On the cover: Ida Fox, MD, who joined the Division of Plastic and Reconstructive Surgery in August 2007, performs surgery. Fox specializes in a range of procedures including microsurgical reconstruction, treatment of nerve injuries and hand surgery. She also is working with neurosurgeon Justin Brown, MD, to develop an interactive website for military physicians focusing on the identification, anatomy and treatment of peripheral nerve injuries.

Other faculty members featured on the cover are (from top) vascular surgeon Robert Thompson, MD, who also serves as vice chairman for research; endocrine and oncologic surgeon Julie Margenthaler, MD; pediatric surgeon Martin Keller, MD; and cardiac surgeon Nader Moazami, MD.

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EACH YEAR, THE DEPARTMENT OF SURGERY

Annual Report describes notable advancements in each aspect of our mission: patient care, research and education. What is remarkable — when looking back over the past decade — is how consistent this progress has been.

The Alvin J. Siteman Cancer Center opened in 1999, and since then, our faculty members have played leading roles in both treating and advancing treatment for cancer patients. We have introduced new surgical techniques and commonly are at the forefront in the use of new procedures. The Department’s NIH research funding has nearly tripled during the past 11 years, and changes in resident and fellowship programs have kept us at the leading edge of graduate medical education.

The 2008 Annual Report offers another exceptional snapshot of key advances made by our faculty and staff. Here are some of the achievements highlighted in this report:

CLINICAL TREATMENT: Our surgeons often are among the first in the country to implement new technologies. This is demonstrated by our urology division, which hosted the first international symposium on robotic kidney surgery, and the heart failure program, which has implanted next-generation ventricular assist devices in a growing number of patients.

Not all advances in patient care are driven solely by new technology. Our trauma surgeons focus on functionally integrating their patients back into society. The story of a 23-year-old man who underwent exercise therapy after treatment for electrocution illustrates the multi-level approach to recovery advocated by the trauma team.

PHYSICIAN ACCESSIBILITY: Our surgeons, along with other Washington University physicians, face a major challenge presented by the closure and reconstruction of Interstate 64, a major highway that serves the Medical Center in midtown St. Louis. Faculty and staff members have done yeoman’s work in expanding services to hospitals in suburban St. Louis and outlying counties to bring care closer for many of our patients.

RESEARCH: The Department continues to be a leader in NIH funding for basic science investigations despite the trend toward flat governmental spending on research. Within the medical school, departmental researchers received two of 15 grants awarded by the new Institute for Clinical and Translational Science (ITCS). The work of Ming You, MD, PhD, on chemopreventive agents for lung cancer provides an excellent example of the type of innovative research being done by our faculty members.

EDUCATION: The Department’s General Surgery Residency and many other training programs annually attract the top candidates in the country. Our cardiothoracic and vascular fellowships are at the forefront of providing more in-depth training for future surgeons. At the same time, our approach to education is broad, encompassing intensive training for medical students and training in minimally invasive surgery for about 1,000 surgeons each year.

These achievements and others reported in this publication demonstrate the continued success in each aspect of our mission.

Timothy J. Eberlein, MD
Bixby Professor of Surgery
Chairman, Department of Surgery
Director, Alvin J. Siteman Cancer Center
The introduction of the left ventricular assist device (LVAD) — a surgically implanted, mechanical device that takes over the pumping function of the left ventricle — was one of two key advancements that changed the course of heart transplantation in the 1980s and 1990s. Although the first heart transplant was done in 1967, transplantation was not a successful treatment until the drug cyclosporine was approved in 1983 to prevent the body’s rejection of the implanted heart. In the 1990s, the first generation of LVADs — which were heavy and used mechanical bearings for operation — came into widespread use for patients awaiting heart transplants.

At Washington University School of Medicine, the first-generation LVADs are being replaced with “rotary” LVADs, which continuously pump blood as they spin. Two of these lightweight devices — the VentrAssist® and HeartMate II® LVADs — have been used by Washington University cardiac surgeons as they progress through clinical trials as both bridge-to-transplant and destination therapy (permanent implantation). In April 2008, the HeartMate II was approved by the FDA as a bridge for patients awaiting heart transplantation.

Nader Moazami, MD, surgical director of Cardiac Transplantation and principal investigator for the national VentrAssist trial, describes both pumps as much quieter and likely to be more durable than first-generation devices. “These devices are great to work with,” says Moazami. “The implantation of the devices is simplified, and we see a lot fewer complications than we used to see.”

Patients Do Well on Devices

Two of Moazami’s patients who received the next-generation VADs report a dramatic improvement in how they feel and a minimal impact as they have returned to the activities they enjoyed before their heart failure.

After giving birth to her son three years ago, Krystal Jordan, a 21-year-old woman from Waynesville, MO, began to...
and daily changing of the dressing on their skin where the VAD’s cord enters their bodies. But they continue to receive care from a team of cardiologists (Gregory Ewald, MD, medical director of the Heart Failure and Cardiac Transplant Program, and Edward Geltman, MD); transplant and artificial heart program nurse coordinators; a nurse practitioner; a social worker; a financial specialist; a dietitian, and a pharmacist. Moazami and cardiac surgeon I-wen Wang, MD, form the surgical part of the team, generally implanting the VADs and performing transplants together.

Moazami emphasizes that the team’s goal is not just survival, but quality of life. “If you are alive, you want to feel alive and do the things you enjoy, such as playing with your grandkids,” he says. “You don’t always want to feel short of breath, fatigued and be bouncing in and out of the hospital.”

In the future, Moazami predicts that a growing number of patients will receive VADs as destination therapy and that technology will continue to evolve. “This is a very dynamic field,” he says. “I suspect that over the next several years, we will see continuous improvements in both of these pumps and newer pumps coming on board.”

Experience heart problems. Diagnosed with post-partum cardiomyopathy, she had a series of strokes and a heart attack and had a defibrillator implanted. Her condition gradually worsened until she had to quit work and had difficulty walking even a short distance in her house. “I felt like I was just slowly losing my life,” she says.

In November 2007, Krystal became the second patient at Barnes-Jewish Hospital to be implanted with a VentrAssist LVAD as she awaited a heart transplant. She says having the device — which weighs just 10 ounces and circulates blood via a hydrodynamically suspended impeller — is an adjustment, but well worth it.

“My life was put on hold for so long, and now it seems like I’m getting it all back,” she says. “I am able to sleep and go to the mall with my friends. I’m not a burden on my family.”

Once she gets her transplant, she plans to enroll at Lincoln University in Jefferson City, MO, and begin the path to becoming a cardiologist — so she can provide hope to others in her situation.

The scope of recovery for Ed Steenbergen, a 72-year-old retired police officer, was similar to Krystal’s after he received his HeartMate II pump in January 2008.

In the 1990s, Ed’s heart had begun to enlarge from an unknown cause, possibly a virus dating as far back as his childhood. A year before his surgery, his heart failure had worsened until he had difficulty walking from his bedroom to the kitchen for breakfast. “I could hardly do anything,” he recalls.

For Ed, implantation of the HeartMate II pump — a small pump that restores hemodynamic function through rotation of a single moving part — is not a bridge to transplant, but destination therapy that will take him through the next eight to 10 years before a new pump is needed. Considered too old for transplant, Ed finds the device and the support of his family key elements in his return to an active lifestyle.

“My wife Kathy and I walk about a mile and a quarter in the evening,” he says. “I get to the gym to work out on the weight machines and shoot baskets. I’m getting back into golf and fishing.”

A Team Approach to Heart Failure

Krystal Jordan, Ed Steenbergen and other patients with next-generation ventricular assist devices have few maintenance duties to keep their devices operating — making sure batteries are charged
The work of Washington University urologic surgeons to develop robotic techniques for removing kidney and bladder tumors is one part “innovation” and one part “education.” As a result, types of surgery that rarely had been performed are gaining popularity as a way to reduce the impact of major operations on patients with these cancers.

A year of innovation began when a da Vinci® robotic system was delivered to the Division of Urologic Surgery in July 2007. Robotic prostatectomy for the treatment of prostate cancer was the main intended use for the system. But Sam Bhayani, MD, a robotic surgeon, and others in the urology division immediately began to expand use of the robot for kidney and bladder cancer. Several successful robotic procedures for these diseases had been reported in the literature, but more work was needed to make the techniques reproducible by other urologic surgeons.

“Within two or three months, I developed a way of doing a partial nephrectomy,” says Bhayani. “I put the four instruments from the robot into the body through tiny keyhole incisions and control them all at the same time. The camera is three-dimensional and provides a high-definition view. I’m able to robotically remove the tumors by manipulating all of the instruments from the console. The robotic system gives me an extra set of hands and better eyesight than I have naturally.”

Bhayani reports that the robotic system allows urologists to perform more complex kidney cancer cases than they could do laparoscopically. The benefits for patients — who may have larger or more numerous vascular tumors — are the same as those for any minimally invasive surgery. Typically, there are fewer complications, a shorter hospital stay and a much faster recovery than with open surgery.

To educate other robotic surgeons, the division sponsored the First Annual Worldwide Robotic Renal Symposium in June 2008 at the School of Medicine. Bhayani was the course chair for the symposium, and Washington University urologist Robert Figenshau, MD, also served as faculty, along with other leading robotic surgeons from around the country. The symposium drew an audience of about 100 surgeons.

Urologic surgeon Adam Kibel, MD, also has expanded the use of the robot to select patients with bladder cancer who require bladder removal. This approach reduces pain and blood loss and shortens hospital stay. It is likely to allow more patients, who may not otherwise be candidates for bladder removal, to undergo this curative procedure.

“Robotic prostatectomy has been around for quite a number of years, but these are new applications for the robot,” says Division Chief Gerald Andriole Jr., MD. “It is gratifying that our faculty members are on the leading edge of this technology.”

A Leader in Laparoscopic and Robotic Surgery

The Washington University Division of Urologic Surgery has a long history of leadership in laparoscopic surgery — performing the first laparoscopic nephrectomy in 1990 — as well as in the new applications of robotic surgery.

Other robotic surgeries performed by faculty members include prostatectomy, sacrocolpopexy for uterine or vaginal vault prolapse, pyeloplasty and adrenalectomy.
A WORK-RELATED ELECTRICAL ACCIDENT left James Musgrave — a former high school tri-athlete in his mid-20s — alive but extensively burned and in a weakened state. A year later, his physical condition was as good as ever, or perhaps even better than before.

James sometimes shares his story with other athletes who work out with him at a local gym. The other athletes undoubtedly consider James’ story inspiring, but they may not know how unusual the story is for someone who has been critically injured. James not only received excellent hospital care and physical therapy, but underwent an intensive six-month, individualized exercise program designed to return him to optimal function.

For the Washington University acute and critical care surgeons who treated James, the meaningful standard for their patients is not mere survival, but return to function — going back to work, sports and other activities they enjoyed before their hospitalization.

According to Timothy Buchman, PhD, MD, chief of the Section of Acute and Critical Care Surgery (ACCS), many physicians view a critically injured patient like James as “damaged goods.” “We view even the most serious injuries as ‘dings and dents,’” and focus our efforts on sustaining and strengthening the core physiological systems,” he says. “We aim for complete restoration of function.”

A Year of Healing

James, 23 years old at the time of his accident, remembers going to bed on the evening of Wednesday, April 25, 2007, before working the next day for his Metro East employer. The next thing he recalls is waking up in the Barnes-Jewish Hospital (BJH) ICU the following Sunday.

James later learned he was electrocuted when he touched a work truck that came into contact with a power line. He suffered cardiac arrest, was administered CPR and transported to Alton Memorial Hospital in Alton, IL. He then was flown by helicopter to BJH, where he was admitted to the ICU under the care of Craig Coopersmith, MD, an ACCS surgeon and co-medical director of the ICU.

When James awoke in the ICU, he had deep electrical burns on both hands, his left elbow, both legs below the knee, his feet and three of his smallest toes. When nurses first got him out of bed, walking was an almost impossible task.

After a few days, James was transferred to a rehabilitation facility where he performed simple tasks such as walking and dressing himself. He also made a series of visits to the wound center at BJH. Buchman, one of the wound center surgeons, amputated the damaged toes and later recommended that James see Diane Kruzsynski, an advanced exercise specialist.

Although not all critically injured patients are candidates for exercise therapy, Buchman believed James’ attitude and physical condition before the accident made success likely. “He had the will and a supportive family,” says Buchman.

In October 2007, when he entered therapy, James estimates his strength was at about 55 percent of his pre-accident level. He also had trouble with his balance, couldn’t turn easily and had difficulty getting up from a sitting position.

Exercise therapy built James’ core strength and also helped him regain his balance. “The activities involved basically every muscle in my body rather than just one,” says James.

Buchman describes the program as an “individualized boot camp,” and James concurs that the workouts were demanding. But, in the end, his stamina returned, and he had good enough balance to stand atop a workout ball. His 6 ft. 2 in. frame now carries a muscular, 195-pound body.

His life plans also have changed. In spring 2008, he enrolled in Lewis and Clark Community College in Godfrey, IL, to become a personal trainer so that he can help others overcome their own obstacles.

James’ recovery is consistent with the vision of Washington University acute and critical care surgeons. “Just having the wound closed isn’t good enough,” says Buchman. “In our view, only the best possible recovery is good enough.”
The Division comprises seven sections and has more than 40 faculty members, making it larger than many entire academic departments of surgery. The following notes will give you a closer look at the activities within each section.

**Section of Acute and Critical Care Surgery**

A health blog in the online edition of the Wall Street Journal envisions a scenario in which a 65-year-old patient comes to the emergency room with a large ulcer penetrating the pancreas. However, three of the five surgeons in the group faced with the problem are specialists who don’t perform emergency laparotomy, the needed procedure, and the two specialists who do perform the surgery are either away or have exceeded their mandated work hours.

The scenario points up the decline in the number of general surgeons in the face of increased specialization and the impact of the trend on patient care. However, this case would present no problems for Washington University surgeons in the Section of Acute and Critical Care Surgery (ACCS). They treat patients with complex general surgical problems and take transfers of these patients around the clock every day of the year. These surgeons also offer training in general surgery to help ensure that the next generation of surgeons is prepared to care for the entire patient.

ACCS surgeons’ treatment of such patients is a complement to their trauma care of critically injured patients at Barnes-Jewish Hospital, the only nationally verified Level 1 trauma center in the region. In addition, ACCS surgeons serve critically ill and injured patients in the ICU who may have an overwhelming infection or acute injuries.

In research, faculty members perform basic science research that may translate into better care for the critically ill and injured. Craig Coopersmith, MD, continues to examine the role of the gut in sepsis. J. Perren Cobb, MD, and his team used microarrays to find 85 genes that were active if a patient was going to develop ventilator-associated pneumonia. The team’s goal is to one day predict which patients will come down with the pneumonia and to treat them beforehand.

**Section of Colon and Rectal Surgery**

Washington University colon and rectal surgeons maintained very active clinical practices at several locations, broke new ground in research and expanded their fellowship program over the course of the past academic year.

In addition to their comprehensive practice at Barnes-Jewish Hospital, colorectal surgeons see patients with benign colorectal conditions and pelvic floor disorders at Barnes-Jewish West County Hospital (BJWCH – in suburban St. Louis County) and Progress West HealthCare Center (in adjoining St. Charles County). Chief James Fleshman Jr., MD, was elected chief of surgical services at BJWCH. Along with the busy practice at BJWCH, several members are building a patient base in their second year at Progress West: Fleshman, Elisa Birnbaum, MD, and Nurse Practitioner Rhonda K. Hageman, FNP-BC.

The section also treats military veterans at the St. Louis VA Medical Center, where it added a full-time surgeon. Assistant Professor Bashar Safar, MBBS, MRCS, who recently completed a colorectal surgery fellowship at Cleveland Clinic Florida, will take cases at the VA Center and Saint Louis ConnectCare, which provides services to uninsured patients.
During the 2008 academic year, faculty members made contributions to a wide range of research focused on colon and rectal cancer:

• Fleshman was involved in a five-year study by the Clinical Outcomes of Surgery Therapy (COST) Study Group that found laparoscopic colectomy was as effective as open surgery for curable colon cancer. The findings of the group appeared in the *Annals of Surgery* with Fleshman as first author of this study.

• Matthew Mutch was co-author of an article in *Gastrointestinal Endoscopy* that examined aberrant crypt foci as a precursor to colorectal adenocarcinoma. He also developed a genetic profile to identify patients with rectal cancer who would benefit from radiation therapy. The Colorectal Surgery Fellowship continued to draw top recruits as it increased its number of ACGME (Accreditation Council for Graduate Medical Education)-approved, board-eligible fellows from two to three. Mutch serves as director of the program.

### Section of Endocrine and Oncologic Surgery

Clinical research and new grants were at the forefront of activity for the Section of Endocrine and Oncologic Surgery over the past year.

Section Chief Jeffrey Moley, MD, is leading four clinical trials of medications to treat advanced thyroid cancer at the Alvin J. Siteman Cancer Center at Barnes-Jewish Hospital and Washington University School of Medicine. Two of the trials have completed patient accrual.

At the 2008 American Society of Clinical Oncology Annual Meeting, Rebecca Aft, MD, and her coworkers reported that women treated for stage II/III breast cancer who also received a bone-strengthening drug were less likely to have breast tumor cells growing in their bones. Aft also received a grant from the Susan G. Komen Breast Cancer Foundation to study the molecular biology of disseminated breast cancer cells, with the goal of developing new targeted therapies, and is principal investigator of a new clinical trial studying a treatment for triple negative breast cancers.

Bruce Hall, MD, PhD, MBA, received a $300,000 grant from the Barnes-Jewish Hospital Foundation to continue the American College of Surgeons National Surgical Quality Improvement Program at the hospital.

In addition to their clinical and research efforts, several faculty members were appointed to important posts. Moley is the newly elected vice president of the American Association of Endocrine Surgeons (2008-2009); Hall was appointed senior fellow at the medical school’s Center for Health Policy and associate chief of surgery at the St. Louis VA Medical Center-John Cochran Division (he reports to Moley, who continues to serve as chief of surgery), and Julie Margenthaler, MD, was appointed program director of the Breast Fellowship Program. Margenthaler was also the first physician to be trained in the program.
and as time has elapsed, more and more centers perform a wide range of routine laparoscopic surgeries. Yet Washington University MIS surgeons continue to expand the scope and complexity of these surgeries.

Although surgeons in the community are able to perform many laparoscopic procedures, Section Chief Brent Matthews, MD; J. Christopher Eagon, MD, and L. Michael Brunt, MD, routinely perform advanced laparoscopic procedures for paraesophageal hernias, achalasia, diseases of the spleen and adrenal glands, and abdominal wall hernias. Many of these procedures are revisional.

Eagon, who specializes in bariatric surgery, offers both laparoscopic Roux-en-Y gastric bypass surgery and the LAP-BAND®

Section of Minimally Invasive Surgery

The formation of the Minimally Invasive Surgery (MIS) Section in July 2007 enabled surgeons who specialize in upper gastrointestinal (GI), hernia, solid organ and bariatric surgery to focus on the development of new therapies, collaborate with physicians in multiple surgical subspecialties, and promote resident and fellow training in minimally invasive techniques.

During the last 15 years, minimally invasive surgery has matured as a subspecialty, and as time has elapsed, more and more centers perform a wide range of routine laparoscopic surgeries. Yet Washington University MIS surgeons continue to expand the scope and complexity of these surgeries.

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Eagon, who specializes in bariatric surgery, offers both laparoscopic Roux-en-Y gastric bypass surgery and the LAP-BAND®
performed the world’s first kidney-pancreas transplant, as the third Anderson-Newton Lecturer in Transplantation. Sutherland spoke on beta cell replacement therapy by pancreas and islet transplantation. The lectureship honors Charles B. Anderson, MD, and the late William T. Newton, MD, two pioneers in transplantation at Washington University.

The Transplant Surgery Section had another outstanding year, with continued growth in the liver transplant and liver surgery programs as well as the kidney transplant program. Surgeons offer removal of benign or malignant tumors as an option for some patients with liver disease, including those who require the most complex procedures and major vascular reconstruction. They also perform liver transplant in patients with both early-stage hepatocellular (primary liver) cancer and cirrhosis who cannot undergo removal. And Barnes-Jewish Hospital is one of the few centers that give the options of liver resection (open and laparoscopic) and liver transplantation to patients with cholangiocarcinoma (bile duct cancer) confined to the bile ducts.

A year after implementing a laparoscopic kidney donor program, Washington University transplant surgeons have a well-established system for performing both laparoscopic and mini-nephrectomy donor procedures. Over the past year, surgeons used laparoscopic donor nephrectomy in about 20 out of 165 kidney transplants (comprising both live and non-living donors).

In research, faculty members continue to study transplant immunology, liver cancer, pediatric liver transplant and other areas of interest. Two faculty members also received research awards from the American Society of Transplantation.

Thalachallour Mohanakumar, PhD, the Jacqueline and William Maritz Professor of Surgery, Pathology and Immunology, was honored by the American Society of Transplantation for his many contributions to the field.

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The Section of Vascular Surgery soon will have access to new imaging technology that will allow its surgeons to participate in the trial of a promising new stent graft device.

Barnes-Jewish Hospital is building a hybrid operating room that can be used for both open surgery and endovascular procedures. The OR has ceiling-mounted X-ray equipment, which provides better imaging quality than current C-arm technology and can be moved along a track. The improved imaging will allow vascular surgeons to implant fenestrated stent grafts in patients with aneurysms that extend into the kidneys and bowel. These grafts — which have small windows, or fenestrations — provide a way for these patients to undergo endoluminal grafting, an option that is currently not available because of the location of the aneurysms.

The new devices represent the latest in a long line of FDA trials for stent grafts that have involved Washington University vascular surgeons.

In basic science research, Section Chief Gregorio Sicard, MD, and Robert Thompson, MD, serve as principal investigators of vascular labs in a multidisciplinary study of metabolic syndrome supported by a Specialized Center of Clinically Oriented Research (SCCOR) grant. The study seeks to determine the incidence and uncover the mechanisms of the disease.

Eric Choi, MD, and John Curci, MD, also have very active labs. Choi studies intimal hyperplasia — the response of blood vessels to injury — and Curci continues to investigate the link between cigarette smoking and aneurysm formation.

The section continues to offer one of the most competitive vascular surgery fellowships in the country. This year, one of the graduates of the program was Chris Chambers, MD, the first fellow to participate in the Early Specialization Program (ESP). Chambers began the program during the last postgraduate year of his general surgery residency.

On a national level, Sicard serves as chairman, and Brian Rubin, MD, as a member, of the Society of Vascular Surgery (SVS) Outcomes Committee, which interacts with regulatory agencies such as the Centers for Medicare and Medicaid Services (CMS). Sicard also was the senior author on a paper on a national carotid disease registry presented at the SVS Annual Meeting in June 2008.
THE PAST YEAR HAS BEEN A DYNAMIC ONE for the Division of Pediatric Surgery. Surgeons introduced new procedures, implemented changes in how care is delivered to patients, enhanced educational opportunities and forged relationships with other laboratories at Washington University School of Medicine.

Brad Warner, MD, division chief and surgeon-in-chief at St. Louis Children’s Hospital (SLCH), introduced a continuum of treatment for patients with short-bowel syndrome including the serial transverse enteroplasty (STEP) procedure. In this relatively new technique, the surgeon makes sequential cuts along the intestine, expands the length of the bowel and decreases its width. It is designed to help patients who are dependent on IV feeding better tolerate nutrition through the gastrointestinal tract.

Pediatric patients with other acute conditions, who already receive leading-edge care at SLCH, may benefit from new initiatives in treatment:

- A multidisciplinary approach to patients with congenital diaphragmatic hernia ensures that key departments are involved in clinical care from the time the child is admitted to the hospital, through stay on the neonatal ICU, surgery and discharge.
- Director of Trauma Marty Keller, MD, has worked to improve the hospital’s treatment of trauma patients. This has included developing stronger relationships with the trauma program at Barnes-Jewish Hospital and with doctors and nurses at outlying hospitals.

In education, the division has strengthened the experience for general surgery residents rotating on the service by developing a bedside, didactic educational opportunities and forged relationships with other laboratories at Washington University School of Medicine.

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In education, the division has strengthened the experience for general surgery residents rotating on the service by developing a bedside, didactic

Martin Keller, MD, sutures in the OR.


Jacqueline Saito, MD, will join the Division as an assistant professor in February 2009. She most recently served on the faculty of the University of Alabama–Birmingham. The Division is recruiting a pediatric surgeon to assume the Jessie L. Ternberg Endowed Professorship (see article in “Giving” section on page 24).

Brad W. Warner, MD
Apolline Blair Endowed Professor of Surgery
Chief, Division of Pediatric Surgery

*Accreditation Council for Graduate Medical Education.
THE DIVISION OF CARDIOThorACIC SURGERY, by maintaining its excellence and launching new initiatives each year, continues to be a national leader in all three components of its mission: patient care, research and training the next generation of cardiothoracic surgeons.

In patient care, the thoracic, cardiac and pediatric cardiothoracic sections are ranked as top programs by U.S. News & World Report. The sections also serve as national referral centers for complex problems and are among the first to offer innovations that may result in better outcomes for patients.

The division’s faculty members not only receive a high level of National Institutes of Health (NIH) funding, but are among the most productive cardiothoracic surgery researchers in the nation. Their collegiality and collaboration in both clinical activity and research also contribute to the success of the cardiothoracic surgery fellowship, which attracts top-caliber applicants year after year.

Section of General Thoracic Surgery
The General Thoracic Surgery Section, under a new chief, continues to expand its use of minimally invasive surgery and is sharing data from groundbreaking lung transplant research with investigators nationwide.

Bryan Meyers, MD, MPH, succeeded G. Alexander Patterson, MD, as section chief and was named the Patrick and Joy Williamson Professor of Surgery. Meyers, who joined the faculty in 1998, is also surgical director of the Lung Volume Reduction Program. Among his specialties, he performs complex esophageal surgeries laparoscopically and has been assisting the other thoracic surgeons with these techniques.

All thoracic surgeons also perform video-assisted thoracic surgery (VATS) lobectomy as their primary treatment for early-stage lung cancer. The technique, which uses a smaller incision than the standard thoracotomy for cancer removal, was initiated within the section by Traves Crabtree, MD, in 2005. Since then, Washington University thoracic surgeons have performed more than 100 VATS lobectomies.

Thoracic surgeons Alexander Krupnick, MD, (left) and Daniel Kreisel MD, PhD, review notes in the lab. Kreisel, Krupnick and Andrew Gelman, PhD, published a paper on a mouse model of lung transplantation that could lead to development of new therapies to prevent lung tissue rejection.

The minimally invasive treatments are part of a comprehensive approach to the treatment of thoracic conditions. The Lung Transplant Program, started in 1988, has performed more than 975 lung transplants. Thoracic surgeons also treat esophageal cancer, respiratory diseases such as histoplasmosis, and obstructive airway tumors.

To advance the science of immunology, Daniel Kreisel, MD, PhD, and Andrew Gelman, PhD, published a paper on a mouse model of lung transplantation that has led other researchers to visit Washington University over the past year. Ultimately, the mouse model could pave the way for developing new therapies to prevent lung transplant rejection — a major problem that limits the long-term success of the procedure. The mouse model was described in the American Journal of Transplantation.

Washington University thoracic surgeons also made contributions to their national specialty associations in 2008. Patterson became president-elect of the American Association for Thoracic Surgery in April, with his succession to the presidency set for next year. General surgery resident Ankit Bharat MD, working with the thoracic faculty in lung transplant research, served as first author and presenter of a paper that won the Chamberlain award as the top thoracic abstract at the Society of Thoracic Surgeons meeting in January.

Section of Cardiac Surgery
The Cardiac Surgery Section serves as the region’s busiest cardiac service and offers a number of multidisciplinary centers of excellence. It also is participating in several important national trials in heart valve surgery and the use of ventricular assist devices (VADs) as bridge-to-transplant and destination therapy.

Section Chief Ralph Damiano Jr., MD, is working with Nader Moazami, MD, and colleagues in cardiology to test an exciting new investigational technology that allows for aortic valve replacement without opening the chest or using a heart-lung machine. The device makes the procedure available to high-risk and formerly inoperable patients. Washington University was selected as one of 10 FDA investigative sites in the trial evaluating this technique which uses a catheter to thread a replacement aortic valve into the heart — a far less invasive procedure than the standard open-heart surgery.
The section is participating in other FDA trials testing two “next-generation” VADs for patients awaiting heart transplantation and for those who cannot undergo transplant (one of the devices has been approved as a bridge to transplant). These lightweight pumps are quieter and may prove to be more durable than the first-generation devices. As a result, more heart failure patients with a broader range of medical problems are receiving the VADs than in the past (see article on page 2).

The group also has pioneered innovative approaches in the treatment of atrial fibrillation, diseases of the thoracic aorta and heart disease in women.

Complementing clinical trials of new devices, basic science research by faculty members continues to receive strong NIH support. Ralph Damiano Jr., MD, Marc Moon, MD, Michael Pasque, MD, and Research Associate Professor Richard Schuessler, PhD, are funded in work ranging from the surgical treatment of cardiac arrhythmias to chronic pulmonary hypertension, aortic insufficiency and inflammation in postoperative atrial fibrillation.

Moon, who serves as program director of the Cardiac Surgery Fellowship and director of the Center for Diseases of the Thoracic Aorta, was named the Joseph Bancroft Professor of Surgery.

The Cardiac Surgery Section is based at Barnes-Jewish Hospital and Washington University Medical Center but also provides services at Christian Hospital in north St. Louis County. During the next year, cardiac surgeons will open a program at the St. Louis VA Medical Center-John Cochran Division.

Section of Pediatric Cardiothoracic Surgery

A major trend in treating pediatric patients with heart conditions is similar to one seen in adult patients — cardiologists are performing more procedures in the catheterization lab that have traditionally been done as operations. Yet Washington University pediatric cardiothoracic surgeons continue to see their volume of cardiac surgeries increase.

Other developments in pediatric cardiac surgery are the treatment of more complex heart conditions, undertaking more complicated operations and performing surgeries on patients at a younger age. For example, patients with tetralogy of Fallot were once treated at around one year of age. Fifteen years ago, surgeons began operating on children with the abnormality at six to eight months of age, and now most patients undergo surgery at about four months of age.

Overall, survival for complex operations at St. Louis Children’s Hospital (SLCH) is increasing.

Both the Lung Transplant and Heart Transplant programs at SLCH continue to be very active, with a record 25 patients receiving heart transplants in 2007. The hospital will also be one of the sites in a multi-center study of the Berlin Heart, an experimental ventricular assist device that can be used as a bridge to transplant in young children. Sanjiv Ganhi, MD, the surgical director of the heart transplant program, has already implanted the device in a number of children (special permission from the FDA has been required up to now) and will lead the trial at SLCH.

Pediatric heart patients requiring intensive care, as well as heart and lung transplant patients, are getting specialized care in the cardiothoracic intensive care unit at SLCH, which opened last year. The new ICU has increased referrals to the hospital and has generated positive feedback from patients and their parents.

Pediatric Cardiothoracic Surgery Section chief Charles Huddleston, MD, and Gandhi are working closely with George Van Hare, MD, the new chief of pediatric cardiology who came to the hospital from Stanford University on Aug. 1. Van Hare specializes in pediatric electrophysiology.
For some time, Washington University School of Medicine has maintained a strong focus on interventions to restore function in this group of patients. This encompasses the work of neurologists and neurosurgeons, but also innovations developed by Susan Mackinnon, MD, chief of the Division of Plastic and Reconstructive Surgery. A number of Mackinnon’s “nerve transfers” have set the standard for restorative procedures in traumatic injury throughout the world.

The Division is collaborating with the Department of Neurosurgery to create a Nerve and Paralysis Center, which will expand the application of nerve transfer procedures. The Center will focus on extending Mackinnon’s techniques — which historically have been used only in the peripheral nervous system — to the central nervous system.

A separate effort is being made to help American soldiers who have been injured with improvised explosive devices (IEDs) in Iraq and Afghanistan. Military physicians are more effective in saving lives and salvaging limbs than ever before, but the ultimate functional outcome for soldiers is poor if time-sensitive peripheral nerve injuries are not appropriately diagnosed and treated. Ida Fox, MD, and Justin Brown, MD, are developing an interactive educational website to educate military physicians in the anatomy, identification and treatment of peripheral nerve injuries.

Faculty members also extend their expertise and innovative approaches to the plastic surgery residency and hand fellowship, which both received full, five-year accreditation from the Accreditation Council for Graduate Medical Education (ACGME). The Plastic Surgery Residency Review Committee has recommended that plastic surgery training be extended to three years and that rotations are added in anesthesia, oculoplastics, oral maxillofacial surgery, orthopedics and surgical dermatology. The start date of these new requirements is 2010. Meanwhile, the requirements for prerequisite training set by the American Board of Plastic Surgery (ABPS) have not changed.

In other clinical areas, the Division continues to offer a full range of services including hand, reconstructive, pediatric and cosmetic surgery. Both cosmetic and pediatric plastic surgeons opened new offices at Barnes-Jewish West County Hospital to make their services more accessible to patients in west St. Louis County. The Division also welcomed Douglas Sammer, MD, a hand surgeon who recently joined the faculty after completing a hand surgery fellowship at Mayo Clinic in Rochester, MN.

Susan Mackinnon, MD, the Sydney M. Shoenberg, Jr. and Robert H. Shoenberg Professor and chief of the Division, was elected to the Institute of Medicine of the National Academy of Sciences. Membership in the institute is one of the highest honors medical scientists in the United States can receive. She also served as president of the American Association of Plastic Surgeons (AAPS) in 2008. Keith Brandt, MD, the William G. Hamm Professor of Surgery, was elected as a director of the ABPS. He also was named to three ABPS committees and is the newly elected Midwest representative of the American Society of Plastic Surgeons Ethics Committee.

Thomas Tung, MD, received Plastic Surgery National Endowment and basic science research grants from the Plastic Surgery Educational Foundation. He also was elected to membership in the AAPS. Gregory Borschel, MD, is in the second year of an AAPS Academic Scholarship Award supporting research into growth factors to improve regeneration in a rat nerve gap model.
Both the PLCO Trial and the REDUCE Trial, which evaluates prostate cancer prevention with dutasteride, are finished accruing patients and well into the analysis phase. A third trial, Complementary and Alternative Medicine for Urologic Symptoms (CAMUS), which is funded by the NIH, will examine the effectiveness of saw palmetto and Pygeum africanum in preventing progression of benign prostatic hyperplasia. The trial is accruing patients. Overall, the Division has 35 clinical trials enrolling patients and 20 peer-reviewed research grants, the most recent being the NIDDK*-funded Discovery Center for Pelvic Pain (with Andriole as PI).

Under program director Steven Brandes, MD, the Urologic Residency Program was re-certified and two of the three 2008 graduates went on to fellowships. A Division fellowship in urologic oncology also received certification.

* National Institute of Diabetes and Digestive and Kidney Diseases

IN BRIEF

H. Henry Lai, MD, was among 15 grant recipients for the Pilot Studies Program of the Institute for Clinical and Translational Sciences (ICTS) at Washington University. The goal of his research is to discover novel diagnostic biomarkers for interstitial cystitis (IC), an inflammatory bladder disease. The ICTS was formed in 2007 as part of a national consortium to improve the way biomedical research is conducted.

Carl Klutke, MD, was named chief of staff-elect at Barnes-Jewish West County Hospital for the next two years and as chief of staff in 2010-2011. Klutke maintains his urologic practice at the hospital and has been on staff since 1989.

Douglas Coplen, MD, was appointed to the American Urological Association (AUA)/American Board of Urology Exam Committee.

Glenn Preminger, MD, professor of urology at Duke University School of Medicine, spoke on stone management and the role of the AUA Office of Education in training and management of certification as the 2008 Justin J. Cordonnier Visiting Professor.
**THE DEPARTMENT OF SURGERY** was an important player in the development of a major research initiative at Washington University that draws on expertise from the medical school, University and community organizations in health care, education and industry.

The Institute for Clinical and Translational Sciences (ICTS) at Washington University, formed in 2007, is part of a national consortium working to improve the way biomedical research is conducted across the country. The ICTS and 37 other academic health centers in the consortium are funded through Clinical and Translational Science Awards provided by the National Institutes of Health (NIH).

Consortium members share the goals of reducing the time it takes for laboratory discoveries to become treatments for patients and engaging communities in clinical research efforts. They also are charged with the task of training the next generation of clinical researchers.

“Interdepartmental collaboration is very strongly encouraged. That’s not just the wave of the future anymore — it’s what people are doing right now.”

Ken Polonsky, MD, the Adolphus Busch Professor of Medicine and chairman of the Department of Medicine, is principal investigator for the grant that funded the program and serves as director. Thompson also played an important role in the grant application and is chairman of the review committee for the Pilot Studies Program.

Earlier this year, two researchers from the Department of Surgery were among 15 grant recipients from the Pilot Studies Program out of a total of about 120 applicants. Urologist H. Henry Lai, MD, received funding for urine proteomic studies in humans, and cancer prevention researcher Aimee James, PhD, MA, was awarded a grant to improve partnerships with safety-net clinics in St. Louis.

“The Department of Surgery did very well in the application process,” says Thompson. “The applications submitted were excellent and were highly competitive in this internal process. It really shows the breadth of the vigorous research going on within the department and institution-wide.”

**Funding Remains Strong**

Despite intense competition for funding, Department of Surgery full-time researchers and faculty members who divide their time between clinical duties and research continue to see substantial support from the NIH and other funding sources.

In fiscal year 2008, researchers received more than $26 million in annual NIH, non-federal and corporate-supported grants. This is over $5 million more than the department received in 2007 and a four-fold increase over the past 11 years.

The Department of Surgery continues to rank among the top academic departments of surgery in NIH support.

The School of Medicine magazine, Outlook, reported in spring 2008 that medical school researchers were among those who originally established the health risks of smoking and continue to examine its effects. A key element of current research is the work of vascular surgeon John Curci, MD, who studies the effects of tobacco smoke on the formation of abdominal aortic aneurysms (AAAs). Although tobacco smoke is a well-recognized cause of lung cancer and emphysema, smoking has nearly as great an effect on the development of aneurysms. Curci’s lab uses a mouse model of aneurysm disease to determine the mechanism that causes smokers to develop aneurysms. The lab also is beginning to study potential medications for aneurysms and whether the drugs maintain their effectiveness in smokers.
RESEARCH AT THE ALVIN J. SITEMAN CANCER CENTER may offer hope to millions of former smokers who heeded warnings about the dangers of tobacco and quit smoking but still did not completely eliminate the risk of lung cancer.

The American Cancer Society estimates there will be about 215,000 new cases of lung cancer (both small cell and non-small cell) in 2008, and the three-year survival rate is about 10 percent. Cancer risk decreases after smoking is stopped, but only very slowly and incrementally. Thus, many former smokers who took an essential step to improve their health may still develop lung cancer.

Since joining the Cancer Center in 2002, Ming You, MD, PhD, a chemoprevention researcher, has devoted considerable energy to finding compounds that can prevent lung cancer in high-risk patients. Two of those compounds — a traditional Chinese herbal medicine mixture called Anti-Tumor B and a standardized mixture of green tea called Polyphenon E — are now in phase II clinical trials at the British Columbia Cancer Agency (BCCA).

In the trials, BCCA pulmonologist Stephen Lam, MD, uses fluorescence bronchoscopy to screen smokers and former smokers for moderate or severe dysplasia that is likely to develop into squamous cell carcinoma, a form of non-small cell lung cancer. In each trial, patients with notable dysplasia are randomized to either one of the agents or a placebo.

You demonstrated the chemopreventive qualities of Anti-Tumor B and green tea in mouse models of squamous cell carcinoma and hopes the agents prove effective enough to merit large-scale phase III clinical trials in humans.

In addition to his work with Anti-Tumor B and green tea, You is investigating other mixtures, pure compounds and agents used in chemotherapy for their chemopreventive properties in mouse models of lung cancer. Many of the compounds come from food, such as broccoli (sulforaphane) and soybeans (genistein). Chemotherapeutic agents tested for preventative properties are non-toxic or low in toxicity.

You collaborates with his wife, Yian Wang, MD, PhD, also a cancer chemoprevention researcher, on mouse models of lung cancers (both small cell and non-small cell) and rat models of breast cancer.

If Anti-Tumor B and green tea prove successful in the phase II trials against squamous cell carcinoma, You would eventually like to see them tested in patients with a high risk for developing lung cancer — including lung adenocarcinoma — as part of a clinical trial at Siteman. Adenocarcinoma accounts for about 40 percent of lung cancers, compared to about 20 to 25 percent for squamous cell carcinoma.

Ultimately, You shares the dream with other chemopreventive scientists that one day, most people will no longer have to deal with cancers at all, or until their 80s or 90s, because they won’t occur or their onset will be significantly delayed. “These chemopreventive agents will be like vitamins: safe, non-toxic supplements that will drastically decrease the recurrence of cancer,” he says.
Surgical residency programs traditionally have taught surgical skills in the operating room using a training model that is more than 100 years old. But recent trends such as the 80-hour work week and the increasing complexity of surgical techniques have made learning basic skills in the OR a less-attractive option. So what can be done to better prepare interns who are entering their surgical residencies?

A number of surgical training programs have begun to offer skill labs so initial training can be done away from a patient setting.* During the past three years, medical educators at Washington University School of Medicine have taken this preparation a step further, teaching skills to fourth-year medical students bound for surgical residencies and developing a model that could be adopted nationally.

In 2006, under the direction of L. Michael Brunt, MD, professor of surgery, the medical school began offering a seven-week course that teaches students a variety of skills ranging from basic suturing and knot tying to more advanced techniques like surgical stapling and laparoscopy. Students are given materials such as suturing pads and instruments to take home so that they can practice on their own. They also learn emergent procedures and participate in a session on management of acute and emergent on-call problems.

“We saw significant improvement in time and technique for almost all of the basic suturing and knot-tying skills,” says Brunt. “We also saw the students’ sense of confidence grow in being able to perform these techniques and manage problems.”

Lola Fayanju, MD 07, a Washington University School of Medicine graduate who is now in her second year of general surgery residency at the school, believes the course has had a positive impact on her training.

“Having recently completed my internship, I really do believe that the overall experience was less painful and far more satisfying because I was armed with skills provided during the course,” she says.

General Surgery Residency program director Mary Klingensmith, MD, who also teaches in the course, says it accelerates students such as Fayanju so that during their first year of surgical residency, they have mastered skills that students from other medical schools may not have experienced.

“This course puts our students ahead of the game,” she says. “They are in a big transition. If we can help them with this aspect, they will have the chance to be more successful surgeons than they otherwise might be.”

Brunt worked with Klingensmith and other colleagues to collect data on skills improvement and student attitudes that were published in the Journal of the American College of Surgeons. He and Fayanju also will make presentations at the 2008 Annual Meeting of the American College of Surgeons, October 12-16 in San Francisco, on the success of the program.

Brunt believes the current paradigm of interns entering surgical residencies without basic surgical skills is no longer acceptable and hopes that the accelerated skills class can serve as a template for other medical schools.

“The class already has made a big impact on students who have been through the training, but it will be especially exciting if it can have a broader impact at the national level,” he says.

*The General Surgery Residency Program at Washington University School of Medicine was one of the first programs in the country to offer an in-depth surgical skills lab.
A 55-YEAR-OLD MAN arrives at the emergency room complaining of severe epigastric burning. He tells physicians he drank a whole bottle of Maalox®, and he has a history of hypertension and high cholesterol. Shortly after arrival, he says he has a funny feeling and then goes into cardiac arrest. The emergency room staff quickly assigns duties and tries to revive him.

For many physicians, their first “code” comes as a resident in a hospital, and they are called upon to respond to a scenario like this. But educators at Washington University School of Medicine say more should be done to prepare medical students for initial patient encounters — everything from “codes” to physical exams — and have developed one of the country’s leading clinical simulation programs.

Mary Klingensmith, MD, program director of the General Surgery Residency, is one of several medical school faculty members who have worked to develop the program which presents third- and fourth-year students with a mannequin that mimics cardiopulmonary conditions, computer simulation to visualize anatomy, synthetic body parts to prepare for physical examination, and actual patient interaction.

“If students can interact with a mannequin or a patient rather than reading about a situation or procedure, it makes the learning more real for them,” says Klingensmith. “It certainly is challenging, but they are much more relaxed when learning in this environment rather than at the bedside.”

Klingensmith, faculty members and nurses from anesthesiology, internal medicine, pediatrics, OB/GYN and emergency medicine combined elements from each of their areas over the past several years to create various simulation experiences:

• A mannequin named “Bobby” that is hooked up to a heart monitor can breathe, sigh, blink and simulate conditions ranging from a collapsed lung to a heart murmur or acute heart attack. An instructor controls Bobby’s symptoms via a computer in an observation room. The mannequin is designed to respond accurately to the medical students’ treatment — as reflected on a monitor — or the instructor can override the computer system if the students are providing the right treatment but Bobby does not detect their actions.

• An endobronchial computer simulator helps students visualize the spatial relationships between the lung, heart and other structures in the chest cavity.

• Plastic body parts are used to teach students the logistics of pelvic and prostate exams, placement of a catheter and drawing blood. This enables students to gain confidence in repetitive skills before encountering patients.

• After preparation, students perform physical examinations on patient actors and ultimately on actual patients.

In addition, fourth-year medical students are assessed on their abilities to independently manage acute scenarios using the mannequin simulator. Students initially volunteered for this exercise, and it was adopted as part of the required curriculum after it proved to be useful for participants.

In fall 2008, all of the program’s components were integrated as part of the Howard and Joyce Wood Clinical Simulation Center at the Farrell Learning and Teaching Center. Klingensmith serves as associate director of the center under director David Murray, MD, the Carol B. and Jerome T. Loeb Professor in Medicine.

Klingensmith works with the program in her role as a Carol B. and Jerome T. Loeb Teaching Fellow. She also has incorporated computer simulation and basic surgical techniques as part of a skills laboratory curriculum for general surgery residents.

“It makes so much more sense to get at least some of the basic learning done in a low-stress environment, at no cost to anybody, with no ethical concerns,” says Klingensmith.
Early Specialization
Fellows Embark on Career Path Ahead of Schedule

Many general surgery residents decide early on what career path they want to follow. For them, wouldn’t it make sense to start their specialization early rather than gaining experience in a wide range of surgical areas?

Washington University general surgery residents who want to pursue fellowships in vascular or cardiothoracic surgery now have just such an option through the Early Specialization Program (ESP). Each fellowship handles the program differently, but two core elements are the same — the trainee begins the fellowship a year early and is eligible for board certification in both general surgery and their specialty.

**Vascular Surgery ESP**

Chris Chambers, MD, was the first to enter and complete the Vascular Surgery ESP, which is known as a 4+2 program. He completed four years of his general surgery residency at Washington University before entering two years of vascular surgery training. Under the traditional 5+2 program, Chambers would have entered the fellowship after five years of training.

Chambers, who has joined a private practice associated with Michigan State University in Grand Rapids, is grateful for the opportunity. “I decided early on in my training that I wanted to be a vascular surgeon, and the program here clearly is one of the best in the country” he says. “The ESP made my training more efficient.”

Gregorio Sicard, MD, the Eugene M. Bricker Professor of Surgery and chief of Vascular Surgery, describes the Vascular Surgery ESP as being in a state of flux. In addition to the 4+2 program, the American Board of Medical Specialties recognizes two other pathways: the 3+3 program and the 0+5 program (five years of vascular surgery training only). Neither of those options allows for board certification in general surgery.

Sicard predicts the traditional 5+2 and 0+5 programs may become the main training program models for vascular surgery. He says the 0+5 program addresses the need to train vascular surgeons for more than two years, but does not add any additional years to post-graduate medical training.

“Most trainees have significant debt from medical school and college,” says Sicard. “You can’t just keep adding years, or they won’t want to choose your specialty.”

**Cardiothoracic Surgery ESP**

Felix Fernandez, MD, the first trainee to enter the Cardiothoracic Surgery Fellowship through the ESP, completed four years of his general surgery residency at Washington University before entering a three-year cardiothoracic surgery program. The traditional model is five years of general surgery and two years of specialty training.

Fernandez, now in the final year of his fellowship, believes the year of extra training has better prepared him to begin an academic thoracic surgical practice and gave him the chance to narrow his focus early on.

“My first year at Barnes as an intern, I rotated on the thoracic service and immediately identified those surgeons as people I wanted to emulate and thoracic surgery as a career,” says Fernandez. “Throughout that time, they have mentored and instructed me.”

To fellowship program director Marc Moon, MD, the Joseph Bancroft Professor of Surgery, the most important goal of the ESP is to increase job-specific training. The ESP also may provide the opportunity for fellows to perform rotations at other institutions at more opportune times during their training.

Fernandez says a two-month rotation at Memorial Sloan-Kettering Cancer Center during the spring of his second year gave him the opportunity to see how surgeons at another nationally recognized center do their work.

Moon also received positive feedback about the rotation.

“The comment of the director was that Felix was the best-trained resident at his level she had seen,” says Moon. “Based on their experience, they were going to try to institute a 4-3 training program at Memorial Sloan-Kettering.”
A Moving Target  
Minimally Invasive Surgical Training  
Continues to Evolve

TO REMAIN SUCCESSFUL, medical educators must keep up with changes in their constantly evolving fields. Although this is true for all educators, it may be especially true for surgeons who teach minimally invasive surgery.

General, colorectal and urologic surgeons who offer courses through the Washington University Institute for Minimally Invasive Surgery (WUIMIS) regularly change their offerings as new technologies and surgical techniques emerge. For example, the Urology Division has been a leader in providing training for new technologies and recently trained more than 100 urologists in robotic kidney surgery as part of an international symposium.

“It’s a bit of a moving target,” says Brent Matthews, MD, chief of the Section of Minimally Invasive Surgery and codirector of WUIMIS. “What we are doing two years from now may be totally different than what we’re doing today. The robotic kidney symposium is a prime example of how we have been able to evolve and stay toward the forefront of not only performing the latest procedures, but teaching others to do them.”

WUIMIS was established in 1993 as the country’s first multidisciplinary group of surgeons formed to advance research, education and patient care in minimally invasive surgery. The Institute comprises faculty members from the Department of Surgery and gastroenterologists, neurosurgeons, OB/GYNs, otolaryngologists and orthopaedic surgeons who offer courses and conduct research.

Among the most common course offerings by WUIMIS are those in gastrointestinal (GI) and colorectal surgery such as laparoscopic hernia repair, laparoscopic colectomy and transanal microsurgery. About 1,000 surgeons a year take courses in minimally invasive surgery at WUIMIS. Of those, approximately 75 percent are practicing surgeons and the rest are general surgery residents or other physicians in training.

“Half to three quarters of the surgeons already perform the procedures highlighted in our minimally invasive surgery courses at WUIMIS. Of those, approximately 75 percent are practicing surgeons and the rest are general surgery residents or other physicians in training.

“Half to three quarters of the surgeons already perform the procedures highlighted in our minimally invasive surgery courses, so they take the courses to increase efficiency or overcome areas in which the procedure is more technically challenging,” says Matthews.

“There are very few surgeons who have no experience whatsoever except for completely novel techniques yet to be performed routinely.”

For those who take courses — many of them community surgeons — the educational experience provided by WUIMIS does not end with the instruction. They are welcome to come back and observe the surgery being performed in the operating room. This enables them to ask questions in real time, see procedures from start to finish and observe segments of the procedure that are difficult to demonstrate with a photo or video.

Course instructors also serve as a resource for community surgeons once they return to their practices. Matthews estimates he receives one to two calls a week from surgeons who have completed courses. “They might say, ‘I am doing this surgery — what do you think about the patient selection and setup?’” says Matthews. “This allows us to be a resource and play a role in the larger medical community.”

Along with changes in techniques and approaches, WUIMIS instructors are seeing significantly higher skill levels in course participants. Because surgeons are demonstrating more expertise, they often are ready to learn procedures for more complex conditions such as recurrent and suprapubic abdominal wall hernias or paraesophageal hernias.

Feedback also is important in setting the direction for coursework. “If participants feel the course is not challenging enough or applicable to the community surgeons’ needs, we change the content,” says Matthews. “We also gear the course to the environment that is most appropriate for that offering — whether that is a lab experience, a didactic experience or observation in the operating room.”
Urologic and colorectal surgeons established offices at Progress West Healthcare Center.

**The Challenges Faced**

by academic departments of surgery and urban medical centers during the past two decades show no sign of diminishing in the foreseeable future. The increasing costs of providing care, declining reimbursements, rising demand for care, caring for those without health insurance, rising medical liability insurance premiums, and competition from community hospitals and outpatient surgery centers continue to test us.

For many years, Washington University general surgeons, along with urologic surgeon Carl Klutke, MD, had offices at Barnes-Jewish West County Hospital (BJWCH), located about 15 miles west of St. Louis. Several years ago, colorectal surgeons opened the Center for Colorectal and Pelvic Floor Disorders (COPE Center). In 2006, a pulmonary/thoracic satellite office opened to provide pre- and post-operative care.

In recent months, a number of other services have opened offices at BJWCH including cosmetic surgery, vascular surgery, pediatric surgery, pediatric plastic surgery, pediatric urologic surgery and transplant surgery. In addition, Department of Surgery faculty members have taken leadership positions at the hospital — Klutke as chief of staff-elect and Colorectal Surgery Chief James Fleshman Jr., MD, as chief of surgical services.

In January 2008, Interstate 64 was closed for construction in suburban St. Louis County starting about five miles west of downtown. When this stretch is re-opened at the end of 2008, the portion of the highway just to the west of the Medical Center will be closed for a year.

Despite the highway closure and the difficulty it presents to patients, the Department of Surgery saw an increase in the number of visits for the fourth straight year and an increase in procedures during fiscal year 2008.

**Outreach Efforts**

The closure of Interstate 64 accelerated efforts by the Department to offer services closer to many of the patients who live in suburban St. Louis and St. Charles counties.

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Urologic and colorectal surgeons were also the first to establish offices at Progress West Healthcare Center, a BJC medical center about 30 miles west of St. Louis. The new facility opened in 2007, with colorectal surgeons and a nurse practitioner treating mostly anal/rectal disorders and urologists treating both adult and pediatric patients.

Patient care at these two hospitals is complemented by the role of Washington University surgeons who serve military veterans at the St. Louis VA Medical Center-John Cochran Division and by cardiothoracic surgeons who serve patients at a number of outlying facilities.

**Electronic Record-keeping and Faculty Initiatives**

Over the past year, the Department of Surgery has worked hard at implementing several major initiatives: an electronic health record software, which began implementation several years ago but now is used by all physicians, and initiatives in the areas of faculty performance evaluation and faculty/employee behavioral code of conduct.

Electronic record-keeping has enabled surgeons to supply information to referring physicians and patients more quickly and has accelerated the billing cycle. In performance evaluation, an online CV system has helped to standardize the data that are used to evaluate faculty. The behavioral code of conduct and process for incidents were written and posted on the Department’s website to make them more accessible for faculty and employees.
The recent expansion of Washington University surgical practices at Barnes-Jewish West County Hospital (BJWCH) follows a long-standing trend in urban academic medicine and in the St. Louis area health care industry.

As population growth occurs farther away from major cities, academic physicians — as well as other urban health care providers — set up offices in suburbs and exurban areas to make their services more accessible to current patients and to attract patients who might otherwise go elsewhere.

BJWCH, part of the BJC HealthCare Network, is a 113-bed hospital located in suburban St. Louis County about 15 miles west of St. Louis. Some Washington University surgeons — such as urologist Carl Klutke, MD, and a number of general surgeons — have maintained practices there for many years. Over the past several years, more surgeons have established offices and begun performing procedures at BJWCH, and Colorectal Surgery Chief James Fleshman Jr., MD, has moved a large portion of his practice there.

During 2008, the creation of new offices was accelerated because of the shutdown of Interstate 64, a major metropolitan highway located next to Washington University Medical Center. The highway will remain closed and under reconstruction until December 31, 2009, in order to improve safety and traffic flow.

The new surgical offices at BJWCH established in recent years provide standard services and also may be tailored to patients with more specialized needs.

Cosmetic Surgery Center
A cosmetic surgery center that opened in May 2008 offers an attractive setting and several new areas of emphasis for plastic surgeons Terence Myckatyn, MD, and Marissa Tenenbaum, MD*: skin care, fat grafting, office procedures such as liposuction and laser liposuction, and post-bariatric surgery body contouring.

Along with Myckatyn and Tenenbaum, Keith Brandt, MD, also performs breast reconstructive procedures including reconstruction for women with breast cancer who opt to have only part of their breast removed along with radiation therapy. Albert Woo, MD, specializes in cosmetic rhinoplasty.

In addition, women may receive leg vein therapy from Washington University vascular surgeons who offer radiofrequency ablation of the saphernous vein and sclerotherapy and excision of varicose veins.

“The new office enables us to be more competitive with private practice cosmetic surgeons,” says Myckatyn. “We offer an aesthetically pleasing office, easier access, and a bit more of a service-industry approach rather than a hospital mentality.”

Thoracic Surgical Office
In 2006, Washington University general thoracic surgeons established an office at BJWCH that has opened the door to many new patients and continues to draw thousands of patients annually.

Thoracic surgery chief Bryan Meyers, MD, reports positive feedback from patients who undergo less-involved diagnostic or therapeutic procedures before coming to Barnes-Jewish Hospital for major operations. The next step may be to develop inpatient treatment.

Center for Colorectal and Pelvic Floor Disorders (COPE Center)
Working with urologist Carl Klutke, MD, and a urogynecologist, Washington University colorectal surgeons diagnose and treat a wide range of benign colorectal and pelvic floor disorders at the COPE Center, which opened at BJWCH in 2004.

The center, led by Ira Kodner, MD, treats conditions such as incontinence, overactive bladder, rectal and uterine prolapse, and internal hemorrhoids. When it opened, the center was the first of its type in the Greater St. Louis Area.

Other Surgical Services
The Washington University General Surgery Division has had a lengthy presence at BJWCH. Services added or expanded in the past year include transplant surgery (liver disease treatment), vascular surgery (endovascular procedures), pediatric surgery, pediatric plastic and urologic surgery, and adult urology (an additional urologist will join Klutke in 2009).

*Tenenbaum will join the practice in February 2009 after completing a cosmetic surgery fellowship in Los Angeles.
A PEDIATRIC SURGERY PROFESSORSHIP recently was created to honor Jessie L. Ternberg, MD, PhD, a pioneering surgeon and the first chief of the Division of Pediatric Surgery at Washington University School of Medicine.

The naming of the Jessie L. Ternberg Professorship in Pediatric Surgery was one of two honors bestowed on Ternberg in May 2008. She also received an honorary doctor of science degree at the medical school’s commencement ceremonies.

“Establishing this professorship is recognition of the many pioneering contributions of Dr. Ternberg’s career,” says Timothy J. Eberlein, MD, Bixby Professor and chairman of the Department of Surgery. “Without doubt, Dr. Ternberg helped establish the field of pediatric surgery. More importantly, she saved the lives of literally thousands of children during her career.

“Dr. Ternberg not only had a pioneering spirit but a passion and tenacity that made her a success. She always maintained her grace in dealing with colleagues and had compassion for her patients. Dr. Ternberg broke many barriers, but most importantly she set the bar high for the generation of trainees that she mentored.”

Ternberg was a pioneer as both a pediatric surgeon and a woman surgeon who achieved many “firsts” at Washington University School of Medicine.

She began her career in 1958 as awareness was growing that children, and especially infants, have surgical problems distinct from those seen in adults.

For 13 years, Ternberg was the only full-time general surgeon at St. Louis Children’s Hospital. After she became chief of the pediatric surgery division in 1972, surgical services expanded quickly.

Ternberg served as pediatric surgeon-in-chief and division chief until 1990. She routinely performed more than 500 operations a year and was known for her expertise in the surgical treatment of congenital gastrointestinal deficiencies in children.

Other contributions came in the areas of research and education. Ternberg also co-authored A Handbook of Pediatric Surgery, which became a standard reference work and helped surgeons understand that diseases take different forms in children.

Ternberg earned her bachelor’s degree in chemistry from Grinnell College in Iowa in 1946 and her doctorate in biochemistry from the University of Texas in 1950. She entered Washington University School of Medicine in 1949 and earned her medical degree in 1953.

When Ternberg completed her internship at Boston City Hospital in 1954, she decided she wanted to be a surgeon but could not find a surgical residency program that would consider accepting a woman. She turned to Carl Moyer, MD, chairman of the Department of Surgery at Washington University School of Medicine, who agreed it was a “bum rap” for women.

When Moyer accepted Ternberg as the first woman general surgery resident in the program, she appreciated the step he was taking. “He went out on a limb, there’s no question about that,” Ternberg says. “I felt I could not fail to make it.”

In her education and career, Ternberg went on to record many other firsts at Washington University School of Medicine — she was the first woman chief resident, first woman surgeon on the faculty, and first woman to head the faculty council.

Ternberg is pleased that the Department of Surgery — under the leadership
of Eberlein — strongly supports the recruitment and promotion of women surgeons. She also praises the efforts of Brad W. Warner, MD, Apolline Blair Professor of Surgery and chief of Pediatric Surgery, to expand the clinical, research and educational scope of the division.

“I’ve been very happily impressed with Dr. Warner,” she says. “He’s doing a great job, and I think it’s going to help to have another professorship available.”

THE LAB OF WILLIAM HAWKINS, MD, assistant professor in the Section of Hepatobiliary-Pancreatic and Gastrointestinal Surgery, recently benefited from a generous donation by the Doug Phillips family.

The late Doug Phillips was a World War II veteran and successful businessman who helped develop the cable television industry in the United States. He was president of his own company and former secretary-treasurer of the Illinois-Indiana Cable Television Association. Phillips also served on hospital and bank boards and was active in many community organizations.

The Phillips family donation provided seed money for Hawkins’ research into novel therapies for pancreas cancer.

“If you always have to wait for a grant to do research, you can’t do anything very creative,” Hawkins says. “When you have a gift like this, you can go out on a limb and say, ‘Let’s try this.’ With the Phillips family seed money, we were able to establish some important research projects that now hold promise for pancreas cancer patients.”

Unrestricted Gifts to the Department of Surgery

Dr. James T. Adams
Dr. Charles B. Anderson
Dr. Dorothy Andriole
Dr. Gerald Andriole
Dr. Trevor Charles Axford
Mrs. Mary Randolph Ballinger
Dr. Walter F. Ballinger
Mr. Dennis O. Battles
Dr. Martin Bergmann
Dr. Thomas J. Blanke
Dr. Richard V. Bradley
Dr. Elizabeth Brunt
Dr. L. Michael Brunt
Dr. Patrick A. Cleary
Mrs. Brenda Vahle Dribin
Mr. Manuel Fernandez
Mr. Arnold Friedhoffler
Dr. Koichi Fuji
Mr. H. Edward Garrett, Jr.
Mr. Lee E. Hanson
Ms. Laura D. Hataway
Dr. Robert S. Hunt
Dr. Maurice J. Jurkiewicz
Dr. Raymond M. Keltner, Jr.
Mrs. Margaret B. Kentney
Dr. Donna Aiko Kono
Dr. John A. Kreager, Jr.
Dr. Norman H. Leffler
Dr. Harry E. Lichtwardt
Dr. Kaye Reid Lombardo
Dr. Saul A. Mackler
Dr. James E. Miller
Dr. Seymour C. Nash
Dr. George A. Oliver
Dr. Richard P. Parsons
Dr. Paul G. Pin
Dr. Richard A. Prinz
Dr. Malcolm R. Rodger, III
Dr. Marc Rubenstein
Dr. Eliyahu Shemesh
Dr. Mark B. Siegel
Dr. William C. Simon
Dr. William Grant Stevens
Dr. Herbert Sunshine
Dr. Jessie L. Temberg
Dr. John Cecil Vander Woude
Dr. Daniel Weisz

Named Professorships in the Department of Surgery

Apolline Blair Endowed Professor of Surgery Brad W. Warner, MD
Bixby Professor of Surgery Timothy J. Eberlein, MD

Eugene M. Bricker Professor of Surgery
Gregorio A. Sicard, MD
Evarts A. Graham Professor of Surgery
G. Alexander Patterson, MD
Jacqueline G. and William E. Maritz Professor of Surgery
Thalachallour Mahanakumar, PhD
Harry Edison Professor of Surgery
Timothy G. Buchman, PhD, MD
John M. Shoenberg Professor of Surgery
Ralph J. Damiano Jr., MD

Joseph Bancroft Professor of Surgery
Marc R. Moon, MD
Joseph B. Kimbrough Chair
Alex A. Kane, MD *
Niess-Gain Professor in the School of Medicine
Graham A. Colditz, MD, DrPH
Patrick and Joy Williamson Professor of Surgery
Bryan F. Meyers, MD, MPH *
Prueitt Professor of Surgery
Steven M. Strasberg, MD

Solon & Bettie Gershman Professor of Surgery
Ira J. Kodner, MD
Sydney M. Shoenberg, Jr. and Robert H. Shoenberg Professor of Surgery
Susan E. Mackinnon, MD
William G. Hamm Professor of Surgery
Keith E. Brandt, MD

*Inaugural holders
Division of Pediatric Surgery
Brad W. Warner, MD, Chief
Apolline Blair Endowed Professor of Surgery
Surgeon-in-Chief, St. Louis Children's Hospital
Patrick A. Dillon, MD
Martin S. Keller, MD
Associate Professors of Surgery
Jacqueline Saito, MD FY09
Assistant Professor of Surgery

Division of Plastic and Reconstructive Surgery
Susan E. Mackinnon, MD, Chief
Sydney M. Shoenberg, Jr. and Robert H. Shoenberg Professor of Surgery
Keith E. Brandt, MD
William G. Hamm Professor of Surgery
Donald V. Huebener, DDS, MS, MAEd
Professor of Surgery
Alex A. Kane, MD
Joseph B. Kimbrough Chair
Associate Professor of Surgery
Thomas H. Tung, MD
Associate Professor of Surgery
Gregory H. Borschel, MD
Ida K. Fox, MD
Terence M. Myckatyn, MD
Douglas M. Sammer, MD FY09
Marissa Tenenbaum, MD FY09
Albert S. Woo, MD
Assistant Professors of Surgery

Division of Urology
Gerald L. Andriole Jr., MD, Chief
Carl G. Klutke, MD
Professors of Surgery
Paul F. Austin, MD
Steven Brandes, MD
Arnold D. Bullock, MD
Douglas E. Coplen, MD
Robert S. Figenshau, MD
M’Liss Hudson, MD
Adam S. Kibel, MD
Associate Professors of Surgery
Sam B. Bhayani, MD
Robert L. Grubb III, MD
H. Henry Lai, MD
Vijaya M. Vemulakonda, MD, JD FY09
Ramakrishna Venkatesh, MD
Assistant Professors of Surgery

Full-Time Research Faculty
Division of Cardiothoracic Surgery
John P. Boineau, MD
Professor of Surgery
Richard B. Schuessler, PhD
Research Professor of Surgery
Brian P. Cupps, PhD
Research Assistant Professor of Surgery
Andrew Gelman, PhD
Assistant Professor of Surgery

Division of Urologic Surgery
Jeffrey M. Arbeit, MD
Professor of Surgery

Division of General Surgery
Graham A. Colditz, MD, DrPH
Niess-Gain Family Professor in Medicine
Associate Director, Prevention and Control
Siteman Cancer Center
Thalachallour Mohanakumar, PhD
Jacqueline G. and William E. Maritz
Professor of Surgery
Paul Goodfellow, PhD
Ming You, MD, PhD
Professors of Surgery
Ross Brownson, PhD FY09
Professor of Surgery and
Professor, George Warren Brown
School of Social Work

Division of Pediatric Surgery
Christopher R. Erwin, PhD
Research Associate Professor of Surgery
Jun Guo, PhD
Research Assistant Professor of Surgery

Division of Urologic Surgery
Jeffrey M. Arbeit, MD
Professor of Surgery
A person familiar to everyone in the Department of Surgery received the highest form of staff recognition from Washington University School of Medicine in June 2008. Tina Grubbs, office coordinator and assistant to Executive Director Jamie Sauerburger, was given the Dean’s Distinguished Service Award for her dedication, efforts to create a positive working environment, and the many occasions on which she went beyond what was required of her. “Tina is one of the most dedicated and committed individuals that we have here at Washington University,” says Sauerburger. “She is proud of where she works and proves every day that she is the front door to helping others understand what a great place this is in which we work and how fortunate we are to be here.” In addition to her many responsibilities with the Department of Surgery, Grubbs finds time to actively volunteer in many community organizations.
Welcome, New Faculty

A group of highly qualified surgeons and research scientists joined the Department of Surgery during the 2008 academic year:

(front row, l-r) Kathleen Raman, MD, assistant professor of surgery, Vascular Surgery; Yan Lu, PhD, research assistant professor of surgery, Oncology; Anne Lin, MD, assistant professor of surgery, Colon and Rectal Surgery; Ida Fox, MD, assistant professor of surgery, Plastic and Reconstructive Surgery; M’Liss Hudson, MD, associate professor of surgery, Urologic Surgery;

(center row, l-r) I-wen Wang, MD, PhD, assistant professor of surgery, Cardiothoracic Surgery; Majella Doyle, MD, assistant professor of surgery, Transplant Surgery; Chris Erwin, PhD, research associate professor of surgery, Pediatric Surgery; H. Henry Lai, MD, assistant professor of surgery, Urologic Surgery; Jun Guo, PhD, research assistant professor of surgery, Pediatric Surgery; Martin Keller, MD, associate professor of surgery, Pediatric Surgery;

(back row, l-r) John Green, MD, assistant professor of surgery, Acute and Critical Care Surgery; Aimee James, PhD, assistant professor of surgery, Oncology; Jay Tichelaar, PhD, research assistant professor of surgery, Oncology; Siobhan Sutcliffe, PhD, assistant professor of surgery, Oncology; and Alexander Krupnick, MD, assistant professor of surgery, Cardiothoracic Surgery.