

REWIRING THE BODY

RECONDITIONED LUNGS

THE FUTURE OF HEALTH

Outlook



Washington
University in St. Louis

SCHOOL OF MEDICINE

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SUMMER 2016

Healthy weight

The science of countering
childhood obesity





ILLUSTRATED BY DWAIN ESPER FROM AUTHORHOUSE



Easing kids' fears

Mini Tandon, DO (left), assistant professor of child psychiatry, wrote a children's book to help kids feel comfortable visiting mental health experts. "Dr. Mini Mental Health Meets Willie Wannaknow" focuses on a boy who is having problems at school because of attention-deficit hyperactivity disorder and uncontrolled movements and sounds (tics). Tandon, who provides readings at area elementary schools, plans to write other books on conditions affecting children and adolescents — from autism to substance use.

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COVER As a young child, Nancy Hulslander was nearing the obese level on the growth chart for girls her age. Today, she is a 14-year-old freshman and competitive swimmer who maintains a healthy weight. Nancy and her family participated in a comprehensive study, headed by obesity expert Denise Wilfley, PhD, that emphasized the importance of establishing routines and building a support network. See page 18.

PHOTO BY JERRY NAUNHEIM

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ERIC YOUNG

Wireless, dissolvable sensors can monitor brain

Implants measure pressure, temperature before being absorbed into the body

Scientists at the School of Medicine and engineers at the University of Illinois at Urbana-Champaign have developed wireless brain sensors that monitor intracranial pressure and temperature and then are absorbed by the body, negating the need for surgery to remove the devices. The tiny implants could be used to monitor patients with traumatic brain injuries and potentially record activity in organ systems throughout the body.

“Electronic devices and their biomedical applications are advancing rapidly,” said co-first author Rory K.J. Murphy, MD, a neurosurgery resident at the School of Medicine and Barnes-Jewish Hospital. “But a major hurdle has been that implants placed in the body often trigger an immune response, which can be problematic for patients. The benefit of these new devices is that they dissolve over time, so you don’t have something in the body for a long time period, increasing the

risk of infection, chronic inflammation and even erosion through the skin or the organ in which it’s placed. Plus, using resorbable devices negates the need for surgery to retrieve them, which lessens the risk of infection and further complications.”

Murphy is most interested in monitoring pressure and temperature in the brains of patients with traumatic brain injury. About 50,000 people die of such injuries annually in the U.S. Doctors must accurately monitor patients with such injuries because an increase in pressure can lead to further brain injury. Yet there is still no way to reliably estimate pressure levels from brain scans or clinical features in patients.

Unwieldy, wired devices used today are rooted in 1980s technology. The tiny new dissolving sensors update brain monitoring for the 21st century.

“The devices commonly used today are based on technology from the 1980s,” Murphy explained. They are large, unwieldy and require wires. But, he added, “There are ways to make them better.”

Murphy collaborated with the laboratory of John A. Rogers, PhD, a materials science and engineering professor at the University of Illinois, to build the sensors. The devices are made mainly of poly lactic-co-glycolic acid (PLGA) and silicone, and they can transmit accurate readings on pressure, temperature and other information.

The researchers used saline baths to show that the implants dissolve after a few days. Next, they showed the devices dissolved in the brains of laboratory rats.

“In terms of the major challenges involving size and scale, we’ve already crossed some key bridges,” said co-senior author Wilson Z. Ray, MD, assistant professor of neurological and orthopaedic surgery, who along with Murphy, is planning to test the technology in patients with traumatic brain injuries.

Is atherosclerosis Alzheimer's disease of blood vessels?

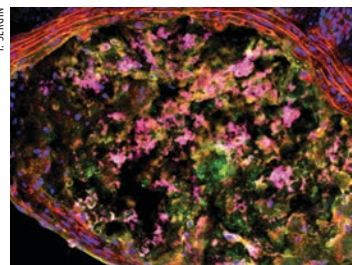
In atherosclerosis, plaque buildup within arteries impedes blood flow. Studying mice and tissue samples from patients' arteries, School of Medicine researchers suggest this accumulation is driven, at least in part, by processes similar to the plaque formation in brain diseases such as Alzheimer's.

Amyloid beta and tau proteins are known to build up in Alzheimer's. This new research on atherosclerosis shows a buildup of similar misshapen proteins inside cells.

Macrophage immune cells attempt to counteract the arterial plaque but become overwhelmed by the inflammatory environment. The overwhelmed immune cells begin filling up with protein junk, interfering with their function.

Senior author Babak Razani, MD, PhD, and Ismail

Sergin, PhD, first author and postdoctoral research fellow, and colleagues showed that the buildup inside macrophages is due to problems with the cell's waste-disposal functions. Normally, a protein called p62 sequesters the



Mouse artery contains large plaque

proteins and delivers them to cellular incinerators called lysosomes. During atherosclerosis, the researchers found the lysosomes break down, and as they cease their waste disposal, p62 builds up.

To determine if excess p62 is damaging, the researchers asked whether atherosclerosis would become less severe if they got rid of it. Surprisingly, when p62 is missing and no longer gathers waste, atherosclerosis in mice becomes even worse.

"If p62 is missing, the proteins don't aggregate," Razani said. This is more damaging to the cell, as it leaves the waste behind rather than having it corralled into one large "trash bin." The study shows that as p62 gathers misfolded proteins, it protects against atherosclerosis, even if the cell can't actually dispose of the waste it gathers. The researchers also found these protein aggregates and high amounts of p62 in patient samples, suggesting these processes are at work in people with atherosclerosis. Such evidence suggests it would be better to focus on fixing the cells' system for getting rid of the large protein aggregates, rather than on ways to stop the aggregates from forming.



\$60 MILLION The Elizabeth H. and James S. McDonnell III Genome Institute will receive \$60 million from the National Institutes of Health (NIH) to study the genetics of common diseases, such as heart disease, diabetes, stroke, autism and epilepsy. The funding will support sequencing the DNA of 150,000 to 200,000 individuals, including a significant percentage of African Americans and other diverse ethnic backgrounds. The goal is to uncover how differences in DNA contribute to disease risk.

Benefits of a 5 percent weight loss

A new School of Medicine study finds that for patients with obesity, losing small amounts of weight brings the greatest health benefits.

Researchers determined that even only 5 percent weight loss lowered patients' risk for diabetes and cardiovascular disease and improved metabolic function in liver, fat and muscle tissue.

Current obesity treatment recommends a 5 to 10 percent weight loss, but losing 5 percent may be easier for patients, said principal investigator Samuel Klein, MD, director of Washington University's Center for Human Nutrition.


The study randomly assigned 40 non-diabetic, obese individuals to maintain their weight or lose 5, 10, and then 15 percent of that weight. The researchers looked at body, organ and cell response before and after each person's weight loss.

Among the 19 volunteers who lost 5 percent of their weight, insulin-secreting cell function improved, as did insulin sensitivity in fat, liver and muscle tissue. Body and liver fat also decreased.

Losing above 5 percent, however, did not provide as many metabolic gains. "Muscle tissue responds to continued weight loss, but liver and adipose tissue have pretty much achieved their maximum benefit at 5 percent weight loss," said Klein.

Klein also wants to expand the research to patients with type 2 diabetes.





Neuroscience

NEW NAME The Department of Anatomy and Neurobiology is now the Department of Neuroscience. The new name does not diminish a longstanding commitment to teaching anatomy to medical students, said Azad Bonni, MD, PhD, the Edison Professor and head of the Department of Neuroscience. “Indeed, anatomy is in the department’s DNA,” he added. The department will focus its research mission on brain development and function and how neuroscience and neuropsychiatry relate to intellectual disabilities and autism spectrum disorders.

THINKSTOCK

Poverty changes brain connectivity

Many negative consequences are linked to growing up poor, and Washington University researchers have identified one more: altered brain connectivity.

Analyzing brain scans of 105 children ages 7 to 12, the researchers found that key brain structures are connected differently in poor children than in more affluent kids. In particular, the brain’s hippocampus — important in learning, memory and stress regulation — and the amygdala — linked to stress and emotion — have weaker connections to other areas of the brain in poor children than in kids with higher income families.



ROBERT BOSTON

Deanna M. Barch, PhD (left), and Joan L. Luby, MD

“In this study, we found that the way those structures connect with the rest of the brain changes in ways we would consider to be less helpful in regulating emotion and stress,” said first author Deanna M. Barch, PhD, Department of Psychological & Brain Sciences chair and the Gregory B. Couch Professor of Psychiatry.

Those in the study who were poor as preschoolers were also more likely to be depressed at age 9 or 10.

“Poverty is one of the most powerful predictors of poor developmental outcomes for children,” said co-investigator Joan L. Luby, MD, the Samuel and Mae S. Ludwig Professor of Child Psychiatry and director of the Early Emotional Development Program.

The researchers measured poverty by considering a family’s size and annual income. They hypothesize that factors such as stress, adverse environmental exposures — including lead, cigarette smoke and poor nutrition — along with limited educational opportunities, can contribute to problems later in life.

But Barch emphasized that by intervening early, the link between poverty and poor outcomes doesn’t necessarily lock a child into a difficult life.

A growing movement: One Health

One Health — a movement aimed at understanding the relationship between human, animal and environmental health — continues to gain traction at the School of Medicine.

Students recently formed One Health at WUSM, a group committed to a multidisciplinary approach to medical research and health care that involves physicians, veterinarians and scientists.

David T. Curiel, MD, PhD, a professor of radiation oncology and cancer biology, is working with Jeffrey Bryan, DVM, PhD, an associate professor of oncology at the College of Veterinary Medicine at the University of



Lemur disease: A link to humans?

Missouri, to study canine cancer vaccines. “Cancer in dogs mimics cancer in humans, pointing to the possibility of improved treatment therapies for both species,” Curiel said.

School of Medicine and Saint Louis Zoo researchers also are collaborating

to study viruses in lemurs facing extinction. Interactions among humans and wildlife may be leading to an increase in infectious diseases, said Sharon L. Deem, DVM, PhD, director of the Institute for Conservation Medicine at the zoo. “As importantly, animals may act as reservoirs or sentinels of diseases for humans.”

New outpatient care center in South St. Louis County

Washington University School of Medicine and Barnes-Jewish Hospital have opened an outpatient facility in south St. Louis County: the Center for Advanced Medicine South County. The two-story facility sits next to Siteman Cancer Center—South County at Interstate 55 and Butler Hill Road. The center provides a wide

range of medical services, including Washington University physician offices in internal medicine, obstetrics/gynecology, ophthalmology, neurosurgery, surgery and orthopedics. The facility also offers outpatient surgery, lab tests, physical therapy, mammography and other imaging.



Investigating cancers with inherited mutations

In a new analysis, researchers have shed light on inherited genetic errors across 12 cancer types, showing a surprising inherited component to stomach and other cancers.

The investigators analyzed genetic information from more than 4,000 cancer cases included in The Cancer Genome Atlas project, a National Institutes of Health (NIH)-funded initiative to unravel cancer's genetic basis.

"This is the first time on a large scale that we've been able to pinpoint gene culprits or even the actual mutations responsible for cancer susceptibility," said senior author Li Ding, PhD, associate professor of medicine and assistant director of the Elizabeth H. and James S. McDonnell III Genome Institute.

Past genomic studies of cancer compared patients' healthy tissue DNA with that of their tumors to uncover mutations that likely play roles in cancer. But this type of analysis can't distinguish between inherited mutations present at birth and mutations acquired over one's lifespan.

The new study analyzes a patient's normal "germline" genetic information, which is inherited from both parents. This provides a genetic baseline of a patient's genes at birth and can reveal whether cancer-associated mutations were already present.

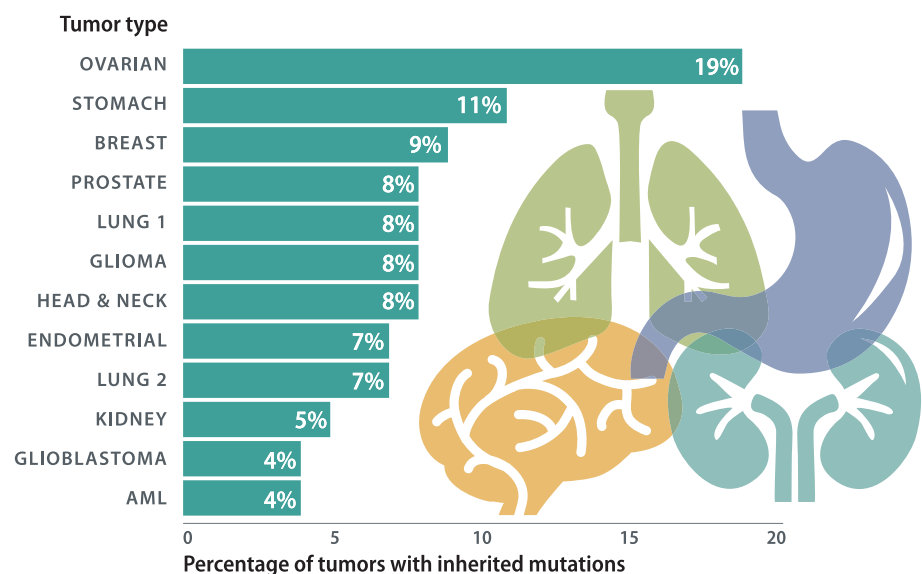
In 114 genes known to be associated with cancer, they found rare germline mutations in all 12 cancer types, but in varying frequencies

depending on the type. For example, 19 percent of the ovarian cancer cases studied carried rare germline mutations, while surprisingly, 11 percent of the stomach cancer cases included such mutations, which is closer to the percentage for breast cancer.

Interestingly, BRCA1 and BRCA2 germline mutations were present in tumor types other than breast cancer, including stomach and prostate cancers, indicating a need for further study, Ding said.

To better understand the BRCA mutations' influence on cancer risk, Ding, associate professor of medicine Feng Chen, PhD, and

Jeffrey Parvin, MD, PhD, professor and director of the Division of Computational Biology and Bioinformatics at The Ohio State University, investigated 68 germline BRCA1 mutations of unknown significance. They found that six of the mutations disabled the gene completely and also were enriched in the tumors, supporting a likely role in cancer. Ding said more research is needed to confirm these results before they can be used to guide health-care decisions. But, she added: "Our strategy of investigating germline-tumor interactions provides a good way to prioritize important mutations that we should focus on."





SARA MOSER

CRIB BUMPERS A new study shows that infant deaths and injuries attributed to crib bumpers have spiked significantly in recent years. Bradley T. Thach, MD, a retired School of Medicine professor of pediatrics, and two former researchers with the U.S. Consumer Product Safety Commission performed the analysis. They found that, in most incidents studied, crib bumpers were the sole cause of harm, rebutting beliefs that items such as blankets, pillows and stuffed animals were to blame. The study authors recommend banning the sale of crib bumpers.

Unanue receives Sanofi-Institut Pasteur Award

Emil R. Unanue, MD, an internationally renowned immunologist at the School of Medicine, has received a Sanofi-Institut Pasteur Award for his invaluable contributions to the field of immunology.

The annual awards honor contributions to biomedical research in fields that profoundly affect global health.

Unanue was recognized for his work to understand how the immune system identifies foreign protein fragments,

or antigens, which help the body mount an immune response. That work has led to research into therapies for autoimmune diseases such as type 1 diabetes, multiple sclerosis and rheumatoid arthritis, which are caused by misdirected immune responses.

“I am very honored to receive this award and this recognition,” said Unanue, the Paul and Ellen Lacy

Professor of Pathology and Immunology. “I have been fortunate throughout my career to work with and among extremely dedicated researchers whose ultimate goal has been to understand and advance science.”

While Unanue was head of the Department of Pathology and Immunology from 1985-2006, the immunology program became one of the world’s most productive centers for immunological research.



GILL LEFANCONIER

Emil R. Unanue, MD

Laser surgery opens blood-brain barrier to chemotherapy

Using a laser probe, School of Medicine neurosurgeons have opened the brain’s protective cover, enabling them to deliver chemotherapy drugs to patients with a form of deadly brain cancer.

In a pilot study, 14 patients with glioblastoma — the most common, aggressive and difficult to treat type of brain cancer — underwent minimally invasive laser surgery to treat a recurrence of their tumors. The surgery is performed while a patient lies in an MRI scanner, providing the neurosurgical team with a real-time look as the laser is robotically inserted into the brain. Heat from the laser is known to kill the brain tumor cells but, unexpectedly, the researchers found that the technology can penetrate the blood-brain barrier.

The new research marks the first time the laser has been shown to disrupt the blood-brain barrier, which shields the brain from harmful toxins, but also blocks potentially helpful drugs, such as chemotherapy.

The laser treatment kept the blood-brain barrier open for four to six weeks, allowing patients to receive multiple chemotherapy treatments, said co-corresponding author Eric C. Leuthardt, MD, professor of neurosurgery, who helped pioneer the laser technology.



ROBERT BOSTON

Eric C. Leuthardt, MD

In the weeks following laser surgery, 13 patients received doxorubicin, a common chemotherapy drug. Twelve patients showed no evidence of tumor progression during the 10-week study.

The laser opens the barrier only near the tumor, leaving the protective cover in place in other areas of the brain. This has the potential to limit the harmful effects of chemotherapy drugs in other areas of the brain, the researchers said.

The researchers are planning another clinical trial that combines the laser technology with chemotherapy and newer treatments, such as targeted therapies and immunotherapy, which prompts the immune system cells to find and destroy cancer.

Using technology to partner with patients: MD/PhD student Avik Som, left, dialysis patient Karen Harrold and nephrologist Will Ross, MD, MPH.



BENJAMIN HUMPHREYS

Technology improves dialysis care

Reduces missed appointments and hospitalizations due to kidney complications

An innovative message-based technology platform developed by Washington University students could dramatically reduce the number of missed dialysis appointments and hospitalizations due to renal complications.

"I was shocked that something so simple could have such a profound result," said Will Ross, MD, MPH, nephrologist and principal investigator of a six-month pilot project in Washington University's Chromalloy American Kidney Center. He added that they have seen a 75 percent decline in the median number of missed appointments and an approximately 50 percent reduction in hospitalized patients.

The technology, known as EpxDialysis, is an automated message system that combines appointment reminders with immediate one-button, toll-free phone access to reschedule appointments or discuss any health concerns with the dialysis team.

Dialysis can feel like "a part-time job with no weekends or holidays off." The messaging technology gives patients a sense of partnership in their care.

"Dialysis patients come to the clinic, on average, 13 times a month. It's like a part-time job with no weekends or holidays off, and adherence is hard," said Avik Som, an MD/PhD student and co-founder of Epharmix, a St. Louis-based health technology startup that creates digital interventions for medical care. Som also is the founder of IDEA Labs, a bioengineering design incubator on campus that already has resulted in multiple inventions moving toward commercialization.

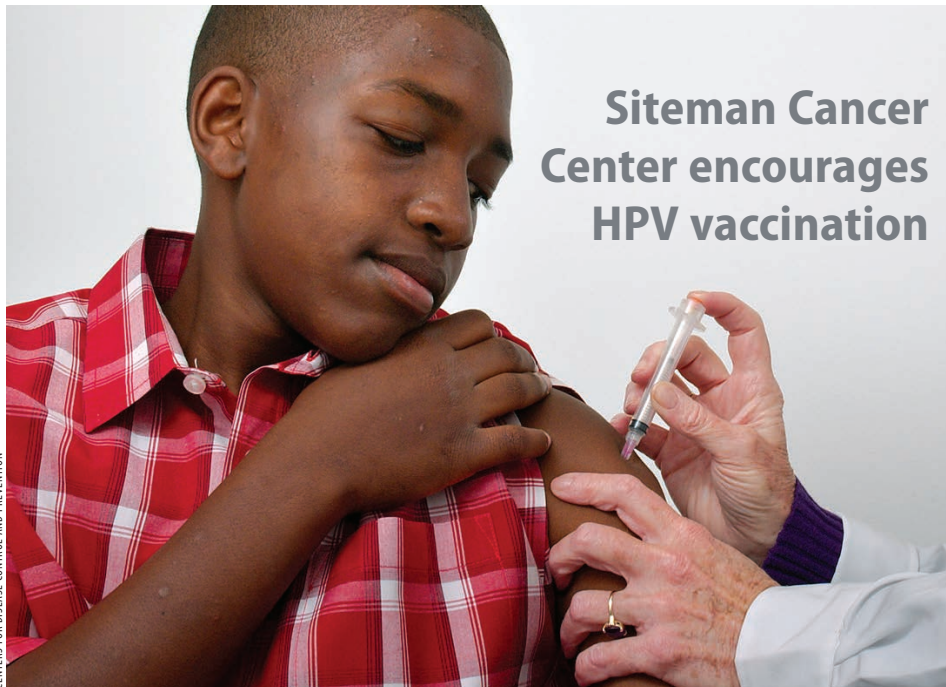
In 2012, Som focused teams of students to identify and remove barriers to better care and outcomes. Epharmix

grew out of that and now is being tested in 15 different clinical settings, including dialysis (EpxDialysis), breastfeeding (EpxBreastfeeding) and fall prevention (EpxFallPrevention).

The pilot EpxDialysis project has helped many patients, said Brenda Bingel, RN, MSN, Chromalloy American Kidney Center manager. Due to one patient's previous lack of adherence, she was not a transplant candidate, but now she is. "It's because the messages are carefully crafted to convey the essence of caring and the fact that we are their partners in keeping them healthy."

With great outcomes already, Epharmix has attracted substantial investment from leading venture capitalists. It's now under further evaluation at other health systems. "We think the technology could be a new standard-of-care practice, and we are eager to share this," Ross said.

— Stephanie Stemmler



Siteman Cancer Center encourages HPV vaccination

Human papillomavirus (HPV) is responsible for 27,000 yearly cancer diagnoses in the U.S., even though a preventative vaccine exists. To reduce that number, Siteman Cancer Center is joining with the 68 other National Cancer Institute-Designated Cancer Centers to promote HPV vaccination. The vaccine is recommended for boys and girls at age 11 or 12 and protects against adult cancers caused by HPV infection, including cervical and throat cancers.

Teaming up to fight Zika

An outbreak of the mosquito-borne Zika virus in the Americas that has been linked to microcephaly, a condition where newborns have abnormally small heads and underdeveloped brains, has prompted new research to better understand the virus.

Two infectious disease laboratories at the School of Medicine are generating Zika antibodies and viral proteins to help develop a precise diagnostic test for Zika, as well as therapeutics and an eventual vaccine.

"It's heartbreaking for the families who are adversely affected by Zika," said one of the researchers, Daved Fremont, PhD, a professor of pathology and immunology. "But we're hoping to help in this outbreak."

Fremont is working with Michael Diamond, MD, PhD, professor of medicine. Together, they have published nearly 40 papers on similar viruses.

Last summer, Diamond learned of a Zika outbreak in South America from colleagues at an infectious disease confer-



JAMES GUTHRIE

ence. They said unusual complications, including microcephaly, appeared to be related to Zika, a typically mild infection that has not been previously known to cause lingering harm. Zika is primarily spread by the *Aedes aegypti* mosquito, a species found across parts of the Americas, including the Gulf Coast.

Viral symptoms are generally mild: fever, rash, joint pain and red eyes. Yet, the World Health Organization has declared the virus an international public health emergency because of the potential link to birth defects. The situation is particu-

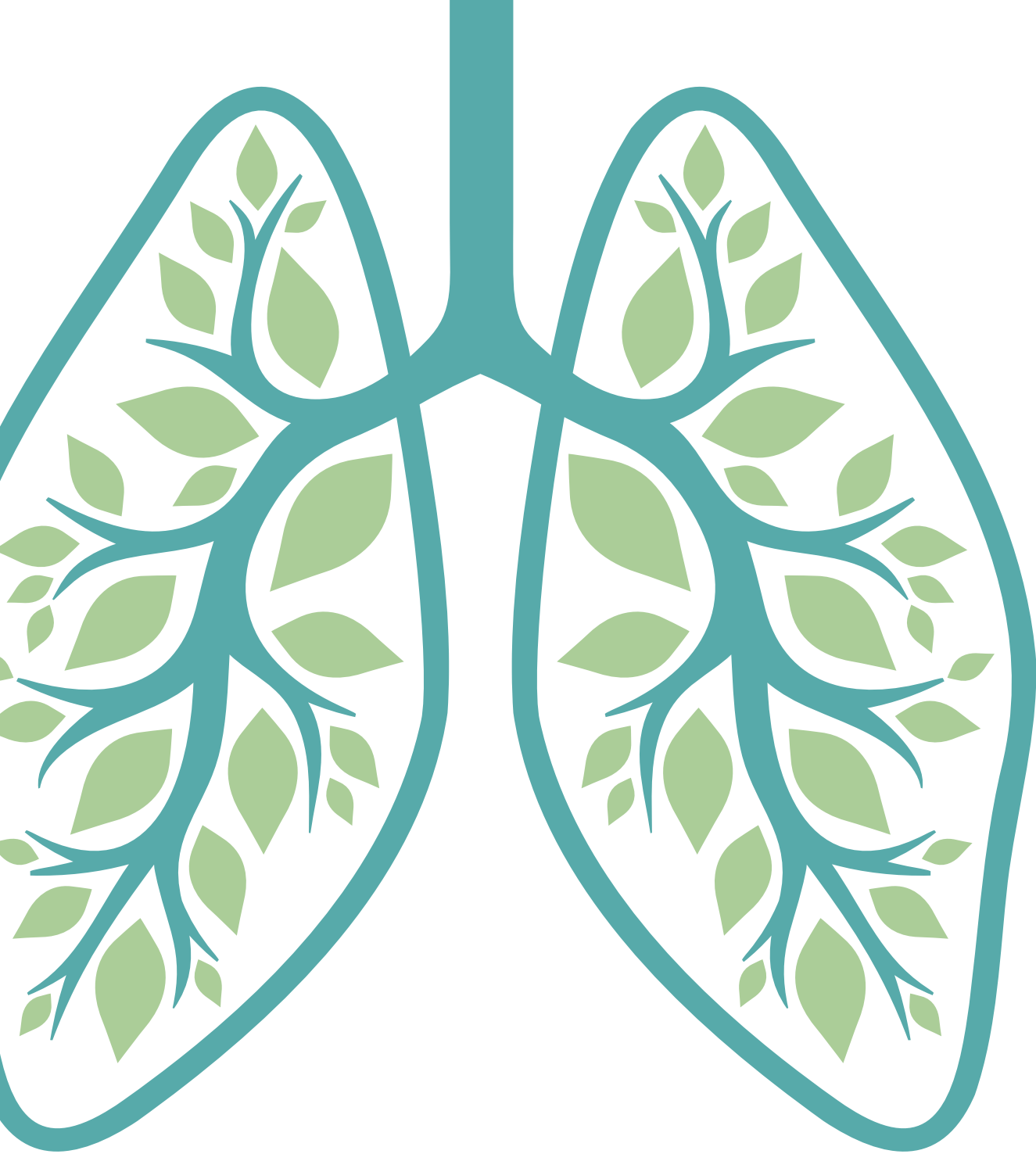
larly urgent because there's no conclusive test, no treatment and no vaccine for Zika.

Diamond and Fremont's laboratories are working to understand how Zika is recognized and neutralized by the immune system — an endeavor critical to developing diagnostics, therapeutics and a vaccine.

Fremont is generating multiple Zika proteins to understand exactly how antibodies bind to the virus to shut down infection. One goal is to understand why the virus seems to behave differently in the current outbreak.

Diamond is creating monoclonal antibodies — an engineered version of antibodies produced naturally by the immune system — to develop a possible Zika diagnostic test. Because the virus is so similar to dengue and yellow fever, current diagnostic tests generate too many false positive results because they often pick up any of those infections, rather than just Zika.

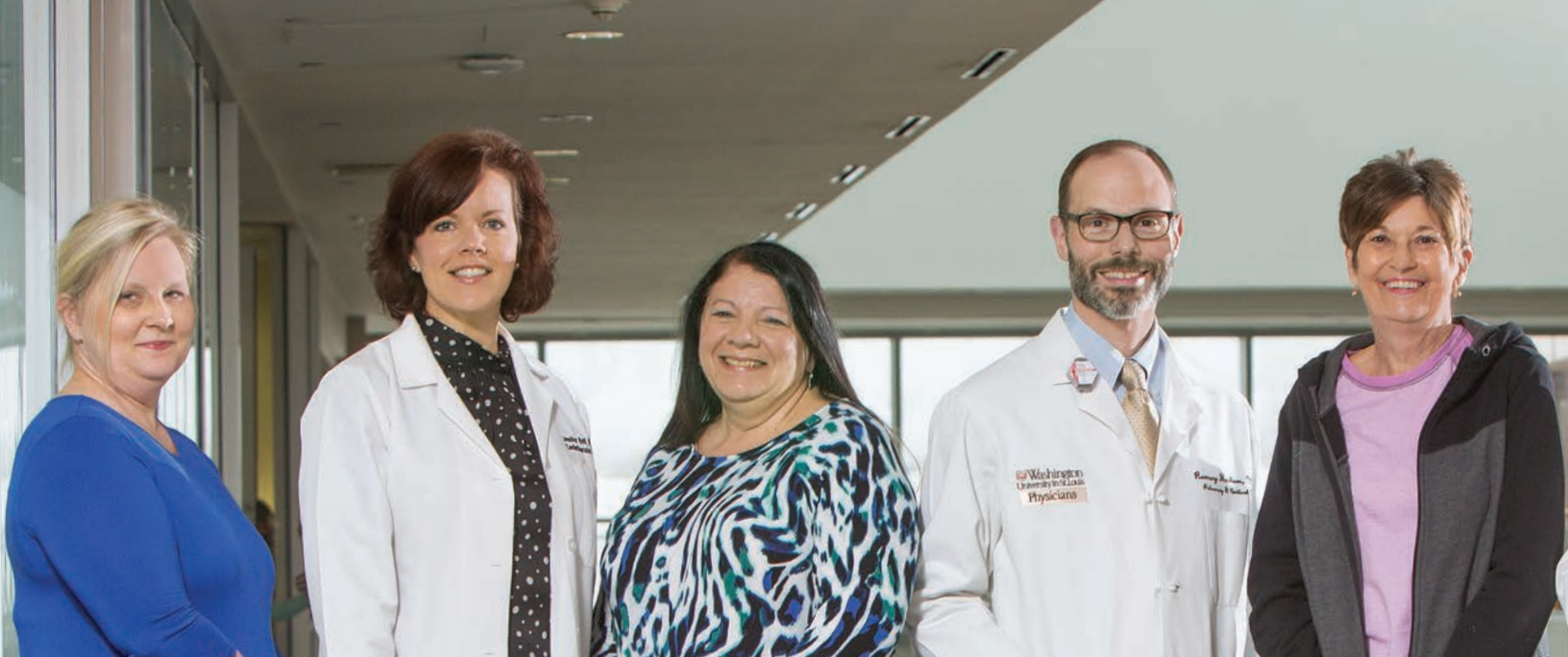
To help other researchers study the virus, Diamond has shared his monoclonal antibodies, developed from a new mouse model of Zika that he and colleagues have also developed.



Reconditioned... lungs?

**They're among the most difficult transplants.
An innovative approach is increasing the options.**

BY KRISTINA SAUERWEIN



Michele Coleman lay close to death last fall with end-stage lung disease when she got a second chance at life.

Thanks to an innovative approach aimed at broadening the pool of lung donors, Coleman, 63, received a new set of lungs that previously had been deemed unacceptable for transplant.

As part of a clinical trial at the School of Medicine, lung transplant surgeons are evaluating whether a sophisticated device can recondition subpar donor lungs to make the organs suitable for transplant. The lungs Coleman received — during surgery at Barnes-Jewish Hospital — first were connected to a machine designed to evaluate and enhance lung function by ventilating and perfusing the organ for up to six hours after the lungs' retrieval from a donor.

The device has the potential to expand the number of donor lungs that can be transplanted, potentially helping the 1,480 U.S. patients currently waiting for lung transplants.

Washington University is one of 16 U.S. medical institutions participating in the trial, which will evaluate the effectiveness of the lung device. About 250 patients nationwide will be enrolled. The technology already is being used in Europe and Canada.

“Currently, many more patients need lung transplants than there are available donors,” said Daniel Kreisel, MD, PhD, professor of surgery and of pathology and immunology at the School of Medicine, and the study’s principal investigator. “We are hopeful that the device can significantly expand the lung donor pool and save more lives.”

In 2015, about 360 people on the lung-transplant waiting list died or became too ill to receive a donor organ, according to the United Network for Organ Sharing, which manages the U.S. organ transplant system.

Two years ago, the U.S. Food and Drug Administration unanimously approved the lung device for use in cases when patients with end-stage lung disease have no other options. “The FDA recognizes that the machine is relatively safe,” said Kreisel, surgical director of the medical school’s lung transplant program. “But further studies are needed before the device can be used widely to aid lung transplant patients.”

In St. Louis, the device is housed at Mid-America Transplant, whose staff is trained to closely monitor the lungs as they are reconditioned.



JERRY MAUNHEIM

Left to right: Laura Ebel, RN, MSN, CCTC, post-transplant coordinator; Jennifer Bell, RN, BSN, CCRC, manager of clinical trials, Department of Surgery; Masina Scavuzzo, RN, BSN, CCTC, pre-transplant coordinator; Ramsey Hachem, MD, medical director of lung transplantation; patient Michele Coleman; Daniel Kreisel, MD, PhD, professor of surgery and of pathology and immunology; and Varun Puri, MD, associate professor of surgery.

Fragile transplants

Spongy and elastic, lungs are one of the most difficult organs to transplant, with only about 20 percent of the organs meeting clinical transplant standards, said Kreisel. The organ's fragility also means lungs are susceptible to injuries and infections and, therefore, frequently are deemed unsuitable for transplant.

The device maintains lungs in a “body-like” environment after a donor's death, by circulating a nutrient solution through the lungs and ventilating them at body temperature. The sterile, controlled setting, close monitoring and lengthened recovery time — between four and six hours — allow surgeons to have an extended and thorough assessment of the lungs and provides time for the organs to recover from the inflammatory shock following brain death.



The reconditioning device ventilates and perfuses the lungs.

About half of the lungs assessed after being reconditioned in the device meet eligibility standards for transplant, Kreisel said. These include previously unsuitable lungs from older donors and lungs donated after cardiac arrest, which stops blood flow to the lungs sooner than brain death.

Coleman, who received her double-lung transplant in November, was the School of Medicine's first patient to receive lungs that had been reconditioned in the device. Before her transplant, chronic obstructive pulmonary disease left her exhausted, mostly bedridden and reliant on an oxygen tank.

“Lung transplants are high-risk procedures, as are all organ transplants,” said Varun Puri, MD, an associate professor of surgery at the School of Medicine who, along with Kreisel, operated on Coleman.

Coleman knew she could die during the surgery Nov. 17. “But I had nothing to lose,” she said. “I was ecstatic for the chance. Without the transplant, I am sure I would have died by Christmas.”

Months later, Coleman is breathing independently as well as showering and dressing herself without having to stop for frequent rests. She can walk again, and does so for at least 30 minutes a day to build strength.

“Michele has been recovering very well,” said her physician, Ramsey Hachem, MD, professor of medicine and the medical director of lung transplantation at Washington University.

“Nov. 17 marked my new beginning,” Coleman said. “I was given a whole new life.” □





Rewiring the body

Severing the brain's critical link to a peripheral nerve can render an arm useless. Pioneering surgeries reroute neural impulses and redefine hope for paralysis.

BY DEB PARKER AND KRISTINA SAUERWEIN

IN MAY 2007, Loren Schaller was 15 when a prisoner mistakenly released from San Quentin randomly followed her into a San Francisco bakery, stabbing her five times. The knife sliced through her jugular vein, severing nerves in her neck. Bystanders' quick actions helped save her life, but Loren's right arm was paralyzed from the shoulder to the wrist.

In the wake of the attack and heavy blood loss, the immediate focus was on keeping Loren alive. Doctors originally thought the paralysis would be short-lived, attributing it to a blood clot compressing her nerves. When the situation didn't improve, a nerve study months later revealed the true problem.

Surgeons tried to reattach the cut nerves, but scar tissue made it impossible to find the nerve endings, and the effort was abandoned. The consensus: Loren would never move her arm again.

Loren's parents, Linda and Tim Schaller, searched the country for a surgeon who could help restore movement in her arm, asking everyone they knew for possible leads.

A triumphal raise of the arms was an impossibility for Loren Schaller, who had suffered a knife attack, until peripheral nerve surgery restored her ability to perform such movements.

Eventually, they came across an article in U.S. News & World Report. Part of a series titled “Medical Mavericks,” the story highlighted the peripheral nerve work of Washington University surgeon Susan E. Mackinnon, MD.

Desperate for answers, the family soon was on a plane to St. Louis. Mackinnon advocated for nerve transfer, a procedure that, at the time, only a handful of U.S. surgeons was capable of performing. To do this, Mackinnon would reroute the circuit — connecting a functioning but redundant nerve in the upper arm to another more crucial nerve that had been severely damaged.

“After seeing Dr. Mackinnon, we finally had hope,” Linda Schaller recalled.

Mackinnon, chief of the Division of Plastic and Reconstructive Surgery and the Sydney M. Shoenberg Jr. and Robert H. Shoenberg Professor of Surgery, long has been in the business of hope.

Hundreds of thousands of people suffer debilitating nerve injuries every year from car wrecks, household mishaps and freak accidents. In a split second, peripheral nerves — the “electrical” wires connecting muscles to the brain and spinal cord — can be shredded or torn, rendering limbs forever lifeless. More than 25 years ago, Mackinnon adopted nerve surgery as her life’s work, and she has continued to push the envelope, exploring new ways to help patients regain some independence.

Nearly a decade since the attack, Loren has recovered remarkably. A 2014 UCLA graduate, she now works as a costume production assistant on ABC’s upcoming eight-part miniseries “When We Rise.” It’s a labor-intensive job; fortunately for Loren, she now has the ability to raise both arms above her head. “She (Mackinnon) rewired me,” Loren said with a smile.

Her parents, award-winning filmmakers, since have produced a documentary on Mackinnon called “A Spark of Nerve,” which premiered last November at the St. Louis International Film Festival.

Taking small steps

In the world of peripheral nerve surgery, Mackinnon has trailblazed a unique niche. Although the Canadian-born Mackinnon started out in general and plastic surgery, she began working closely with neurosurgeon Alan Hudson, who was interested in nerve regrowth. In 1988, they performed the world’s first successful nerve transplant at Toronto’s St. Michael’s Hospital. Using nerves from a cadaver, the breakthrough restored movement to a nine-year-old boy’s injured leg.

Since joining the medical school faculty in 1991, Mackinnon has taken “incremental, small steps,” expanding upon those early techniques — moving from nerve grafting to nerve transplantation to nerve transfer — all while building a comprehensive nerve care center. The school’s Center for Nerve Injury and Paralysis is considered among the country’s most innovative.

The team includes several plastic and reconstructive surgeons dedicated to peripheral nerve injury repair, such as Thomas H. Tung, MD; Ida K. Fox, MD; Grant M. Kleiber, MD; Amy M. Moore, MD; and Alison K. Snyder-Warwick, MD; along with researcher Andrew Yee.

Tung and Moore were among the first to do nerve transfers for the treatment of lower-extremity nerve injury. Both are very active in basic science and clinical research related to nerve injury. Snyder-Warwick is the regional leader for reanimation after facial nerve paralysis. Kleiber is the newest member of the group who is knowledgeable about nerve transfer and other microsurgical techniques.

All work collaboratively to share information about unique and complicated cases. As Mackinnon explains, each surgery builds on the next.

FILM SITE
sparkofnerve.com

VIEW THE MOVIE
FROM CAMPUS
[wustlmed.
kanopystreaming.com](http://wustlmed.kanopystreaming.com)



At the St. Louis premiere of “A Spark of Nerve,” from left to right: Loren Schaller; her mother, Linda Schaller; music composer Fred Story; Loren’s father, Tim Schaller; and surgeon Susan Mackinnon, MD. Said Linda Schaller: “We made the film because we wanted others to know that there is hope.”



All those who've had a successful nerve transfer surgery, raise your arms Tom Wachtel, MD, with Loren Schaller.

A wiggle stuns the world

In 2008, Tom Wachtel, a 69-year-old Phoenix trauma surgeon, was driving to the hospital to perform emergency surgery when his car struck the median and flipped nose to end. Wachtel broke his neck and suffered a devastating spinal cord injury that left him a quadriplegic.

A couple years later, he sought out Mackinnon. Nerve transfer surgery never had been applied to a patient with a spinal cord injury and Mackinnon wasn't sure it would work. Wachtel was willing to take the chance on the belief that others could learn from the experience.

For nine months post-surgery, they waited. That's how long it took for the rerouted nerve to grow six inches toward Wachtel's hand muscles.

One day he wiggled his finger and thumb. And Mackinnon? "I just went to the floor. I was so stunned and excited," she said.

Wachtel had become the first quadriplegic to regain hand function via nerve transfer surgery, and the story made international headlines.

Eventually, Wachtel managed to eat a complete meal by himself and take control over other small, daily tasks. He gained enough independence to celebrate his 50th wedding anniversary at a Las Vegas restaurant. Two years into his recovery, he could catch a soccer ball.

Mackinnon since has trained Fox as the surgical lead on nerve transfer procedures involving the cervical spinal cord. In total, 14 patients at Washington University Medical Center have undergone the procedure.

The technique has shown promising results for restoring function to select patients that otherwise would have been confined to a lifetime of hand paralysis, and ultimately laying the foundation for an emerging medical specialty.

"The world of nerve transfer surgery has been evolving for the last couple decades, in large part due to the efforts of Dr. Mackinnon," said Gerald Wolff, MD, residency program director for the rehabilitation center at University of Ottawa in Canada, who was mentored by Mackinnon and Fox on the procedure.

The technique lays the foundation for an emerging medical specialty

"Dr. Mackinnon's application of nerve transfers to restore upper-extremity function in tetraplegics (quadraplegics) is a pioneering technique. This is fast becoming the standard of care for treating those with peripheral nerve injuries," he added.

In the U.S., approximately 250,000 people suffer from spinal cord injuries; more than half involve the neck. At this time, the nerve transfer surgery, however, is only effective in injuries affecting the lower neck.

Following a paralyzing spinal injury, nerve transfer surgery performed by Ida Fox, MD, left, helped physician Michael Bavlsik, MD, resume activities such as grasping an otoscope.



The brain in conversation with the muscles

Seven vertebrae in the neck, denoted as C1 through C7, make up the cervical spinal cord. This nerve transfer surgery targets patients with injuries involving motor level function at the C6 or C7 vertebrae. It typically does not help patients who have lost all arm function due to higher injuries in the C1 through C5 levels.

In the procedure, Fox bypasses the spinal cord's multitude of soft nerve bundles, which act as activity conduits to the brain, and instead redirects functioning nerves from a quadriplegic patient's elbows or shoulders, connecting them to injured nerves going to areas of the hand or arm.

“When you ask spinal cord injury patients what they miss most, what they want to improve their quality of life, hand function is No. 1 on the list,” Fox continued. “Having your hand lets you navigate the world.”

Washington University primary care physician Michael Bavlsik, MD — a father of eight — agrees. Fox restored his ability to use his left hand following a 2012 car accident that left him a quadriplegic who moves about in a motorized wheelchair. Bavlsik now can grip an otoscope, reach out to get patient charts and drive. “I am extremely grateful for this surgery,” Bavlsik said.

Post-surgery, patients undergo extensive physical therapy to train the brain to recognize the new nerve signals, a process that takes up to two years.

Fox engages in meticulous pre-surgical patient screening, spending hours assessing overall health and social support, among other factors. She works with a team of colleagues, including physical therapists, led by Lorna Kahn, PT, CHT; physiatrists, including Neringa Juknis, MD, and Rimma Ruvinskaya, MD; and neurologists, led by Craig Zaidman, MD.

Most patients say hand function would help restore quality of life

“In essence, the new nerve network reintroduces conversation between the brain and the muscles,” Fox said. “This permits patients to regain enough movement to perform tasks that encourage independence, such as drinking a glass of water or using the bathroom without assistance. These breakthroughs may seem small to most people but they are huge in terms of a patient's quality of life.

Site offers how-to for surgeons, perspective for patients

Most important in the patient evaluation is the psychological component. “This trumps everything,” Fox said. “It is so vitally important. You have to set realistic expectations. This operation is not a cure. It’s not going to bring the patient back to pre-injury movement. It is incremental, but very real progress.”

This past fall, the Journal of Plastic and Reconstructive Surgery published a study led by Fox that assessed outcomes of nerve transfer surgery in nine cervical spinal cord-injury patients with upper-limb paralysis. Most patients reported improved hand and arm function.

Expanding training

Because so few surgeons perform spinal cord nerve transfers, quadriplegic patients from across the U.S. travel to the School of Medicine seeking its expertise. And Mackinnon and Fox are passionate about teaching these methods to surgeons far and wide.

The pair traveled to Ottawa in March 2015, supervising as Kirsty Usher Boyd, MD, a former surgical fellow at Washington University, became the first surgeon in Canada to perform the nerve transfer procedure on a quadriplegic patient, 44-year-old Tim Raglin. Eight years earlier, Raglin had dove off the dock of his family’s cottage — a jump he had made hundreds of times before, but this time water levels were unusually low and he struck the bottom.

Mackinnon and Fox guided Boyd through patient evaluation, delicate nerve topography, physiology and anatomy.

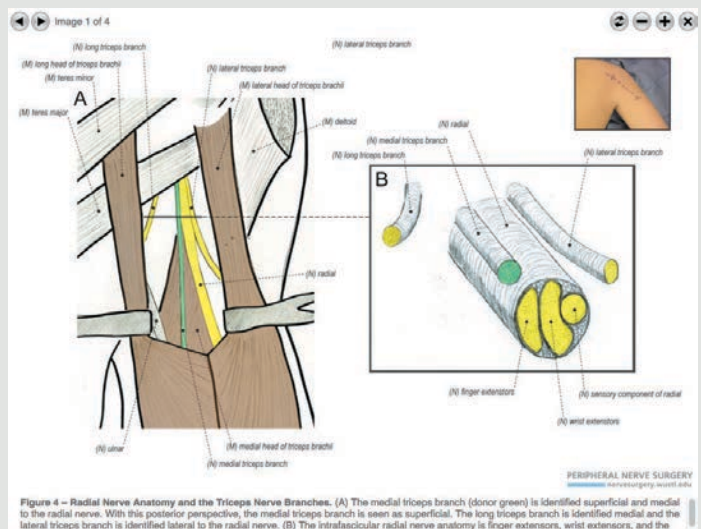
In another training initiative, the medical school’s plastic and reconstructive surgery division has launched a website, Peripheral Nerve Surgery: A Resource for Surgeons. The website offers step-by-step surgical videos on procedures ranging from simple nerve repairs to more complex injuries. “Every ‘recipe’ we have will go on there,” Mackinnon said.

For Mackinnon and Fox — standing on the forefront of these novel procedures — the hope is that more surgeons will embrace these adaptive techniques, restoring limbs and life to patients worldwide. □

Sparked by the wars in Iraq and Afghanistan and initially geared toward military doctors, an open-access website now is an available tool for all surgeons and patients. The site provides step-by-step training videos and other learning resources for peripheral nerve surgeries.

Because of improvements in body armor, thousands of service men and women were surviving injuries that previously would

have proven fatal, but returning home with debilitating peripheral nerve injuries. To better deal with this health-care crisis, the Henry M. Jackson Foundation for the Advancement of Military Medicine called for proposals. The Washington University team developed the site in response. Division team members respond to viewer questions and continually sharpen the website’s effectiveness as a teaching tool.







America's growing problem

Averting the lifelong health risks and spiraling social costs of childhood obesity

BY DEB PARKER AND BRENDA MURPHY-NIEDERKORN

Although an active child, Nancy Hulslander began gaining weight exponentially after kindergarten. By second grade, she was nearing the obese level on the growth chart for girls her age, and encountered teasing.

Nancy was on an all-too-familiar path: Nationally, one in three children is either obese or overweight; obesity rates have more than doubled for children and quadrupled for adolescents in the past 30 years.

Living near the School of Medicine, Nancy had access to evidence-based resources that are unavailable to many kids. She and her mother, Vicki, enrolled in the Comprehensive Maintenance Program to Achieve Sustained Success (COMPASS), a National Institutes of Health (NIH)-funded study headed by Denise Wilfley, PhD, director of the Weight Management and Eating Disorders Research Program. Four years after completing the study, Nancy is now a 14-year-old freshman and competitive swimmer who maintains a healthy weight.

Early intervention, Wilfley said, is key in stemming the obesity epidemic.

Researcher in motion: Community engagement is all in a day's play for Denise Wilfley, PhD, center, an advocate for evidence-based weight management strategies involving patients, families, physicians and communities.

JERRY MAJUNHEM



Nancy Hulslander dove head-first into a healthier lifestyle by drawing upon a multipart resource program along with her own indomitable spirit. "I'd tell other kids to never give up. It's never too late to change."

JERRY WAJONHEIM

A threat to public health

Although the category "severely obese" (defined as having a body mass index [BMI] at least 20 percent greater than 95 percent of children of the same age and sex) did not exist 40 years ago, it is the fastest growing among young people.

Type 2 diabetes and cardiovascular disease, traditionally diseases of adulthood, are being diagnosed in kids with obesity. These children are also at higher risk for low self-esteem, social isolation, depression and anxiety.

"Kids with obesity are more likely to have severe obesity as adults," said Wilfley, the Scott Rudolph University Professor of Psychiatry. "This generation of youth may be the first to live shorter lives than their parents. And, more of those years will be spent disabled from medical problems. Childhood obesity is a huge public health threat."

Even though Nancy joined a swim team as a young child, physical activity did not counteract the effects of diet. One of the most misunderstood issues in obesity treatment is the role of physical activity, Wilfley said. Although physical activity has many positive benefits — improved school performance, mood and overall health — it often is an inefficient way to offset calories.

"A child would need to run for three hours to burn off the calories in a fast food meal (cheeseburger, fries and soft drink) that takes 10 minutes to eat," Wilfley said. "Even very physically active children may gain weight eating a 'typical' American diet."

The kids being followed in COMPASS really are no different than many kids their age who are bombarded daily with unhealthy food options, Wilfley said. And busy parents often have no idea where to start when it comes to regaining control.

More than a "calories-in-calories-out" approach, COMPASS taught parents to re-engineer the home, school and community environments.

The emphasis: Make the healthy choice the easy choice by building social support and routines. Families learned the importance of providing accessible nutrient-dense foods at home; becoming advocates at school; and leveraging the support of friends in healthy eating and activities.

Navigating the way

In collaboration with Seattle Children's Hospital Research Institute, COMPASS enrolled more than 170 families with one or more children who were overweight and at least one parent who was overweight. The study tested family-inclusive strategies for long-term weight loss in children.

A "traffic light" approach made it fun for kids and simpler to understand. The Traffic Light Diet was designed in the 1970s by Wilfley's longtime collaborator Leonard H. Epstein, PhD, SUNY Distinguished Professor of Pediatrics, University at Buffalo. The diet uses traffic light colors to categorize food choices: green for anytime foods; yellow for sometimes foods; and red for rare foods.

COMPASS extended the traffic light colors to physical activity. Nancy and other participants were encouraged to eat plenty of green foods (fruits and vegetables) and perform activities like biking. And they were told to limit red foods, which are high in fat and sugar, and sedentary (red) activities such as watching TV.

One of the overarching research objectives was to understand the role of familial and social factors in the prevention and treatment of weight and eating disorders. "Young children do not have power over their environment," Wilfley said. "If you can change the parent's behavior and help that adult acquire healthier eating habits and physical activity patterns, that's going to have a positive effect on the child."

Getting Nancy's mom on board provided support at home. But, for new behaviors to stick, modifying other social settings was just as crucial.

The family enlisted the aid of Nancy's school, which posted the traffic light guidelines. In learn-

Altering adults' health behaviors can have a positive effect on their children as well.



JERRY MAUNHEIM

ing about COMPASS, the school community eagerly teamed up to help Nancy and her peers make healthy choices.

"It's a double dose of support for the child," said Dorothy Van Buren, PhD, assistant professor of psychiatry. "If a child is trying to eat healthfully, but the only food at a school party is cupcakes, it's not realistic. This approach helps parents be more aware of what's happening at school, to speak up and lead by example."

Using social support is key to solidifying change. Friends also have the power to inspire green eating and activity. "Parents can help by ensuring that playdates involve physical activity and nutritious snacks and by encouraging children to seek out active friends who will make it easier to choose sports over screen time," Wilfley said. "We want to interrupt that unhealthy cycle to prevent further weight gain and ingrain healthy habits."

Prior to COMPASS, a nutritionist simply recommended that Nancy add more protein to her diet. "COMPASS helped us realize there is no silver bullet," Vicki said. "It was important that Nancy and every family member — including our extended school family — commit to making small changes and incorporating them into everyday life."

As Wilfley has shown, family-based interventions help kids lose weight. Maintaining weight loss, however, remains challenging. Wilfley

Wilfley's investigations into the range of weight management concepts suggest the need for multipart strategies far beyond the fad diets and quick fixes embraced by popular culture.

Extended periods of weekly intervention yield better weight-loss outcomes in kids

combined the family-based intervention with a weight-maintenance intervention, and sought to understand the optimal “dose” — frequency and length of treatment — for durable success.

All COMPASS participants underwent four months of intensive treatment, meeting weekly with behavioral change experts and weighing in.

Over eight more months, some families participated in high-dose treatment (32 weekly sessions) with continued focus on enhanced family, peer and community support, which Wilfley terms as social facilitation maintenance (SFM). SFM differs from generally dispensed health advice by recognizing the importance of the child’s social network in bringing about change. High-dose SFM was compared to two low-dose interventions, SFM or an educational control focused on eating and activity behaviors.

Kids who received weekly intervention of high-dose SFM yielded the best weight-loss maintenance outcomes, and children who received low-dose SFM responded better than the control.

Advocating for children

The majority of kids do not have access to such multicomponent weight-reduction therapies. The U.S. Preventative Services Task Force recommends coverage for both adults and children with obesity. Medicare is providing coverage consistent with these guidelines for adults, but Medicaid and private insurers do not yet reimburse for these treatments in children.

“We have a treatment that works for children with obesity, but several barriers impede its wider spread such as lack of insurance coverage; finding solutions to these barriers fuels my passion,” said Wilfley, who co-chairs the Missouri Children’s Services Commission Subcommittee on Childhood Obesity, which strives to improve access.

Over the past 25 years — with more than \$30 million in NIH funding — Wilfley has investigated the causes, prevention and treatment of eating disorders and obesity. Initially Wilfley was

drawn to the study of binge eating as a postdoctoral fellow at Stanford University. She received NIH support for one of the first controlled studies in those who binge eat by comparing the use of Interpersonal Psychotherapy (IPT), which works to enhance social support and decrease interpersonal stress, to Cognitive-Behavioral Therapy (CBT), which aims to improve eating patterns and the way people think about their shape/weight.

Her subsequent studies in documenting the diagnostic and clinical significance of binge eating led to the disorder’s inclusion in The Diagnostic and Statistical Manual of Mental Disorders (DSM-5) as a psychiatric diagnosis.

“Denise’s study was groundbreaking,” said W. Stewart Agras, MD, emeritus professor of psychiatry and behavioral sciences at Stanford University School of Medicine. “There definitely was no binge-eating disorder at that time and very little treatment. She has clearly shown that IPT is effective in treating binge-eating disorder, and is as good as CBT.”

One of the most striking findings in Wilfley’s study of patients with binge-eating disorder was their report of being overweight or obese as children. This finding sparked Wilfley’s interest in childhood obesity and early intervention.

“Denise is one of the leading childhood obesity investigators working today,” Epstein said, crediting her for innovative treatments that lead to success.

Small changes can reap lifelong results. Wilfley cited the example of an 8-year-old with obesity. At age 8, the child would need to lose only 4 pounds to no longer be obese. That number rises to 16 pounds by age 12, and to 65 pounds by age 18. “Parents may be told not to worry — that their child will grow out of it,” Wilfley said. “But if a child is overweight at age 5, we can predict that he or she will be obese by age 12.”

Wilfley, along with Epstein, is leading a 500-family study focused on implementing weight-reduction therapy in health-care settings. “Moving treatment into primary care capitalizes on the relationship between providers and families and creates a team dedicated to supporting children and families in engineering healthier lifestyles,” Wilfley said. “This study will move us closer to improving accessibility of childhood obesity treatment, and we are working to improve collaboration among insurers, policy makers and health-care providers to make effective care widely available.” □

Becoming healthier together: Stephanie Esses, a nurse practitioner at St. Louis Children's Hospital, and Julia Partin (right) prepare a meal with their children, Margo, 2, and Olivia, 4, at their home in Olivette. Esses brought home insights she learned through a BJC HealthCare-sponsored employee program.



JERRY NAUNHEIM

Employee program empowers families

Wilfley recently designed an employer-funded obesity treatment program for St. Louis-based BJC HealthCare. Incorporating insights from COMPASS, the program, named MyWay to Health, is helping employees and their family members lose weight and lower the health-related costs of obesity.

Participating BJC employees and their immediate family members receive private sessions with a wellness coach, who reviews lifestyle habits and develops individualized strategies.

The first group of more than 250 participants averaged a BMI of 37.70 kg/m². A year later, results showed an average weight loss of 26.57 pounds and body weight loss of 11.42 percent, as well as significant improvements in cardio-metabolic outcomes, waist circumference, body composition, quality of life and body image.

Stephanie Esses, a pediatric nurse practitioner in the St. Louis Children's Hospital Pediatric Intensive Care Unit — who did the program with her wife — lost 59 pounds. Their two preschool-aged daughters joined in. “We looked at how we could incorporate our children’s playtime at the park into our exercise routine,” Esses said. “We’ll power walk for an hour before the kids play. It’s a nice lesson in developing a healthy lifestyle for them to see us working out together.”

A 10 percent reduction for someone with a BMI of 39 decreases medical costs by almost \$2,600 annually. Based on estimated reduced medical expenses, Wilfley expects MyWay to Health to pay for itself in one year and to produce a return on investment for BJC in subsequent years. □



The next destination

ANTICIPATION. UNCERTAINTY. EXCITEMENT. NERVES.

Match Day, the day when thousands of graduating medical students across the country simultaneously find out where they will head for residency training, took place March 18 this year. On this fateful day in the Eric P. Newman Center auditorium, students at Washington University School of Medicine came to the microphone one-by-one, tearing open their envelopes and announcing the news to classmates, family and friends.

Overall, 91 School of Medicine students matched in 19 specialties. The most popular specialties were internal medicine, orthopaedic surgery and pediatrics. Twenty-nine students will complete some or all of their residency training at Washington University-affiliated programs, including those at Barnes-Jewish and St. Louis Children's hospitals. Outside of Missouri, California and Massachusetts are popular destinations with 19 students entering premier training institutions in those states.

ARIZONA

Phoenix

University of Arizona
College of Medicine

INTERNAL MEDICINE

Audrey Lee

CALIFORNIA

Los Angeles

Cedars-Sinai Medical Center

ORTHOPAEDIC SURGERY

Tonya An

University of California,
Los Angeles Medical Center

ANESTHESIOLOGY

Ari Huverserian

ORTHOPAEDIC SURGERY

Jack Wang

PATHOLOGY

Cherise Meyerson

University of California,
Los Angeles/EyeSTAR Program

OPHTHALMOLOGY

Michel Sun

San Diego

University of California,
San Diego Medical Center

OBSTETRICS-GYNECOLOGY

Erin Swor

RADIOLOGY-DIAGNOSTIC/ RESEARCH

Adam Searleman

San Francisco

University of California,
San Francisco

EMERGENCY MEDICINE

Tiffany Cheng

NEUROLOGY

Josiah Gerdtz

ORTHOPAEDIC SURGERY

Gopal Lalchandani

PEDIATRICS

Jane Symington

Stanford

Stanford University Programs

PATHOLOGY

Simon Chen

CONNECTICUT

Farmington

University of Connecticut
School of Medicine

GENERAL SURGERY

Neel Joshi

New Haven

Yale-New Haven Hospital

PSYCHIATRY-COMBINED ADULT/CHILD

Emily Olfson

DISTRICT OF COLUMBIA

Washington

Children's National
Medical Center

PEDIATRICS-PRIMARY

Johanna Kaufman

ILLINOIS

Chicago

Northwestern McGaw/NMH/VA

GENERAL SURGERY

Katherine Ott

INTERNAL MEDICINE

Punit Vachharajani

Rush University Medical Center

ANESTHESIOLOGY

Yulong Chen

INDIANA

Indianapolis

Indiana University School
of Medicine

VASCULAR SURGERY

Katherin Leckie

IOWA

Iowa City

University of Iowa
Hospitals and Clinics

ORTHOPAEDIC SURGERY

Emily Connor

LOUISIANA

New Orleans

Tulane University School
of Medicine

OBSTETRICS-GYNECOLOGY

Ariel Thomas

MARYLAND

Baltimore

Johns Hopkins Hospital

DERMATOLOGY

George Denny

EMERGENCY MEDICINE

Daniel Brenner

INTERNAL MEDICINE

Christopher Cole

Paul Scheel

MASSACHUSETTS

Boston

Boston Children's Hospital

PEDIATRICS

Andrew Groves

Maria Trissal

Brigham and Women's Hospital

NEUROLOGY

Jeffrey Gluckstein

Massachusetts General Hospital

INTERNAL MEDICINE

Lawrence Benjamin

David Qualls

Marc Sherman

RADIOLOGY-DIAGNOSTIC

Francis Deng

MICHIGAN

Ann Arbor

University of Michigan Hospitals

DERMATOLOGY

Ji Won Ahn

OPHTHALMOLOGY

Rohan Jalalizadeh

PLASTIC SURGERY (INTEGRATED)

Gina Sacks

MISSOURI

St. Louis

Barnes-Jewish Hospital

ANESTHESIOLOGY

Gary Hammen

DERMATOLOGY

Caroline Fischer

Aaron Russell

EMERGENCY MEDICINE

Daniel Greenstein

INTERNAL MEDICINE

Monique Bruinsma

Yee-Shiuan Chen

Matthew Crisp

Ryan Day

Jaspur Min

Andrew Perry

Natalia Brito Rivera

Ross Vyhmeister

Tina Zhu

INTERNAL MEDICINE- PRIMARY

Kelsey Moon



ROBERT BOBSON

NEUROLOGY
Chris Chou

ORTHOPAEDIC SURGERY
Marie Morris

PATHOLOGY
Lulu Sun

PATHOLOGY-CLINICAL
Mark Zaydman

PLASTIC SURGERY (INTEGRATED)
Ema Zubovic

PSYCHIATRY
Celina Jacobi
Shawgi Silver

UROLOGY
Jonathan Weese

St. Louis Children's Hospital

PEDIATRICS
Leslie Fogel
Sarah Greene
Daisy Zhou

Washington University

OPHTHALMOLOGY
Owen Qi

NEW YORK

Bronx

Einstein Campus/
Montefiore Medical Center

OBSTETRICS-GYNECOLOGY
Ann Frisse

Great Neck

Hofstra North Shore-LIJ
School of Medicine

INTERNAL MEDICINE
Alicia Chionchio

New York

New York Hospital For
Special Surgery

ORTHOPAEDIC SURGERY
Kenneth Lin

New York-Presbyterian Hospital

ANESTHESIOLOGY
Lisa Ma

New York University
School of Medicine

OTOLARYNGOLOGY
Lindsey Moses

PEDIATRICS
Ashley Gefen

Rochester

University of Rochester/
Strong Memorial Hospital

**INTERNAL MEDICINE-
PRELIMINARY**
Cheryl Chu

ORTHOPAEDIC SURGERY
Raymond Chen

OHIO

Cincinnati

Christ Hospital/
University of Cincinnati

FAMILY MEDICINE
Brian Bouchard

Cleveland

Case Western Reserve/
University Hospitals

OBSTETRICS-GYNECOLOGY
Lauren Martin

Columbus

Ohio State University
Medical Center

ORTHOPAEDIC SURGERY
Sravya Vajapey

OREGON

Portland

Oregon Health & Science
University

INTERNAL MEDICINE
Daniel Feng
Sophia Li

ORTHOPAEDIC SURGERY
Torgom Abraamyan

UROLOGY
Brent Knight

PENNSYLVANIA

Philadelphia

Hospital of the University
of Pennsylvania

NEUROLOGY
Alice Cai

Thomas Jefferson University

ORTHOPAEDIC SURGERY
Brianna Fram

Pittsburgh

University of Pittsburgh
Medical Center

ANESTHESIOLOGY
Wen Xu

DERMATOLOGY
Teerawit Supakorndej

UROLOGY
Anand Mohapatra

TENNESSEE

Nashville

Meharry/Metro General Hospital

**INTERNAL MEDICINE-
PRELIMINARY**
Scott Douglas

TEXAS

Dallas

University of Texas
Southwestern Medical School

PSYCHIATRY
Bayan Jalalizadeh

Houston

Baylor College of Medicine

DERMATOLOGY
Johnny Zhao

EMERGENCY MEDICINE
Sergio Molina

PEDIATRICS/GLOBAL HEALTH
Paul George

RADIATION-ONCOLOGY
Sam Sun

See more photos online:

wumcnews.org/match2016

WISCONSIN

Madison

University of Wisconsin
Hospital and Clinics

RADIATION-ONCOLOGY
Jacob Witt

Milwaukee

Medical College of Wisconsin
Affiliated Hospitals

PEDIATRICS
Allison Blonski

CANADA

Toronto

University of Toronto

ORTHOPAEDIC SURGERY
Aouod Agenor





THE FUTURE OF HUMAN HEALTH

Donors to the School of Medicine have played a pivotal role

in *Leading Together: The Campaign for Washington University*, which met its \$2.2 billion goal in April 2016, two years ahead of schedule. Widespread participation from thousands of medical school alumni, faculty, staff, patients and friends accounts for half of this total goal. Such philanthropy strengthens the university's leadership and contributions to society.

From the beginning of the campaign, the university identified \$4 billion in needs to fully realize its strategic plans, which focus on four key areas: preparing tomorrow's leaders, advancing human health, inspiring innovation and entrepreneurship, and enhancing the quality of life.

To enable even greater impact on society, the Board of Trustees voted in January 2016 to increase the campaign goal to \$2.5 billion. *Leading Together* will conclude June 30, 2018.

"We have not yet accomplished everything we set out to do," said Chancellor Mark S. Wrighton. "A great university has great responsibilities — to our students and to the society we serve. That responsibility has increased in proportion to the growth and progress we have achieved through the campaign. It offers an unprecedented opportunity — and a responsibility — to aim even higher."

We invite your support of this historic endeavor.

With support from *Leading Together*, Washington University is making breakthroughs in medicine, opening treatment possibilities for cancer, Alzheimer's disease, mental illness and other devastating diseases. The Center for Advanced Medicine, pictured, is a nexus for the delivery of innovative therapies.



Together, we heal. Advancing human health

Innovative technologies



Attracting great people

The combined philanthropy of many individuals helps attract and retain outstanding faculty and students. People are at the heart of the medical school's mission, whether they are patients benefiting from lifesaving treatments, students becoming the next generation of health-care leaders, or world-class researchers searching for new treatments and cures.

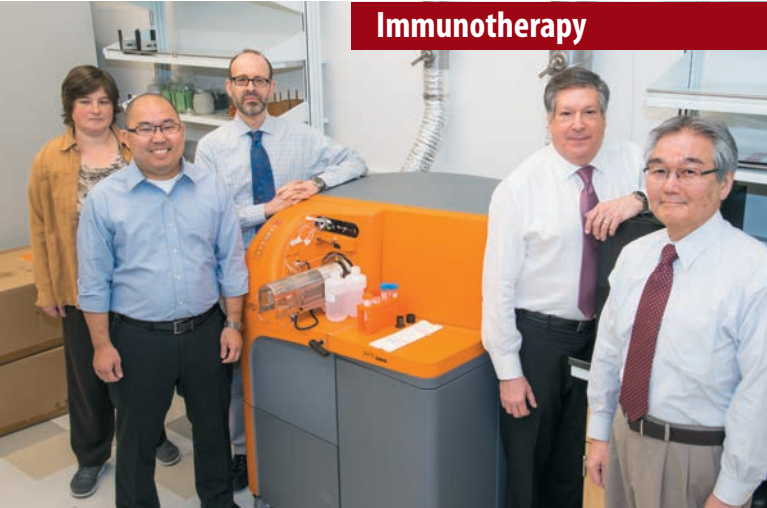
Educational programs



Endowed professorships are critical to recruit and retain outstanding faculty. These awards recognize extraordinary achievement and provide vital support for the research, teaching, and work of distinguished physicians and scientists. Samuel Achilefu, the Michael M. Ter-Pogossian Professor of Radiology and co-director of the Center for Multiple Myeloma Nanotherapy, for example, is a highly active researcher supported by these endowments. His research projects include developing goggles that help surgeons see cancer in real time and a therapy that uses a combination of light and a photo-sensitizing drug to kill malignant cells.

To date, 55 School of Medicine professorships have been created as a result of donations to *Leading Together*.

Immunotherapy



Scholarships Because more than 80 percent of medical students, 85 percent of physical therapy students, and 90 percent of occupational therapy and audiology students receive financial aid, the need for scholarship support continues to be a priority of the *Leading Together* campaign. Scholarship support helps these exceptional students obtain a first-class education without worrying about excessive debt. With support from annual and endowed scholarships, the average debt of a Washington University medical school graduate in 2014 was 46 percent less than the average debt for all U.S. medical students, allowing outstanding young physicians to practice in their field of choice.

through the Campaign for Washington University

Fostering breakthroughs

At a time when government funding for science has declined, endowments reward and encourage groups of researchers to take risks on innovative projects, enabling them to test new ideas and pose new research questions. While professorships reward individual faculty members, research endowments can energize entire teams.

Research endowments Through the Charles F. and Joanne Knight Alzheimer's Disease Research Fund, collaborators are working on compounds that may one day treat Alzheimer's and also on early detection methods, with the goal of prevention. Another endowment allows members of The Elizabeth H. and James S. McDonnell III Genome Institute to conduct research into the genetic origins of a variety of diseases, such as childhood cancer, in hopes of more effective treatments.

Other research endowments created through *Leading Together* include the:

- Donald Danforth Jr. Advanced Research in Neurological Disorders Endowed Fund for research into a range of conditions that cause injury and impairment to the brain and central nervous system.
- Alvin J. Siteman Cancer Research Fund for pioneering investigations into cancer prevention, diagnosis and treatment.
- Taylor Family Institute for Innovative Psychiatric Research to advance the science underlying the diagnosis and treatment of psychiatric illnesses.
- Alan A. and Edith L. Wolff Institute to advance the most promising biomedical research projects focused on preventing, treating and curing disease.

Reinventing research and learning

Innovation and collaboration are core values at the university. Two new initiatives exemplify the medical school's willingness to invest in interdisciplinary training and research.

Center for Human Immunology and Immunotherapy Programs The new Center for Human Immunology and Immunotherapy Programs (ChiiPs) will help scientists harness the body's immune system to fight infections and cancer.

ChiiPs aims to turn new discoveries into better diagnoses and treatments for inflammation-related disorders such as Alzheimer's, diabetes and macular degeneration.

Robert Schreiber, PhD, Alumni Endowed Professor of Pathology and Immunology and director of CHiiPs, and his colleagues have shown that the immune system plays a key role in controlling tumor growth. Co-opting the body's immune system to drive some cancers into dormancy could transform cancer from a catastrophic illness into a controllable condition.

Center for Interprofessional Practice and Education

Traditionally, physicians, nurses, pharmacists and other health-care professionals train separately, yet must work together as high-functioning teams. To bridge this gap, the medical school has partnered with the St. Louis College of Pharmacy and the Goldfarb School of Nursing at Barnes-Jewish College to create the Center for Interprofessional Practice and Education (CIPE).

Among the benefits of better-integrated teams are increased patient satisfaction and reduced health-care costs. "Health-care workers make fewer errors when they collaborate and feel respected by one another," explained Heather Hageman, CIPE inaugural director.

For students, interprofessional learning ranges from lectures and small groups to simulated and real clinical care experiences that facilitate collaboration and teamwork. The center will reshape curricula, fostering interprofessional education research and improving patient outcomes.

A vision for better vision

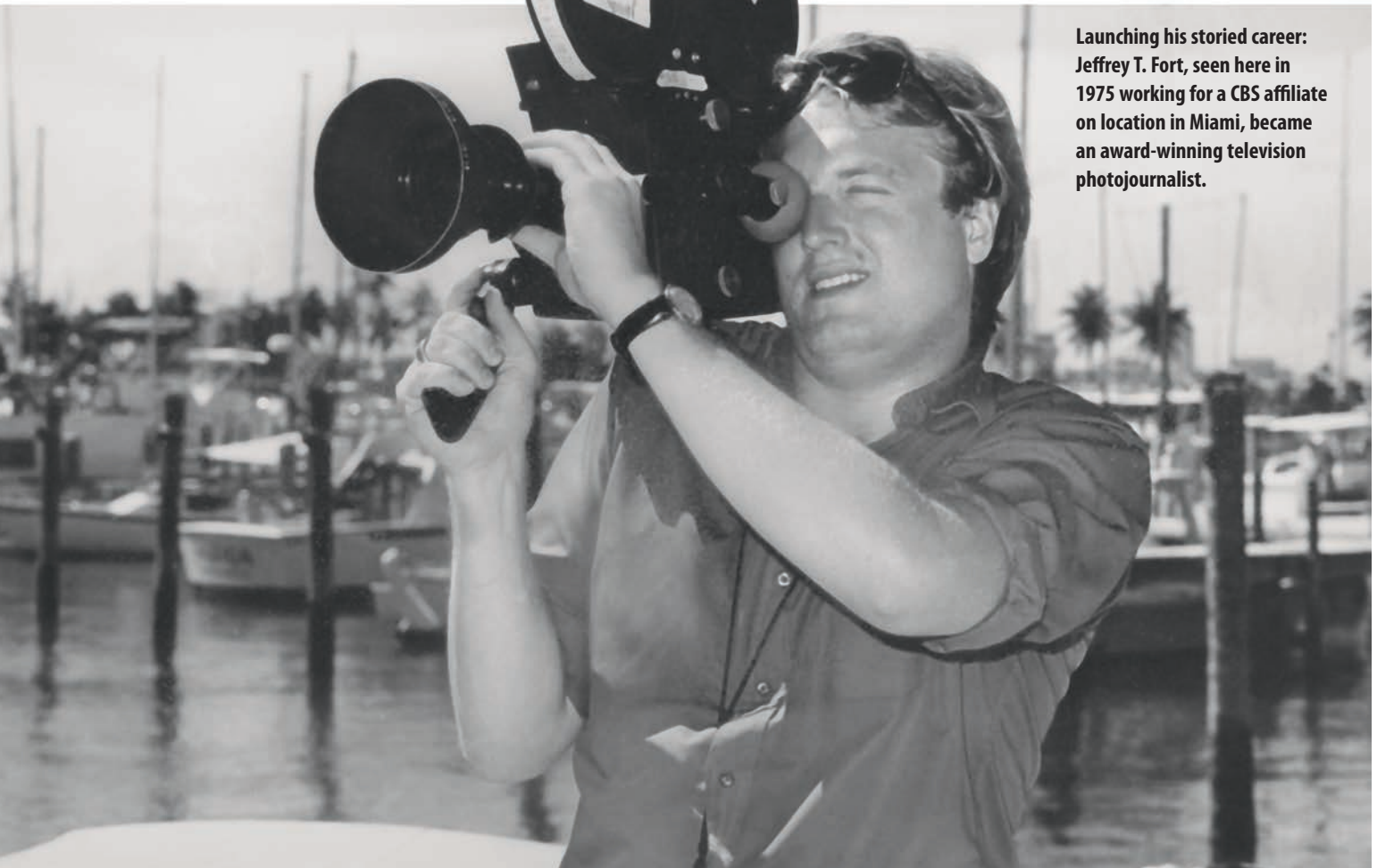
Cameraman's gifts support top ophthalmologists

While driving at night, Jeffrey T. Fort began noticing “halos” around car headlights. Air puff tests at the optometrist’s office always came back negative for glaucoma, but the problem persisted. Eventually, Fort underwent a comprehensive eye exam at Washington University Medical Center, where a doctor discovered substantial optic nerve loss due to chronic untreated glaucoma.

As an award-winning professional photographer and cameraman for TV shows such as “Candid Camera” and “Inside Edition,” Fort was worried.

“I thought, ‘Oh my gosh, I’m going to lose my eyes.’”

Launching his storied career: Jeffrey T. Fort, seen here in 1975 working for a CBS affiliate on location in Miami, became an award-winning television photojournalist.





Care, compassion and connection with patients: A tradition in ophthalmology continues with Carla Siegfried, MD, the inaugural recipient of a professorship honoring Allan Kolker, MD.

Seated, from left: Allan Kolker, MD, wife Jackie, grateful patient and donor Jeffrey T. Fort; and, standing, Carla Siegfried, MD

The doctor, glaucoma specialist Allan E. Kolker, MD '57, a former professor of clinical ophthalmology, and his wife, Jacquelyn "Jackie," who ran the practice, immediately reassured him. So began Fort's 30-year relationship with the Kolkers, who went above and beyond his expectations.

To accommodate Fort's atypical working hours, the Kolkers arrived in the office early. In addition, they made themselves available during off-hours for emergencies. One Saturday night, when Fort had sudden vision problems, the couple insisted that he come to their house for an examination. Through the years, Fort observed that the pair treated all patients with special kindness, including those who couldn't pay.

Fort, who began having other issues with his eyes after his glaucoma diagnosis, credits a team of ophthalmologists at the School of Medicine for helping preserve his vision. In gratitude, he has made two significant gifts — establishing a professorship and a fund supporting retinal research — within the Department of Ophthalmology and Visual Sciences. In so doing, Fort is acknowledging the excellence of the entire Department of Ophthalmology and Visual Sciences, including researchers, biotechnologists, nursing and support staff who work together to deliver outstanding care and push the boundaries of ocular science. "Much like a Broadway show, the stars are best when the crew is the best," Fort said.

To recognize the Kolkers' "boundless care and compassion," Fort endowed the Jacquelyn E. and Allan E. Kolker, MD, Distinguished Professor of Ophthalmology and Visual Sciences. Carla J. Siegfried, MD, is the inaugural recipient.

Allan Kolker, who joined the ophthalmology faculty in 1963, has made many contributions to the field of ophthalmology. Author of more than 130 scientific publications, Kolker has led international efforts to advance glaucoma awareness

and treatment. He was a founding member of the American Glaucoma Society, served on the American Academy of Ophthalmology's board of trustees, and was director of both the American Board of Ophthalmology and the St. Louis Glaucoma Institute.

Siegfried, a glaucoma specialist who worked closely with Kolker in caring for patients, said she is humbled by the appointment. Upon retiring, Kolker referred many patients to her. "I am so honored," she said. "Having the Kolker name associated with this professorship is very meaningful to me. Dr. Kolker was a compassionate practitioner with shoes that are too big for me to fill, but I do feel that same caring connection with patients."

After joining the School of Medicine faculty, Siegfried began studying with David Beebe, PhD, now deceased, the former Janet and Bernard Becker Professor of Ophthalmology and Visual Sciences.

Beebe was investigating why patients developed cataracts after undergoing a vitrectomy, a surgery in which the eye's gel-like vitreous humor is removed and replaced with saline. The surgery is performed to repair retinal detachments and remove membranes from the retinal surface, among other reasons. Siegfried's research focuses on the increased risk of glaucoma following vitrectomy.

Using a modified probe in the eyes of patients who had prior vitrectomy, the researchers discovered increased oxygen levels throughout the eye, including the area of internal fluid drainage where eye pressure is determined. The most important glaucoma risk factor of increased eye pressure may be associated with this oxygen damage to the drain of the eye.

Siegfried is exploring how the eye maintains oxygen gradients, opening the door to potential treatment options for patients at risk for glaucoma or in need of vitrectomy.



The Jeffrey T. Fort Innovation Fund will aid investigators, including Rajendra Apte, MD, PhD, in exploring underlying mechanisms of visual diseases.

As well as being a photographer and cameraman, Fort also has launched several successful businesses. These entrepreneurial experiences inspired him to establish the Jeffrey T. Fort Innovation Fund dedicated to retinal research. “Much like starting a business or planting seeds in a garden, I wanted to enhance research to find solutions to visual impairment,” he said.

Rajendra Apte, MD, PhD, the Paul A. Cibis Distinguished Professor of Ophthalmology and Visual Sciences, is the principal investigator. A retinal surgeon with a busy practice, Apte studies the mechanisms of age-related macular degeneration, diabetic retinopathy and other blinding conditions. In particular, he is investigating how the aging immune system and metabolic dysfunction contribute to eye disease.

“It’s really wonderful to have people like Jeffrey who understand that progress sometimes happens very slowly,” Apte said. “With his gift, we can test new hypotheses in macular and retinal degeneration that we might have otherwise put on the back burner, and support outstanding students and scientists. Our combined efforts are being translated into novel therapies that will help millions of patients, and I am grateful to Jeffrey for making this happen.”

With the creation of the Innovation Fund, Jeffrey Fort also acknowledges the excellent care he received from many physicians, including:

Rajendra Apte, MD, PhD

Paul A. Cibis Distinguished Professor of Ophthalmology and Visual Sciences

Michael A. Kass, MD

Bernard Becker Professor of Ophthalmology and Visual Sciences

Kevin J. Blinder, MD

Professor of clinical ophthalmology and visual sciences

James C. Bobrow, MD

Professor of clinical ophthalmology and visual sciences

M. Gilbert Grand, MD

Professor of clinical ophthalmology and visual sciences

Matthew A. Thomas, MD

Professor of clinical ophthalmology and visual sciences

Daniel P. Joseph, MD

Associate professor of clinical ophthalmology and visual sciences

Michael J. Isserman, MD

Assistant professor of clinical ophthalmology and visual sciences

Such philanthropy allows researchers to generate sufficient data to compete for federal funding, and strengthens departments by encouraging “star faculty” to stay put, said Todd P. Margolis, MD, PhD, the Alan A. and Edith L. Wolff Distinguished Professor and chair of ophthalmology and visual sciences.

“As a faculty member, you don’t have a contract. You’re a free agent,” Margolis said. “Contributions like Jeffrey Fort’s allow us to compete for the best and the brightest. When you have people as talented as Dr. Siegfried and Dr. Apte, you want to do everything you can to support them, so that they can continue to do what they do best.”

Fort is grateful for the research and people in the Department of Ophthalmology and Visual Sciences who enabled him to keep his vision, and he continues learning about the advances happening here.

At a recent department event, Fort had the opportunity to meet researcher Mae Gordon, PhD, professor of ophthalmology and visual sciences. Learning about Gordon’s research affected Fort profoundly, and enhanced his belief in the potential for research to find ways to not only prevent blindness, but to restore sight.

1940s

Benjamin Jolly, MD 40, celebrated his 100th birthday in December 2015. He retired after 50 years in general surgery and stays active keeping up with sports and the stock market.

1950s

Shirley Stockham, NU, after spending 25 years in nursing, now owns a Nature's Sunshine business, which she enjoys operating with her partner.

1960s

E. Mitchell Singleton, MD 64, was awarded the 2015 Distinguished Citizen Award by the Washington County (Arkansas) Historical Society.

Col. Josh "Doctor Josh" Grossman, MD 65, enjoys regular speaking engagements, as well as writing reviews for medical publications.

Edna Thayer, NU 66, continues to be a freelance speaker; she has given more than 800 talks across the U.S. and Canada on the health benefits of laughter.

Sister Mary Jeremy Buckman, NU 67, received the Legend in Nursing March of Dimes Award for her decades of service to the profession. She remains active in health care by serving on committees and boards of Mercy Health System and volunteers in Mercy Health Archives.

Mary Mohr, NU 69, retired after 35 years at Washington University Clinical Research Center. She now enjoys spending time with grandchildren and "sharing Juice Plus for health and wealth around the world."

1970s

Don Knudson, MD 73, continues to practice at a multi-specialty clinic in Sioux Falls, S.D., and enjoys his work. He has fond memories of piling into the car with several medical school classmates on

Saturday mornings following biochemistry lectures and driving to an "all-you-can-eat" restaurant near the airport.

Linda Peterson, MD 74, retired in 2008 and enjoys making beaded jewelry. Her husband, **McKim Peterson, MD 74**, recently retired and is taking woodlot management classes.

Robert Weiss, MD 74, has retired and plans to rejoin the Peace Corps-Seed Global Health at Gulu University in northern Uganda.

Terri Kent, HA 79, retired in February 2015 as executive director at Lakeview Senior Living, which she helped open in 2009. She and her husband are enjoying time to travel and look forward to finishing their mountaintop home near Tabernash, Colo.

1980s

Linda Struckmeyer, OT 82, has been published in the American Journal of Occupational Therapy. The paper is titled "Home Modifications for People With Alzheimer's Disease: A Scoping Review."

Synthia Solochek, OT 83, lives in Arizona and is married with two teenage sons. In 2015, she celebrated her 20th anniversary of working for CARF International, an accreditor of health and human services programs.

Karen Mathews, MD 85, completed a master's degree in health administration at Ohio University in August 2015.

Douglas Noordsy, MD 85, was appointed clinical professor in the Department of Psychiatry and Behavioral Sciences at Stanford University School of Medicine.

Claire Skaggs Smith, OT 85, is working as a pediatric occupational therapist at Children's Therapy Works in Sarasota, Fla.

1990s

Judith Lieu, MD 92, is the otolaryngology residency program director at Washington University School of Medicine.

Michael Naylor, MD 95, lives with his wife, Katie, and their six children — five girls and one boy — in South Carolina.

Denise Dewald, MD 98, works in primary care pediatrics and internal medicine in Chicago and her daughter, Emily, is a freshman at Washington University. Denise and her husband, Lei, have been married 22 years and are proud parents of Emily (LA 19), Dava and Zoë.

Joel Rubenstein, MD 98, was promoted to associate professor in the Division of Gastroenterology at the University of Michigan, and was named the director of the Barrett's Esophagus Program.

Geoffrey Kerchner, MD 99, left a faculty position at Stanford University to join Genentech, where he designs phase I and II trials of novel therapies for Alzheimer's disease and other neurological illnesses. He still enjoys seeing patients and consulting on research projects at Stanford.

Katie Nowak, PT 99, attained fellow status with the American College of Healthcare Executives (ACHE). She also received a scholarship from Toshiba for the ACHE Executive Program and is a member of the Focus St. Louis 40th Leadership class.

2000s

Tess Chapman, MD 00, a pediatric radiologist, co-authored a textbook, "Pediatric Radiology: The Essentials," with a colleague at Seattle Children's Hospital.

Michael Kappelman, MD 00, was awarded funds from the Patient-Centered Outcomes Research Institute as principal investigator to study anti-TNF monotherapy versus combination therapy with low-dose methotrexate in pediatric Crohn's disease.

Kimberly Masker, OT 00, completed a clinical doctorate in occupational therapy, with a specialty track in hand therapy, from Rocky Mountain University of Health Professions in Provo, Utah.

Todd Levy, OT 02, worked with a young patient who was the first to undergo pediatric hand transplant surgery.

Deborah Chen-Becker, MD 03, became a private pediatrician at Children's Medical Center in Denver.

Amy Gentile, OT 03, was awarded a patent for Couch Aid, designed to promote better body mechanics when standing from the couch. The device helps patients remain independent and in their homes longer.

Kevin Wilson, MD 05, was elected to the board of directors of the American Academy of Otolaryngic Allergy for a three-year term.

Ying (Maggie) Chen, HS 10, has received several significant research awards in the past year to further studies focused on defining the molecular mechanism underlying genetic determinants of primary nephrotic syndromes. Chen received a prestigious, three-year Clinical Scientist Development Award from the Doris Duke Charitable Foundation as well as career development awards from both the Central Society for Clinical and Translational Research and the Nephrotic Syndrome Study Network to support her ongoing research

Mitchell Bronwen, PT 14, began working at Drum Hill Physical and Sports Therapy in Chelmsford, Mass.

California Medical Center before settling in Arizona as a general practitioner. With further training, Andrews became an anesthesiologist and served at Scripps Memorial Hospital La Jolla. He is survived by eight children and 16 grandchildren. His wife, Tillie, preceded him in death.

Ralph V. Gieselman, MD 47, HS 52

Gieselman, a longtime St. Louis physician, died Sunday, April 26, 2015. Born in St. Louis, Gieselman attended Washington University, completed postgraduate training at Barnes Hospital and became board-certified in internal medicine and gastroenterology. He later joined the faculty as a professor of clinical medicine. Gieselman served in the U.S. Army during World War II and the Korean War. After resigning his commission, Gieselman became chief of medicine at the newly opened Cochran Veterans Administration Hospital in St. Louis. He entered private practice and, in 1955, founded Internal Medicine Associates Ltd., which endures to this day. After retirement, Gieselman moved to Hermann, Mo., where he and his wife were active in civic and church activities, including prison and nursing home ministries. Gieselman is survived by: his children, Linda (Laszlo), Andrew (Wendy), Gwen (Randy) and Gaye (Mark); grandchildren, Ben (Ziggy) and Elizabeth (Neeraj); and three step-grandchildren and two great grandchildren. His wife of 67 years, Betty Lou (Boulware), preceded him in death.

Richard Landau, MD 40, LA 40

Landau, an endocrinology specialist at the University of Chicago, died Tuesday, Nov. 3, 2015. He was 99. Born in St. Louis, Landau attended Washington University for undergraduate and medical degrees before completing a residency at the University of Chicago. During World War II, Landau served as a U.S. Army physician in the Pacific theater. He returned to the University of Chicago in 1946 as an instructor of medicine and became a full professor in 1959. He later served as program director for the Clinical Research Center, associate chairman of medicine and chief of the endocrinology section. He is survived by: two daughters, Kay Fricke

and Susan (David) Axelrod; a brother, William; five grandchildren and one great-granddaughter.

Lida Lee Magness, NU 46

Magness died Friday, Aug. 7, 2015. She was 90. Born in Pittsburg, Kan., Magness graduated from Kansas State College and then nursing school at Washington University. Regardless of where she was living, Magness was an active member of the community, spending time with many organizations, including the American Red Cross, Camp Fire Girls and in church ministries. She is survived by children, grandchildren, great grandchildren, and great-great grandchildren.

Albert Loren Rhoton Jr., MD 59, HS 65

Rhoton died Sunday, Feb. 21, 2016. He was 83. Rising from the poverty-stricken Kentucky Appalachians, Rhoton attended WUSM and graduated with the highest academic standing. After completing neurosurgical training at Washington University, he joined the Mayo Clinic staff and later became professor and chairman of the Department of Neurological Surgery at the University of Florida. Rhoton served as the president of the American Association of Neurological Surgeons, among many other organizations, and was an honored guest or was elected to honorary membership in neurological societies across the globe. In all, he published nearly 500 scientific papers. Rhoton received distinguished awards including, but not limited to, the Cushing Medal of the American Association of Neurological Surgeons and the Medal of Honor of the World Federation of Neurosurgical Societies. He is survived by his wife of 58 years, Joyce; their children, Dr. Eric Rhoton (Diane), Dr. Albert Rhoton (Marya), Dr. Alice Rhoton-Vlasak (Richard) and Laurel Rhoton-Selner (Jim); 12 grandchildren and three great grandchildren; a brother, Dr. Richard Rhoton, and a sister, Sue Johnson.

Albert G. Smith, MD 47

Smith, a former department chair of pathology at Louisiana State University, died Tuesday, Oct. 13, 2015, in Shreveport. He was 91. A native of Charleston, Mo., Smith received a degree from WUSM, where he was a proud member of the

IN MEMORY

A L U M N I

Robert O. Andrews, MD 57

Andrews, a La Jolla, Calif., anesthesiologist and father of eight, died Thursday, Nov. 26, 2015. He was 89. Andrews enlisted in the U.S. Army at age 17 and was attached to the 41st infantry as a rifleman based in the Philippines. Later, he was assigned to the Recovered Personnel Detachment Unit in Hiroshima, Japan, assuming responsibility for the retrieval and care of U.S. soldiers. After an honorable discharge, he entered the University of Arizona, where he completed bachelor's and master's degrees before attending the School of Medicine. Andrews worked as an intern at Los Angeles County/University of Southern

medical fraternity. He completed residencies at St. Luke's Hospital in St. Louis and at Columbia and Duke universities. Smith served as an associate professor at Duke for 17 years and as deputy chairman of the Department of Pathology at University of Tennessee Medical School for four years. He joined Louisiana State University when its medical school was being formed (1969-70) and served as the first chairman of its pathology department; he was one of the last founders to retire. Smith and his wife, Harriet, endowed the first chair at Louisiana State University Medical School. He is survived by: his wife of 64 years; a brother and sister; children Susan Reid Smith Erba and Alan English Smith; and grandchildren Paul Francis Elba Jr., David Morris Elba, Samantha Ann Smith and Jacob Reid Smith.

Mary Sherwood Stewart, NU 45

Stewart, a nursing educator and volunteer, died Sunday, Jan. 17, 2016. She was 93. Born in Tulsa to a medical family, Stewart attended nursing school at Washington University. After graduating, she taught anatomy, microbiology and surgical nursing at the university. She worked as a volunteer in many capacities, such as tutoring elementary age children in city schools and seeing patients and training staff at Grace Hill Settlement House. Stewart was preceded in death by two infant children and her husband, Floyd. Survivors include: Raymond (Tik); Allan (Nancy Halstead); three grandchildren, three great-grandchildren and other extended family.

Anna Tollner, NU 51

Tollner died Tuesday, Nov. 17, 2015. She was 93. Tollner was a U.S. Army veteran, having served as a first lieutenant in World War II, and was honored as the Greater Cincinnati Woman Veteran of the Year in 2012. She served as the clinical director at Good Samaritan Hospital in Cincinnati. Tollner is survived by her sister, Freda Hill, and many nieces and nephews.

Duane D. Warden, MD 48

Warden, a retired obstetrician-gynecologist, died Tuesday, Dec. 15, 2015. He was 90. Born in Grant City, Mo., he attended Central Missouri State University before being admitted to WUSM. He completed

residency and spent two years in the U.S. Army before beginning his medical practice. Over the course of his 35-year career, Warden delivered more than 6,500 babies. In 1990, he retired from medicine to breed Angus cattle full time. He is survived by: his wife, Carol Spetman; children Jon, Susan and Craig; four grandchildren; and a sister, Marilyn.

F A C U L T Y

Jason S. Goldfeder, MD

Jason S. Goldfeder, MD, a revered teacher in the Department of Medicine, died Wednesday, Dec. 9, 2015, following a 12-year battle with amyotrophic lateral sclerosis. He was 45. An assistant professor of medicine, Goldfeder died at his Ladue home, supported by his wife, Nguyet Minh Nguyen, MD, also an assistant professor of medicine in the Department of Medicine. In 1998, he joined the faculty and served for several years as director of the university's Wohl Clinic. For nearly a decade, he directed the internal medicine board review course. In 2003, he was appointed associate program director of the internal medicine residency program at Barnes-Jewish Hospital (BJH). He is credited with developing curriculum in several important areas of internal medicine for medical students and house staff. Goldfeder stepped down from full-time work in 2007, but volunteered in the Wohl Clinic through 2010. From April 2011 until his death, he participated in house staff education by helping with board exam preparation. He earned a bachelor's degree in chemistry from the University of Pennsylvania, a medical degree from The Johns Hopkins University School of Medicine and completed an internship and residency at BJH. Goldfeder also is survived by: his mother and stepfather, Judy and Arthur Sales; father and stepmother, Ron and Sherye Goldfeder; a brother, Greg (Allison) Goldfeder; stepsisters Deborah (Matthew) Graver, Lori (David) Kline and Tami (David) Palkovitz; a stepbrother, Craig Frand; and several in-laws, nieces and nephews.

Charles L. Roper, MD

Charles L. Roper, MD, a cardiothoracic surgeon and a professor emeritus of surgery, died of respiratory failure Thursday, Dec.

17, 2015, in Kirkwood, Mo. He was 90. Early in his surgical career, Roper demonstrated groundbreaking techniques when he partnered with the late Joseph Ogura, MD, former head of the Department of Otolaryngology. Together, the physicians pioneered esophageal reconstruction procedures that allowed patients reliant on gastrostomy tube feedings to resume oral feedings. His medical expertise is noted in dozens of peer-reviewed publications, and he served on the editorial boards of several prestigious journals. Roper became an emeritus professor in 1993, but remained a mentor at WUSM and acted as a sounding board on difficult surgical cases. A St. Louis Cardinals fan, Roper also was a consulting physician for the team. Roper served in the U.S. Army with service in Europe during World War II. He earned a bachelor's degree in biology at Colorado College in 1949 and a medical degree at the University of Colorado in 1953. Roper interned at the now-defunct St. Louis County Hospital and completed a general surgery residency and cardiothoracic fellowship at Barnes Hospital. In 1959, he became a WUSM faculty member. Roper is survived by his wife, Dorothy Lea Roper; his six children, Elizabeth Roper, Charles Roper Jr., Deborah McNamara, Catherine Noll, William Roper and Sandra Coburn; and 15 grandchildren and five great-grandchildren. He is preceded in death by his first wife, Gail Roper.

Stuart Weiss, MD

Stuart Weiss, MD, a longtime professor of clinical neurology, died Tuesday, Oct. 27, 2015, in St. Louis. He was 85. Born in St. Louis, he earned bachelor's and medical degrees at Washington University in 1950 and 1954. He completed a neurology residency at Barnes Hospital and a fellowship at New York Presbyterian-Columbia University Medical Center. For the past 51 years, he practiced neurology at Barnes-Jewish Hospital and was a professor of clinical neurology at WUSM. Weiss is survived by his wife of 60 years, Marlita Wennerman Weiss; his children Dr. Lori (Bradford Wainer) Weiss, Michael (Diane) Weiss and Debra Weiss; his brother, Gerald (Virginia) Weiss; and several grandchildren.

Shirley Ann Sahrman, PT, PhD

*Professor emeritus of physical therapy,
of neurology and of cell biology & physiology*

Where did you go to high school?

*Nerinx Hall High School, where I won the senior
award for excellence in athletics and academics. In
those days, even at 5'4" you could play basketball!*

Why physical therapy?

*I wanted to help children who were paralyzed
due to polio. For somebody who was as active as
I was it was hard to imagine people who couldn't
participate in athletics, or couldn't even walk.*

What's your legacy?

*The Movement Science Program, which I developed
and directed, has increased the pool of academic
researchers whose work infuses this field with
new knowledge of human movement.*

*Like Dr. Sahrman, consider supporting
Washington University School of Medicine
through an estate gift, life income plan or
other planned gift. For more information, visit
plannedgiving.wustl.edu or call 800.835.3503.*



LEADING *Together*

The Campaign for Washington University

*Consult with your legal or tax adviser
before making a charitable gift.*

Shirley Ann
Sahrman, PT, PhD,
and Louise

Favorite honor:

*The Mary McMillan Award. It is the highest honor
from the American Physical Therapy Association.*

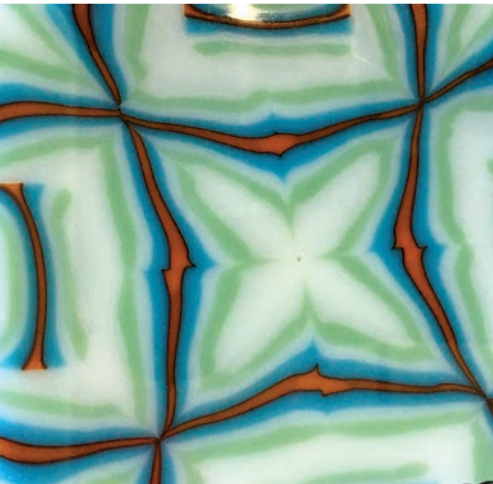
How does a movement expert stay active?

*Walking four to five miles a day with my dog,
Louise, a Louisiana Catahoula Leopard Hound.*

I support the School of Medicine because:

*I couldn't imagine a better place, where mentors,
colleagues and students set wonderful examples.
That's why I put off retirement for so long!*



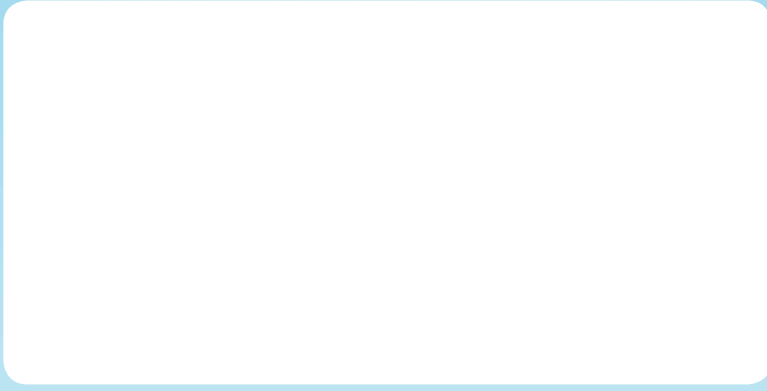


Art Show 2016

The School of Medicine Art Show, held this past January in the Farrell Learning and Teaching Center, presented a wide range of work. The show has become an annual tradition since it was first held 10 years ago. Organized and curated by medical students, the show highlights the diverse artistic talents of the medical school community.

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Signaling spring

A rosy-pink redbud tree in bloom near the Ellen S. Clark Hope Plaza on the Medical Campus.

