patel, “The return on a little dialogue is really high.”

Patel is also director of craniofacial surgery at St. Louis Children's Hospital, and with Alison Snyder-Warwick, MD, runs the Cleft Palate-Craniofacial Institute, one of the largest and oldest centers of its kind in the Midwest. The program has treated more than 4,000 patients with cleft lip and palate, and another 2,800 with major craniofacial anomalies. It was one of the first centers to offer endoscopic craniofacial surgery, reducing hospital length of stay and costs. The center has published multiple studies reporting good outcomes with the technique.



Alison Snyder-Warwick, MD, fourth from left, with fellow members of the Plastic Surgery Research Council Executive Committee.

HIGHLIGHTS

Alison Snyder-Warwick, MD, has developed a surgical niche at St. Louis Children's Hospital with her treatment of facial nerve disorders and paralysis. There are more than 100 causes of facial paralysis, with conditions such as Moebius syndrome — a congenital condition accompanied by the inability to smile, frown or raise eyebrows — occurring in only about 1 in 50,000 to 1 in 500,000 newborns. Her basic science research focuses on the terminal Schwann cell, a unique cell present at the nerve-muscle interface that may have an important role in recovery after nerve injury. Snyder-Warwick communicates with international researchers in facial nerve disorders through the Sir Charles Bell Society, in which she serves as secretary. She is also a member of the Plastic Surgery Research Council Executive Committee.

The Maintenance of Certification exam of the American Board of Plastic Surgery (ABPS) has a radically different format from previous years, thanks to the efforts of faculty member Keith Brandt, MD, who became the ABPS executive director in 2015. Previous exams contained four modules (hand, craniofacial, comprehensive and cosmetic) that required study of 400 questions for a 200-question exam. Typically, diplomates crammed right before the exam, thus creating an artificial knowledge spike immediately beforehand. Given every 10 years, the exam also referenced dated developments. The new ABPS continuous certification uses an annual exam of 30 self-assessment questions based on the most current literature. The diplomate is asked not to study to identify their knowledge gaps at baseline. The new certification exam seeks to elevate all diplomates to a higher and more current level of knowledge.

Division of Public Health Sciences

The division is a leader in public health research, education and outreach. Its researchers play major roles in cancer prevention, strategies to reduce community health disparities, and efforts to improve quality and access to health care in Missouri and beyond.

Master of Population Health Sciences

11

graduates (2019)

20

currently enrolled

30

faculty

169

peer-reviewed
publications

99

clinical
research
studies

\$6.8
million

in research grants



Public Health Sciences Division Chief and founder Graham Colditz, MD, DrPH, has bolstered community outreach at Siteman Cancer Center and encouraged collaboration among Washington University researchers.



Two leadership pathways: outreach, mentoring

In 2016, public health sciences researchers Bettina Drake, PhD, MPH, and Mary Politi, PhD, took part in the Academic Medical Leadership Program for Physicians and Scientists, which prepares academic medical faculty to take on expanded leadership roles in their departments. Drake and Politi were selected for the program to build on the leadership skills they already practiced in their academic work. Three years later, Drake and Politi are using this training in key leadership roles.

Bettina Drake, PhD, MPH, left, is associate director for community outreach and engagement for Siteman Cancer Center, and Mary Politi, PhD, is co-director of faculty career development mentoring in the Department of Surgery.

A Leader in Outreach

When Drake was appointed associate director of community outreach and engagement for Siteman Cancer Center in 2018, she found herself engaged at a higher level in work that enriched her research goals. “My work has always been a combination of epidemiology research in cancer disparities and community outreach and education,” Drake said. “This new position allows me to help others create similarly meaningful connections between their research and the communities they serve.”

Drake functions as a vital conduit between science and the community. She manages population-based data to study cancer burdens in the Siteman catchment area, helping investigators understand those burdens and adjust their research to fit community needs.

In 2017, Drake was one of 18 female faculty members chosen for the second cohort of Washington University’s Women Faculty Leadership Institute (WFLI), established to prepare senior women faculty for leadership roles within the university.

Forging New Career Paths

Politi has always been a strong mentor in Public Health Sciences, and she now uses her leadership training to play a bigger role in helping her colleagues forge career paths that suit them best. Alongside Majella Doyle, MD, Politi is co-leader of Faculty Career Development in the Department of Surgery. Politi and Doyle coach colleagues to define their career goals as a first step to success and work with division chiefs on their annual career development meetings with faculty.

“Whether their focus is research and clinical work or improving their teaching, we help faculty build their careers toward a specific goal,” Politi says.

Politi’s own passion for coaching others is no surprise — her research focuses on shared medical decision making to empower patients to make more informed and personalized choices about their health. She takes a similar approach with faculty, helping them find a personally meaningful path forward.



Aimee James, PhD, MPH, left, and Chief Graham Colditz, MD, DrPH, discuss a colon cancer awareness project.

HIGHLIGHTS

An educational video has been created to encourage colorectal cancer screenings in rural southern Illinois. [Aimee James, PhD, MPH](#), and her research team produced the video as part of James’ colorectal cancer research and outreach with Southern Illinois Healthcare (SIH). The video, which features a primary care physician from southern Illinois as well as patient perspectives, addresses many of the common questions and concerns patients often have about colorectal cancer screening. It will be shown in waiting areas and exam rooms of SIH clinics, with the goal of encouraging patients to talk about screening with their physician.

The Division of Public Health Sciences is teaming up with BJC Collaborative (BJCC) on [I-STEP \(Increasing Screening through Engaging Primary Care Providers\)](#), a new initiative to educate patients and physicians about the potentially life-saving benefits of low-dose CT (LDCT) lung cancer screening. I-STEP assists primary care providers in setting up a simple, low-cost, office-based system to increase referrals for LDCT screening. Decatur Memorial Hospital (Decatur, Ill.) was the first to start the initiative in April. Memorial Health System (Springfield, Ill.) joined in July, and four more hospitals will follow in three-month increments over the course of the next year.

[The Masters in Public Health Sciences \(MPHS\) program](#), housed within the surgery department in the Division of Public Health Sciences, is now in its ninth year and has trained nearly 100 clinicians in clinical outcomes and population health research. MPHS alumni come from across the medical school campus — from surgery to psychology, from medical students to residents, fellows and attending physicians. This diversity of perspectives and experiences enriches the training that students receive in collaborative research.

Division of Urologic Surgery

The division is nationally recognized for its research on detection of prostate cancer and determining its level of risk for patients. Its urologists are leaders in reconstructive and robotic urology, and in operative techniques. The residency makes reporting and evaluating safety events a major emphasis.

28,285
outpatient visits

\$2.9 million
in research grants

22,349
total procedures

71
clinical
research
studies

20
faculty



Greg Murphy, MD, right, performs a buccal ureteroplasty with Eric Kim, MD, center, and resident Grant Henning, MD.

UROLOGIC SURGERY



Division at forefront of risk stratification

The Division of Urology is at the forefront of evaluating new methods to better risk-stratify men with elevated levels of prostate-specific antigen (PSA).

Chief Gerald Andriole, MD, left, and Eric Kim, MD, work on methods to better risk-stratify men with elevated PSA levels.

Researchers in the division developed use of the PSA test as a screening tool for prostate cancer in the 1990s. While the test was a major advance in assessing potential cancer, it is imprecise. More accurate testing methods would avoid repeat biopsies that can cause pain and increase the risk of infection but better detect aggressive cancers. Researchers have been evaluating various methods for the past decade. Here, they are studying combinations of methods to better risk-stratify prostate cancer patients.

“We are evaluating the use of multiple tests that are proven individually to help determine if your elevated PSA means you have cancer,” says Division Chief Gerald Andriole, MD, the Robert K. Royce Distinguished Professor of Urologic Surgery. “A primary goal is to determine whether these tests could be used together to better inform a urologist’s decision.”

These tests include combinations of molecular biomarkers and advanced imaging technologies, such as machine learning applied to diffusion-basis spectrum imaging with MRI, and using prostate-specific membrane antigen (PSMA) positron emission tomography (PET) in combination with MRI for early detection.

Andriole, a nationally recognized expert in prostate cancer screening and prevention, and urologist Eric Kim, MD, have published several studies exploring the value of these combined tests. Washington University urologists at Siteman Cancer Center are part of a multi-institutional U.S. study testing the combination of 4Kscore®, a blood test to identify men with high-grade prostate cancer, and prostate MRI. Other trials are evaluating the combination of prostate MRI with the urine test SelectMDx, which measures the expression of two mRNA cancer-related biomarkers, and the ConfirmMDx epigenetic test.

Additional studies by Kim and Andriole demonstrate the variability of radiologists’ interpretation of prostate MRI. “To reduce that variability, the MRI should be done at a high-volume center, which typically has demonstrated expertise in image interpretation,” says Andriole.



Resident Laura Lee, MD, left, and Erica Traxel, MD, right, check on a patient in clinic.

HIGHLIGHTS

Urology Residency Program Director **Erica Traxel, MD**, has overhauled the training program and made key changes since becoming director in 2014. She has helped the residency to grow from three residents per year to four. After participating in both the department’s Innovations in Surgical Education and Patient Safety Workgroups, where she has drawn upon the experience of other surgical educators, she has expanded the focus of the urology residency to include patient safety/quality effectiveness. Residents are encouraged to report safety events into an online event reporting system, and cases are then selected for discussion at a monthly morbidity and mortality conference. Traxel also emphasizes resident well-being and has recruited faculty advisors with a strong interest in mentoring residents both socially and professionally.

Reconstructive urologist **Gregory Murphy, MD**, is one of a limited number of urologists performing buccal ureteroplasty in the United States and the only one in the central Midwest. Use of buccal mucosa has emerged as a promising method of ureteral reconstruction due to injury, radiation or other causes. More common methods include use of bowel tissue, which risks infection, and moving the kidney lower in the abdomen.

Urologist **Gino Vricella, MD**, and plastic and reconstructive surgeon **Alison Snyder-Warwick, MD**, performed the first vaginoplasty in the St. Louis region on an 18-year-old transgender woman in June 2019. Vaginoplasty is a gender confirmation surgery pursued by transgender women and AMAB (assigned male at birth) nonbinary people. Vricella and Snyder-Warwick work closely in collaboration with the Washington University Transgender Center, established in 2017. Vricella received training in gender confirmation surgery at University Hospitals Case Medical Center, Cleveland.

Education

The General Surgery Residency is a leading academic surgical training program shaped by national leaders in developing surgical curriculum, early specialization programs and simulated training. With its additional focus on psychological safety, the residency has great breadth in addressing key initiatives in surgical training.

102

residents

28

clinical
fellows

17

research
fellows

4th in U.S.

surgery residency ranking



Resident Jennifer Yu, MD, MPHS, left, trains medical student Aaron Zuckerman.



Vice chair participant in transformative era

Vice Chair for Education Mary Klingensmith, MD, has advocated for and helped lead a transformative era in general surgery residency training since completing her residency at Brigham and Women’s Hospital in 1999. After a century of training under the “see one, do one, teach one” model, residencies adopted a series of revolutionary changes: a mandated 80-hour weekly duty hour limit, emergence of simulated training, innovative curriculum development and a much greater focus on resident wellness.

Mary Klingensmith, MD, has played a major role in shaping today’s general surgery residency.

Klingensmith, the Mary Culver Distinguished Professor of Surgery, served as Washington University General Surgery Residency program director from 2001–2012 and was an early advocate of simulated training. Her interest began after she was directed to close her first incision independently on a patient who had undergone a mastectomy. Although the closure went well, she felt “horribly unprepared.” “I vowed that I would find a better way to teach those who came after me,” she says.

Under Klingensmith, the residency was one of the earliest to teach manual skills on synthetic body parts, perform procedures on animal and cadaver models, and utilize computer simulation. In the late 2000s, Klingensmith worked with other educators to develop the Howard and Joyce Wood Clinical Simulation Center, where residents simulated emergency treatment on a high-fidelity mannequin mimicking cardiopulmonary conditions and resuscitation of traumatically injured patients. Michael Awad, MD, PhD, program director from 2012–2014, introduced whole-procedure simulation.

The residency program is a leader in curriculum development, with early adoption of more structured learning approaches based on resident/faculty goal setting and formal assessment, along with flexibility to pursue more focused training in their chosen specialty. Nationally, Klingensmith led development of the Surgical Council on Resident Education (SCORE) national surgery residency training curriculum, used almost universally. Awad leads the Society of American Gastrointestinal and Endoscopic Surgeons (SAGES) committee, developing a national curriculum for minimally invasive surgery fellowships.

Current residency program Director Paul Wise, MD, and residents have dialogues and ongoing initiatives in resident wellness, including presentations at this year’s final conference by female and male chief residents on the complexities of parenthood and training.

“We are clearly a national leader in surgical education when you look at the breadth of things we are doing,” says Klingensmith.



Piroška Kopar, MD, right, discusses ethics with fellow surgeon Jessica Kramer, MD, before a resident conference.

HIGHLIGHTS

Piroška Kopar, MD, a fellowship-trained surgical educator, has taken the lead in ethics training for surgical residents. Kopar is working to make ethics part of morbidity and mortality conference discussions and standardized testing, and envisions having ethics questions on residents’ mock oral boards. She also wants to teach residents how to ask questions of patients’ family members to establish trust and other important ways to get to the heart of what patients want. The idea is to make ethics a central component of residents’ work instead of letting it reside on the periphery, where it may become marginalized. She continues the work of **Ira Kodner, MD**, emeritus professor of surgery, and **Mary Klingensmith, MD**, vice chair of education, who worked together on surgical ethics in the residency program and nationally in a resident ethics training program.

Vice Chair for Education **Mary Klingensmith, MD**, is the founding director of the Washington University Academy of Educators. The academy aims to build a community of educators and train faculty in new, innovative and inspiring ways to teach in an academic medical setting. The academy reaches all learners, from medical students to faculty, and includes a strong mentorship component. It offers two certificate programs: one for faculty who wish to learn more about curriculum design, assessment methods and leadership, and another pathway for instructors who are one to three years out of medical training. Klingensmith has served in key leadership roles at Washington University School of Medicine and nationally in surgery and surgical education. She has served twice as an acting or interim associate dean, and she credits the support of Department of Surgery Chair **Timothy Eberlein, MD**, for the opportunities to contribute to education outside the department.

EDUCATION

50

Education

Michael Awad, MD, PhD, will lead national curriculum development for minimally invasive surgery fellowships.



Department's Michael Awad plays role in national medical school curriculum

Michael Awad, MD, PhD, director of the Washington University Institute for Surgical Education, was named chair of the Society of American Gastrointestinal and Endoscopic Surgeons (SAGES) Resident and Fellow Training Committee, which oversees resident and fellowship training for the specialty. He will lead the committee in developing a national curriculum for minimally invasive surgery (MIS) fellowships and a new foregut fellowship.

Since all MIS surgeries are video-based, a potential feature of the curriculum is video-based assessment with third-party reviewers and a formal grading rubric. SAGES works with the Fellowship Council to set the criteria for accreditation of MIS fellowships.

Awad, who also serves as director of the Washington University Integrated Surgical Disciplines Clerkship for medical students, is also contributing to the medical school's curriculum renewal process. One of the goals is to give students greater exposure to various surgical disciplines so they can select specialties that offer training programs immediately after graduation — such as vascular and cardiothoracic surgery — and thus bypass the traditional general surgery residency.

Photo right: Office of Surgical Education
Top row: Christa Donald, Lindsey Ballard, Leanna Bell, Janel Johnson, Kellie Hunter. **Bottom row:** Karree Hughes, Emily Stroisch, Heather Fone, Stephanie Martino. **Not pictured:** Rae Lynne Meyer



Amy Cyr, MD, lecturing to a group of medical students as part of the Surgical Disciplines Clerkship.

HIGHLIGHTS

RESTRUCTURING

An administrative restructuring of the Department of Surgery's residency and fellowship programs has led to more centralized operations. Traditionally, a residency coordinator divided time in providing support for these programs while also handling clinical support responsibilities for surgeons. The structure of this educational support position has now shifted to a dedicated focus on one or two residencies or fellowships.

Education support specialists are in charge of all aspects of accreditation for the training programs, along with their respective residency and fellowship program directors. This includes the requirements for Accreditation Council for Graduate Medical Education (ACGME)-accredited programs, which include the residencies and about half of the fellowships.

These administrative professionals have a common workspace located in office suites on one floor of an ancillary building at Barnes-Jewish Hospital, rather than being housed in each individual section as they were previously. Although the residencies have specialty-specific goals, they also have common program requirements, and this co-location optimizes communication by helping coordinators share best practices and expertise across programs.



The newly expanded Office of Surgical Education is changing the paradigm of education by centralizing all departmental staff in order to increase specialization and resources.

Residencies & Fellowships

General Surgery Residency

Program Director: Paul Wise, MD

The Washington University General Surgery Residency Program, which began in 1919 and remains one of the top surgical residency programs in the United States, was among the earliest surgical training programs in the country to introduce a skills and simulation lab that allowed trainees to learn a variety of technical skills at their own pace. The five-year program is consistently noted as innovative, with Program Director Paul Wise, MD, and other educational leaders nationally recognized for contributions enhancing postgraduate surgical education.

Five associate program directors offer expertise in specific areas of surgical education and engage residents on a daily basis. Department faculty — many of whom have been or are current leaders of national organizations — also enthusiastically embrace their roles as educators and mentors. For clinical training, the volume of cases is extensive: residents train in five hospitals, including Barnes-Jewish Hospital, St. Louis Children’s Hospital, the John Cochran VA Hospital, and two community hospitals. Along with a wide variety of clinical opportunities, the department has a strong research component to the residency program.

The department is engaged in robust basic science research, but residents also can engage in clinical, translational or outcomes research or earn advanced degrees in public health, clinical investigation, business administration or education.

International Surgical Rotation

For general surgery residents desiring an international experience, the department offers a two-month rotation at Mzuzu Central Hospital in Malawi, Africa, a resource-limited hospital that serves the needs of nearly 2.5 million citizens. Residents care for a wide range of adult and pediatric surgical patients, performing more than 100 cases during their rotation. The opportunity has been offered for the past four years.

Plastic Surgery Residency

Program Director: Marissa Tenenbaum, MD

The Plastic Surgery Residency is a six-year integrated program, including five years of plastic surgery training in breast, craniofacial, pediatrics, head/neck trauma, hand, microsurgery, transgender, cosmetic and peripheral nerve surgery. Residents also complete rotations in all the general surgery experiences required by the American Board of Plastic Surgery as well as subspecialty rotations in oculoplastics, surgical dermatology, orthopedic hand surgery and anesthesia. Training takes place at Barnes-Jewish Hospital, Barnes-Jewish West County Hospital, Christian Hospital, The Shriner’s Hospital for Children – St. Louis and St. Louis Children’s Hospital. The program has a distinguished history: James Barrett Brown, MD, and Vilray Blair, MD, two of the founders of the plastic surgery specialty, initially developed the training program at Washington University School of Medicine in the early 20th century.

Urology Residency

Program Director: Erica Traxel, MD

The Urology Residency is a five-year program. In the first year, interns spend six months on the urology service and six months on general surgery rotations. In the remaining four years, residents rotate at Barnes-Jewish Hospital, St. Louis Children's Hospital, the VA St. Louis Health Care System, Barnes-Jewish West County Hospital and Christian Northeast Hospital. Residents are exposed to a volume and diversity of surgical cases that are among the highest in the country for urologic residency programs. The program, which has prepared graduates for careers in urologic surgery since 1910, places major emphasis on technological innovation, scientific inquiry, and patient safety/quality improvement.

Vascular Surgery Residency

Program Director: Jeffrey Jim, MD, MPHS

The Integrated Vascular Surgery Residency is a five-year training program for medical school graduates who decide to focus exclusively on vascular or endovascular surgery and the management of patients with vascular diseases. The program has full accreditation and graduated its first resident in 2017. For trainees who have completed their general surgery residency and then decide to specialize in vascular surgery, the section also offers a two-year accredited fellowship in vascular surgery.

Fellowships

Advanced Gastrointestinal/Minimally Invasive Surgery Fellowship

Program director: L. Michael Brunt, MD

Breast Disease Fellowship

Program director: Julie Margenthaler, MD

Cardiothoracic Surgery Fellowship

Program director: Spencer Melby, MD

Colorectal Surgery Fellowship

Program director: Steven Hunt, MD

Hand, Nerve and Microsurgery Fellowship

Interim director: Ida Fox, MD

Hepatobiliary-Pancreatic Surgery Fellowship

Program director: William Hawkins, MD

Minimally Invasive Urology Fellowship

Clinical fellowship director:

R. Sherburne Figenshau, MD

Research fellowship director:

Ramakrishna Venkatesh, MD

Pediatric Surgery Fellowship

Program director: Patrick Dillon, MD

Pediatric Urology Fellowship

Program director: Douglas Coplen, MD

Surgical Critical Care Fellowship

Program director: Douglas Schuerer, MD

Transplant Surgery Fellowship

Program director: Majella Doyle, MD, MBA

Vascular Surgery Fellowship

Program director: Jeffrey Jim, MD, MPHS

Research

The department is a leader in NIH funding among its peers nationwide and has robust basic science, clinical and public health sciences research. Key cancer biology, immunologic, pancreas and breast cancer research are among areas of excellence for department investigators.

819

clinical research
studies

\$2.8 million

clinical trial contract
income funding

145

active grants

\$23.6 million

awarded peer-reviewed
grants



Researcher Wenjun Li, MD, in the Thoracic Immunology Lab.



Vaccines, tumor atlas among notable research

Basic and translational research is a long-standing strength of the Department of Surgery. Even today, in a challenging funding environment, surgeon-scientists and researchers continue to receive notable awards and report significant findings. Recent studies point toward potential major advances in treating cancer and lung transplant rejection.

Daniel Kreisel, MD, PhD, seeks to better understand the immune response during lung transplant in order to improve survival.

Vice Chair for Research William Gillanders, MD, and his lab are conducting trials that combine a neoantigen vaccine — personalized to each patient — with current treatment options to try to prevent recurrence in patients with triple negative breast cancer, an aggressive form of the disease.

Gillanders and Surgical Oncology Chief Ryan Fields, MD, are surgical co-principal investigators on a \$9 million National Institutes of Health (NIH) grant to study the life histories of breast and pancreatic cancers. The grant is part of the NIH Human Tumor Atlas Network (HTAN), a large-scale effort to understand the life span of tumors, including how normal cells become cancerous; how various cancers evolve in response to treatment; and what changes occur when tumors become resistant to therapy or spread. Gillanders will focus on how cancer immunotherapy works, while Fields will study metastasis and resistance in pancreatic cancer.

A study led by Daniel Kreisel, MD, PhD, the G. Alexander Patterson, MD, Mid-America Transplant Endowed Distinguished Chair in Lung Transplantation, used an animal model to identify a process that may prevent antibody-mediated rejection — a particularly deadly form of rejection — in lung transplant patients.

The study, published in *The Journal of Clinical Investigation*,* could lead to development of therapies to treat this form of rejection.

Researchers in the lab of Nupam Mahajan, PhD, have identified a type of the protein kinase, called ACK1, as a new therapeutic target for drug-resistant prostate and breast cancers. They developed a small molecule inhibitor, (R)-9b. Early animal models have found the inhibitor to be effective. Those study results will now be submitted to the U.S. Food and Drug Administration (FDA) for approval to test the inhibitor in human clinical trials.

Daniel Kreisel has a pending patent entitled “Compositions and methods for detecting CCR2 receptors” (application number 15/611,577).

* Li W, Gauthier JM, Higashikubo R, Hsiao H-M, Tanaka S, Vuong L, Ritter JH, Tong AV, Wong B, Hachem RR, Puri V, Bharat A, Krupnick AS, Hsieh CS, Baldwin III WM, Kelly FL, Palmer SM, Gelman AE, Kreisel D. Bronchus-associated lymphoid tissue-resident Foxp3 T lymphocytes prevent antibody-mediated lung rejection. *The Journal of Clinical Investigations*. Published Feb. 1, 2019.

HOPE

IN ACTION

HIGHLIGHTS

CLINICAL RESEARCH

Surgeons have continued an upward trend to expand clinical research efforts in the Department of Surgery. Over the past year, faculty have initiated trials to: evaluate telemonitoring to aid “prehabilitation” before pancreatectomy surgery, track pain medication use through an electronic follow-up system, and determine whether electrical stimulation during ulnar nerve decompression optimizes hand function after surgery. Other trials measure the use of neoantigen vaccines in breast and pancreas cancers and the tracking the effectiveness of a Facebook app created to help kidney donor champions tell the recipient’s story. Researchers are also tracking outcomes of HIV-positive liver and kidney transplant recipients who have accepted HIV-positive donor organs under the HOPE (HIV-Positive Organ Policy Equity) Act.

Administration of clinical research was centralized eight years ago to provide better efficiency and consistent support for faculty members, and to ensure adherence to increasingly complex regulatory guidelines. Research administrators have added a quality assurance program to internally audit studies unmonitored by an external source.

BASIC AND TRANSLATIONAL RESEARCH

The Department of Surgery remains in the top tier of NIH funding among its peers nationwide and continues to publish numerous basic science and translational findings during the course of each academic year. Among its focused areas of study are breast cancer, cancer biology and immunology, lung transplantation immunology, nerve repair, cardiovascular physiology and pancreas cancer.

PUBLIC HEALTH RESEARCH

Establishment of the Division of Public Health Sciences within the department has fostered collaboration among public health and surgical investigators. The division’s research offers true breadth from epidemiology to comparative effectiveness, health disparities, public health, health literacy and communication, and other areas. (See more on Public Health Sciences, page 38).

New Research Awards

FUNDING ABOVE \$1,000,000

Washington University School of Medicine

Timothy Eberlein, MD / Chair, Department of Surgery
Centene Corporation / Personalized Medicine Initiative
 01/01/2019 – 12/31/2028

The university received an award of \$10M per year for 10 years to fund personalized medicine research in Cancer (Breast and Pancreatic), Alzheimer's Disease, Obesity and Diabetes. For the first year of funding (04/01/19-03/31/20), principal investigators in the Department of Surgery lead seven of the cancer projects. The first year of funding for those projects is \$1,712,500.

Division of General Surgery Section of Surgical Oncology

Ryan C. Fields, MD
William E. Gillanders, MD
Samuel Achilefu, PhD (Radiology)
Li Ding, PhD (contact principal investigator, Medicine)
NIH U2C / Washington University Human Tumor Atlas Research Center
 09/30/18-08/31/23: \$8,835,023

William E. Gillanders, MD
NIH R01 / Targeting Neoantigens in Triple Negative Breast Cancer
 8/1/19-7/31/24: \$3,180,480

Division of Urologic Surgery

Nupam Mahajan, PhD
NIH R01 / Molecular Mechanisms of Castration Resistant Prostate Cancer Recurrence & Therapeutic Strategies
 12/14/18 – 11/30/23: \$2,839,308

NIH R01 / Targeting a Novel Epigenetic Signaling Nexus ACK1-pY88H4-AR/AR-V7 in Drug Resistant Metastatic Prostate Cancer
 03/01/19 – 02/28/22: \$1,003,388

H. Henry Lai, MD
NIH U01 / Symptoms of Lower Urinary Tract Dysfunction Research Network (LURN) Second Phase Study
 09/09/19-8/31/24: \$2,418,474

NIH U01 / Multidisciplinary Approach to the Study of Chronic Pelvic Pain (MAPP) Research Network Extension Study
 08/14/19-06/30/22: \$1,168,038

Division of Public Health Sciences

Graham A. Colditz, MD, DrPH
Ross C. Brownson, PhD
NIH P50 / Washington University Implementation Science Center for Cancer Control
 09/18/19-08/31/24: \$7,639,459

Erika Waters, PhD, MPH
NIH R01 / Child Asthma Exacerbation: Role of Caregiver Risk Beliefs
 09/01/18 – 06/30/22: \$2,585,035

Ying Liu, MD, PhD
NIH R01 / Residential Mobility, Treatment Quality and Survival in Low-Income Women with Breast Cancer
 09/30/18 – 08/31/21: \$1,075,887

FUNDING \$100,000 – \$999,999

Division of Cardiothoracic Surgery

Daniel Kreisel, MD, PhD

Cystic Fibrosis Foundation / Investigating the Immunofibrosis Continuum in CLAD
01/01/19 – 12/31/20: \$729,001

Michael Pasque, MD

NIH R56 / Left Ventricular Distribution Patterns of the Regionally Varying Ischemic Myocardial Contractile Substrates Associated with Ischemic Mitral Regurgitation
09/01/18 – 08/31/19: \$389,375

Andrew Gelman, PhD

Cystic Fibrosis Foundation / Elucidating Mechanisms of ECP to Better Understand CLAD Pathogenesis
01/01/19 – 12/31/20: \$324,000

Division of General Surgery

Section of Transplant Surgery

Jae-Sung Kim, PhD

NIH R01 / Autophagy in Liver Injury
01/10/19 – 08/31/19: \$338,865

Division of Pediatric Surgery

Jesse Vrecenak, MD

Children's Discovery Institute / In Utero Transplantation for Mucopolysaccharidosis VII
02/01/19 – 01/31/22: \$448,895

Division of Urologic Surgery

Nupam Mahajan, PhD

Prostate Cancer Foundation / Targeting Androgen Receptor and ACK1 Signaling with Novel Epigenetic Therapeutics in Castration-Resistant Prostate Cancer
08/31/18 – 08/31/19: \$450,487

Division of Public Health Sciences

Yikyung Park, ScD

NIH R01 / Temporal Dietary Patterns: Development and Evaluation against Adiposity and Metabolic Biomarkers
12/01/18 – 11/30/21: \$969,107

Bettina Drake, PhD, MPH

Department of Defense / Treatment Options and Survival of Metastatic Prostate Cancer Patients
05/15/19 – 05/14/22: \$590,104

Department of Defense / Prostate Cancer Biorepository Network (PCBN) – Washington University Network Site
09/30/18 – 09/29/21: \$533,750

Ying Liu, MD, PhD

American Cancer Society / Disparities in Adherence to Adjuvant Therapy for DCIS and Outcomes
07/01/18 – 06/30/21: \$570,000

Yin Cao, ScD, MPH

NIH K07 / Optimizing the Impact of Aspirin for Chemoprevention
09/30/18 – 09/29/21: \$567,342

National Comprehensive Cancer Network / Disparities in Young-Onset Colorectal Cancer Survival According to Patient, Treatment, and Tumor Molecular Characteristics
07/01/18 – 06/30/20: \$150,000

Saira Khan, PhD

Department of Defense / Chemotherapeutic Potential of Metformin and Statins to Prevent Progression to Lethal Prostate Cancer
08/01/18 – 07/31/20: \$254,299

RESEARCH

Focused areas of research excellence

Abdominal aortic aneurysms

Breast cancer

Cancer biology

Cancer epidemiology and public health

Cancer immunology

Cardiovascular physiology

Diabetes and peripheral arterial disease

Education

Lung transplantation immunology

Peripheral nerve injury

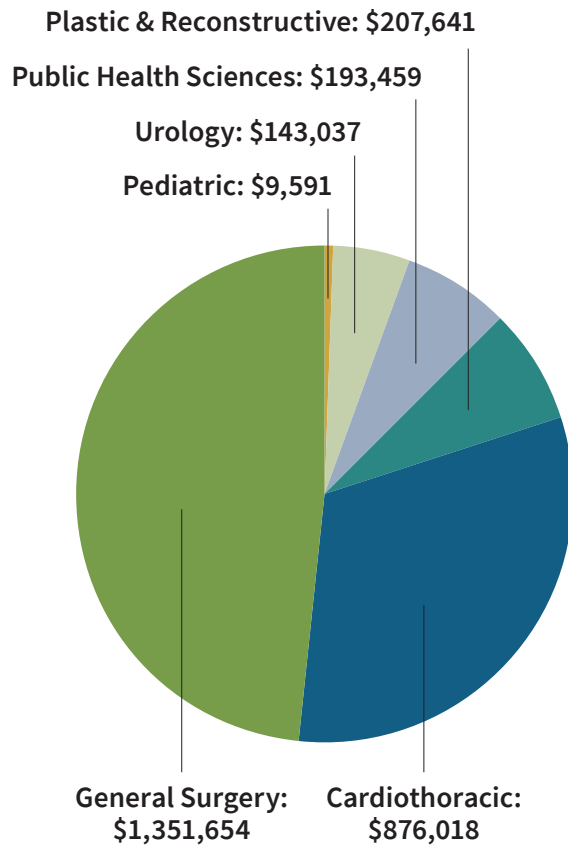
Pancreas cancer

Prostate cancer

Sepsis and critical injury

Clinical Trial Contract Income

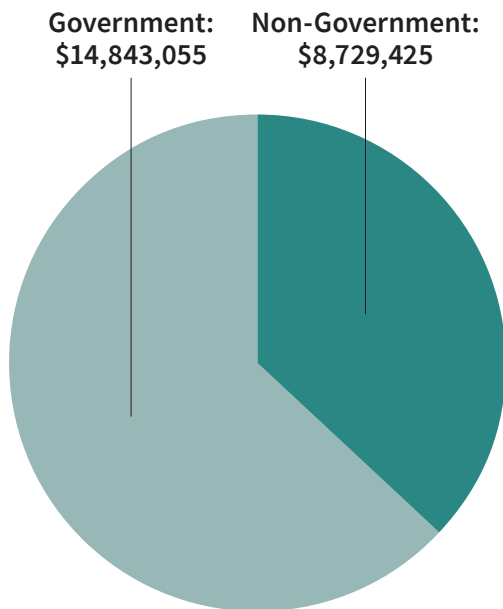
TOTAL: \$2,781,400



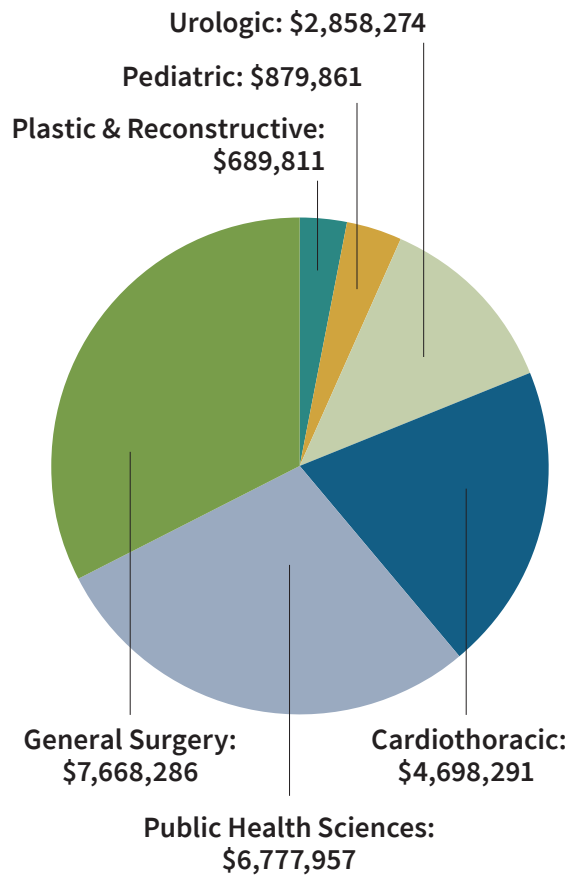
Research Grants

TOTAL: \$23,572,480

BY SOURCE



BY DIVISION



Merit Awards awarded by the U.S. Department of Veterans Affairs

Many Department of Surgery faculty members hold joint appointments at the John Cochran Division of the VA St. Louis Health Care System. Three faculty members in the Division of Cardiothoracic Surgery currently have VA Merit Awards which are held at the VA.

Daniel Kreisel, MD, PhD

Leukocyte trafficking in thoracic grafts

Spencer J. Melby, MD

Contribution of Inflammation and Oxidative Stress in Pericardial Fluid to Postoperative Atrial Fibrillation After Cardiac Surgery

Varun Puri, MD, MSCI

Defining Quality of Care in Lung Cancer

Clinical

The department is a leader in cultivating patient care and achieving successful outcomes. Our highly active faculty treat patients across 16 practice sites and combines surgical innovation, research, and training within all clinical operations. Using both proven practices and state-of-the-art technology, the department consistently ensures patient care is the priority while setting the global standard for multidisciplinary care.

203,728

outpatient visits

131

surgeons

729,431

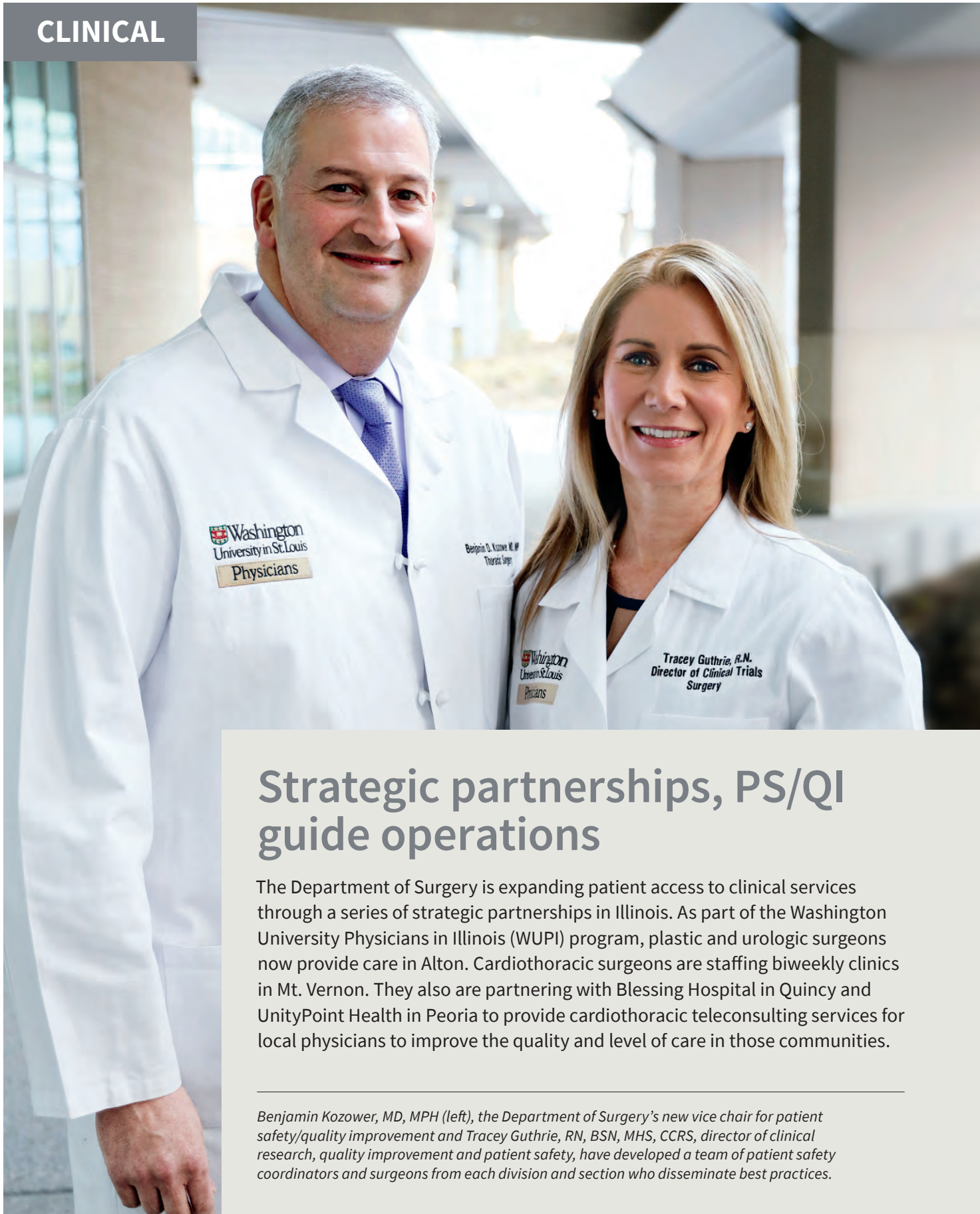
total procedures

67

nurse practitioners and
physician assistants



Clinical suites are housed in the Center for Advanced Medicine on the Washington University Medical Campus.



Strategic partnerships, PS/QI guide operations

The Department of Surgery is expanding patient access to clinical services through a series of strategic partnerships in Illinois. As part of the Washington University Physicians in Illinois (WUPI) program, plastic and urologic surgeons now provide care in Alton. Cardiothoracic surgeons are staffing biweekly clinics in Mt. Vernon. They also are partnering with Blessing Hospital in Quincy and UnityPoint Health in Peoria to provide cardiothoracic teleconsulting services for local physicians to improve the quality and level of care in those communities.

Benjamin Kozower, MD, MPH (left), the Department of Surgery's new vice chair for patient safety/quality improvement and Tracey Guthrie, RN, BSN, MHS, CCRS, director of clinical research, quality improvement and patient safety, have developed a team of patient safety coordinators and surgeons from each division and section who disseminate best practices.

On the Washington University Medical Campus, a Department of Surgery patient safety/quality improvement (PS/QI) group was developed in 2012 and led by urologic surgery Division Chief Gerald Andriole, MD, the Robert K. Royce Distinguished Professor of Urologic Surgery. This program has led to initiatives within the department that address key issues such as surgical site infections and readmissions. Andriole, who became vice chair for patient safety and quality improvement, led efforts to significantly reduce surgical site infections and develop enhanced recovery after surgery (ERAS) protocols that have improved care and shortened length of stay. Annual PS/QI efforts by faculty, residents and fellows in each division also have successfully resulted in decreasing weekend readmissions, promoting psychological safety in the operating room and increasing proper opioid disposal. Andriole transitioned his vice chair role on October 1, 2019 to Benjamin Kozower, MD, MPH.

Kozower and Tracey Guthrie, RN, BSN, MHS, CCRC, director of clinical research, quality improvement and patient safety, now lead a team of patient safety coordinators and surgeons from each division and section who disseminate best practices.

The initiatives have a foundation in a program started more than a decade ago to create a more supportive work environment and increase faculty input, which subsequently led to working groups focused on PS/QI as well as surgical quality and education.

To develop the next generation of quality improvement leaders, four faculty members are participating in the Intermediate Improvement Science Series (I²S²) at Cincinnati Children’s Hospital. The nine-month course has participants working on real projects within their respective institutions that can result in immediate improvements in health care. Kozower; Shaina Eckhouse, MD; Erica Traxel, MD; and Tiffany Osborn, MD, MPH, are taking the course along with the department’s patient safety coordinator, Dee Dee Epstein, RN, BSN.

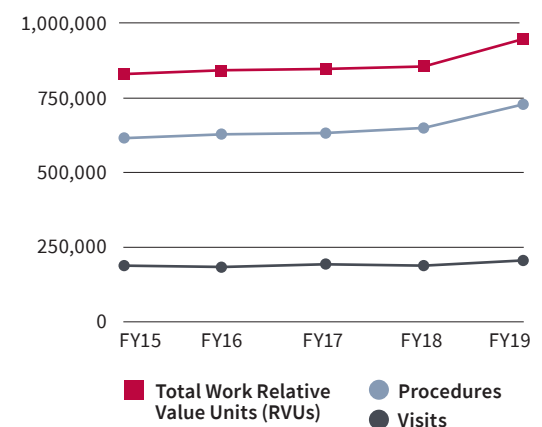


The Annual Patient Safety and Clinical Effectiveness Meeting generates lively discussions on patient safety/quality improvement projects.

HIGHLIGHTS

Fourth-year plastic surgery resident **Teri Moak, MD**, won an award at the Fifth Annual Patient Safety and Clinical Effectiveness Meeting in May 2019. The central topic of the meeting was creating a culture of safety. Moak won for her project on the Professionalism Time Out (PTO), which she learned in the operating room of Plastic and Reconstructive Surgery Chief **Susan Mackinnon, MD**, the Shoenberg Professor of Plastic and Reconstructive Surgery. PTO is conducted before every operation as each team member introduces herself or himself by first name and role, and all acknowledge the Professional Agreement, which reinforces the patient’s care as the primary focus of the team. Moak recruited six attending surgeons to incorporate PTO into their ORs and surveyed OR team members three months before and three months after its implementation. The short-term effect was a better-established common goal, flattening of the communication hierarchy, and improved patient-centered behavior.

Visits, Procedures and Work RVUs (2015–2019)



WASHINGTON UNIVERSITY MEDICAL CAMPUS



Washington University Medical Campus

Washington University Medical Campus includes Barnes-Jewish Hospital, St. Louis Children's Hospital, and the Alvin J. Siteman Cancer Center at Barnes-Jewish Hospital and Washington University School of Medicine. Covering 178 acres over 18 city blocks, the Medical Campus is located at the intersection of St. Louis' Central West End and Forest Park Southeast (also known as the Grove) neighborhoods.

The School of Medicine's clinical practice group of more than 1,593 full-time clinical physicians and surgeons, called Washington University Physicians, is one of the largest academic clinical practices in the nation. In addition to providing care on the Medical Campus, these physicians see patients at locations across the St. Louis region.

Surgeons are among almost 1,700 attending physicians at Barnes-Jewish Hospital, the largest hospital in Missouri. Barnes-Jewish is consistently ranked among the nation's best hospitals by *U.S. News & World Report*. The hospital holds advanced certification from the Joint Commission for lung volume reduction surgery and is an American College of Surgeons-verified Level I trauma center. The hospital has 1,386 licensed beds.

St. Louis Children's Hospital is the largest children's hospital in the region, with 390 licensed beds and an American College of Surgeons-verified Level I pediatric trauma center. It offers comprehensive services in every pediatric medical and surgical specialty and is recognized as one of America's top children's hospitals by *U.S. News & World Report*, which in 2019 ranked the hospital in all 10 specialties surveyed.

Siteman Cancer Center is the only National Cancer Institute-designated Comprehensive Cancer Center in Missouri and is ranked as one of the nation's top cancer facilities by *U.S. News & World Report*. Siteman provides care for nearly 75,000 people a year, including 12,000 newly diagnosed patients.

The hospitals on the Medical Campus are affiliated with BJC HealthCare, one of the largest nonprofit health care organizations in the country.

Multidisciplinary research in nearly every area of biomedicine is a hallmark of the medical school. The school has 13 Fellows of the National Academy of Sciences. It received \$449.3 million in National Institutes of Health funding in 2018. There has been a 28 percent increase in NIH funding over the last three years.

MEET ME IN ST. LOUIS



Minimally Invasive Surgery Section Chief Michael Brunt, MD, who has been a team physician with the St. Louis Blues for 25 years, celebrated the club's National Hockey League championship by hoisting the Stanley Cup after game 7 at TD Garden in Boston. "An incredible experience!" he exclaimed. Brunt treats a high volume of professional, collegiate and amateur athletes for sports hernias along with Blues players.

Newcomers soon discover St. Louis is an ideal place to train or pursue an academic career. A leading center for international research and destination for patients seeking exceptional care, the city also attracts engineers, entrepreneurs, artists and other innovative professionals working at the forefront of diverse fields.

St. Louis is livable, with a patchwork of eclectic neighborhoods not far from the Medical Campus. The city earns accolades from techies, foodies, music lovers and outdoor enthusiasts.

The neighborhoods closest to the Medical Campus offer trendy restaurants and bars, historic charm and a quick commute. The campus is located in



Gateway Arch National Park

the city's Central West End, an area brimming with dining and entertainment options that cater to the area's young professionals. The Medical Campus also borders Forest Park, where miles of multi-use trails wind around some of the city's most popular destinations: the art museum, zoo, science center and other free attractions.

Outside the Central West End, many neighborhoods boast a burgeoning culinary scene, microbreweries and hip nightlife. St. Louis has a significantly lower cost of housing than the nation's major coastal cities, and children of all ages enjoy a substantial number of free attractions year round.

NOTED ACCOMPLISHMENTS



Graham Colditz, MD, DrPH, the Niess-Gain professor of surgery and director of the Division of Public Health Sciences, was named to the National Institutes

of Health (NIH) Council of Councils. The group and its 27 members, selected from NIH institutes and advisory councils, advises the NIH director on policies and activities of the Division of Program Coordination, Planning, and Strategic Initiatives. The Council of Councils makes recommendations on emerging scientific opportunities, rising public health challenges and knowledge gaps that deserve special emphasis or would otherwise benefit from strategic planning and coordination. Colditz was one of 10 newly appointed members of the Council of Councils.



Trauma surgeon **Laurie Punch, MD**, received the 2019 Gerry and Bob Virgil Ethic of Service Award from the Washington University Gephardt

Institute for Civic and Community Engagement. The award is given annually to a select group of Washington University community members for their service and contributions to the St. Louis region. Punch is director of Power4STL, a nonprofit that aims to reduce harm from violence through community health outreach. She also has taught some 2,000 people bleeding-control skills and trauma first aid through the program “Stop the Bleed.” Punch was one of seven recipients.

PROFESSORSHIPS



Rebecca Aft, MD, PhD, was chosen to become the inaugural holder of the newly established Jeffrey F. Moley Professorship in Endocrine and Oncologic Surgery.



William Gillanders, MD, vice chair of research, was named the Mary Culver Professor of Surgery.



Andrew Gelman, PhD, a nationally recognized lung immunobiology researcher, was installed as the Jacqueline G. and William E. Maritz Endowed Chair in Immunology and Oncology.



Nupan Mahajan, PhD, was named the Endowed Professor of Urologic Surgery Research.

TRANSITIONS



Richard Schuessler, PhD, professor of surgery and biomedical engineering, will retire at the end of 2019 after a 35-year research career in the Division of Cardiothoracic

Surgery. Schuessler joined the faculty in 1984 to work alongside cardiac surgeons James Cox, MD, and John Boineau, MD, on the surgical treatment of heart arrhythmias. Their research led to the development of the Cox-Maze procedure, the first cure for atrial fibrillation (AF). The procedure, first performed by Cox in 1987, was highly successful and yet challenging to perform. It required the surgeon to make small, strategically placed incisions in the atria, creating scar tissue to guide the heart's electrical signals. Schuessler worked with Cardiothoracic Surgery Division Chief Ralph Damiano Jr., MD, to replace these surgical incisions with radiofrequency tissue ablation, creating a simplified Cox-Maze IV procedure that is both successful and widely replicated.

Schuessler considers a study by Farah Musharbash, MD, a Washington University medical student at the time, as best representing the contribution of the Cox-Maze procedures.* Patients with AF who had the Maze procedure at the same time as other heart procedures had a 62 percent survival rate at 10 years, the same as patients without AF undergoing these procedures. Patients with AF who did not undergo the Maze procedure along with these heart procedures had only a 42 percent survival. Schuessler also directed the cardiothoracic surgery laboratory and administered the Washington University Cardiothoracic National Institutes of Health (NIH) T32 Institutional Research Training Grant since its inception in 1994.

* *The Journal of Thoracic and Cardiovascular Surgery*. 2018 January; 155(1): 159–170.



Hepatobiliary-Pancreatic and GI (HPB-GI) surgeon **Steven Strasberg, MD**, received the 2019 Barnes-Jewish Hospital Medical Staff Lifetime

Achievement “Master Physician” Award. The annual award honors physicians for superlative service and commitment for 25 years or more at Barnes-Jewish Hospital and its predecessor institutions. Strasberg joined the faculty in 1992 and founded the Section of HPB-GI Surgery, which he led until 2007. He is perhaps best known for developing the Critical View of Safety method of identifying anatomic structures during cholecystectomy. The Society of American Gastrointestinal and Endoscopic Surgeons used this method as part of a national initiative to reduce injuries during that operation. Strasberg's many prestigious honors include the American Surgical Association Medallion for the Advancement of Surgical Care and the Distinguished Service Award of the Americas Hepato-Pancreato-Biliary Association.



Congratulations to **Greg Barnett** on his retirement after 16 years as the Department of Surgery's media and marketing administrator. We're

sorry to see Greg leave, and we're grateful for his years of commitment. He initiated and crafted the department's strongest content pieces, including the Annual Report, quarterly newsletters and dozens of websites. He was a great content creator, an innovative storyteller and a valued colleague.

LEADERSHIP

NATIONAL AND INTERNATIONAL ORGANIZATIONS

Gerald Andriole, MD

Robert K. Royce Distinguished Professor of Urologic Surgery

Board of Directors, Society of Urologic Oncology and its Clinical Trials Consortium

Michael Awad, MD, PhD

Associate Professor of Surgery

Treasurer, Association for Surgical Education

Member of Board, Association for Surgical Education

Chair, Resident and Fellow Training Committee, Society of American Gastrointestinal and Endoscopic Surgeons (SAGES)

Co-Chair, Education Council, SAGES

Jeffrey Blatnik, MD

Assistant Professor of Surgery

Member, Board of Governors, Americas Hernia Society

Keith Brandt, MD

William G. Hamm Professor of Surgery

Executive Director, American Board of Plastic Surgery

L. Michael Brunt, MD

Chief, Section of Minimally Invasive Surgery

Advisor, Society of American Gastrointestinal and Endoscopic Surgeons Board of Governors

Member, Board of Directors, SAGES Education and Research Foundation

Second Vice President and Member, Board Fellowship Council

President-Elect, Central Surgical Association

William Chapman, MD

Eugene M. Bricker Chair of Surgery

Treasurer, American Society of Transplant Surgeons

Graham Colditz, MD, DrPH

Neiss-Gain Professor of Surgery; Chief, Division of Public Health Sciences

Advisor, National Cancer Moonshot Initiative

Advisor, National Cancer Institute Board of Scientific Advisors

Member, National Institutes of Health (NIH) Council of Councils

Timothy Eberlein, MD

William K. Bixby Professor of Surgery; Chair, Department of Surgery

Board of Regents, ACS; Immediate Past Chair, National Comprehensive Cancer Network

Editor-in-Chief, *Journal of the American College of Surgeons*

Mary Klingensmith, MD

Mary Culver Distinguished Professor of Surgery; Vice Chair for Education

Member, American College of Surgeons (ACS) Academy of Master Surgeon Educators

President, SCORE, Inc.

Member, American Board of Medical Specialties Committee on Certification

Erin Linnenbringer, PhD

Assistant Professor of Surgery

Jane Engelberg Memorial Fellowship Advisory Group, National Society of Genetic Counselors

Julie Margenthaler, MD

Professor of Surgery

President-Elect, American Society of Breast Surgeons

Executive Committee, American Society of Breast Surgeons (2017–2020)

Marc Moon, MD

John M. Shoenberg Professor of Surgery

President-Elect, American Association for Thoracic Surgery

G. Alexander Patterson, MD

Joseph Bancroft Professor of Surgery

Editor-in-Chief, *The Annals of Thoracic Surgery*

Mary Politi, PhD

Professor of Surgery

Vice President, Society for Medical Decision Making

Alison Snyder-Warwick, MD

Assistant Professor of Surgery

Secretary, Sir Charles Bell Society

Secretary-Treasurer, Plastic Surgery Research Council

Siobhan Sutcliffe, PhD, ScM, MHS

Professor of Surgery

Project Leader, Multidisciplinary Approach to the Study of Chronic Pelvic Pain Research Network

Marissa Tenenbaum, MD

Associate Professor of Surgery

Clinical Editor, *Aesthetic Surgery Journal*

Board of Directors, American Society for Aesthetic Plastic Surgery

Thomas Tung, MD

Professor of Surgery

Board of Directors, American Society of Plastic Surgeons

Brad Warner, MD

Jessie L. Ternberg, MD, PhD Distinguished Professor of Pediatric Surgery

Chair, Nominating Committee, American Pediatric Surgical Association

NATIONAL AND INTERNATIONAL AWARDS

Doug Brown, PhD

Surgical Education Coordinator

Association for Surgical Education Clerkship Coordinator Recognition Award

Emily Onufer, MD

General Surgery Resident

Rosenkrantz Research Award, American Academy of Pediatrics

Tara Semenkovich, MD, MPHS

General Surgery Resident

Society of Thoracic Surgeons' President's Award

Jennifer Yu, MD

General Surgery Resident

2018 Association for Surgical Education Outstanding Resident Teacher Award

WASHINGTON UNIVERSITY SCHOOL OF MEDICINE

Michael Awad, MD, PhD

Associate Professor of Surgery

2018 and 2019 Distinguished Service Teaching Awardee – Clinical Teacher of the Year

Sam Bhayani, MD

*Holekamp Family Endowed Chair
in Urology*

Chief Medical Officer, Faculty
Practice Plan

Jeffrey Blatnik, MD

Assistant Professor of Surgery

Jeffrey Moley Resident Mentoring
Award and Graham Teaching Award

Douglas Brown, PhD

Surgical Education Coordinator

2019 Distinguished Service Teaching
Awardee – Clerkship Administrator
of the Year

Michael Brunt, MD

Minimally Invasive Surgery Chief

2018 Distinguished Service Teaching
Awardee – Clinical Teacher of the Year

Bettina Drake, PhD, MPH

Professor of Surgery

Associate Director, Community Outreach
and Engagement, Siteman Cancer Center

Julie Grossman, MD

General Surgery Resident

2019 Distinguished Service Teaching
Awardee – Resident of the Year

Laurie Punch, MD

Associate Professor of Surgery

2018 Distinguished Service Teaching
Awardee – Clinical Teacher of the Year
Recipient, 2019 Gerry and Bob Virgil
Ethic of Service Award

2018-2020 Carol B. and Jerome T. Loeb
Teaching Fellow

2019 Distinguished Service Teaching
Awardee – Humanism in Medicine
Award Nominee

Raphael Sun, MD

General Surgery Resident

2018 Distinguished Service Teaching
Awardee – Resident of the Year

Paul Wise, MD

Professor of Surgery

Director, Washington University
Inherited Colorectal Cancer and
Polyposis Registry

Inaugural member of Washington
University School of Medicine
Academy of Educators

2019 Distinguished Service Teaching
Awardee – Clinical Teacher of the Year

Jennifer Yu, MD

*General Surgery Administrative
Chief Resident*

2019 Keith D. Amos, MD Memorial Award

2019 Distinguished Service Teaching
Awardee – Resident of the Year

**BARNES-JEWISH HOSPITAL,
ST. LOUIS CHILDREN'S HOSPITAL,
SITEMAN CANCER CENTER,
BJC HEALTHCARE AND JOHN
COCHRAN VA MEDICAL CENTER**

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Professor of Surgery

Vice Chair for Clinical Affairs,
Department of Surgery

Director, Abdominal Organ
Transplantation Program, St. Louis
Children's Hospital

Bettina Drake, PhD, MPH

Professor of Surgery

Associate Director of Community
Outreach and Engagement and Chair,
Behavioral Science Subcommittee,
Siteman Cancer Center

Shaina R. Eckhouse, MD

Associate Professor of Surgery

Surgical Representative, Perioperative
Services, Barnes-Jewish Hospital

Ryan Fields, MD

Chief, Section of Surgical Oncology

Co-Leader, Solid Tumor Therapeutics
Program, Siteman Cancer Center

Bruce Hall, MD, PhD, MBA

Professor of Surgery

Chief Quality Officer, BJC HealthCare

Virginia Herrmann, MD

Professor of Surgery

Head, High-Risk Breast Cancer Clinic,
Siteman Cancer Center

Steven Hunt, MD

Associate Professor of Surgery

Surgical Co-Director, Center for
Advanced Medicine, South County

Aimee James, PhD, MPH

Professor of Surgery

Co-leader, Prevention and Control
Research Program, Siteman Cancer
Center

John Kirby, MD

Associate Professor of Surgery

Medical Director, Rehabilitation
Services, Barnes-Jewish Hospital

Benjamin D. Kozower, MD, MPH

Professor of Surgery

Vice Chair for Patient Safety
and Quality Improvement

Daniel Kreisel, MD, PhD

*G. Alexander Patterson, MD/Mid-America
Transplant Endowed Distinguished Chair
in Lung Transplantation*

Surgical Director, Lung Transplant
Program, and Scientific Director,
Washington University and Barnes-
Jewish Transplant Center

Matthew Mutch, MD

*Solon and Bettie Gershman Professor
of Surgery, Chief, Section of Colon and
Rectal Surgery*

Chief of Surgery, Barnes-Jewish
West County Hospital

Kamlesh Patel, MD, MSc

Associate Professor of Surgery

Medical Director, St. Louis Children's
Hospital Operating Room

Medical Director of Craniofacial Surgery,
St. Louis Children's Hospital

Co-director 3D Printing Center, St. Louis
Children's Hospital

Jacqueline Saito, MD, MSCI

Associate Professor of Surgery

Outcomes Physician, Center for
Clinical Excellence, BJC HealthCare

Douglas Schuerer, MD

Professor of Surgery

Director of Trauma, Barnes-Jewish
Hospital

Alison Snyder-Warwick, MD

Assistant Professor of Surgery

Co-Director, Cleft Palate and
Craniofacial Institute

Jason Wellen, MD, MBA

Associate Professor of Surgery

Director, Abdominal Organ
Transplantation Program,
St. Louis Children's Hospital

Surgical Representative, Perioperative
Services, Barnes-Jewish Hospital

FACULTY

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William K. Bixby Professor of Surgery; Director, Alvin J. Siteman Cancer Center



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Majella Doyle, MD, MBA

Professor of Surgery; Co-Director, Faculty Career Development/Mentoring; Vice Chair for Clinical Affairs



William E. Gillanders, MD

Professor of Surgery; Vice Chair for Research



Mary E. Klingensmith, MD

Mary Culver Distinguished Professor of Surgery; Vice Chair for Education; Director, Washington University School of Medicine Academy of Health Professions Educators; Associate Director, Simulation Center



Benjamin D. Kozower, MD, MPH

Professor of Surgery; Vice Chair for Patient Safety and Quality Improvement



Tiffany M. Osborn, MD, MPH

Professor of Surgery; Co-Director, Leadership and Professional Development



G. Alexander Patterson, MD

Joseph C. Bancroft Professor of Cardiothoracic Surgery; Co-Director, Leadership and Professional Development



Mary C. Politi, PhD

Professor of Surgery; Co-Director, Faculty Career Development Mentoring

Peter S. Goedegeburre, PhD

Associate Professor of Surgery

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Michael Awad, MD

Associate Professor of Surgery; Director, Integrated Surgical Disciplines



Sam B. Bhayani, MD

Holekamp Family Endowed Chair in Urology; Chief Medical Officer, Washington University Physicians



Shaina R. Eckhouse, MD

Associate Professor of Surgery; Surgical Representative, Perioperative Services, Barnes-Jewish Hospital



Bruce Lee Hall, MD, PhD, MBA

Chief Quality Officer, BJC HealthCare



Aimee S. James, PhD, MPH

Professor of Surgery; Practice of Medicine Section Leader, Public Health



Matthew G. Mutch, MD

Solon and Bettie Gershman Chair for Colon and Rectal Surgery; Chief of Surgery, Barnes-Jewish West County Hospital



Laurie J. Punch, MD

Associate Professor of Surgery; Director of Medical Student Community Engagement



Jacqueline M. Saito, MD, MSCI

Associate Professor of Surgery; Outcomes Physician, Center for Clinical Excellence, BJC HealthCare



Jason R. Wellen, MD

Associate Professor of Surgery; Surgical Representative, Perioperative Services, Barnes-Jewish Hospital

DIVISION OF CARDIOTHORACIC SURGERY



Ralph J. Damiano Jr., MD, Chief

Evarts Ambrose Graham Professor of Surgery

Section of Cardiac Surgery



Marc R. Moon, MD, Chief

John M. Shoenberg Chair in Cardiovascular Disease

Ralph J. Damiano Jr., MD

Chief, Division of Cardiothoracic Surgery; Evarts Ambrose Graham Professor of Surgery

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Associate Professor of Surgery; Chief of Cardiothoracic Surgery, St. Louis VA Medical Center-John Cochran Division

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Spencer J. Melby, MD

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Akinobu Itoh, MD, PhD

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Kunal Kotkar, MD

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Section of General Thoracic Surgery



Bryan F. Meyers, MD, MPH, Chief

Patrick and Joy Williamson Chair in Cardiothoracic Surgery

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Jacqueline G. and William E. Maritz Professor of Surgery, Pathology and Immunology

Daniel Kreisel, MD, PhD

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G. Alexander Patterson, MD
Joseph C. Bancroft Professor of Cardiothoracic Surgery

Benjamin D. Kozower, MD, MPH

Professor of Surgery

Wenjun Li, MD

Varun Puri, MD, MSCI

Associate Professors of Surgery

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Assistant Professor of Surgery

Xingan Wang, MD, PhD

Instructor in Surgery

Section of Pediatric Cardiothoracic Surgery



Pirooz Eghtesady, MD, PhD, Chief

Emerson Chair in Pediatric Cardiothoracic Surgery, St. Louis Children's Hospital; Professor of Surgery

Aaron Abarbanell, MD, MS

Dilip Nath, MD*

Assistant Professors of Surgery

Anoop Brar, PhD

Instructor in Surgery

Critical Care Service in the Cardiothoracic Intensive Care Unit

Thomas J. Graetz, MD, Chief

Associate Professor of Anesthesiology

Michael S. Avidan, MBBCh, FCA

Dr. Seymour and Rose T. Brown Professor of Anesthesiology and Surgery

Charl J. de Wet, MBChB

Associate Professor of Anesthesiology and Surgery

Diego Casali, MD

Daniel A. Emmert, MD, PhD

Mohammad Helwani, MD, MSPH

Clare H. Ridley, MD

Adnan Sadiq, MD

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Adjunct Associate Professor of Surgery

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Zachary Englert, DO
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Chelsea Hutchinson, MD
Deacon Life, MD
Major Charlie Srivilasa, MD*
Adjunct Assistant Professors of Surgery

Cody Barnes, MD*
Jessica Kramer, MD*
Instructors in Surgery

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Matthew G. Mutch, MD, Chief
Solon and Bettie Gershman Chair for Colon and Rectal Surgery

Ira J. Kodner, MD
Professor Emeritus of Surgery

Paul E. Wise, MD
Professor of Surgery

Sean C. Glasgow, MD
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Associate Professors of Surgery

Matthew L. Silveira, MD
Radhika K. Smith, MD
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Section of Hepatobiliary-Pancreatic and Gastrointestinal Surgery



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Neidorff Family and Robert C. Packman Professor of Surgery

Steven M. Strasberg, MD
Pruett Family Professor of Surgery; Carl Moyer Departmental Teaching Coordinator

Chet Hammill, MD
Associate Professor of Surgery

Dominic Sanford, MD
Dirk M. Spitzer, PhD
Assistant Professors of Surgery

Section of Minimally Invasive Surgery



L. Michael Brunt, MD, Chief
Professor of Surgery

Mary E. Klingensmith, MD
Mary Culver Distinguished Professor of Surgery

Michael M. Awad, MD, PhD
J. Christopher Eagon, MD
Associate Professors of Surgery

Jeffrey A. Blatnik, MD
Francesca M. Dimou, MD*
Shaina R. Eckhouse, MD
Sara E. Holden, MD
Assistant Professors of Surgery

Section of Surgical Oncology



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Professor of Surgery

Rebecca L. Aft, MD, PhD
Jeffrey F. Moley Professor in Endocrine and Oncologic Surgery

Timothy J. Eberlein, MD
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Mary Culver Professor of Surgery

Virginia M. Herrmann, MD
Julie A. Margenthaler, MD
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Taylor C. Brown, MD*
Amy Cyr, MD
Katherine Glover-Collins, MD, PhD
(T.K.) Pandian, MD, MPH*
Assistant Professors of Surgery

Section of Transplant Surgery

William C. Chapman, MD, Chief
Eugene M. Bricker Professor of Surgery

Majella Doyle, MD, MBA
Jae-Sung Kim, PhD*
Surendra Shenoy, MD, PhD
Professors of Surgery

Jason R. Wellen, MD, MBA
Associate Professor of Surgery

Adeel S. Khan, MD, MPH
Yiing Lin, MD, PhD
Brian W. Wong, PhD
Assistant Professors of Surgery

Vijay Subramanian, MD
Instructor in Surgery

Section of Vascular Surgery



Luis A. Sanchez, MD, Chief
Gregorio A. Sicard Distinguished Professor of Vascular Surgery

Gregorio A. Sicard, MD
Emeritus Professor of Surgery

Patrick J. Geraghty, MD
Brian G. Rubin, MD
Robert W. Thompson, MD
Professors of Surgery

Jeffrey Jim, MD, MPhS
Associate Professor of Surgery

Sean J. English, MD
Vipul Khetarpaul, MD*
John W. Ohman, MD
Nanette R. Reed, MD
Mohamed A. Zayed, MD, PhD
Assistant Professors of Surgery

Gerald R. Fortuna Jr., MD
Adjunct Associate Professor of Surgery

DIVISION OF PEDIATRIC SURGERY



Brad W. Warner, MD, Chief
Jessie L. Ternberg, MD, PhD Distinguished Professor of Pediatric Surgery; Surgeon-in-Chief, St. Louis Children's Hospital

Patrick A. Dillon, MD
Jun Guo, PhD
Martin S. Keller, MD
Jacqueline M. Saito, MD, MSCI
Associate Professors of Surgery

Baddr Shakhshsheer, MD*
Jesse D. Vrecenak, MD
Assistant Professors of Surgery

DIVISION OF PLASTIC AND RECONSTRUCTIVE SURGERY



Susan E. Mackinnon, MD, Chief
Sydney M. Jr. and Robert H. Shoenberg Chair in Plastic and Reconstructive Surgery

Keith E. Brandt, MD
William G. Hamm Professor of Plastic Surgery

Terence M. Myckatyn, MD
Thomas H. Tung, MD
Professors of Surgery

Amy M. Moore, MD
Head of Hand and Trauma Surgery

Ida K. Fox, MD
Kamlesh B. Patel, MD
Marissa M. Tenenbaum, MD
Associate Professors of Surgery

Donald W. Buck II, MD
John M. Felder, MD
Mitchell A. Pet, MD
Alison K. Snyder-Warwick, MD
Matthew D. Wood, PhD
Assistant Professors of Surgery

DIVISION OF PUBLIC HEALTH SCIENCES



Graham A. Colditz, MD, DrPH, Chief
Neiss-Gain Professor of Surgery; Associate Director, Prevention and Control, Alvin J. Siteman Cancer Center; Deputy Director, Institute for Public Health

Ross C. Brownson, PhD
Professor, George Warren Brown School of Social Work

Lisa M. Klesges, PhD, MS*
Margaret Olsen, PhD, MPH
Professors of Surgery; Professors of Medicine

Bettina F. Drake, PhD, MPH
Aimee S. James, PhD, MPH
Mary C. Politi, PhD
Siobhan Sutcliffe, PhD, ScM, MHS
Yan Yan, MD, PhD
Professors of Surgery

Feng Gao, MD, PhD, MPH, MS
Allison King, MD, MPH, PhD
Esther J. Lu, PhD
Jingqin (Rosy) Luo, PhD
Yikyung Park, ScD
Adetunji T. Toriola, MD, MPH, PhD
Erika Waters, PhD, MPH
Associate Professors of Surgery

Jean S. Wang, MD, PhD
Associate Professor of Surgery; Associate Professor of Medicine

Yin Cao, ScD, MPH
Su-Hsin Chang, PhD, MSc
Kia L. Davis, ScD, MPH
Cynthia Herrick, MD
Ashley Houston, OTD, MSCI, MPA, OTR/L*

Shu Joy Jiang, PhD, MSC*
Jean Hunleth, PhD, MPH
Erin L. Linnenbringer, PhD
Ying Liu, MD, PhD
Angela Mazul, PhD, MPH*
Michelle Silver, PhD, ScM*
Fei Wan, PhD*
Assistant Professors of Surgery

Kenneth R. Carson, MD
Assistant Professor of Surgery; Assistant Professor of Medicine

DIVISION OF UROLOGIC SURGERY



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Robert Killian Royce, MD, Distinguished Professor of Urologic Surgery

Sam B. Bhayani, MD
Holekamp Family Endowed Chair in Urology

Arnold D. Bullock, MD
Alan A. and Edith L. Wolff Distinguished Professor of Urology

R. Sherburne Figenshau, MD
Taylor Family and Ralph V. Clayman Chair in Minimally Invasive Urology

Nupam Mahajan, PhD
Endowed Professorship of Urologic Research; Professor of Surgery

Ramakrishna Venkatesh, MD
Professor of Surgery

Douglas E. Copen, MD
H. Henry Lai, MD
Associate Professors of Surgery

Christopher T. Arett, MD
Alana C. Desai, MD
Kefu Du, MD

Dane P. Johnson, MD
Eric Kim, MD
Kiran Mahajan, PhD
Gregory P. Murphy, MD
Zachary Smith, MD*
Ralph J. Torrence, MD
Erica J. Traxel, MD
Gino J. Vricella, MD
Assistant Professors of Surgery

Arjun Sivaraman, MD, MBBS, MS, MCH*
Instructor in Surgery

*Joined faculty in fiscal year 2019-20

NEW FACULTY

DIVISION OF CARDIOTHORACIC SURGERY

Section of Cardiac Surgery



Dipesh Shah, MD
*Assistant Professor
of Surgery*

Residency: Cardiovascular surgery, G.B. Pant Hospital,

New Delhi, India; cardiovascular surgery, LPSIC, Kanpur, India

Fellowships: Advanced cardiovascular surgery, Mayo Clinic, Rochester, MN; cardiopulmonary transplantation and mechanical circulatory support, University of Pittsburgh Medical Center, Pittsburgh, PA

Clinical Interests: Adult cardiac surgery, minimally invasive cardiac surgery, heart failure and cardiothoracic transplantation, structural heart disease and transcatheter valve procedures

Research Interests: Clinical outcomes research, heart failure devices, heart transplant, xenotransplantation, stem cell therapy for heart failure

Section of Pediatric Cardiothoracic Surgery



Dilip Nath, MD
*Assistant Professor
of Surgery*

Residency: Congenital cardiac surgery, University

of Southern California/Children's Hospital, Los Angeles

Fellowships: Post-doctoral research fellowship, surgery, University of Minnesota; post-doctoral research fellowship, cardiothoracic surgery, Washington University in St. Louis

Clinical Interests: Pediatric cardiothoracic surgery, congenital heart conditions, closure of atrial and ventricular septal defects, pediatric heart transplant, repair of Tetralogy of Fallot, Fontan procedure, Glenn shunt procedure, repair of coarctation of aorta, repair of atrioventricular canal

Research Interests: Congenital heart disease, solid organ transplant

DIVISION OF GENERAL SURGERY

Section of Acute and Critical Care Surgery



Cody Barnes, MD
Instructor 1-year position

Residency: General surgery, University of Missouri Hospital and

Clinics—Columbia, MO

Fellowships: Critical care surgery, Washington University School of Medicine

Clinical Interests: Acute care surgery

Research Interests: Blood component therapy, infrared imaging and recognition of sepsis, Arabidopsis thaliana protein and genome research



Colonel Jeffrey A. Bailey, MD
Professor of Surgery

Residency: General surgery, Saint Louis University

School of Medicine

Fellowships: Critical care surgery, trauma surgery, Saint Louis University School of Medicine

Clinical Interests: Trauma programs, trauma systems, injury prevention, pre-hospital care, tactical combat casualty care, en-route care, combat surgery, damage control resuscitation and surgery, emergency general surgery

Research Interests: Trauma education and training, trauma systems, trauma prevention, trauma registries and informatics, trauma outcomes, emergency general surgery registries



Jessica Kramer, MD
Instructor 1-year position

Residency: General surgery, Emory University, Atlanta, GA

Fellowships: Burn surgery, Grady Hospital, Atlanta, GA; critical care surgery, Washington University School of Medicine

Clinical Interests: Trauma

Research Interests: education research, simulation training, antibiotic utilization

Section of Surgical Oncology (Formerly Endocrine and Oncologic Surgery)



Taylor Brown, MD
*Assistant Professor
of Surgery*

Residency: General Surgery, Yale –

New Haven Hospital

Fellowships: Resident research, Yale Endocrine Neoplasia Laboratory; Endocrine surgery, Yale – New Haven Hospital

Clinical Interests: Endocrine, thyroid, parathyroid, adrenal surgery

Research Interests: Endocrine cancer genetics and genomics



T.K. Pandian, MD, MPH
*Assistant Professor
of Surgery*

Residency: General surgery, Mayo Clinic College of

Medicine & Science, Rochester, MN

Fellowships: General surgery, Mayo Clinic College of Medicine & Science; Brigham and Women's Hospital, Massachusetts General Hospital, Harvard Medical School, Boston, MA

Clinical Interests: Endocrine, thyroid, parathyroid, adrenal surgery

Section of Minimally Invasive Surgery



Francesca M. Dimou, MD
*Assistant Professor
of Surgery*

Residency: Surgery, The University of South Florida

Fellowships: T-32 surgical research in gastrointestinal diseases, The University of Texas Medical Branch, Galveston, TX; advanced gastrointestinal/minimally invasive surgery, Weill Cornell Medicine/ New York Presbyterian, New York, NY

Clinical Interests: Bariatrics, foregut surgery, abdominal wall reconstruction, robotic surgery

Research Interests: Clinical research of patient-centered outcomes in hepatobiliary surgery (benign gallbladder disease), bariatrics surgery, foregut surgery and robotics

Section of Vascular Surgery



Vipul Khetarpaul, MD
Assistant Professor of Surgery

Residency: General surgery/vascular surgery,

Washington University School of Medicine

Fellowships: Vascular surgery, Washington University School of Medicine

Clinical Interests: Open and endovascular surgery, aortic and carotid surgery, peripheral vascular disease/limb salvage, varicose veins, dialysis access

Research Interests: Endovascular and minimally invasive advances in peripheral vascular disease, complex aortic pathology

DIVISION OF PEDIATRIC SURGERY



Baddr Shaksheer, MD
Assistant Professor of Surgery

Residency: General surgery, University of Chicago

Fellowships: Pediatric surgery, St. Louis Children’s Hospital/Washington University School of Medicine

Clinical Interests: Pediatric colorectal surgery, adolescent bariatric surgery

Research Interests: Recidivism in bariatric surgery, adolescent bariatric surgery, clinical ethics

DIVISION OF PUBLIC HEALTH SCIENCES



Lisa M. Klesges, PhD, MS
Professor of Surgery

Graduate Education: MS, psychology/research methods, University

of Memphis, TN; PhD, epidemiology/behavioral epidemiology, University of Minnesota, Minneapolis, MN

Research Interests: Dissemination and implementation research, evidence-based health behavior change, research methods in cancer prevention and control, childhood obesity prevention



Ashley Housten, OTD, MSCI, MPA, OTR/L
Assistant Professor of Surgery

Graduate Education:

MPA, George Mason University, Fairfax, VA; OTD, MSCI, Washington University School of Medicine

Post Doctoral Education: T32 postdoctoral scholar, Washington University School of Medicine; Health Services Research, R25T, and K99 postdoctoral fellow, University of Texas MD Anderson Cancer Center, Houston, TX

Research Interests: Supporting cancer screening and treatment decision-making to reduce health disparities and to address challenges associated with health literacy in diverse populations; dissemination and implementation of decision support strategies to improve health behaviors and outcomes; using qualitative and mixed-methods to identify challenges and opportunities to strengthen patient-provider engagement in decision-making across the cancer care continuum



Shu Joy Jiang, PhD, MSc
Assistant Professor of Surgery

Graduate Education:

PhD, statistics, University of Waterloo, Canada; MSc, statistics, University of Western Ontario, Canada

Post Doctoral Education: Postdoctoral fellow in biostatistics, Harvard School of Public Health, Boston, MA

Research Interests: Statistical methodology in precision medicine, multistate models, correlated processes involving comorbidities



Michelle Silver, PhD, ScM
Assistant Professor of Surgery

Graduate Education:

PhD, ScM, epidemiology, Johns Hopkins School of Public Health, Baltimore, MD

Post Doctoral Education: Cancer prevention fellow, National Cancer Institute, Rockville, MD; research fellow, epidemiology, Johns Hopkins School of Public Health, Baltimore, MD

Research Interests: Cervical cancer screening and prevention; HPV vaccination; understanding the delivery of the BRCA1/2 testing and impact on preventive health services



Fei Wan, PhD
Assistant Professor of Surgery

Graduate Education:

PhD, biostatistics, MS, computer science and information technology, University of Pennsylvania, Philadelphia; mathematics, University of Cincinnati, applied statistics, University of Vermont, Burlington, VT

Research Interests: Causal interference, biostatistics, health service research

GIVING

The Department of Surgery gratefully acknowledges the generosity of the following donors:

Aesthetic Surgery Education & Research Foundation
American Hepato Pancreato Biliary Association
American Medical Association Foundation
American Society Reconstructive Microsurgery
American Surgical Association Foundation
Mr. Joel J. Barrientos
Dr. & Mrs. Keith Eric and Tina Brandt
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Brown Foundation Barrett
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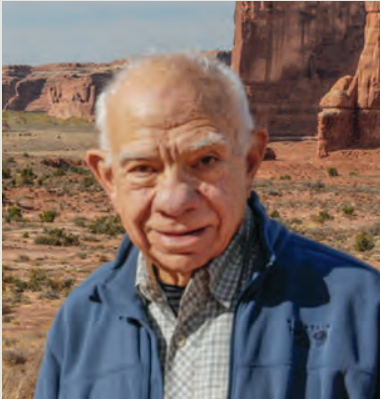
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IN MEMORY



Jerome Fred Levy, MD, a distinguished surgeon and emeritus professor at Washington University School of Medicine in St. Louis, died June 12, 2019, of pancreatic cancer at home in St. Louis. He was 84.

A Washington University alumnus, Levy earned — in only three years and with honors — a bachelor’s degree in chemistry in 1954. He then earned a medical degree in 1958 and a master of liberal arts in 2010.

A native St. Louisan, Levy also began his professional career at Washington University. He started as a resident in surgery at what was then called Barnes Hospital and ascended to become an associate professor in clinical surgery before retiring from his surgical practice in 2002.

Early in his medical practice, Levy was drafted during the Vietnam War to serve as a captain in the U.S. Army, primarily with the 101st Airborne at Fort Campbell, Kentucky.

He trained as a vascular surgeon and eventually focused his practice on treating patients with breast cancer, becoming one of the region’s first surgeons to perform immediate reconstruction following a mastectomy. Additionally, Levy wrote and published a book entitled *Your Breasts*, aimed at educating lay audiences in breast care.

“Jerry was loved by his patients and was an early pioneer of breast conservation and immediate reconstruction,” said Timothy J. Eberlein, MD, the Bixby Professor of Surgery, head of the Department of Surgery and director of the Alvin J. Siteman Cancer Center at Barnes-Jewish Hospital and Washington University School of Medicine. “He was a renaissance man, having many outside interests where he also excelled. He and his wife, Judy, collected prints, and he was a superb nature photographer.”

Levy’s passion for arts compelled him to earn a master of liberal arts degree from University College in Arts & Sciences, for which he was featured as a 2010 outstanding graduate. He also traveled the globe, helped build his second home in Idaho and was committed to his Jewish faith through his deep involvement with Congregation Temple Israel.

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