Continuum

Achieving Broad-Based Excellence

Department of Surgery Annual Report 2012
The Successful Academic Department of Surgery of the Future will be built on the tradition and values of the past, but will plan for the future. This idea summarizes my presidential address to the American Surgical Association in April 2012, and I drew from our own department’s experience as an example of how such a model can work.

Past leaders in the medical school and our Department of Surgery laid a strong foundation. The vision of Robert Brookings, president of the Washington University Board of Trustees, led to a modernized medical school with a full-time faculty model. One of the school’s first full-time leaders was Evarts Graham, MD, Bixby Professor and chairman of the Department of Surgery, a surgeon-scientist who helped develop the oral cholecystogram and performed the first successful single-stage total pneumonectomy. Later in this report, there is a profile of the past leaders of the department and their exceptional record of contributions to surgery.

In recent years, our department has continued to evolve and innovate in response to outside forces such as declining clinical reimbursement, increased competition for peer-reviewed funding, and higher levels of professional and personal stress. To address these realities, six years ago, we created a program to first examine the viewpoints of our faculty and then create a more supportive environment, and enhance and formally train our leadership. More recently, we began workgroups on surgical quality and effectiveness, clinical quality of care, and innovations in surgical education.

In this report, you will see surgeon-scientists continuing in the tradition of their predecessors, yet adapting to the new realities of the research environment; surgeons participating in multidisciplinary centers and engaging in well-controlled clinical trials, quality and outcomes initiatives; and educators creating new paradigms for surgical education through early specialization and the academy model, which moves away from learning by osmosis.

Mark Twain once said, “Plan for the future, because that is where you are going to spend the rest of your life.” Our faculty has heeded this advice by embracing change, building on the past and focusing on the future.

Timothy Eberlein, MD
William K. Bixby Professor of Surgery
Chairman, Department of Surgery
Director, Alvin J. Siteman Cancer Center
The Department of Surgery at Washington University School of Medicine is fortunate to have a rich history of success on which to build. As it moves forward to meet the challenges of the current academic health care environment, the department draws upon its historic strengths in collaboration and research to foster excellence in research, education and patient care across all surgical subspecialties.

The department’s comprehensive research efforts range from conducting basic science to leading major national multicenter clinical trials to engaging in public health, quality improvement and patient safety research. An interdisciplinary approach to investigation allows the department’s physician-scientists to address increasingly complex issues more effectively than would otherwise be possible and to more quickly translate findings into clinical solutions.

Building on the success of the past, the department offers comprehensive clinical care in every surgical subspecialty; it aims to increase its impact regionally and nationally through geographic expansion and emphasis on interdisciplinary, team-based care. In education, department faculty are leading the development of innovative, efficient approaches to surgical training.

Its collective strengths in all three missions create a synergistic momentum that positions the department to meet the challenges ahead as it continues working to improve human health.
THE DEPARTMENT OF SURGERY historically has been a leader in clinical innovations, research and graduate medical education and is positioned to remain an influential force in academic surgery in the critical years ahead.

The medical field was changing when the department was established, just as it is today. Frederick Murphy, MD, recruited from Harvard, was the first surgeon-in-chief and performed Barnes Hospital’s first operation (an appendectomy) in 1914. But when Washington University President Robert S. Brookings created a full-time faculty model for the medical school, Murphy did not agree and abruptly resigned. With the help of Brookings, the medical school engaged philanthropist William Bixby, who helped endow a full-time chair of surgery, and Evarts Graham, MD, was selected as the first William K. Bixby Professor and chair. Another benefactor, Mary Culver, endowed the department, which is today known as the Mary Culver Department of Surgery.

Graham is known for the development of the oral cholecystogram, performing the first single-stage total pneumonectomy in which the patient survived, and research linking cigarette smoking to lung cancer. The chairs who have followed — Carl Moyer, MD; Walter Ballinger, MD; Samuel Wells Jr., MD, and Timothy Eberlein, MD — have also made important
contributions: in medical and surgical treatment, research and/or shaping graduate medical education. All have been leaders in their field with Graham, Wells and Eberlein serving as presidents of the American Surgical Association. Many other Washington University surgeons, including Eugene Bricker, MD, who developed the ileal conduit for urinary diversion and was president of the American Surgical Association, also have helped shape the field of surgery.

Today, academic departments of surgery face many challenges to their historic missions. These include lower reimbursement, threats from other disciplines, increased competition for peer-reviewed funding, and a dramatic increase in monitoring and oversight. At Washington University, the Department of Surgery is exploring key opportunities to remain at the leading edge of academic surgery.

Clinical Innovation, Collaboration and Prevention

In 1933, James Gilmore, a Pittsburgh obstetrician, was admitted to the chest clinic at Barnes Hospital with a suspected lung abscess and a collapsed lung. Doctors diagnosed squamous cell carcinoma, and Graham performed the first successful removal of an entire lung. Gilmore led a long life, and for more than 20 years after the operation, Gilmore and Graham corresponded with and visited each other.

The introduction of new treatments — including the use of silver nitrate solution to treat acute burns, made possible by Moyer’s research, and the development of the Cox-Maze procedure to treat atrial fibrillation — continues to benefit patients in the current era. Recently, Washington University has been a leading enroller for two PARTNER (Placement of AoRTic traNscathetER) Trials, investigating the placement of an aortic valve using a catheter in inoperable and high-risk patients with aortic stenosis. Cardiac surgeons have worked together with cardiologists in these trials.

Many other treatment advances have also come from collaborative efforts. This integrated approach, pioneered by Bricker and embraced by Ballinger and Wells, can be seen today in the Washington University and Barnes-Jewish Heart & Vascular Center, which incorporates cardiology, cardiac surgery and vascular surgery; and the Washington University and Barnes-Jewish Transplant Center, with specialists in surgery and medicine. Eberlein also uses this model.
Points of Distinction

- **Performed first successful surgical removal of a lung** 
  (Evarts Graham, 1933)

- **Developed Maze procedure, the first surgical cure for atrial fibrillation** 
  (James Cox, John Boineau, Richard Schuessler, 1987)

- **Performed first nerve transplant using nerve tissue from a cadaver donor** 
  (Susan Mackinnon, 1988)

Research

Department of Surgery chairs have carried on a strong tradition as scientists wanting to solve practical problems. Graham performed important work in gallbladder imaging and smoking, and Moyer in the study of silver nitrate for burns; in addition, Ballinger was well regarded for his studies in the pathophysiology of gastrointestinal diseases such as ulcers. The work of Wells in identifying the gene responsible for the MEN syndromes — which result in thyroid cancer — led to the first surgical prevention of cancer based on genetic testing. And Eberlein, a surgical oncologist, has helped to establish Siteman as an international leader in clinical trials, basic science and translational research, including work with Washington University’s Genome Institute to sequence the first cancer genome.

In recent years, collaboration — among surgical faculty and with scientists in other departments — has led to a critical mass in a number of groundbreaking projects. These include development of the first mouse model of lung transplantation to help understand the molecular mechanisms that control lung transplant rejection; the study of ATP channel heart muscle cell contractility and the potential use of a drug to lessen the impact of myocardial stunning; and the work of several faculty members with a world-renowned biomedical engineer in the development of photoacoustic imaging to screen for precancerous tissue in patients with Barrett’s esophagus, to identify the sentinel lymph node in breast cancer patients, and to identify single-cell melanoma tumor cells in planning a wide excision for melanoma.

Education

Graham was an early leader in surgical residency education who stressed the importance of the basic sciences in the
training of surgeons and believed that the study of general surgery should constitute a large share of the time spent in preparing for a career in a surgical specialty.

Moyer was best known as a wonderful teacher who took great interest in his students and was a superb role model. He also had a strong social conscience and supported the education of African-American physicians at the Homer G. Phillips City Hospital, one of only three institutions at the time where this type of training occurred. Wells took surgical training a step further, transitioning the department to a completely full-time model for faculty.

For most of the 20th century, the motto of general surgery residency training was “see one, do one, teach one,” and residents spent long hours in surgical training. As these trends began to change at the millennium, former General Surgery Residency Program Director Mary Klingensmith, MD, led the adoption of duty-hour restrictions and was one of the first to introduce a surgical skills lab. Klingensmith now serves as vice chair of education and leads efforts to look at early specialization in all subspecialty fellowships. Michael Awad, MD, the newly appointed general surgery residency program director, is overseeing design of a residency web portal and migration to an academy model in which general surgery residents discuss goals with a faculty member, receive feedback and undergo a formal assessment. Both Eberlein and Klingensmith are leading a national initiative to create a new model of more efficient and effective surgery training.

Trauma fellows and general surgery residents benefit from the involvement of Douglas Schuerer, MD, in national patient safety initiatives. Schuerer, second from left, is director of the Surgical Critical Care Fellowship.
Division of Public Health Sciences

**Highlights**

- Washington University researchers reported that more than half of all cancer is preventable in a review article in *Science Translational Medicine*. **Graham Colditz, MD, DrPH,** and co-authors found that lifestyle choices play a significant role in causing cancer, with smoking alone responsible for a third of all U.S. cases and excess body weight accounting for another 20 percent.

- **Kimberly Kaphingst, ScD,** is collaborating with **Jennifer Ivanovich, MS,** and researcher **Paul Goodfellow, PhD,** in a proposed study to examine how to communicate genome sequencing results to young breast cancer patients.

- A grant from the Centers for Disease Control and Prevention enables the Young Women’s Breast Cancer Program (YWBCP) to provide support and education services for women 45 and younger diagnosed with breast cancer. Program director **Jennifer Ivanovich, MS,** is principal investigator. The YWBCP is also developing a genetics navigation tool to help young survivors understand their family-based cancer, learn about new developments in genetic testing and prepare them for the next wave of clinical genetic testing, specifically gene panels and whole exome sequencing.

- **Bettina Drake, PhD, MPH,** extended her community-based research on minority recruitment into clinical studies to include the participation of African-American men in pancreas cancer trials. African-American men have a higher incidence of pancreas cancer but less involvement in studies than whites.

- Public health researchers created a health app called Zuum, which provides risk estimates for heart disease, stroke, diabetes, lung cancer and colon cancer, breast cancer and prostate cancer. The tool, available on iTunes, also explains how to lower risk and to see the impact of positive changes on future risk.

- **Instructor Su-Hsin Chang, PhD,** is working with bariatric surgeon Esteban Varela, MD, MPH, to study the cost-effectiveness of various forms of weight-loss surgery.

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Master’s degree program: SHARPENING RESEARCH SKILLS

As a student in the Master of Population Health Sciences program, Lola Fayanju, MD, MPH, left, worked with MPH instructor Aimee James, PhD, MPH, to hone her skills in studying breast cancer care disparities.
Oluwadamilola “Lola” Fayanju, MD, MPHS, and breast surgeon Julie Margenthaler, MD, Washington University breast surgeon at Barnes-Jewish Hospital, met when Fayanju was a third-year medical student and Margenthaler was a breast disease fellow at Washington University. Working at a ConnectCare clinic for low-income patients, Margenthaler had already observed that a high percentage of women with breast cancer were first being seen in the late stages of the disease. And Fayanju had been struck by treatment disparities on a number of rotations she had served.

“I had seen striking, systematic differences among patients with different socioeconomic status,” Fayanju says.

The next year, Fayanju chose to do a research elective with Margenthaler, who had joined the faculty as a breast surgeon. With a grant from the Program for the Elimination of Cancer Disparities at the Alvin J. Siteman Cancer Center at Barnes-Jewish Hospital and Washington University School of Medicine, the two launched a research project to interview women about their health history prior to their diagnosis with breast cancer. Fayanju continued the project as a resident through her first residency research year, which she used to complete the MPHS degree in 2011.

“I used the skills I acquired in the MPHS program to do justice to the data,” says Fayanju. “It’s notable that women are actually getting mammograms at a fairly high rate. But there are other points along the time line of care at which to intervene and improve outcomes.”

Graham Colditz, MD, DrPh, chief of the Division of Public Health Sciences and the Niess-Gain Professor in the School of Medicine, says Margenthaler, in her work with Fayanju and another surgery resident who entered the MPHS program this year, is helping the next generation of breast surgeons focus on the causes of and solutions for disparities in breast cancer treatment.

Fayanju will take this perspective with her. “It’s a lifelong commitment,” she says.
Division of General Surgery
Section of Acute and Critical Care Surgery

**Highlights**

- The Washington University and Barnes-Jewish Trauma Center recently received Level I designation from the State of Illinois. The program is now designated as a Level I trauma center in both Missouri and Illinois, and was also re-verified by the American College of Surgeons (ACS) as a Level I trauma center. The ACS designation is considered a gold standard for trauma centers. Barnes-Jewish cares for approximately 14,500 trauma patients a year.

- The Surgical and Wound Care Clinic moved into the new Barnes-Jewish Center for Outpatient Health, which provides upgraded facilities for patients and physicians. Formerly located on the first floor of Barnes-Jewish Hospital, the clinic treats acute care surgery patients and many other patients with wounds. Among its new services is hyperbaric oxygen therapy, used to treat wounds that won’t heal as a result of diabetes or radiation injury.

- The Section of Acute and Critical Care Surgery welcomes Robert Winfield, MD, as an assistant professor. He joins the section after completing a fellowship in trauma surgery and critical care at the University of California-San Diego and a surgical residency at the University of Florida in Gainesville. Winfield’s practice includes a full range of critical care, trauma surgery and acute care surgery.

- Douglas Schuerer, MD, Barnes-Jewish Hospital director of trauma, has been elected chair of the East Central Region Emergency Medical Services (EMS) Committee. As a subcommittee of the state advisory council of the Missouri Department of Health and Senior Services, the committee serves as a liaison to the regional emergency medical services and hospital community.

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Husband-and-wife team Grant Bochicchio, MD, MPH, right, and senior research administrator Kelly Bochicchio, RN, MS, evaluates the diabetes drug glyburide for its potential to prevent secondary brain injury resulting from trauma.
THE IMPACT of improvised explosive devices (IEDs) and other blast injuries has been devastating for American soldiers in Iraq and Afghanistan. Many times, when there is trauma to the head, it is not the initial blast that kills the soldier; rather, he or she dies from secondary effects to the brain. This has prompted Grant Bochicchio, MD, MPH, chief of the Section of Acute and Critical Care Surgery, to study the sequelae of traumatic brain injury and has led to a clinical trial testing the safety of a promising drug that may diminish the effects of traumatic brain injury.

“First, you have the initial trauma — the contusion from the event itself,” says Bochicchio, also the Harry Edison Professor of Surgery. “However, over the next 24 to 48 hours, you have swelling that occurs, which is really what causes death in a lot of patients or soldiers. And in those who do survive, it can cause permanent and debilitating brain damage.”

Bochicchio is the co-principal investigator of a Department of Defense grant evaluating the impact of glyburide, a medication originally used to treat diabetes that blocks the SUR1 ion channel in the brain. This medication has been shown to prevent secondary brain injury in animal studies performed by Marc Simard, MD, PhD, and Bochicchio. As the basic science research continues in animals, a human trial will soon begin to study whether this drug can be given safely to healthy adults who are undergoing physical exercise to simulate the characteristic activities of soldiers in the military. Bochicchio will serve as principal investigator of this randomized trial, which will recruit healthy, non-diabetic volunteers to exercise on a treadmill three times a day under careful medical supervision to guard against any potential side effects.

“Results of this important work may also be applicable to brain injury in the civilian world,” says Bochicchio. “If patients are in a bad car crash, we hope someday to give this medication in order to prevent secondary brain injury and potentially save lives.”

The clinical trial complements the efforts of Washington University plastic and reconstructive surgeons, who have created a website showing surgeons how nerve transfer techniques can be used to restore function in the limbs of soldiers injured in explosions and combat.

“We hope someday to give this medication in order to prevent secondary brain injury and potentially save lives.”

Grant Bochicchio, MD, MPH
IN THE 1970s, the Washington University colon and rectal surgery service became one of the earliest to offer radiation therapy in combination with surgery to treat rectal cancer. Operative treatment has since evolved, improving patients’ quality of life, and stands at the threshold of several new frontiers.

“In the earliest days, if you had cancer in the lower part of the rectum, you ended up with a colostomy bag — because the technology didn’t allow us to take out very small tumors without using this option,” says Steven Hunt, MD, Washington University colorectal surgeon at Barnes-Jewish Hospital. “We’ve come a long way in avoiding these types of resection.”

Although open surgery has improved to preserve bowel function in many cases, the use of a minimally invasive technique — transanal endoscopic microsurgical (TEM) excision — is further transforming rectal cancer surgery. During this procedure, a 20-cm-long proctoscope placed through the anus allows surgeons to visualize and resect tumors without removing the rectum and without an abdominal incision.

“We began using the TEM procedure for polyps in 2006,” says Hunt. “In the early stages, we only used the procedure in rectal cancer patients who we did not think would survive a large abdominal operation.”

But when the medical literature showed TEM alone could be curative for early-stage rectal cancer, Hunt began offering it. And now that studies show TEM with chemoradiation may be effective for some advanced rectal cancers, its use may be expanded in coming years.

TEM is not the only advancement in rectal cancer treatment at Alvin J. Siteman Cancer Center at Barnes-Jewish Hospital and Washington University School of Medicine. Radiation oncologist Parag Parikh, MD, is now working with colorectal surgeons to offer patients a one-week radiation course, followed by early chemotherapy, before surgery. This compares to a traditional regimen of about three months before surgery, which may allow some cancers to spread to the liver and other organs.
Steven Hunt, MD, performs a transanal endoscopic microsurgical (TEM) excision. The minimally invasive tumor removal technique preserves function and is one of many advances improving quality of life for rectal cancer patients. A new technology called gene expression profiling may also shape the future of treatment. Washington University colorectal surgeon Matthew Mutch, MD, is collaborating with Matthew Kalady, MD, of the Cleveland Clinic to see whether the technique can identify who will benefit from radiation and chemotherapy, and what regimen to use. “If we can accomplish that, we will develop a therapeutic trial,” Mutch says.

Healthy Retirement

Richard Stallard, 71, of Granite City, Ill., is back to riding his trike motorcycle, fishing and spending retirement with his wife, Letha Nell, after successful treatment of appendiceal cancer that had spread to his abdomen. In April 2010, Section Chief James Fleshman Jr., MD, operated to remove Stallard’s appendix, colon and rectum and enrolled him in a trial at Siteman Cancer Center to treat carcinomatosis of the abdomen. The trial combined the current standard of care – debulking the cancer, stripping the lining of the abdominal cavity and chemotherapy – with surgical insertion of catheters into both sides of the abdomen. Chemotherapy was administered intravenously and via the catheters. Stallard did not receive the full course of catheter treatment because of pain but responded well overall. When tests showed there was no return of the cancer, Fleshman removed the catheters, created a new rectum out of small intestine, and created a diverting ileostomy. Three months later, the ileostomy was closed to restore normal bowel function. Today, Stallard is cancer free and enjoying retirement once again.
Highlights

- Julie Margenthaler, MD, has been named surgical director of the Joanne Knight Breast Health Center in the Center for Advanced Medicine. At the center in 2011, Margenthaler and colleagues evaluated and treated roughly 560 new breast cancer patients and more than 1,500 new patients with other breast disorders. As surgical director, Margenthaler organizes the surgical services for breast patients, including clinical, research, patient education and training components. She also serves as the liaison between the surgical services and other sections.

- A randomized study led by Rebecca Aft, MD, PhD, found that zoledronic acid (Zometa®) administered with chemotherapy improves disease-free and overall survival in the subset of patients with estrogen receptor-negative stage II and III breast cancer. Findings will appear in the British Journal of Cancer.

- A clinical trial is under way to test whether photoacoustic tomography is effective in finding the sentinel lymph node in breast cancer patients. The new technology couples ultrasound and a laser system to identify the sentinel node. Julie Margenthaler, MD, collaborated with Lihong Wang, PhD, the Gene K. Beare Distinguished Professor of Biomedical Engineering, to develop the technology.

- Rebecca Aft, MD, PhD, and medical oncologist Cynthia Ma, MD, PhD, will open a randomized clinical trial evaluating the effect of a potential anti-cancer drug called hedgehog inhibitor LDE225 on bone marrow-disseminated tumor cells in women with early stage estrogen receptor-negative and HER2-negative breast cancer. LDE225 is known to be a potent inhibitor of the Hh signaling pathway, which has been implicated in the development and maintenance of breast cancer.
“Government efforts to tie reimbursement for Medicare and Medicaid to quality issues have come to the forefront in the past seven to eight years,” says Hall. “I would say it’s a sea change.”

Barnes-Jewish Hospital was one of the original 14 hospitals participating in ACS NSQIP®, which began in 2001 and now includes roughly 500 hospitals. As the hospital’s surgeon champion for the program, Hall is working with surgical leaders and hospital administrators to address specific concerns, such as surgical site and urinary tract infections. As the hospital’s surgeon champion for the program, Hall is working with surgical leaders and hospital administrators to address specific concerns, such as surgical site and urinary tract infections. As the hospital’s surgeon champion for the program, Hall is working with surgical leaders and hospital administrators to address specific concerns, such as surgical site and urinary tract infections. As the hospital’s surgeon champion for the program, Hall is working with surgical leaders and hospital administrators to address specific concerns, such as surgical site and urinary tract infections.

“The goal is to establish a BJC-wide surgical collaborative, so surgical care across all institutions will become better, as well as more consistent and standardized,” Hall says.

Hall also serves as a liaison to both the National Quality Forum (NQF) and the Centers for Disease Control (CDC).

Data collection for ACS NSQIP® at Barnes-Jewish, which began with general and vascular surgery, has been expanded to include all specialties within the Department of Surgery. In addition, the department has launched a Clinical Effectiveness Group to develop quality improvement initiatives.
Pancreatic cancer: IMPROVING OUTCOMES

Ryan Fields, MD, has received the American Surgical Association Research Foundation Fellowship Award to compare the genetic differences between primary and metastatic colorectal cancers in individual patients. The ultimate goal is to determine mechanisms of metastasis with the hope of using genetic information to improve and guide treatments. Fields is also collaborating with David Curiel, MD, PhD, director of the Biologic Therapy Core and an expert in gene therapy, and has received a grant from the Siteman Cancer Center to treat patients with advanced extremity melanoma with a novel viral gene therapy/isolated limb infusion approach.

William Hawkins, MD, received an R01 grant from the National Institutes of Health (NIH) to study a novel treatment for pancreas cancer using sigma-2 receptors, which are over-expressed in proliferating cancer cells. He has developed and will be testing several novel drugs where a ligand of the sigma-2 receptor is utilized to target and kill pancreas cancer cells.

Steven Strasberg, MD, is principal investigator of the Drug Eluting Bead, Irinotecan (DEBIRI) Trial at Siteman Cancer Center. The treatment is for liver cancer that has metastasized from colon cancer. The beads are given directly to the liver tumor through interventional radiology techniques to shrink the tumor for surgical removal.

Three Washington University teams received a $400,000 grant from the Foundation for Barnes-Jewish Hospital to study mechanisms of chemotherapy resistance in pancreas cancer. David Linehan, MD, is leading the grant, with David DeNardo, PhD, of the Molecular Oncology Section of the Department of Pathology and Immunology.
INCREDIBLE PROGRESS has been made in the safety of operations for pancreatic cancer over the past 70 years. Washington University hepatobiliary-pancreatic and GI (HPB-GI) surgeons have contributed to this advancement — especially in the area of reducing complications — and continue to look at ways to improve operative outcomes and patient survival.

Most pancreatic cancers are adenocarcinomas — aggressive tumors that appear in the head of the pancreas and spread to other organs. In the 1930s, surgeon Allen Whipple modified the pancreate-duodenectomy procedure for pancreatic cancer, in which the head of the pancreas, the gallbladder, portions of the stomach and small intestine, and the bile duct are removed. In 1945, when Whipple converted the operation from a two- to a one-stage procedure, patient mortality was 31 percent. Today, the Whipple procedure — the definitive operation for cancer of the head of the pancreas — is considered very safe at Washington University and other major treatment centers.

“Two main things have improved the mortality rate for the Whipple procedure,” says Steven Strasberg, MD, HPB-GI surgeon at Barnes-Jewish Hospital. “The first is a better overall understanding of patient selection, operative care, anesthesia, post-operative care and the general health of patients. The other factor is a better understanding of how to perform the procedure safely.”

Since 1990, major improvements have occurred in the rate of postoperative fistulas, or leaks — complications that cause sickness in patients. In 2002, Washington University HPB-GI surgeons reported on a new technique that resulted in a fistula rate of just 1.5 percent, the lowest reported in any large surgical series. In August 2011, these surgeons and Barnes-Jewish Hospital nurses implemented an intensive postoperative plan in which every negative event after surgery is recorded. The result was only two higher-level complications and no deaths in the first 75 patients.

Washington University HPB-GI surgeons, led by William Hawkins, MD, also recently reported on the use of mesh to reduce leakage in a procedure for adenocarcinoma of the pancreas body and tail.

These improvements are incremental steps as doctors seek to improve a five-year survival rate of just six percent for all pancreatic cancers. Section Chief David Linehan, MD, says surgeons have begun to perform pancreatic resections laparoscopically, further reducing morbidity.

“Washington University is a leader in multi-modality cancer therapy,” says Linehan.

Steven Strasberg, MD, right, receives an international lifetime achievement award.

Strasberg Receives International Award

Steven Strasberg, MD, the Pruett Professor of Surgery and Carl Moyer Departmental Teaching Coordinator, has received the Lifetime Achievement Award/Gold Medallion of the International Hepato-Pancreato-Biliary Association (IHPBA) for his numerous contributions to the field of HPB surgery.

Strasberg received the award at the 10th World Congress of the IHPBA, held in Paris on July 1-5. A number of other faculty members from the sections of HPB-GI Surgery and Transplant Surgery also attended the meeting.

A leading academic surgeon, Strasberg is the author of nearly 250 peer-reviewed journal articles, some of which are among the most highly cited in the HPB field; has given 120 invited talks around the world; is a current or former member of the executive committees of several national and international organizations, including the IHPBA; and is a past president of the American Hepato-Pancreato-Biliary Association.
A clinical trial will test whether photoacoustic endoscopy is more effective than biopsies in detecting precancerous tissue in patients with Barrett’s esophagus. Brent Matthews, MD, will conduct the trial. Collaborator Lihong Wang, PhD, the Gene K. Beare Distinguished Professor of Biomedical Engineering invented photoacoustic endoscopy, which applies photoacoustic tomography by way of an endoscope.

Brent Matthews, MD, was elected treasurer and secretary of the American Hernia Society, which serves as a professional forum for the exchange of information about the diagnosis and treatment of abdominal wall abnormalities. Matthews will become president-elect of the organization in March 2013.

The biomaterials lab of Corey Deeken, PhD, is developing a synthetic mesh for hernia repair. The mesh is made of poly-caprolactone, a material that will trigger a biologic response in the body to aid soft tissue repair. Deeken and Matthew MacEwan, an MD/PhD student, received a Bear Cub grant from Washington University to develop the mesh. Deeken has spent two years analyzing specifications of FDA-approved meshes; the ultimate goal is to develop a commercially available mesh.

Michael Awad, MD, PhD, was named program director of the Washington University General Surgery Residency (see page 37) and elected to represent the Association of Program Directors in Surgery to the Society of American Gastrointestinal and Endoscopic Surgeons (SAGES). Education is a core mission of SAGES, a worldwide community of surgeons that promotes minimal-access surgery, endoscopy and other emerging techniques.
Although sports hernias, also called athletic pubalgia, can occur in recreational athletes, they are more common among professional and college athletes. The condition differs from a true hernia in that there is no hole in the abdominal wall, but rather a weakening. It can be repaired in an open procedure.

MICHAEL BRUNT, MD, is a familiar face to many Midwestern professional and collegiate athletes who have suffered what are commonly known as sports hernias. In many cases, these injuries could be career-limiting, but with proper treatment and rehabilitation, the athlete can return to the field or the rink at full strength.

“Hockey, soccer and football are the three most common sports for these types of injuries,” says Brunt. “It’s probably related to the sudden accelerating movements, the change of direction that’s required in those particular sports. It’s less common in baseball and basketball, but can be seen in almost any sport.”

The sports hernia, more accurately called an athletic pubalgia, occurs when there is chronic exertional lower abdominal or inguinal pain that affects an athlete’s ability to perform at a high level. It is not a true hernia, in the sense that there is not a hernia bulge, but there is a weakening and deterioration of tissue in the inguinal floor or a tear in the rectus sheath where it attaches onto the pubic bone.

Brunt began offering surgical treatment for these injuries in the early 1990s and has been the St. Louis Blues team general surgeon for 18 years. Over the past 10 years, referrals have increased substantially, and he estimates only two or three other centers in the United States have a similar case volume.

Surgeons who treat athletic pubalgia must understand other injuries in the hip and pelvis and be able to rule them out. When Brunt diagnoses a pubalgia and surgery is indicated, he usually performs an inguinal floor repair using tension-free mesh as an open procedure. Brunt works with a multidisciplinary team including sports orthopedists, athletic trainers, physical therapists and radiologists.

Most groin injuries respond to rest and more conservative management. But, Brunt says, trials support the use of surgery over non-operative management for athletes with chronic groin pain in whom other causes have been excluded.

“The biggest opportunity for improving treatment of athletic pubalgia may be prevention,” says Brunt. “Athletes do a lot of weight training. They get out of balance between their lower body, thigh muscles and abdomen, and this creates an imbalance across the pubis. Better recognition of some of the risk factors in training could help prevent this.”

“Back on Track”

Rick Barnes, DO, 48, an ENT surgeon, is typical of the patients seen by surgeon Michael Brunt, MD, for sports injuries. A former runner at the University of Mississippi, Barnes continues to run competitively and compete in triathlons and raced in a stage of the Tour de France in the summer of 2010.

But it was a backwards flip and spill down a Black Diamond hill while snow skiing that tore his rectus abdominis muscle and led Barnes to seek out Brunt. After the accident, it was very painful to run, and Brunt operated on Barnes’ athletic pubalgia in July 2011.

Barnes was back to racing competitively three months later and did not feel limited less than a year after the surgery.
Cross training promotes
BROADER PERSPECTIVE

Highlights

- Yiing Lin, MD, PhD, joined the faculty after completing a general surgery residency and transplant surgery fellowship at Washington University. Lin will focus his research on the genetics of hepatocellular carcinoma. He will be involved in all areas of abdominal transplantation.

- Providing vascular access for kidney dialysis — and the high failure rate of arteriovenous fistulas, which are created surgically to connect a vein and an artery to increase blood flow — is a major cost and health care issue. Juxta-anastomotic stenosis (JAS), or narrowing of a vein at the connection of the artery to the vein, is a major cause of arteriovenous fistula failure and occurs in up to 65 percent of cases. Surendra Shenoy, MD, PhD, was the senior author of an article in the Journal of Vascular Surgery showing that a novel technique, the piggyback Straight Line Onlay Technique (pSLOT), significantly reduces JAS and improves the maturation of arteriovenous fistulas.

- Transplant surgeons are working with hepatologists Thomas Kerr, MD, PhD, and Jacquelyn Fleckenstein, MD, who recently joined Washington University Physicians, to expand access to liver transplant services to more patients outside the St. Louis region. Jeffrey Crippin, MD, medical director of liver transplantation, already sees patients in Cape Girardeau, Mo.

- Transplant surgery is one of the most active specialties within the Division of General Surgery to offer clinical trials to patients. Transplant surgeons currently offer more than 30 trials, including trials of immunosuppressive drugs, liver cancer therapy, and novel hemostatic techniques during liver surgery to limit blood loss after resection. Washington University is a top enroller in one of the hemostasis trials with more than 40 patients.

Hepatobiliary-pancreatic surgeon Steven Strasberg, MD, mentored former transplant fellow Yiing Lin, MD, PhD, as part of a new cross-training program that gives fellows in both specialties a broader understanding of the other service.
A NEW ARRANGEMENT between two fellowship programs — transplant surgery and hepatobiliary-pancreatic (HPB) surgery — allows trainees to spend a two-month rotation cross training on the other service. The arrangement has broadened trainees’ perspectives and strengthened both programs, according to fellows and program leaders.

The approach makes sense because the two specialties are closely related and treat many similar conditions, especially in the area of liver disease.

“I spent several weeks with each of the HPB surgeons and participated in liver, pancreas and bile duct surgeries,” says Yiing Lin, MD, PhD, who completed the transplant fellowship in June 2012 and has since joined the transplant faculty. “There are some unique aspects to surgery with both groups. For example, with liver transplants, the way transplant surgeons handle and cut through the liver is different than the techniques used by non-transplant hepatobiliary surgeons.”

Lin says he also gained valuable experience in working with cancer patients during all phases of treatment.

“How they deal with issues in their specialty really informs the way I am going to practice in the future,” says Lin.

Kamran Idrees, MD, who completed an HPB fellowship in 2012, helped procure organs from donors with irreversible brain damage at Mid-America Transplant Services in St. Louis and also took part in liver, kidney and pancreas transplants.

Idrees says even the kidney transplants were valuable because they involved sewing blood vessels and creating anastomoses, or connections, between vessels, which is also required during pancreas tumor removal. By participating in transplant conferences, he also developed critical thinking skills that will allow him to assess the appropriate treatment for liver cancer patients, with options such as resection or downstaging the cancer before transplant.

William Chapman, MD, chief of the Section of Transplant Surgery and the Eugene M. Bricker Professor of Surgery, says the Transplant Fellowship is the first in the United States to offer certification by both the American Society of Transplant Surgeons and the American Hepato-Pancreato-Biliary Association. The cross-training has helped make both fellowships highly competitive, which is especially important in the transplant field, where a number of fellowships go unfilled. This is partly because prospective fellows see that the number of openings for transplant surgeons is limited by the scarcity of donor organs.

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In research, he worked with a team of biomedical engineers to develop an image-guidance system for liver surgery that has improved pre-operative imaging and enables surgeons to better track anatomical location of instruments.

The chair was named in honor of Bricker, an internationally renowned surgeon whose career at Washington University spanned more than 35 years.
A clinical trial of a new “off-the-shelf” fenestrated stent graft that could broaden the ability of vascular surgeons to treat patients with complex aneurysms began accepting patients at Washington University in the spring of 2012. Fenestrated stents are designed for patients with aneurysms close to the arteries that feed the kidneys and feature small openings that can be strategically positioned to allow blood to pass into the renal arteries. Currently, only custom-made devices are available in a few referral centers like Barnes-Jewish Hospital.

The section enrolled the first intern of the new Vascular Surgery Residency program in June 2012. The five-year program (known as a 0+5 track) focuses training after medical school exclusively on vascular surgery, endovascular surgery and the management of patients with vascular disease. The residents will learn the necessary skills from general, vascular and critical care surgeons. They will also receive important specific training in radiology and benign hematology, among other areas. The section will maintain a traditional fellowship (5 + 2 track) — two years of specialized training in vascular surgery after a five-year general surgery residency.

Brian Rubin, MD, worked with Barnes-Jewish Hospital to produce a video on peripheral vascular disease, which was used as part of a campaign to raise awareness of the condition and treatment available from Washington University vascular surgeons.

Patrick Geraghty, MD, was elected as secretary of the Midwestern Vascular Surgical Society, which promotes the advancement of diagnosis and treatment of vascular disease and has members in 12 Midwestern states.

Jeffrey Jim, MD, was the lead author of an article in the Journal of Vascular Surgery that addressed the possible future shortage of vascular specialists in the country; he also worked on the Society for Vascular Surgery Fellowship Development Task Force to address this important issue.
RESEARCH BEGUN in the 1990s by Washington University vascular surgeons may lead to the first nonsurgical treatment to control the growth of small aortic aneurysms, if a multicenter clinical trial now under way proves successful.

Work by Robert Thompson, MD, and John Curci, MD, Washington University vascular surgeons at Barnes-Jewish Hospital, showed in mice and humans that the antibiotic doxycycline inhibits an enzyme called matrix metalloproteinase 9 (MMP-9), important in aneurysm formation; further, they found that doxycycline actually suppresses the formation of aortic aneurysms in mice. Doxycycline is now being tested in humans with abdominal aortic aneurysms as part of a National Institute on Aging randomized clinical trial at Washington University and 15 other sites. Thompson is lead investigator of the Washington University trial. Curci is one of the national principal investigators, and his laboratory will perform the blood analyses.

“Patients will receive treatment for at least two years from enrollment,” says Thompson. “Even if doxycycline successfully slows the rate of growth of aneurysms, we’re going to be left with questions about dose, duration of treatment and other variables. Furthermore, if it works, it’s potentially a huge breakthrough in the clinical treatment of aneurysms.”

MMP-9 degrades structural components of the aortic wall such as collagen and elastin, thus contributing to aneurysms. Thompson’s lab started testing doxycycline — a cheap, commonly used drug in the tetracycline class — in rat and mouse models of aneurysm disease; they chose doxycycline because tetracyclines were already known to inhibit MMPs. Curci, then in postgraduate training, helped conduct animal research and a later study showing that even brief treatment with doxycycline reduced the expression and activation of MMP-9 in human aneurysm tissue.

The national trial, called the Non-Invasive Treatment of Abdominal Aortic Aneurysm Clinical Trial (N-TA’CT), will track aneurysm growth through computed tomography scans conducted every six months in patients given either doxycycline or a placebo. Through blood samples, investigators will check levels of doxycycline and analyze blood biomarkers of aneurysm disease.

“There are likely half a million patients in the country at any one time who have these small aneurysms,” says Curci, “Most will eventually grow to rupture or require surgery. If we have something to slow or stop the growth of aneurysms, so they never rupture or need surgical treatment, it revolutionizes aneurysm therapy. They can be screened with an ultrasound and treated with a drug, reducing both risk and cost for the patient.”
the Division of Vascular Surgery and the Gregorio A. Sicard Distinguished Professor of Vascular Surgery, and all of the other vascular surgeons; and cardiologist Alan Braverman, MD, the Alumni Endowed Professor of Cardiovascular Disease in Medicine, all play an active role in evaluating patients. Working with the patient’s primary care physician or cardiologist, the team may recommend surgical intervention, endovascular intervention or a medical approach with blood pressure control and long-term surveillance. Moon surgically treats aortic conditions in the ascending aorta, but works together with vascular surgeons on problems in the descending and thoracoabdominal aorta.

“Patients now present with more complex aneurysms than they did years ago, due in part to our ability to get them through an acute pathological state,” says Moon. “We can offer not only an open approach or endovascular approach, but a combined approach that brings together all the positives that both the thoracic and vascular surgeons can contribute.”

Yet Moon says medical prevention is the most important piece of...
Throughout the department, trainees are taught a highly collaborative and multidisciplinary approach to medicine — an approach that prepares them well as the next generation of leaders in the field. Above, research fellow Shoichi Okada, MD, right, confers with cardiothoracic surgeon Marc Moon, MD.

The puzzle. Hypertension is the most common risk factor for the development of aneurysms and aortic dissections, with the patient’s primary care physician or cardiologist playing an intimate role in controlling this aspect of the disease.

The Center for Diseases of the Thoracic Aorta offers advanced multidisciplinary treatment. Cardiothoracic and vascular surgeons work with primary care physicians to offer surgical or medical interventions and long-term surveillance.

“Our combined approach brings together all the positives that both the thoracic and vascular surgeons can contribute.”

Marc Moon, MD
Lung cancer studies evaluate LONGEVITY, QUALITY OF LIFE

Highlights

- **Traves Crabtree, MD**, was the lead author in a study showing that a patient education process may alleviate the emotional and physical difficulties lung cancer patients face before and after surgery. He and co-authors reported that lung procedure patients who watched a 30-minute preparation video reported less anxiety about the procedure, less physical pain after the operation and higher overall satisfaction with the operative experience. The study, comparing 136 patients who were given the video with 134 patients who received only the standard physician’s consultation and written materials, was published in the *Journal of the American College of Surgeons*.

- **Varun Puri, MD**, is leading a clinical trial in the Prevention of Post-Operative Pneumonia (POPP). In this trial, patients undergoing a major thoracic operation first undergo an intensive oral hygiene regimen to reduce pathogenic bacteria in the mouth and lessen the impact of aspiration that may occur at the time of surgery. Goals are to improve survival and decrease the cost and length of hospitalization.

- **Traves Crabtree, MD**, served as the 2012 co-director of STS University, an educational program held at the Society of Thoracic Surgeons Annual Meeting. This program allows thoracic surgeons to try new technology and to receive input from expert surgeons. Crabtree organized the thoracic courses, which included a simulated version of video-assisted thoracic surgery (VATS) lobectomy and techniques for esophageal and bronchial interventions. STS University drew hundreds of participants at the 2012 Annual Meeting.

In clinical trials, radiation oncologist Jeffrey Bradley, MD, and thoracic surgeons Varun Puri, MD, and Bryan Meyers, MD, MPH, are comparing the relative merits of surgery versus stereotactic radiation therapy for early-stage lung cancer.
to establish within that middle ground, where do patients fall?”

Within the past year, the thoracic surgery section has reported on two retrospective studies comparing treatment options for patients with stage I lung cancer. One study found that stereotactic body radiation therapy was less costly, but patients eligible for surgical intervention had longer survival than those not eligible, and surgery appeared to meet reasonable standards for cost effectiveness. The other concluded that, for patients who cannot undergo removal of an entire lobe of the lung, sublobar resection looks comparable to and competitive with stereotactic radiotherapy.

“We are trying our best to overcome selection bias,” says Bryan Meyers, MD, MPH, chief of the Section of Thoracic Surgery and the Patrick and Joy Williamson Professor of Surgery. “But there is always concern about bias in retrospective studies in which you don’t randomly assign therapies to patients. We are quite eager to support the new prospective trial and get an unbiased answer.”

Stephen Broderick, MD, who joined the faculty in July 2012 after completing a cardiothoracic surgery fellowship at Washington University, is looking at yet another angle in the treatment of lung cancer: the quality of life resulting from different therapies. “We are studying what patients’ lives are like after different treatments of stage I lung cancer, not simply how long they live.”

All six thoracic surgeons have joined radiation oncologists at the Alvin J. Siteman Cancer Center at Barnes-Jewish Hospital and Washington University School of Medicine in a multicenter lung cancer clinical trial. The trial randomly assigns patients with stage I non-small cell lung cancer and diminished lung function to either surgical removal of a portion of the lung or stereotactic body radiation therapy.

“Early-stage lung cancer patients clearly fall into one of three categories,” says Varun Puri, MD, Washington University thoracic surgeon at Barnes-Jewish Hospital. “The first includes individuals who are good performance status and can undergo surgical removal of a lobe, which remains the gold standard. At the other end are patients who are clearly poor operative candidates and are suitable for stereotactic radiation therapy. This trial tries to establish within that middle ground, where do patients fall?”

Evarts Graham, MD, published the first evidence linking smoking with lung cancer in 1950. The paper is now considered the seminal contribution to research on smoking and cancer.

Washington University thoracic surgeons continue to break new ground in advancing more effective lung cancer therapies, drawing on recent studies comparing widely used treatment options and a long history of treating the disease.

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All of the studies continue the tradition of Washington University thoracic surgeons in the treatment of lung cancer. Evarts Graham, MD, the first chairman of the Department of Surgery, performed the first successful removal of an entire lung in 1933.
The Section of Pediatric Cardiothoracic Surgery welcomes **Umar Boston, MD**, as an associate professor. Boston served as director of the Adult Congenital Heart Surgery Program at LeBonheur Children’s and Methodist University Hospitals in Memphis, Tenn. At Washington University, he continues his work with adult patients who underwent congenital heart surgery while treating the full range of children with heart and lung conditions at St. Louis Children’s Hospital.

Pediatric Cardiothoracic Surgery Chief **Pirooz Eghtesady, MD**, joined with **Alec Patterson, MD**, chief of the Division of Cardiothoracic Surgery, and **Varun Puri, MD**, to perform what — to the surgeons’ knowledge — was the first lung autotransplantation in a patient who had undergone a previous lung transplant. The 9-year-old boy had developed life-threatening complications after a surgeon had transplanted both lungs into his left chest cavity, reasoning that the chest cavity on the right side was too small. During the 14-hour operation, the surgeons removed the right lung from the left side of the chest, reconstructed the anatomy and placed the lung in the correct side. The patient is doing well.

The volume of on-pump, open-heart surgeries increased dramatically in early 2012 over the number performed in January-March 2011. This happened, in part, because of new insurance agreements made by Children’s Hospital that expand coverage in other states and the number of children who were referred for transplant but received an alternative surgical approach.

The Washington University and Barnes-Jewish Heart & Vascular Center — which comprises caregivers in pediatric cardiothoracic surgery, pediatric cardiology, critical care and anesthesiology — has developed a scorecard with nearly 300 metrics as team members focus on quality of care.
The FDA had recently approved the use of the Berlin Heart, a ventricular-assist device, as a bridge to transplant in children. But the device had not been used very effectively in patients with single-ventricle physiology. Instead, doctors started Stas on drugs to help his heart contract and later placed him on a ventilator. When his circulation continued to deteriorate, doctors tried implanting the Impella cardiac-assist device, which caused kidney dysfunction, then removed it and employed a different cardiac-support technique called extracorporeal membrane oxygenation (ECMO).

ECMO is only used for short-term cardiac support and wasn’t helping much. The Berlin Heart offered a way to restore circulation and organ function, but there was a risk it would not help Stas. With limited options, Stas’ family agreed to try the device, and Eghtesady performed a 12-hour operation in which he modified the implantation.

Rebecca Bartlett saw Stas improve after the Berlin implantation, and he received his new heart 27 days later. She reported Stas was gaining strength and behaving like a normal 4-year-old two months after the surgery.

“Stas is the first child with single-ventricle anatomy to be bridged successfully to heart transplantation. He also is unusual in that he was sicker than most children who undergo heart transplant,” says Eghtesady. “But I’m happy to say that his long-term prognosis is now similar to that of any other child receiving a heart transplant.”
The Division of Pediatric Surgery welcomes Adam Vogel, MD, as an assistant professor of surgery. Vogel completed a general surgery residency at the University of Chicago and a pediatric surgery fellowship and surgical critical care fellowship at the University of Texas in Houston. Vogel will work with the Extracorporeal Membrane Oxygenation (ECMO) Program and serve as the pediatric surgery representative in the Vascular Malformations Clinic at St. Louis Children’s Hospital.

The American College of Surgeons (ACS) has verified Children’s Hospital as a Level 1 Pediatric Trauma Center. During the verification process, the ACS confirms the presence of resources for the optimal care of injured patients. Children’s is the only ACS-verified Level 1 pediatric hospital in Missouri and Illinois.

Pediatric surgeon Marty Keller, MD, and adult thoracic surgeon Alexander Krupnick, MD, are spearheading a multi-disciplinary effort in the treatment of chest wall deformities, such as pectum excavatum and pectus carinatum. Others involved in the care of pediatric patients include specialists in radiology, orthopedics, cardiology and pulmonary medicine. A prosthetist offers non-surgical options to children.

Inflammatory bowel diseases such as Crohn’s disease and ulcerative colitis affect all aspects of children’s lives. Pediatric surgeons provide surgical consultation and work as part of a team with pediatric gastroenterologists, nurses, dietitians, radiologists and social workers to provide a full range of care to patients in the Inflammatory Bowel Disease Center at St. Louis Children’s Hospital.

The Pediatric Acute Wound Service (PAWS) at St. Louis Children’s Hospital offers comprehensive care for skin wounds to meet the special needs of children. Above, Kate Bernabe, MD, treats a burn on a young patient.
WASHINGTON UNIVERSITY pediatric surgeons at St. Louis Children’s Hospital have taken on long-standing medical challenges in recent years. They have improved survival for infants born with congenital diaphragmatic hernia and are part of a national quality-improvement program analyzing outcomes of surgical procedures. Most recently, they stepped up efforts to help some of the sickest children with skin wounds.

“The patients at highest risk for skin wounds are the sickest patients, and many times it’s not possible to do a normal skin care routine for those patients to prevent any skin breakdown, whether it’s a pressure ulcer or device skin breakdown or an IV infiltration breakdown,” says Kate Bernabe, MD, surgical director of the Pediatric Acute Wound Service at St. Louis Children’s Hospital, as well as communicating directly with caregivers, to raise awareness of the problem.

“Nurses are at the forefront of detecting these because part of their daily assessments is a skin exam of the entire body,” says Bernabe. “They want to take good care of these patients, but more education needs to be done to recognize the starting of a pressure ulcer, and then how to take care of it, so it doesn’t progress.”

The scientific literature on pressure ulcers in children is sparse and does not entirely reflect different weights and body size proportions. By tailoring wound care to pediatric patients, Bernabe is continuing the tradition of adopting surgical care to the special needs of children started by Jessie Ternberg, MD, PhD, who pioneered surgical care at St. Louis Children’s Hospital.

Intensive diagnostics and treatment by Kate Bernabe, MD, and the PAWS unit laid the foundation for Adi Hayes to begin recovering from a persistent foot infection.

Specialized Wound Care for Kids

Adi Hays, 13, was referred to Kate Bernabe, MD, director of the Pediatric Acute Wound Service (PAWS), because of a persistent infection in her foot that had continued on and off for several years. Adi has spina bifida with poor circulation in her lower extremities.

Bernabe says Adi’s case is an example of the type of complex wound often seen on the PAWS Unit. Simpler wound care over the course of nine months had not been effective, so Bernabe suggested Adi undergo an MRI. When the MRI showed a deeper bone infection, doctors expanded Adi’s antibiotic regimen to include intravenous antibiotics.

The wound healed enough that it became easier for Adi to walk, but infection persisted. The next step was a bone biopsy to learn more about the infection and the type of treatment that may eliminate it.

Since then, Adi has been placed on a new intravenous antibiotic, and her orthopedic surgeon is continuing her care. Bernabe believes the diagnostic work and treatment she received on the PAWS Unit helped move Adi and her family along the path to healing.
The surgery.wustl.edu page contains information about a groundbreaking peripheral nerve transfer procedure developed by Susan Mackinnon, MD, which has restored limited hand function in one patient with C7 spinal cord injury. The technique is appropriate for C6 and C7 injuries. Instead of operating on the spine itself, the surgeons rerouted working nerves in the upper arms. These nerves still "talk" to the brain because they attach to the spine above the injury.

Following the surgery, performed at Barnes-Jewish Hospital, and one year of intensive physical therapy, the patient regained some hand function, specifically the ability to bend the thumb and index finger. He can now feed himself bite-size pieces of food and write with assistance.

The case study, published online in the *Journal of Neurosurgery*, is, to the authors' knowledge, the first reported case of using nerve transfers to restore the ability to flex the thumb and index finger after a spinal cord injury.

"This procedure is unusual for treating quadriplegia because we do not attempt to go back into the spinal cord where the injury is," says plastic surgeon Ida Fox, MD. "Instead, we go out to where we know things work — in this case the elbow — so that we..."
can borrow nerves there and reroute them to give hand function. If we can restore the ability to pinch between the thumb and index finger, it can return some very basic independence.

The surgery was developed and performed by the study’s senior author Susan Mackinnon, MD, the Sydney M. Shoenberg Jr. and Robert H. Shoenberg Professor and chief of the Division of Plastic and Reconstructive Surgery. Specializing in injuries to peripheral nerves, she has pioneered similar surgeries to return function to injured arms and legs.

Mackinnon operated in the upper arms; she took a non-working nerve that controls the ability to pinch and plugged it into a working nerve that drives one of two muscles that flex the elbow. After the surgery, the bicep still flexes the elbow, but the nerve to the brachialis muscle, which also flexes the elbow, now bends the thumb and index finger.

Mackinnon does not anticipate a limited window of time for performing the surgery. Spinal cord injury, unlike peripheral nerve injury, allows for repair in the right circumstances even years after injury. But it will not benefit patients with higher injuries, in vertebrae C1 through C5, and it cannot restore leg or bowel/bladder function.

"If we can restore the ability to pinch between the thumb and index finger, it can return some very basic independence."

Ida Fox, MD

After surgery to restore hand function, intensive physical therapy is required to retrain the brain to communicate with new nerve connections.
who could potentially be harmed,” says Andriole. “On the other hand, if you screen only men who are at higher risk for dying of prostate cancer — about 10 to 15 percent — there is a greater percentage of men who stand to benefit and commensurately fewer who stand to be harmed.”

In the journal *European Urology*, Andriole and other scientists advocated a risk-based approach that would encourage PSA testing for African-American men, the ethnic group at highest risk for prostate cancer; men with a strong family history of prostate cancer; and those with additional risk factors related to age, other illnesses, prostate volume and previous biopsy status.

Andriole acknowledges that widespread testing has led many men with slow-growing tumors to be over diagnosed and over treated with aggressive therapies. For these men, who are unlikely to die from their prostate cancer, the cost and side effects of biopsies and treatments outweigh the benefits of PSA testing.

“If you screened all men, since only about three out of 100 are going to die of prostate cancer, there are only three men who would potentially benefit and 97
This major national study has found that annual prostate cancer screening does not reduce deaths from the disease, even among men in their 50s and 60s and those with underlying health conditions.

The first systematic evaluation of the PSA test was conducted by Washington University urologists more than 20 years ago. Since then, the division’s urologists have continued to evaluate use of the test.

“Mass screening is not the way to go. We have to take a more nuanced approach.”

Gerald Andriole, MD

3-D Tools Provide Edge in Laparoscopy

It seems intuitive that 3-D eyewear would help surgeons better visualize laparoscopic surgery. Washington University urologists have taken a scientific look at their value and reported results at the American Urologic Association Meeting in May 2012.

The study had subjects with various ability levels — from expert surgeons to people with no medical training — perform three tasks from the Fundamentals of Laparoscopic Surgery skill set developed by the Society of American Gastrointestinal and Endoscopic Surgeons: using laparoscopic instruments to transfer an object from one peg to another, cutting a piece of pre-traced gauze, and suturing and knot tying.

“We found that, overwhelmingly, the 3-D imaging confers an advantage,” says Brian Benway, MD, who led the study. “Tasks were completed more quickly and there were fewer errors in 3-D. Advantages were seen for all groups, and the side effects of 3-D such as headaches, dizziness and disorientation were no more common than with standard 2-D.”
Education

**Highlights**

- Three surgeons have been appointed associate program directors of the General Surgery Residency: Hepatobiliary-pancreatic and GI surgeon **Ryan Fields, MD**, director of resident research, meets with junior residents before their lab year to guide them in selecting appropriate research or other options. Breast surgeon **Amy Cyr, MD**, provides breast education and helps residents prepare for boards. Colorectal surgeon **Bashar Safar, MD**, supervises residents in the ConnectCare Clinic, which provides medical care to underserved populations.

- The Nexus Project, an online resource to help U.S. medical schools, surgical residencies and surgical fellowships develop curricula, launched in April 2012. General Surgery Residency Program Director **Michael Awad, MD**, is spearheading the project, funded by the U.S. Department of Education.

- **Michael Brunt, MD**, was inducted into the Alpha Omega Alpha Honor Medical Society as faculty, along with **Susan Pitt, MD**, chief resident, general surgery, and Washington University medical students who are going into a surgical specialty.

- **Mary Klingensmith, MD**, Mary Culver Distinguished Professor of Surgery, received the 2012 Parker J. Palmer Courage to Teach Award at the ACGME 2012 Educational Conference. The award recognizes those who exemplify the spirit of Palmer, an author and educator who encourages other educators to “give heart” and have “the courage to explore one’s ignorance as well as insight, to yield some control in order to empower the group, to evoke other people’s lives as well as reveal one’s own.” Klingensmith also was elected as a director of the American Board of Surgery and as a director of the American Board of Thoracic Surgery.

Residents hone laparoscopy skills: Above, assistant professor Erica Traxel, MD, instructs urology chief resident Shaun Grewal, MD; below, professor Mary Klingensmith works with research resident Lindsey Saint, MD.
TRADITIONAL MODELS of postgraduate medical education are undergoing significant transformations within the Department of Surgery, with a faculty workgroup serving as a springboard and forum on ideas to increase training efficiency. The department’s training takes place at Barnes-Jewish Hospital and St. Louis Children’s Hospital.

The department already had taken a lead in the trend toward early specialization with programs that allow general surgery residents to begin fellowships in vascular or cardiothoracic surgery a year early. When the American Board of Surgery approved early specialization for almost all specialties, other surgical fellowship directors began looking at ways to adopt the model.

“As medical care becomes increasingly complex, it’s evident that not every individual needs to learn the entire breadth of surgery,” says Mary Klingensmith, MD, vice chair for education and the Mary Culver Distinguished Professor of Surgery. “And there is a lot of concern that medical students are not interested in surgical training because it takes so long.”

In addition to the early specialization programs in vascular and cardiothoracic surgery, the plastic surgery residency moved to a six-year integrated program in 2011-12, rather than require three years of general surgery and three years of plastic surgery training. And the vascular surgery fellowship took a step further in 2012-13 by offering a track in which trainees do not enter a general surgery residency, but rather spend five years learning vascular surgery, with some general surgical skills taught early in the program.

For all training programs, an Innovations in Surgical Education Workgroup has provided synergy as educators look at early specialization, preparedness for practice and other issues. Educators in the urology residency and the colorectal, hepatobiliary-pancreatic and minimally invasive surgery fellowships are developing innovative ways to allow trainees to reach subspecialty training earlier. Workgroup members are seeking ways to improve measuring proficiency.

The general surgery residency is piloting an “academy model” in which, akin to medical school courses, general surgery residents discuss goals with a faculty member as they begin a rotation, receive mid-term feedback and undergo a formal assessment at the end. The model contrasts with current advancement based on time spent in training.

“We are going to see changes in general surgery residency education, the likes of which we haven’t seen in the last 50 years,” says General Surgery Residency Program Director Michael Awad, MD, PhD.

Awad Directs General Surgery Residency

Michael Awad, MD, PhD, has been appointed program director of the General Surgery Residency Program at Washington University. He assumed his new role in February 2012, succeeding Mary Klingensmith, MD, who now serves full-time as the department’s vice chair for education.

Awad earned a medical degree from Brown University and completed a surgical residency at The Johns Hopkins Hospital. He completed a fellowship in laparoscopic and endoscopic surgery at Legacy Health Systems in Portland, Ore., before joining the Washington University faculty in 2009.

As an associate program director for the general surgery residency, Awad served as director of the Surgical Skills Laboratory. In 2010, he received a grant from the U.S. Department of Education to develop an online resource to help educators in U.S. medical schools, surgical residencies and surgical fellowships develop curricula and meet national accreditation requirements.

Klingensmith began as program director of the general surgery residency in 2001. Under her leadership, the program introduced one of the earliest surgical skills labs for general surgery residents, implemented duty hour restrictions before they were mandated, and worked in concert with cardiothoracic and vascular fellowships to introduce early specialization programs.
In basic science and translational research bring a unique clinical perspective to the laboratory, but more than ever, they are facing challenges that can make this component of their life’s work difficult. Namely, it is difficult to balance clinical duties with a whole-hearted approach to research, funding has become scarcer, and there is a strong movement toward more collaborative work, with surgeon-scientists doing less basic science research.

Three surgeon-scientists are among a sizeable group of faculty members in the Department of Surgery who are meeting these challenges to make major contributions in the treatment of disease.

Urologic surgeon Henry Lai, MD, who joined the faculty in 2007, had a unique pathway to a major multicenter research project on pelvic pain, the cause of which often eludes doctors. Unlike many other young researchers, Lai did not get his start through a National Institutes of Health (NIH) career development award; he recruited researchers from

John P. Boineau, MD

Heart researchers in the Division of Cardiothoracic Surgery lost a friend and colleague, and the field of electrophysiology a giant, when John Boineau, MD, 78, died of leukemia on Nov. 7, 2011.

Boineau was a pioneer in the surgical treatment of Wolf-Parkinson-White (WPW) syndrome, a heart condition that can lead to episodes of rapid heart rate, and atrial fibrillation (AF), a condition where the heart rhythm is irregular and too fast. At Washington University, he was involved in the development of the Cox-Maze procedure to treat AF.

Boineau joined the faculty in 1984 as a professor of surgery and of medicine and co-director of the Cardiothoracic Surgery Research Laboratories. In addition, he was director of the Department of Medicine’s Pacemaker Center and Outpatient Pacemaker Services and medical director of cardiac rehabilitation at the Heart Care Institute at Barnes-Jewish West County Hospital.

James Cox, MD, Emeritus Evarts A. Graham Professor of Surgery, credits Boineau as among the first to describe the mechanisms of the WPW syndrome, ventricular tachycardia/fibrillation and atrial flutter/fibrillation. “Ninety-nine percent of all arrhythmias fall into one of those three categories,” says Cox. “That’s 30 percent of all heart disease. I think that’s a pretty good legacy.”

Richard Schuessler, PhD, research professor of surgery, who worked with Boineau and Cox on the development of the surgical treatment of AF in the mid-1980s, describes Boineau as a brilliant scientist who came up with hundreds of ideas every week.

“John was a superb and caring physician,” says Schuessler. “He was an outstanding mentor to me and hundreds of cardiology, surgery, and biomedical engineering students, residents and fellows.”

Boineau earned a medical degree from Duke University School of Medicine and completed a residency in cardiology at Georgetown University School of Medicine. He returned to Duke for a fellowship in adult and pediatric cardiovascular disease, and then served on the faculty until 1972. Prior to joining the Washington University faculty, Boineau was on the faculties at the University of Southern California and the Medical College of Georgia.
other departments and submitted a successful U01 grant application with the National Institute of Diabetes and Digestive and Kidney Diseases (NIDDK) for his basic science research and clinical studies on pelvic pain phenotypes and epidemiology.

Thoracic surgeon Daniel Kreisel, MD, PhD, and breast cancer surgeon William Gillanders, MD, both received NIH career development grants and were able to build on the early departmental support. Kreisel has an R01 NIH grant and has joined with colleagues Andrew Gelman, PhD, and Alexander Krupnick, MD, to study innate and adaptive immune responses in the lung. Gillanders has worked collaboratively with basic scientists to develop a clinical trial of a mammaglobin-A DNA vaccine for breast cancer patients with metastatic disease and to explore the use of genomics to develop personalized breast cancer vaccines.

“It’s certainly more challenging to do research, but at the same time, I think if surgeons are not involved in basic research, our specialty will be perceived as a purely technical field,” says Kreisel. “We have a lot of insight from taking care of patients on a daily basis. I think we should be at the forefront of doing research into surgical diseases.”
INITIATIVES TO GROW clinical volume continued to yield favorable results for the Department of Surgery in the 2012 fiscal year as the number of visits and procedures grew for the eighth consecutive year.

In recent years, expansion of clinical practices to outlying areas and the addition of new faculty members and services have helped sustain growth. This trend held true in 2012 and holds promise for the new year.

As the Alvin J. Siteman Cancer Center at Barnes-Jewish Hospital and Washington University School of Medicine has opened new facilities, various services have expanded to treat patients at these centers. Colorectal and hepatobiliary-pancreatic-GI (HPB-GI) surgeons travel to offer treatment at Siteman’s West County facility in Creve Coeur, Mo., while a thoracic and a breast cancer surgeon are based at Siteman’s location in St. Peters, Mo. These services have made it possible for patients to receive advanced cancer care from top specialists close to home.

In early 2013, when Siteman opens a new facility in South St. Louis County, four surgical specialties will work with medical and radiation oncologists to treat patients in this highly populated area. Colorectal, HPB-GI, thoracic and urologic surgeons will offer consultations at the new facility, where patients can undergo their initial visit, chemotherapy and radiation therapy.

New Clinical Services

In 2012, the department added four new surgeons, some of whom offer services that were previously unavailable.

From left, Hersh Maniar, MD, Ralph Damiano Jr., MD, Mitchell Faddis, MD, and Philip Cuculich, MD, exemplify the team approach needed for advanced care. With joint expertise in cardiac surgery, cardiology and electrophysiology, they provide leading-edge treatment for atrial fibrillation.
HPB-GI surgeon Ryan Fields, MD, treats not only liver and gastrointestinal disease but skin cancer, including melanoma, Merkel cell carcinoma, and basal and squamous cell carcinoma. Plastic and reconstructive surgeon Amy Kells, MD, PhD, uses her skills in hand and microsurgery to treat patients who come to the emergency room with limb-threatening injuries — treating patients at an earlier stage than other reconstructive surgeons. And the Wound Healing Program — based in the new Center for Outpatient Health in the Central West End — began offering hyperbaric oxygen to treat wounds that won’t heal as a result of diabetes or radiation injury.

Challenges Ahead

Despite positive growth, the Department of Surgery faces the dual challenges of decreased overall reimbursement and the trend toward tying reimbursement to performance measures. The department has played a leadership role in the American College of Surgeons’ surgical quality improvement programs, which gather data on surgical complications at Barnes-Jewish Hospital and St. Louis Children’s Hospital, and remains committed to addressing areas of concern.

Surgeon Combines Plastics, Trauma Care

With fellowship training in both hand and trauma surgery, plastic and reconstructive surgeon Amy Kells, MD, PhD, brings a high level of expertise to an important part of her practice: treating patients who come to the emergency department with severe injuries to the extremities.

While on call with the emergency departments of Barnes-Jewish Hospital and St. Louis Children’s Hospital, Kells treats such injuries as severed hands and fingers, electrical and other types of burns, and crush injuries.

“I focus from the shoulder down,” says Kells.

Recent patients include an Arkansas man who got his hand caught in a cement mixer, whose treatment saved three of his fingers, and a young man with electric burns on both hands and arms, who was treated with a fasciotomy to improve circulation to the injured tissue.

Kells estimates her work in the emergency department makes up about 50 to 75 percent of her practice. She also treats problems in the hand such as carpal tunnel syndrome and performs general and lower-extremity reconstruction.

Kells completed a trauma fellowship at the University of Maryland, hand surgery fellowships at New York University and SUNY Syracuse, and a plastic surgery residency at the University of Texas Branch Hospitals in Galveston, Texas.

Department of Surgery Clinical Activity

The Department of Surgery’s growth in clinical activity includes increased volume at off-site facilities.
Ballinger honored through
EDUCATIONAL ENDOWMENT

"He was the consummate gentleman, a very astute thinker and a real Renaissance man."
—Timothy Eberlein, MD

AN EDUCATIONAL ENDOWMENT honoring the late Walter Ballinger, MD, a former chair of the Department of Surgery, and his wife, Mary Randolph, was recently established to benefit surgical residents in the coming years.

Ballinger, professor emeritus of surgery, died in April 2011 at the age of 85. The Ballingers established the fund to help residents who wish to devote additional time to scholarly activities over and above the standard clinical experience on their path to becoming surgical leaders. Faculty and friends of the department have made gifts to the fund, as well.

“He was the consummate gentleman, a very astute thinker and a real Renaissance man,” says Timothy Eberlein, MD, who became the Bixby Professor of Surgery and chair of the Department of Surgery in 1998 and developed a friendship with Ballinger over the years. “He had a real, genuine love of Washington University and the Department of Surgery. He didn’t take sides, but was always genuinely concerned about you, much the way your grandfather would be about your career or schooling. He was a real steward of the department and took extraordinary pride in hearing about what the department was doing.”

Ballinger arrived at Washington University School of Medicine in 1967 at age 42 as the Bixby Professor, chair of the department and surgeon-in-chief at Barnes Hospital. He stepped
down as department chair in 1978 and retired as a surgeon in 1991, but continued to teach in the school’s former Health Administration Program.

A general surgeon, most of Ballinger’s work was in intestinal and vascular surgery; his research focused on the effects of surgery on the vagus nerve in the small intestine. In the mid-1970s, Ballinger and the late Paul Lacy, MD, a world leader in the study of the physiopathology of insulin-dependent diabetes, eliminated diabetes in a primate by transplanting insulin-producing cells called islets of Langerhans from a healthy primate pancreas.

Ballinger earned a medical degree from the University of Pennsylvania. He completed residencies at Bellevue Hospital and Columbia-Presbyterian Medical Center in New York. He was a captain in the medical corps of the U.S. Army in the early 1950s. He spent several years at Jefferson Medical College in Philadelphia before becoming associate professor of surgery at The Johns Hopkins University School of Medicine, where he was a Markle Scholar.
Faculty

Timothy J. Eberlein, MD, Chairman
William K. Bixby Professor of Surgery; Director, Alvin J. Siteman Cancer Center

Gregorio A. Sicard, MD
Executive Vice Chair

Ralph J. Damiano Jr., MD
John M. Shoenberg Chair in Cardiovascular Disease; Vice Chair for Clinical Services

Mary E. Klingensmith, MD
Mary Culver Distinguished Professor of Surgery; Vice Chair for Education

Robert W. Thompson, MD
Vice Chair for Research

Section of Cardiac Surgery

Ralph J. Damiano Jr., MD, Chief
John M. Shoenberg Chair in Cardiovascular Disease

Marc R. Moon, MD
Joseph C. Bankoff Professor of Cardiovascular Surgery

William A. Gay Jr., MD
Jennifer S. Lawton, MD
Nabil A. Munfakh, MD
Michael K. Pasque, MD
Professors of Surgery

Richard B. Schuessler, PhD
Research Professor of Surgery

Thomas B. Ferguson, MD
Professor Emeritus of Surgery

Scott C. Silvestry, MD
Associate Professor of Surgery

Brian P. Cupps, PhD
Research Associate Professor of Surgery

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

Hersh S. Maniar, MD
Sunil M. Prasad, MD
Stefano Schena, MD, PhD
Assistant Professors of Surgery

Section of Thoracic Surgery

Bryan F. Meyers, MD, MPH, Chief
Patrick and Joy Williamson Chair in Cardiothoracic Surgery

G. Alexander Patterson, MD
Evarts Ambrose Graham Professor of Surgery; Director of Lung Transplantation

Charles L. Roper, MD
Professor Emeritus of Surgery

Daniel Kreisel, MD, PhD
Associate Professor of Surgery

Traves D. Crabtree, MD
Andrew E. Gelman, PhD
Alexander S. Krupnick, MD
Varun Puri, MD
Assistant Professors of Surgery

Wenjun Li, MD
Research Assistant Professor of Surgery

Stephen Broderick, MD
Instructor in Surgery

Section of Pediatric Cardiac Surgery

Pirooz Eghtesady, MD, PhD, Chief
Professor of Surgery; Cardiothoracic Surgeon-in-Chief, St. Louis Children’s Hospital; Co-Director, St. Louis Children’s and Washington University Heart Center

Umar S. Boston, MD
Associate Professor of Surgery

Critical Care Service in the Cardiothoracic Intensive Care Unit

Michael S. Avidan, MBChB, FCA, Chief
Associate Professor of Anesthesiology and Surgery

Charl J. de Wet, MBChB
Michael H. Wall, MD
Associate Professors of Anesthesiology and Surgery

Heidi K. Atwell, DO
Daniel A. Emmert, MD, PhD
Thomas J. Graetz, MD
Isaac P. Lynch, MD
Adnan Sadiq, MD
Assistant Professors of Anesthesiology and Surgery

Division of General Surgery

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

Section of Colon and Rectal Surgery

John P. Kirby, MD
Tiffany M. Osborn, MD
Douglas J.E. Schuerer, MD
Associate Professors of Surgery

Jeffrey Bailey, MD
Kareem D. Husain, MD
Robert E. Southard, MD
Robert D. Winfield, MD*
Assistant Professors of Surgery

Thomas Blanke, MD
Stephanie Bonne, MD*
Instructors in Surgery

Section of Colon and Rectal Surgery

James W. Fleshman Jr., MD, Chief
Professor of Surgery

Ira J. Kodner, MD
Solon and Betty Gershman Chair in Colon and Rectal Surgery

Elisa H. Birnbaum, MD
Professor of Surgery

Matthew G. Mutch, MD
Paul E. Wise, MD*
Associate Professors of Surgery

Sekhar Dharmarajan, MD
Steven R. Hunt, MD
Bashar Safar, MBBS, MRCS
Assistant Professors of Surgery

Section of Hepatobiliary-Pancreatic and Gastrointestinal Surgery

David C. Linehan, MD, Chief
Professor of Surgery

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

David P. Jaques, MD
Professor of Surgery; Vice President of Surgical Services, Barnes-Jewish Hospital

Cancer Research

Paul J. Goodfellow, PhD
Yian Wang, MD, PhD
Professors of Surgery

Timothy P. Fleming, PhD
Research Professor of Surgery

Peter S. Goedegebuure, PhD
Research Associate Professor of Surgery

Jennifer L. Ivanovich, MBA, MS
Research Assistant Professor of Surgery

Division of General Surgery

William K. Bixby Professor of Surgery

Timothy J. Eberlein, MD
William K. Bixby Professor of Surgery; Chairman, Department of Surgery

Research Professor of Surgery
For More Information about the Department of Surgery, Contact:

Timothy J. Eberlein, MD  
William K. Bixby Professor and Chairman  
Department of Surgery  
Washington University School of Medicine  
Campus Box 8109  
660 S. Euclid Ave.  
St. Louis, MO 63110  
Phone: (314) 362-8020  
Fax: (314) 454-1898  

Jamie Sauerburger  
Executive Director, Business Affairs  
Phone: (314) 362-6770

surgery.wustl.edu

Other Contact Information

Division of Cardiothoracic Surgery  
(314) 362-6025  
Section of Cardiac Surgery  
(314) 362-7327  
Section of General Thoracic Surgery  
(314) 362-8598  
Section of Pediatric Cardiothoracic Surgery  
(314) 454-6165

Division of General Surgery  
(314) 362-7792  
Section of Acute and Critical Care Surgery  
(314) 362-9347  
Section of Colon and Rectal Surgery  
(314) 454-7183  
Section of Endocrine and Oncologic Surgery  
(314) 747-0064

Section of Hepatobiliary-Pancreatic and Gastrointestinal Surgery  
(314) 747-2938  
Section of Minimally Invasive Surgery  
(314) 454-7195  
Section of Transplant Surgery  
(314) 362-7792  
Section of Vascular Surgery  
(314) 362-7408

Division of Pediatric Surgery  
(314) 454-6066  
Division of Plastic and Reconstructive Surgery  
(314) 362-4586  
Division of Public Health Sciences  
(314) 454-7940  
Division of Urologic Surgery  
(314) 362-8212

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St. Louis Children's Hospital

St. Louis Children's Hospital is listed on U.S. News & World Report's Honor Roll of America's best hospitals and is ranked fifth in the nation by Parents magazine.

The Alvin J. Siteman Cancer Center

The Alvin J. Siteman Cancer Center at Barnes-Jewish Hospital and Washington University School of Medicine is the only National Cancer Institute comprehensive cancer center within 240 miles.

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