First Steps Four-year-old Jessica Hill is learning to walk—thanks to help from the School of Medicine’s new Pediatric Spinal Cord Injury Program and the loving support of her parents, Kevin and Leann Hill. For more on Jessica’s remarkable recovery from paralysis, please turn to page 18.
Guaranteed INCOME for Life
The Washington University Charitable Gift Annuity
See page 36

Class Notes
Update Yourself!
Your classmates would like to hear what you've been doing. Please take a moment to complete the postage-paid reply card on page 36.

2001!
Joseph A. Borrelli Jr., MD, assistant professor of orthopaedic surgery, is among a select group of surgeons nationwide who perform complex and technically demanding acetabular (hip) fracture repair. The devastating injury results from "high-energy" trauma and requires extensive rehabilitation. For more on this story, please turn to page 8.

**FEATURES**

8 **Bad Breaks** BY CANDACE O'CONNOR
The worst kind of fractures—those from high-speed motor vehicle accidents and falls—get the best kind of treatment.

12 **Minding Human Medical Research** BY HOLLY EDMISTON
One for all and all for one describes the highly successful relationship between university investigators and those who choose to participate in human research.

18 **You Go, Girl!** BY DIANE DUKE WILLIAMS
One small child defies the odds by learning to walk—as part of the new Pediatric Spinal Cord Injury Program.

20 **The New Microbiology** BY DARRELL E. WARD
Technical advances of the past half-century have turned the study of microbiology into a whole new ballgame.

26 Dennis Cooper, MD ’71, top Phoenix ophthalmologist and amateur archaeologist
Marshall receives Merrifield Award

OUTSTANDING CAREER ACHIEVEMENT in peptide research has earned Garland R. Marshall, PhD, professor of biochemistry and molecular biophysics and of biomedical engineering, the Bruce Merrifield Award sponsored by the American Peptide Society. The award was bestowed earlier this year at the combined 2nd International Peptide Symposium and 17th American Peptide Symposium in San Diego.

The award is named in honor of R. Bruce Merrifield, PhD, a recipient of the 1984 Nobel Prize in chemistry and a professor at Rockefeller University. It holds special meaning for Marshall because he was Merrifield’s first graduate student.

Marshall, who also is resident member of the Washington University Center for Computational Biology, worked in Merrifield’s lab during the initial development of an important new way to synthesize peptides, a medically important chain of amino acids. The new chemical approach allowed the routine synthesis of peptides and later, small proteins. Ultimately, it began a revolution in molecular biology, enabling scientists to routinely synthesize other biopolymers such as nucleic acids and oligosaccharides.

Today, after 35 years of innovative research, Marshall is internationally known for his own work with peptides. He first described a peptide inhibitor of angiotensin II, a hormone involved in hypertension. He led the exploration into important receptors for biologically active peptides, and he pioneered the development of HIV protease inhibitors. His lab created MVT-101, an inhibitor that was used to produce the first crystal structure of the HIV protease enzyme combined with an inhibitor.

Marshall also has played an important role in developing molecular modeling and associated computer graphics for three-dimensional studies of molecules and the design of novel therapeutics. Recently, he has become interested in the modeling of metals in biological systems and has founded a company that develops novel ligands for metals that might have therapeutic applications.

Medical missionary

Dawn R. Schuessler, clinical research nurse coordinator in neurosurgery at the School of Medicine, attends to a young patient in Nairobi, Kenya. A team of St. Louis neurosurgeons and nurses, including eight faculty and staff from Washington University Medical Center, ventured to Kenyatta National Hospital on a two-week mission earlier this fall during which they trained nursing staff, provided the hospital with much-needed supplies, and completed 35 surgeries.

Picus to direct diagnostic radiology

DANIEL D. PICUS, MD, professor of radiology and of surgery, has been named director of the division of diagnostic radiology at the School of Medicine’s Mallinckrodt Institute of Radiology.

Picus has been chief of vascular and interventional radiology since 1987. Interventional radiology encompasses a variety of minimally invasive procedures done with imaging guidance, such as dilating an artery with the help of a balloon catheter.

He has published more than 135 scientific articles and is a popular lecturer on vascular and nonvascular diagnosis and intervention. In addition, Picus has served on several editorial boards, including Radiology and the Journal of Endourology, and is a member of many medical societies, including the Radiological Society of North America, the Association of University Radiologists and the International Society of Biliary Radiology.
Holtzman named first Charlotte and Paul Hagemann Professor of Neurology

Alzheimer's specialist David M. Holtzman, MD, was recently named the first Charlotte and Paul Hagemann Professor of Neurology. The couple, now deceased, were Washington University alumni.

The professorship was established by Paul O. Hagemann, MD, who was a professor emeritus of clinical medicine, and his late wife, Charlotte, to promote basic research on the mechanisms underlying Alzheimer's.

Hagemann became interested in Alzheimer's research after both his second wife, Charlotte, and his brother developed the neurodegenerative disease. Until his death in 1998, he participated as a control subject in an Alzheimer's Disease Research Center study at the School of Medicine that compared normal aging with aging in people with the disease.

Holtzman, currently associate professor of neurology and of molecular biology and pharmacology, focuses his research on the underlying mechanisms of acute and chronic neuron dysfunction in the brain, particularly the connection between these processes and Alzheimer's.

Less expensive antibiotics effective for uncomplicated sinusitis

Older, cheaper antibiotics are just as effective in treating acute, uncomplicated sinusitis as newer, more expensive drugs, according to new research at the School of Medicine.


"Our findings suggest that doctors should keep it simple when treating adults for acute, uncomplicated sinusitis," says Jay F. Piccirillo, MD, associate professor of otolaryngology and lead author of the study. Express Scripts Inc., a St. Louis-based pharmacy benefit management firm, provided the data and funding for the study.

In the study, researchers examined data from 29,102 adults who received initial antibiotic treatment for acute, uncomplicated sinusitis between July 1, 1996, and June 30, 1997.

The team found that 17 different antibiotics, categorized as first-line or second-line, had been prescribed to patients with sinusitis. First-line antibiotics, such as amoxicillin, are older, less expensive, and generally are recommended for initial treatment of an infection. Second-line antibiotics, such as clarithromycin and amoxicillin-clavulanate, are intended for patients who are not helped by or cannot tolerate first-line drugs, targeting a wider range of bacteria than first-line drugs.

The study revealed that 60 percent of all patients in the database had received first-line antibiotics, while 40 percent had received second-line therapy.

The researchers deemed treatment to be successful if the patient did not require additional antibiotics for 28 days following initial treatment. Patients who received first-line antibiotics had a 90.1 percent success rate; for those who received second-line drugs, the success rate was 90.8 percent.

"Essentially, the two types of antibiotics were equally successful," says Piccirillo, who also is director of the clinical outcomes research office in the Department of Otolaryngology.

But while the effectiveness of the two groups of drugs was nearly identical, their cost was strikingly different: Charges for patients who received first-line antibiotics were, on average, $68.98, while charges for those given second-line antibiotics were $135.17, a difference of $66.19.

By showing the cost differential as the only significant distinction between treatments, the study validates nationally accepted practice guidelines that recommend initial use of first-line over second-line antibiotics.
Lenke named Gilden Professor

Spinal surgeon Lawrence G. Lenke, MD, has been named the first Jerome J. Gilden MD Professor of Orthopaedic Surgery. The professorship is supported by a donation from the late Mildred B. Simon, who named the position in honor of Gilden, her longtime physician.

The professorship honors Gilden, assistant professor emeritus of orthopaedic surgery and former head of the division of orthopaedic surgery at Jewish Hospital from 1988–96. Simon, a St. Louis resident, died in 1998 at the age of 105. She was very active throughout her life in Temple Israel and was a patient of Gilden’s for nearly 40 years.

Lenke studies innovative techniques of spinal surgery, pediatric and adult scoliosis, and low-back pain. As part of a major, multicenter study of three common problems of the lower spine, he compares surgical and nonsurgical treatments to learn which of the therapies more effectively reduces pain. He is co-principal investigator at the Washington University/Barnes-Jewish Hospital site of this five-year national effort, known as the Spine Patient Outcomes Research Trial, or SPORT.

Gastroenterology

New, less invasive technique to diagnose acid reflux

A tiny capsule the size of a coffee bean may be the answer to one of the most common digestive tract problems in the United States: gastroesophageal reflux.

Gastroenterologists at the School of Medicine and Barnes-Jewish Hospital are one of five groups in the country using a novel means of testing for the disorder.

Known as the Bravo pH System,” the test measures the amount of stomach acid reaching the esophagus over a 24-hour period in patients who may have reflux but have never been officially diagnosed with the problem.

Reflex occurs when the valve between the esophagus and stomach weakens, and gastric fluids flow back up into the esophagus and throat. The condition can cause symptoms ranging from heartburn to chest pain that mimics heart disease. Some people become hoarse and have difficulty speaking, and chronic reflux is thought to increase the risk of esophageal cancer in some people.

“All of us reflex from time to time, but people with a serious problem will have symptoms almost every time they eat, or every time they lie down or engage in other activities that trigger symptoms,” says Ray E. Clouse, MD, professor of medicine and of psychiatry and director of the Digestive Disease Clinical Center at Barnes-Jewish Hospital.

The most common way to diagnose reflux is to put a patient on treatment, such as antacids or other drugs, and then follow the patient to see if symptoms improve or go away.

But even years later, symptoms may return, and many patients then opt for minimally invasive surgery to strengthen the valve between stomach and esophagus.

Sometimes it is possible to diagnose reflux by examining a patient with an endoscope, a rubber tube with a camera at the end that is slipped into the esophagus of a sedated patient. The other option is 24-hour pH testing to monitor acid levels in the esophagus, which involves running a catheter up the patient’s nose and down the back of the throat into the esophagus.

The Bravo system dispenses with the catheter entirely. Instead, it uses a small capsule that doctors attach to the wall of the esophagus near the junction to the stomach. The capsule transmits electrical signals to a pager-like device.

“We’d rather have patients free to spend a more typical day, so we can get an accurate measure of their reflux problems and when they occur,” says Clouse.

After about a week, the capsule falls away from the wall of the esophagus and passes naturally out of the system.

Not all patients are candidates for this type of pH monitoring, but it does provide a new, less invasive option for some people with the condition.
Researcher receives Investigator Award

Only four Kirsch Foundation grants were awarded this year, and Susan R. Wente, PhD, associate professor of cell biology and physiology, received one of them.

The $150,000 Investigator Award from the Steven and Michele Kirsch Foundation is significant—it is meant to support an awardee's research program rather than a particular research project.

Wente studies the movement of molecules between the two main compartments of the cell, the nucleus and the cytoplasm, and how that transport is regulated.

Most kinds of cells above the level of bacteria have their genetic material encapsulated within a nucleus. The nucleus is bounded by a membrane that has pores in it, and the pores regulate the flow of molecules into and out of the nucleus.

Wente has performed pioneering work on the biochemical traffic signals that help regulate the transport of molecules, as well as on the structure of the pores themselves, which are made of some 30 different small-protein subunits.

A detailed understanding of nuclear-cytoplasmic transport could lead to a better understanding of a variety of diseases, including cancer, muscular dystrophy and viral diseases such as acquired immunodeficiency syndrome (AIDS).

The Kirsch Foundation's Investigator Awards provide support for medical investigators at the associate professor level who focus on an area of basic medical research that has the potential for significant breakthroughs.

Applications for the competitive award are by invitation only. Ten universities were asked to submit two applications each.

The California-based Steven and Michele Kirsch Foundation was established in 1999. Active philanthropists since the early 1990s, the Kirsches' organization is committed to solving a range of medical and environmental problems, from curing cancer and other major diseases to cleaning up the air and supporting the local Silicon Valley community.

Forest Park Southeast dedicates center

Washington University Medical Center celebrated with its Forest Park Southeast neighbors at the grand opening of the Adams Park Community Center in November. Cutting the ribbon with William A. Peck, executive vice chancellor for medical affairs and dean, center, are Steven H. Lipstein, president and CEO of BJC HealthCare, left, and Kevin McCormack, McCormack Baron & Associates, right.

Inset: I. Jerome Fiance, MD, emeritus clinical professor of medicine, who heads the neighborhood redevelopment effort, with Dr. Cleveland Hammonds Jr., of the St. Louis Public Schools.

Search begins for Peck's successor

A search committee to identify candidates for the position of executive vice chancellor for medical affairs and dean at the School of Medicine has been appointed by Mark S. Wrighton, chancellor of Washington University in St. Louis.

William A. Peck, MD, who has led the university's medical enterprises since 1989, has announced his plans to conclude his deanship effective June 30, 2003. At that time, Peck plans to continue his association with Washington University as professor of medicine.

"Bill Peck is without a doubt one of the most effective leaders in the history of American medical education, and his tenure reflects exceptionally well by all measures on what is one of the finest medical schools in the world," says Wrighton.

The committee will consider what attributes and experience would best prepare a person to lead the School of Medicine before it begins to focus on identifying and recruiting candidates. The 14-member search committee will be chaired by Richard H. Gelberman, MD, Fred C. Reynolds Professor and head of orthopaedic surgery.
Top professors honored by students at teaching awards ceremony

Scot G. Hickman, MD, 2003 Coursemaster of the Year; Jeffrey E. Saffitz, MD, PhD, 2003 Professor of the Year; Bradley A. Evanoff, MD, 2004 Stanley J. Lang Lecturer of the Year; Dana R. Abendschein, PhD, 2004 Professor of the Year, and Robert S. Wilkinson, PhD, 2004 Coursemaster of the Year, were among those acknowledged by medical students at the annual teaching awards ceremony in November. Joseph Ippolito, graduate research assistant in molecular biology and pharmacology, was named Teaching Assistant of the Year. Clinical Teacher of the Year and Resident of the Year awards were bestowed on 20 other honorees.

Cicero receives funds for addiction research, named to seed capital board

Training more scientists to investigate the factors that contribute to alcohol, drug and nicotine dependence and abuse is the goal behind a major federal grant received by the School of Medicine.

Neuroscientist Theodore J. Cicero, PhD, vice chancellor for research and professor of neuropharmacology in psychiatry, has received a five-year, $2.2 million grant from the National Institute of Drug Abuse to direct a multidisciplinary training program in drug abuse. The grant renews a training program that has been under way at Washington University for more than a decade.

In the program, eight postdoctoral fellows receive two to three years of training in one of several areas. The training program places special emphasis on providing research training for physicians, due to a national shortage of clinical researchers.

“Fellows can choose to specialize in the neurobiology of drug abuse, the molecular and cellular mechanisms involved, cognitive neuroscience, or in several genetic approaches that can help us better understand the problem of drug abuse,” says Cicero. The program encourages fellows to familiarize themselves not only with their particular specialty, but to delve into at least one other area of drug abuse research.

In addition to medicine, fellows admitted to the program come from diverse backgrounds including psychology, psychiatry, endocrinology, mathematics, economics, anthropology, sociology, social work and neuroscience. Each is linked to a research mentor who studies one or more aspects of substance abuse.

Cicero also has been named the new chairman of the Missouri Seed Capital Investment Board, an organization that helps fund technology start-up companies, especially those related to the life sciences. Washington University is a major investor in the seed capital fund.

Similar to venture capital, seed capital is used to nurture the initiation and early growth of promising and innovative new companies. Unlike venture capital, seed capital funds also can be used to create a company in response to a promising new technology.

As chairman of the state board, Cicero will oversee a group of 13 individuals, including eight representatives appointed by the governor, a representative from each of the state’s four innovation centers—Kansas City, Rolla, Columbia and St. Louis—and the director of the Missouri Department of Economic Development.
A safer and easier way to treat patients with the most common form of irregular heartbeat, atrial fibrillation, is being studied by researchers at the School of Medicine.

Investigators recently showed that applying the new technique, bipolar radiofrequency, in sheep yields similar results to a more invasive Maze procedure, the traditional curative treatment for the condition. The new procedure, using the Atricure Bipolar Handpiece, is performed in less time and with less extensive surgery than before. More importantly, it can be done without using a heart-lung machine to stop the heart.

Sunil M. Prasad, MD, postdoctoral surgery fellow, presented the findings at the American College of Surgeons' 2001 Clinical Congress in October. Ralph J. Damiano Jr., MD, professor of surgery and chief of cardiac surgery, led the study.

Atrial fibrillation affects more than 2 million Americans. The condition causes painful symptoms and may account for roughly 15 percent of all strokes in the United States. Medication can alleviate symptoms in some patients, but it cannot cure the problem.

Normally, electric signals trigger the synchronized contraction of muscles in the heart's two upper chambers, the atria. During atrial fibrillation, a chaotic web of electric impulses spreads throughout the atria, causing the chambers to quiver rather than contract in unison.

In 1985, researchers at the School of Medicine developed a surgical cure called the Maze procedure to control these erratic impulses. In the procedure, surgeons make small, strategically placed incisions in the atria. The slits generate scar tissue that serves as a barrier, trapping abnormal electric signals in a "maze."

Only one path remains intact, guiding impulses to their correct destination. With a success rate of more than 90 percent, the Maze procedure revolutionized the treatment of atrial fibrillation. However, it is technically difficult and therefore is not performed frequently. Because surgeons must temporarily stop the heart in order to make the incisions, not all patients are healthy enough to endure the operation.

Now researchers have developed an alternative: bipolar radiofrequency. The method uses two electrodes that pass a current through a section of heart tissue. The current heats and kills a band of clamped tissue. Like Maze procedure incisions, radiofrequency energy causes scar tissue that blocks the abnormal impulses responsible for atrial fibrillation.

The team tested the procedure on five sheep at four of the standard Maze incision locations. Each lesion took nine seconds to complete, as compared with Maze incisions, which take five to 10 minutes to create.

Preliminary findings suggest that the procedure is safe to do in human patients. Damiano and his colleagues will be the lead investigative site of a multicenter clinical trial of the new technique.

Creating the right ripple effect for a healthier heart

Anatomy of a healthy heartbeat
The electrical impulse begins at the sinus node (SA), then spreads across the upper chambers, the atria, like ripples on a pond. Next, the ripples reach the atrioventricular node (AV), signaling the ventricles to contract from the bottom up. Right: The impulse spreads from the sinus node in this computer image of a heart in action.

Havoc: An electrical firestorm
Atrial fibrillation is like too many ripples on the pond. The atria convulse with erratic electrical charges, the AV node gets mixed signals about when to "fire," and the result is a dangerously rapid, irregular heartbeat. Blood pools in the atria; clotting is possible, leading to a stroke. Right: The firestorm in progress.

A-Maze-ing results
School of Medicine researchers developed the Maze procedure, which directs the atrial electrical impulses through a surgically created "maze" of scar tissue. The highly effective procedure is technically challenging, however. Now, researchers are perfecting new, minimally invasive techniques, using the Atricure Bipolar Handpiece (right), to complete the operation more quickly and with less disruption of heart tissue.
Jay Smith was heading home from a St. Louis Rams football game when his tire caught the edge of the road, his car skidded down an embankment, and it struck a tree.

**BAD**

St. Louis police officer Darren Hill was driving at 60 miles an hour when he lost control of his patrol car and slammed into a retaining wall.

**BREAKS**

Washington University sophomore Emily Levin was in-line skating in Forest Park when she traveled down a steep hill, into a designated crosswalk, and was struck by a passing bus.
Though their hips were shattered, each person walks again—
their fractures repaired through the most complex,
technically demanding type of orthopaedic trauma surgery.

BY CANDACE O’CONNOR

All three—Smith, Hill and Levin—suffered “high-energy trauma,” the kind of injury that occurs in high-speed motor vehicle accidents and falls from more than 10 feet. They did not fit the usual demographic for such mishaps: young men from 18 to 45, driving recklessly and often drunk, late at night or on the weekend. But each of them emerged from his or her accident with the same, devastating hip injury, an acetabular fracture.

“Think of the patient’s hip as a ball and a socket,” says Joseph A. Borrelli Jr., MD, assistant professor of orthopaedic surgery, who performed the surgery on each. “As a result of the high-energy trauma, the ball is driven into the socket, or ‘acetabulum,’ and it fractures. Since the socket is part of the pelvis, and in a very difficult spot to get to, the surgery for this injury is associated with many potential problems.”

Luckily, acetabular fractures are not common; there are probably fewer than 10,000 in the United States each year. There are also fewer than a dozen orthopaedic surgeons nationwide who specialize in such complex reconstructions—and Borrelli is among this select group. With his partner, William M. Ricci, MD, he has made Barnes-Jewish Hospital (BJH) a regional referral center for these fractures, treating patients from as far away as Arkansas, Tennessee, Texas and South Dakota. He is also actively developing new clinical protocols and basic research projects related to these injuries.

In Jay Smith’s accident, his acetabulum splintered, but he had no other injuries, just severe pain in the area of his hip. That pain is also what Darren Hill remembers, along with the sight of his fractured left forearm, left and right tibias, and right ankle. Emily Levin was the most severely injured, with an acetabular fracture and an open pelvic fracture, visible through a large laceration. Drifting in and out of consciousness, she was rushed to the BJH emergency room, where the trauma team worked feverishly to save her life. Soon her father, a New York orthopaedic trauma surgeon, was making calls to colleagues asking them to recommend surgeons who could perform her acetabular surgery—and discovered that two specialists were faculty at Washington University.

Shortly after their accidents, all three patients underwent acetabular reconstruction, the most complicated, technically demanding kind of orthopaedic trauma surgery. To get to the patient’s shattered hip socket, the medical team—composed of surgeons, anesthesiologists, skilled nurses and X-ray technicians—has to skirt critical arteries, veins and nerves. Any mistake could cause serious bleeding or nerve injury that might mean permanent weakness or paralysis. When they reach the socket, surgeons must move in from behind and piece it together like a jigsaw puzzle. Then they fix it in place, screwing in plates up to eight inches long that remain in the body.

It is critically important to get this reconstruction just right, ideally within two millimeters of perfection. Any displacement in the articular...
surface — where the ball and socket meet and "articulate," or rub together — will expose the injured cartilage to stresses that will eventually lead to its deterioration. These displacements are referred to as "steps and gaps" — the bane of an orthopaedic trauma surgeon. And there are other potential complications as well. “You also want to be as sure as you can that your screws don’t enter the joint space, because that would be like trying to walk with a pebble in your shoe,” says Borrelli.

Performing this type of surgery requires enormous stamina and concentration, since operations may be up to 12 hours long. One blessing is the timing. Unlike some surgical procedures that must be done immediately, acetabular fractures can often wait for several days, even a few weeks. “But you still have to enjoy being up when half the world is sleeping, doing long, challenging operations,” says Borrelli, who did his orthopaedic trauma fellowship at Tampa General Hospital and joined the Washington University faculty five years ago.

In a procedure like this, so fraught with potential complications, planning is crucial. But X-rays alone may not be enough since bones block good views of the acetabulum; it is also hard to roll an injured, hurting patient into position for the necessary images. So Borrelli has become a proponent of adding CT scans to the planning mix. As part of his research, he also has compared the use of X-rays and CT in assessing patients’ postoperative outcome. In one study, he looked at 15 patients to see how many had step and gap problems: X-ray indicated a single deformity, while CT was more accurate, showing that six had a significant displacement.

After his operation, Jay Smith spent seven days recovering at BJH.

Jay Smith says he is about 90 percent better following his surgery and rehabilitation.

He recalls his first, tentative trip to the water cooler, bent over a walker. Because of his multiple injuries, Darren Hill had six surgeries, spending eight weeks in BJH followed by nearly four months in a nursing home. For two of those months he was bedridden, forgotten even to sit at a 90-degree angle; gradually, he began physical therapy and progressed from a walker to crutches to a cane. Emily Levin was unconscious for 12 days, then wide awake — sleepless — for a full week. In BJH for six weeks, with worried family and friends at her bedside night and day, she had nine surgeries, including two orthopaedic procedures. In early June, an air ambulance ferried her to a rehabilitation hospital near her home, where she began aggressive therapy.

No matter how hard surgeons work to eliminate steps and gaps, says Borrelli, some patients will go on to develop arthritis just because of the trauma to their cartilage. In his basic science research, Borrelli has studied this phenomenon — first by looking at the effect of high-impact injuries on bovine cartilage; and more recently, thanks to funding from the Orthopedic Research and Education Foundation, by developing an animal model for these cartilage injuries, the only such in vivo model in existence.

Already, he has found that there can be irreversible cartilage damage after trauma, even without an acetabular fracture. The reason may emerge in another study, funded by the Orthopaedic Trauma Association, in which he is looking closely at
"apoptosis" or programmed cell death, a process that can be stimulated in cartilage by high-impact injury. Physicians have to find new ways to keep these cells alive, he says, if they want to reduce the incidence of post-traumatic arthritis.

During the postoperative recovery period—which often lasts nine months or more—Borrelli and his team carefully monitor each patient’s progress. Working with Jack R. Engsberg, PhD, of the Human Performance Laboratory, they use video cameras and other tools to measure stride length, walking speed and body angles, and compare that with data on people who have not been injured (see graphic below).

They also assess muscle strength and ask patients to complete a detailed Musculoskeletal Functional Assessment questionnaire (MFA). In studying the results, they have found that good outcome seems to correlate with strength in particular muscles around the hip. Now they have applied for an NIH grant to look at rehabbing those muscles in patients who scored poorly on the MFA to see whether that improves their quality of life.

Three years out from his accident, Jay Smith says he is about 90 percent back to normal. An insurance agent by day, he can still referee collegiate sports by night, including some Washington University games. He is not in pain, "but when it rains, or the weather changes, I notice it."

Nearly two years later, Darren Hill is hoping to be back on the police force full time in January; in fact, that goal was what kept him going from the start. "I have crashed into a wall and lived. I can do anything now," he says.

Astonishingly, Emily Levin took a full load of courses at SUNY-Stonybrook this past fall, just six months after her injury. She has some physical therapy ahead, as well as plastic reconstructive surgery. This January, she returns to Washington University and perhaps will even go skiing this winter.

"I can't wait," she says. "That would be an understatement," adds her mother.

All say they are grateful to Borrelli and his staff, as well as the emergency room trauma teams that stabilize patients in the first critical hours after an accident.

"Having patients like Emily and Jay and Darren—seeing their hips heal and watching them get on with their lives—that is wonderful," says Borrelli. □
The Human Studies Committee strives to maximize the benefits.

Committee members use three guiding principles—autonomy, beneficence, and justice—when considering the merits of a study.
and minimize the risks

THE BENEFITS of human medical research start with just one person—someone who agrees to become a research subject. More people join a study and researchers begin to build a body of data. That information helps them to develop medications and procedures that will benefit greater society.

But all research involves risk. How is that risk assessed? How is research with human subjects conducted in the most humane, ethical, safe and effective way?

At the School of Medicine, investigators began to ask themselves these questions decades ago and were among the first to establish standardized procedures providing safeguards for both researchers and subjects. Today, this type of oversight is mandated by the federal government, amid a sea of changing regulations. With a volunteer group of reviewers from the Medical Center and the community, Washington University has managed to not only stay ahead of the curve, but to be a leader at the forefront of ethical concerns—always with the best interest of just one person in mind. ▶
Doing the Right Thing
The watchful work of the Human Studies Committee

Before clinical research begins, a team of medical professionals and local community members validate its appropriateness. The Human Studies Committee (HSC) is nearly 300 volunteers working on more than a dozen committees to review the thousands of proposed and ongoing clinical research studies at the School of Medicine.

Lives in the balance
Acceptable studies protect and may even heal the patient, while providing hope for future health care benefits for others.

Unacceptable studies may pose undue risks to participants' physical and/or emotional well-being.

Three guiding principles
Human medical research poses a spectrum of ethical issues. The HSC weighs the needs of the select groups proposed for study and each study's predicted benefits to science, ensuring that medical research is ethical, just and reasonable. HSC members are trained to make decisions based upon three principles— all historically complex philosophical ideals:

- Protect the right and foster the ability of people to decide.
- Maximize possible benefits, minimize possible harm.
- Distribute the benefits and burdens equitably.

AUTONOMY  BENEFICENCE  JUSTICE

NEW STUDY
Application for Review
Study Protocol
Consent Form

PROPOSED

HSC

WUSM
Clinical Investigator

An investigator submits a proposal for the study, detailing the clinical protocol, and includes a copy of the consent form participants will be asked to sign. Only 1 out of 20 proposals receive approval "as is." Most are returned for adjustment or clarification. The investigator revises and resubmits the proposal for approval.

Ongoing review process
The HSC reviews approved studies at least annually: Is the study effectively moving toward its goal? Revisions may be required. Cause for concern: Serious "adverse events"— unanticipated negative responses from study participants—receive prompt attention, and may result in suspension or cancellation. HSC members monitor reports from similar studies around the world.

Every study is open to scrutiny until closed at WUSM—months, years, even decades later.

Winter 2001 Outlook
What makes the Human Studies Committee (HSC) at the School of Medicine so effective? Those who serve on its many component committees credit the group's two administrative leaders: Philip A. Ludbrook, MD, associate dean and chairman, and Patricia M. Scannell, director. For 13 years, the two have dedicated themselves to keeping Washington University one step ahead—by addressing possible areas of concern early, often before a new issue comes under scrutiny.

"It is this type of preventive thinking, driven by ethical concern, that has kept Washington University up to date and apart from the kinds of difficulties that other universities have faced in recent years," says Ludbrook.

The key to the success of any human studies committee, he says, is ethics. In fact, the seminal group of the School of Medicine's HSC was an ethics committee founded by John D. Vavra, MD, in the late 1960s. Vavra, who was a professor of medicine, started the group several years before there was any government requirement to monitor clinical research. When federal agencies, such as the Food and Drug Administration (FDA) and the National Institutes of Health (NIH), began to regulate research involving human subjects in the 1970s, expanding the purview of the ethics committee was a natural progression.

For some researchers, however, the HSC's efforts, while appreciated, also can be frustrating. Though the review process is streamlined and the number of committees and reviewers has been increased to accommodate the volume of protocols submitted, making required changes and resubmitting a study can delay research.

But just as in good medicine, prevention is the key to better overall health. The state of research at the School of Medicine is no different. While the process may not always go as quickly as a researcher might hope, most would agree that the goal of protecting everyone involved—human subjects of research, investigators, and the institution—outweighs any necessary inconvenience.

In fact, many of the university's researchers are themselves HSC reviewers. And with one of the largest human research agendas in the country, it is fitting that the process of internal review be as comprehensive as possible.

"Serving on the committee is looked upon quite agreeably by large numbers of our investigators," says Ludbrook. "Researchers here are often happy to serve or even volunteer to serve."

At times, the HSC has even had to institute a waiting list for prospective members. Ludbrook says the reason why is simple.

"We are already in an environment where people help people—serving on a human studies committee is a logical extension of that."

Community members who give their time to HSC service do so because they have a sincere desire to help others, says Scannell. Many have an interest in medicine and they are proud to be associated with Washington University.

Getting people from all walks of life to participate and keeping them interested isn't a problem.

---

Philip A. Ludbrook, MD, associate dean and chair, and Patricia M. Scannell, director, have teamed up for more than a decade to ensure that the Human Studies Committee lives its mission: to protect the rights and welfare of human subjects.

Background photo: Founder John D. Vavra, MD

Outlook Winter 2001
An area that does pose a challenge is managing the documentation involved in the submission and review process. A top priority of the group, already begun, is to convert all required forms to electronic, web-accessible versions.

The HSC comprises an advisory committee, a genetics research committee, four new-protocol committees, and two continuing review committees, as well as four subcommittees that review adverse events, revisions and amendments in existing research. By February 2002, four additional committees will join the mix.

This year, the combined committees of the HSC will review about 3,300 protocols, with a 40-60 split between new and continuing studies, says Scannel.

To keep up, the HSC has increased its administrative staff to more than 20 people, and recently expanded its office space, moving to new quarters in July 2001.

The new space includes a large conference room to accommodate HSC committees and the group's education program. Before the move, meetings were held in various spaces throughout the Medical Center.

TO SERVE AND PROTECT

By design, the Human Studies Committee recruits a diverse group to fill its ranks. From those one might expect to find on such a panel — doctors, nurses, researchers — to members who might seem like less obvious choices — legal professionals, clergy and other members of the nonmedical community — the HSC strives to include all segments of the population in its deliberations. Assembling an eclectic body brings its own rewards: Members of this all-volunteer committee tend to be ethically principled and curious about medical science, whether from within the institution or outside it. A high level of motivation to "give something back to the community" often translates into years of dedicated service.

Denise A. Canfield, RN, CCRC
Administrator for Education, Center for Clinical Studies
New Protocol Committee (5 Years)

"The people who serve on the Human Studies Committee are fascinating — they bring a variety of backgrounds and education levels to our meetings, but once there, we leave our work 'hats' at the door. We discuss each protocol and its ethics, and the different perspectives make the process intellectually stimulating, often bringing up viewpoints I hadn't considered. Most importantly, we protect study subjects — if we didn't, people wouldn't participate and medical research couldn't move forward."

Steven B. Scholnick, PhD
Associate Professor of Otolaryngology, Head and Neck Cancer Researcher, New Protocol Committee (8 Years)

"After eight years on the committee, I'm still impressed with how conscientious its members and administrators are, even in the face of an ever growing number of protocols and regulations that are continually in flux, either because of evolving perceptions of research or in response to government monitoring. The volunteers from outside the university deserve special credit for their efforts. While our work does fulfill a legal obligation, it also helps to assure the larger community that it can trust what's going on at our institution."
and benefits the study's participants, as well as science and society. Other key concerns include issues of informed consent, confidentiality, and whether a study will involve a vulnerable population, such as children or pregnant mothers.

"We don't regard ourselves as scientific peer reviewers," Ludbrook explains. "We're not required to sort out the absolute correctness or incorrectness of the science—we hope that has already been done for us. We make sure that the ethical and regulatory priorities are properly addressed."

And once the HSC recruits its reviewers, the staff goes to great lengths to keep them happy. One way they do that is by putting the needs of the reviewers first.

"It takes a while to train people and for them to gain confidence," says Scannell. "Once that's done, we want them to stay long-term. That said, I think one of our biggest goals is to respect our volunteers' time."

In addition to meetings, each reviewer is assigned individual cases to review in-depth, and that preparation time can take anywhere from two to six hours, or even more.

"That's where the training and longevity come in," explains Scannell. "We also try to make the paperwork flow efficiently. We make everything as obvious as possible so that we don't waste people's time, which is the most valuable thing they have."

That respect translates into a committee member loyalty that's quite remarkable. Many reviewers stay on with the HSC for years.

"We don't set term limits," says Ludbrook. "Once these generous committee members gain experience, we want to hang onto them."

"For investigators whose mission is to be on the cutting edge of science, the review process can be frustrating—even a month's delay can be a tremendous setback. At those moments, it's good to remember that the process is there to protect all of us—research subjects, investigators and the School of Medicine. The Human Studies Committee exists to ensure that studies done with human subjects are in compliance with all appropriate regulatory guidelines and are conducted to the highest standards."

Judge Lloyd J. "Jack" Vasquez Jr.
ADMINISTRATIVE JUDGE, EQUAL EMPLOYMENT OPPORTUNITY COMMISSION (EEOC)
CHAIR, NEW PROTOCOL COMMITTEE (16 YEARS)

"Being part of the Human Studies Committee at Washington University School of Medicine is a very rewarding experience. In my position as chair, I work with a group of people who are dedicated to protecting human subjects. Obviously, this is very important and we are fulfilling a vital role. Our committee functions very much like an athletic team—it's a closely-knit, highly skilled and intelligent group with diverse skills. We meet and exchange ideas as a team of individuals."

Carleen Reck, SSND
DIRECTOR, CRIMINAL JUSTICE MINISTRY SOCIETY OF ST. VINCENT DEPAUL PRISONER RESEARCH ADVOCATE (6 MONTHS)

"As a prisoner advocate, I'm happy any time to work for basic justice issues, such as serving on the Washington University Human Studies Committee to review prison-related protocols. Doing so allows the prison population the same opportunity to contribute to scientific research as anyone else, but ensures that it is done in a way that doesn't take advantage of a vulnerable group. I am very impressed with the genuine concern shown by committee members for study participants."

Outlook Winter 2001
LEANN HILL WAS SITTING ALONE
in the neonatal intensive care unit at
St. Louis Children's Hospital when she was
told that her tiny, 21-day-old daughter,
Jessica, would probably never walk.

Dashed dreams of taking Jessica to the park, playing
chase and other activities rushed through her mind.
"But then I decided I was just lucky to have her,"
recounts Hill. "I just sat next to her bed, held her hand
and told her, 'It doesn't matter if you can't walk. I can
take you anywhere you need to go.'"

When she entered the world nine weeks early,
weighing a mere 3 pounds and 4 ounces, Jessica was
battling an unknown disease that caused hydrocephalus
and severe spinal cord injury that paralyzed her from
the chest down.

But today, Jessica is a vivacious 4-year-old who has
defied the odds. She has recovered sensation throughout
her body, and last year, she took her first steps using
braces and a walker. Most days, with the help of a
partial-weight-supported walking system, Jessica
works out on a treadmill and plays soccer with her
mom in their living room
in Troy IL.

Leann Hill and her
husband, Kevin, attribute
their daughter's recovery to
the new Pediatric Spinal Cord
Injury Program at the School of
Medicine, headed by John W. McDonald,
MD, PhD, assistant professor of neurology and
director of the program.

"She had very little movement when we went to see
Dr. McDonald," says Hill.
Before they met with McDonald, the Hills were frustrated because no one was willing to give Jessica more than maintenance therapy, which included improving range of motion, preventing spasticity and teaching daily care. They believed their daughter, age 3 at the time, would benefit from more aggressive therapy.

McDonald normally didn't treat children, but he examined Jessica and discovered that much of her spinal cord had been preserved. He agreed that she needed more advanced rehabilitation. And after receiving calls about other children, McDonald decided to launch the Pediatric Spinal Cord Injury Program in July 2001.

Only 10 percent of the estimated 11,000 new spinal cord injuries each year occur in children younger than 15. But a child's injury, whether congenital or the result of an accident, can be devastating for a family. In addition to varying degrees of paralysis, spinal cord injury often causes loss of bowel and bladder control, skin problems, and developmental scoliosis.

"Initially, when parents are faced with this tragedy, they consider it the end of life," says Rimma Ruvinskaya, MD, instructor of neurology and a member of the Pediatric Spinal Cord Injury Program team. "It's unimaginably horrible to understand that your child cannot move and cannot do the simplest things."

A year after injury, most children—like Jessica—just receive maintenance therapy. But children have a better chance of recovering from spinal cord injury than adults and can greatly benefit from intensive rehabilitation. In the past five years, McDonald says, basic science research has demonstrated that the ability of the spinal cord to regenerate is much greater in the immature nervous system than in the adult nervous system.

In the new pediatric program, which is part of the Spinal Cord Injury Program instituted in 1998, children learn to walk and care for themselves. The program emphasizes activity-dependent therapy through partial-weight-supported walking, electrical stimulation of muscles and aquatic rehabilitation. "The nervous system is accustomed to being active, and we must work to maintain this activity after an injury," says McDonald.

A multidisciplinary team of physicians cares for patients, which Leann Hill considers one of the program's greatest strengths. "I've been impressed with how they work together and talk to you as a group," she says. "It's a place where they help me coordinate Jessica's care."

Parents and caregivers also learn, as children grow, to let them become independent. And the program focuses on all aspects of the children's lives, including changing social and psychological needs.

Treating a child with spinal cord injury is complex. But Michael J. Noetzel, MD, associate professor of neurology who also is a member of the Pediatric Spinal Cord Injury Program team, says children can make great strides because they don't recognize barriers. "More than anything, their mindset makes a difference. They adapt so much better than an adult would," he says.

The Hills have high hopes that Jessica will one day walk on her own. In the meantime, they're grateful for the rehabilitation she's received. "To actually have a pediatric spinal cord injury program so close to home is more than any parent could hope for," says Hill.
Revolutionary technical advances deepen the understanding of fundamental life processes.

BY DARRELL E. WARD
Microbiology isn’t what it used to be, and Scott J. Hultgren’s laboratory is a perfect example of how the field has changed. “It’s not just streaking bacteria on plates anymore,” says Hultgren, PhD, Helen L. Stoever Professor of Molecular Microbiology. “The field has become a melting pot of disciplines working together to understand the molecular basis of infectious diseases.”

In the early days of microbiology, people studied the bacterium itself, simply trying to understand it. Next, investigators infected animals with a pathogen and studied the outcome. They also learned to isolate toxins and other products of microbes and then tested their effects on cells, cell components and animals. A long period followed when it was difficult to get beyond this descriptive science.

The development of recombinant DNA technology broke that logjam and has had a profound effect on microbiological research—and on almost every field of medicine—that continues to the present day. Today, the dark world of microbial parasites is being illuminated by scientists who can eliminate, replace and monitor specific genes. Other methods enable researchers to tag and locate specific proteins within pathogens and to identify genes that are active and inactive in both parasite and host cells.

The work is yielding valuable new insights into the relationship between the human cell and the infectious organism, into the balance between host and pathogen.
a multidisciplinary approach

Hultgren’s research focuses largely on understanding the cause of urinary tract infections (UTIs) and developing more effective methods of treatment. Researchers in his laboratory work with investigators from other specialties to approach these questions from many angles.

UTIs are caused by strains of *Escherichia coli* bacteria, occur predominantly in women, and frequently recur. Doctors have assumed that recurrent UTIs were caused by the repeated introduction of *E. coli* into the urinary tract, during sex or due to poor hygiene. Although the likely source of the originating infection, Hultgren and colleagues have discovered that the bacteria can latently infect bladder cells; activation can cause recurrence.

Infected *E. coli* bind to bladder cells using hair-like pili that contain a type of protein known as an adhesin. The adhesin binds with a receptor on the cell's outer layer, triggering it to reach out and envelop the bacterium in a vacuole, or small pocket, within the cell. Hultgren’s laboratory is working to understand this process and to develop a vaccine that will block it.

Other approaches his group is taking include crystallographers studying the structure of the adhesin-receptor interaction; immunologists examining the host's immune response to the bacterium; cell biologists studying the pathways used by the invading bacteria to enter the cell; biochemists studying how the pili and adhesin proteins are formed, and geneticists investigating the genetic basis for the bacterium's virulence.

high-resolution microscopy and genome sequencing

L. David Sibley, PhD, associate professor of molecular microbiology, uses the latest tools of molecular science to learn how the parasite *Toxoplasma gondii* infects cells.

Thought to infect 50 percent of the world’s population, *Toxoplasma* is a highly successful parasite. It causes toxoplasmosis, which often remains asymptomatic, but can result in encephalitis (a swelling of the brain) and sometimes in eye and lung disease. It is also an important cause of congenital infection that can result in severe birth defects.

People acquire *Toxoplasma* by eating undercooked meat or by ingesting soil containing parasite spores. Enzymes in the intestine liberate the tiny, slipper-shaped parasites, which cross the intestinal lining and enter nucleated cells. There, each one forms a cyst and multiplies until the cell bursts, liberating about 250 parasites, each of which then crawls off to infect other cells.

Sibley is working to understand the parasite's unusual motility and how it recognizes and invades cells. *Toxoplasma* infects cells by striking them head-on, pushing in the membrane —like pushing in the side of a balloon with a finger— until it creates a small oval compartment in the cell.

"It represents a very clever stealth mechanism," he says. "The host cell doesn't know it's been infected."

Sibley and his colleagues use high-resolution confocal microscopy to examine how the parasite interacts with the host cell. A kind of light microscope that enables researchers to view a very thin slice of a cell, the technique produces a clearer image and greater resolution than the typical light microscope.

Investigators are using confocal microscopy with living cells, as well as electron microscopy with fixed cells, to localize specific proteins in the parasite and in host cells.

In collaboration with the School of Medicine's Genome Sequencing Center, Sibley's laboratory has sequenced regions of *Toxoplasma* genes and genes of related parasites that are active during different stages of infection.

"This work reveals the inner workings of *Toxoplasma*, and it enables us to identify genes that are present in a wide range of organisms—including their human or animal hosts—and those that are unique to the parasite," says Sibley. "The latter group provides potential targets for vaccine development or for new drugs designed to combat infection."
RNA interference

Tamara L. Doering, MD, PhD, assistant professor of molecular microbiology, studies Cryptococcus neoformans, a yeast-like fungus that causes cryptococcal meningitis. The disease strikes people with severely suppressed immunity and can be fatal if left untreated.

Cryptococcus is a sugar-coated parasite with an outer capsule of carbohydrates that is essential for the organism to cause disease. Once inside the host, the organism churns out huge quantities of capsule material that accumulate in tissues and disrupt the body’s immune response.

“We want to learn how the capsule is produced,” says Doering, “and then we’ll try to develop compounds that inhibit the process.”

Doering also uses confocal microscopy to study the structure of the capsule and how new material is added as it grows. But one of the most essential tools available to modern microbiologists is the ability to manipulate genes: turning them on and off, replacing one with another and disrupting or monitoring their activity.

Certain biological idiosyncrasies of Cryptococcus make such work more difficult than for some other organisms. Doering has shortcut some of the difficulties because the entire genome for Cryptococcus has been sequenced, and the data are available online. This information has enabled her to quickly identify genes that are likely to be important for production of the capsule.

For example, transporter proteins move sugars from one area of the cell to another and are essential for construction of the capsule. By comparing bits of similar proteins found in other organisms with the DNA sequence for Cryptococcus, she can identify genes that seem likely to code for a transporter protein in Cryptococcus.

But how does Doering know that her gene codes for a transporter protein? One way is to stop the gene from working to see how it affects capsule production. Doering does this using a technique developed only in the last few years, double-stranded RNA interference.

When Cryptococcus makes a transporter protein, a gene is turned on in the cell nucleus, and a copy of the gene is made in the form of messenger RNA (mRNA). The mRNA, which consists of a single strand of RNA, then moves to the cytoplasm where the protein is assembled. Scientists have learned, however, that if even a short piece of double-stranded RNA is present that matches the structure of an mRNA, the latter is destroyed. This prevents the protein from being produced.

“Once we understand the biology,” says Doering, “we can also look for ways to outsmart the pathogen.”

assembling microarrays

William E. Goldman, PhD, professor of molecular microbiology, studies Histoplasma capsulatum, the parasitic fungus that causes histoplasmosis. This fairly common infection is usually brought under control by a healthy immune system in a few days, but the organism is never eliminated from the body.

Goldman’s laboratory is investigating how Histoplasma infects macrophages and establishes both primary and latent infections. Studies involve disrupting and replacing genes, and monitoring gene activity using reporter genes tagged with a fluorescent protein that glows green when the gene of interest is active.

Goldman also is working with Elaine Mardis, PhD, assistant professor of genetics, who is leading the Genome Sequencing Center’s effort to sequence the Histoplasma genome. The two-year project will enable researchers to assemble microarrays, which will allow them to monitor the activity of thousands of genes simultaneously. Ultimately, the method will reveal the underlying genetic circuits that drive host-pathogen interactions.

“These type of advances in technology have led the transformation of microbiology into a multidisciplinary science,” Goldman says. “They enable us to ask more sophisticated questions and to do analyses in greater detail.”

Outlook Winter 2001
Before coming to medical school, I spent two years training as a hospital chaplain. My first day of chaplaincy was filled with anxiety and uncertainty: "What am I doing here? I'm not a real chaplain. I shouldn't be bothering these sick patients. I can't possibly be doing these people any good."

As I continue my medical training, I realize that these same concerns are being raised again, with the exception that "doctor" is replacing "chaplain." Struggling to come to terms with these doubts has helped me, both as a medical student and as an on-call chaplain at Barnes-Jewish Hospital.

A hospital chaplain is specially trained to provide ministry in a hospital setting. Usually, but not always, chaplains are ordained clergy. While finishing my master's of theological studies degree at Weston Jesuit School of Theology in Cambridge, Massachusetts, I applied to the Clinical Pastoral Education (CPE) program at Brigham and Women's Hospital in Boston. I thought training as a chaplain might give me insight into dealing with patients in my future career as a physician.

CPE is an educational model focused on a process of action and reflection. Those in CPE don't learn how to become chaplains by reading books about chaplaincy or studying theories of hospital ministry (although this is certainly one of its components). Instead, the primary goal of CPE is to allow the student to "act" as a chaplain in a clinical setting and then to "reflect" in a group setting on the experiences of ministry and the emotional and spiritual issues involved in working with patients.

Initially, this was very challenging. In medical school, we learn how to be physicians by studying the basic science underlying health and disease and by learning how to interview and examine a patient; our education is very skills-oriented. When I began CPE, I was expecting the same approach, but it was very different.
Most CPE students, when they first step onto a hospital floor, question their legitimacy and are forced to deal with the authority with which they have suddenly been invested. This is called "claiming one's pastoral identity." This means coming to terms with the facts: "I am a chaplain, and people see me as one." My first night on call, I was paged to the surgical unit. A man had collapsed at home that morning and his brain stem was severed. The family, very devout Anglicans, had decided to withdraw life support. When I walked on the unit, the son immediately shook my hand and said, "Thank you so much, Father. You are the only one who can really provide what he needs now." Pretty intimidating, since I wasn't a priest and didn't feel like I had much to offer.

A year later, while working full time as a chaplain resident, one of the hospice patients I had been working with for several months died. Her son came to me and said, "You know, Mom was Lutheran, but we don't really like our pastor. Please do her funeral for us." By that time, I had "claimed my authority" as a chaplain, but as a minister? Using the Lutheran Book of Worship, I crafted a complete funeral service, including a 10-minute sermon on the gospel selected by the family. When it was over, the deceased's children thanked me profusely—and handed me a check for my services as a pastor.

My experiences have taught me three valuable lessons. First, each of us has a lot more to offer than the ability to solve problems. This is a difficult thing to remember in medical school—that most of life's problems cannot be solved, but we as human beings still have an enormous amount that we can offer to one another. As physicians-in-training, we are taught to be the best problem solvers we can be. As a chaplain, I am constantly reminding myself not to try to solve my patients' problems, especially as most of them have no clear solution. One night, I spent an hour with a man who had suffered a major heart attack. He talked about his life and his many regrets; I said almost nothing. At the end of our visit, he said, "I just thank you for listening to me. You're the only person who's done that."

Second, it's not about me. When I received that check after conducting my first funeral, my thoughts were all self-focused. "How can I take this? Did I do a good job?" The funeral was for the patient's family. As a chaplain, I struggle with the tendency to project my own emotions onto patients. It's certainly important to ask patients what they want (we call this "contracting" in CPE). However, it's equally important not to project my own emotional baggage onto patients or to assume that I know what they need.

The final lesson is more spiritual: Don't presume to know what impact you might have. As a chaplain and a religious person, I believe that God is present in ways that I cannot imagine, doing things I simply cannot predict. However, even the most non-religious person must realize that chance dictates outcomes much more frequently than we might like to admit. The most important lesson I have learned as a chaplain is never to assume that I know what my impact has been on a situation, or what difference I've made. We all have a lot less control than we tend to admit.

I acknowledge that I don't always put these lessons into practice. However, my training and work as a chaplain allow me to remain mindful of these issues so that when I enter a room, I am aware of how they will impact on my interactions with patients. I hope to carry what I’ve learned into my career as a physician.

David Grenda is a third-year MA/MD student at the School of Medicine. He currently is doing hematopoiesis research in the laboratory of Daniel C. Link, MD. He plans to pursue an academic career as a researcher and clinician.
The road less traveled

**WILLIAM HELVEY, MD '56**, says his wife smiles when someone asks him, “What kind of a doctor are you?” (Grace Jones married Bill while she was in the nurse anesthetist program at Barnes Hospital and he was a medical student.) He ventured from internship to U.S. Navy flight surgeon, and then played an early role in the National Aeronautics and Space Administration (NASA) space program.

He also co-founded the San Francisco Airport Medical Clinic and companies that pioneered computerized patient monitoring systems, that export high-tech medical equipment and train foreign physicians to use it, and that created and maintain the MDX (Medical Data Exchange) Health Digest, a database for “consumers.”

As a flight surgeon, Helvey cared for 150 Marine Corps pilots; 10 lost their lives in aircraft accidents. “We easily forget in peace time that preparation for national defense is a risky business,” he says.

The early astronauts owed their safety in part to Helvey. First as director of the Life Sciences Laboratories at Republic Aviation in New York, and later as Director of Biotechnology at Lockheed in California, he supervised for NASA the testing of the Apollo space suit and studies of long-term effects of 100 percent oxygen use at various cabin pressures.

In 1967, Helvey volunteered at a Vietnamese civilian hospital, under the State Department’s Agency for International Development program. The American Medical Association recognized that service with its Humanitarian Award.

Helvey is a Fellow of the Aerospace Medical Association and of the International Academy of Astronautics. He chaired the Biotechnology Committee of the American Institute of Aeronautics and Astronautics and the Life Sciences Committee of the International Astronautical Federation.

When his Medicare card arrived, Helvey decided it was “now or never” to fulfill his dream to fly a small plane cross-country. He helped build an open-cockpit experimental aircraft and made the first of three transcontinental solo flights, covering 45 states from California to Maine to Florida. Along the way, he viewed such national landmarks as the Statue of Liberty, the Gateway Arch, the Grand Canyon, Mount Whitney and the Golden Gate Bridge. Then it was back to Palo Alto in Northern California (his home for 37 years).

“I’m glad I took the career path less traveled,” he says. Along the way I met queens, princes, astronauts and cosmonauts; the first physician in space, Boris Yegerov, took Grace shopping in Moscow when I was a guest of the USSR Academy of Sciences. I never ceased being a student, meeting new challenges and learning new disciplines. The culmination was getting my pilot’s license at age 67 and flying ‘low and slow’ across this beautiful country at age 69.”

That’s what kind of a doctor he is.

**Seeing 1,000-year-old wonders**

**DENNIS COOPER, MD '71**, has many accomplishments but says the best is “that my two sons, grown and with master’s degrees, still come home on their own and enjoy traveling and hanging out with Dad.”

A single parent, he raised them through their teenage years. He had to learn to cook and has now compiled a cookbook of recipes from his mother, patients and friends. Profits from its sale go to Research to Prevent Blindness.

Traveling with Cooper often means hiking into Navajo country in Arizona to explore and photograph thousand-year-old Anasazi ruins and petroglyphs.

Through years of volunteering with the University of Arizona’s mobile Medical Eye Unit which provides
care to Native Americans, he met guides who came to trust that he was not a looter. They took him to places like Square House ruin in Mystery Valley, Poncho House, Seventeen Room House, and Batwoman House, sites not found on any map. Now, several times a year, Cooper leads groups to these wonders.

He has practiced ophthalmology in Scottsdale since 1977, when he was discharged from the U.S. Army Medical Corps (a major, decorated with the Army Commendation Medal). Concurrently, he has been on the staff of Scottsdale Healthcare, where he has chaired the department of surgery and currently chairs ophthalmology. Cooper teaches family practice residents there and, next year, will start an ophthalmology program for medical students for the University of Arizona.

Although the university's School of Medicine is located in Tucson, students often study in Phoenix due to the larger population and concentration of physicians there. Cooper was named "Teacher of the Year" in 1990 and has been on Phoenix's "Top Docs" list three times.

An active Washington University alumnus, Cooper co-chairs its Regional Cabinet in the Phoenix area. He remembers faculty who inspired him, especially the late Jacob Probststein, MD, who once told him, "It's not your job to keep everybody alive. It's your job to offer comfort along the road."

Cooper says, "I try to do that everyday, whether with patients in Scottsdale, or on the reservation, or with friends and family. All of us want to make a difference, and offering expertise and comfort is my way."

**An advocate for the elderly**

*Last April,* the South Dakota Hospice Organization honored Priscilla Bade, MD '87, with its Meritorious Service Award in the Physician Hospice Category. The award recognized her exemplary patient care, her work with the Rapid City Regional Hospital's Palliative Care Committee, and her service as an instructor for the "Education for Physicians on End-of-Life Care" project.

Bade, a geriatrician and associate professor of internal medicine at the University of South Dakota School of Medicine, has been an energetic advocate for elderly and hearing-impaired patients since she began practicing. She is medical director of Beverly Healthcare-Bella Vista, a nursing home, and co-medical director of senior services at Rapid City Regional Hospital.

"Geriatrics appeals to me," she says, "because of its emphasis on the whole person and its inclusion of psychosocial and practical everyday issues." Through a monthly Geriatric Forum, she helps to educate other health care practitioners who care for the elderly.

Bade has a congenital hearing loss and practices with adaptive equipment. The first resident at Hennepin County Medical Center in Minneapolis to use a display pager, she had to show hospital staff how to page her with the "new-fangled gadget."

She has since authored publications in medical journals and a chapter in the *Geriatrics Review Syllabus* on how to communicate with hearing-impaired patients. She is active in the international organization, Self Help for Hard of Hearing People, Inc. (SHHH) and is starting a Rapid City SHHH group. Before moving to Rapid City in 1998, she practiced in Sioux Falls SD, and she still edits the newsletter for the SHHH group there.

Hearing loss has not diminished Bade's achievements. She earned both her bachelor of science degree (*cum laude,* in electrical engineering) and her medical degree from Washington University. She went on to earn a master's degree in biostatistics and epidemiology at the Medical College of Wisconsin while doing her fellowship in geriatric medicine there.

In July 2001, she was elected to fellowship in the American College of Physicians. The department of internal medicine at the University of South Dakota has honored her with Special Achievement Awards for clinical skills, research on osteoporosis, and service.

In her limited leisure time, Bade plays the organ at her church and enjoys embroidery and crafts.
All in the family

Schnucks donate chair for neurofibromatosis research

"WE DO THINGS AS A FAMILY," says Doris Schnuck, explaining why the new professorship she and her children have endowed at the School of Medicine is called the Donald O. Schnuck Family Chair in Neurology for Neurofibromatosis Research in memory of her late husband, Donald Schnuck.

Its goal is straightforward: "We hope to help find a cure," she says. The Schnuck family owns and operates St. Louis-based Schnuck Markets Inc.

Neurologist David H. Gutmann, MD, PhD, has been named to the chair. The Schnucks have been following his work since 1990, when he was a member of the team that identified the gene for the more common form of neurofibromatosis, NF1, on which he shares a patent. Gutmann, who is associate professor of genetics, of neurology and of pediatrics, directs the neurofibromatosis program at St. Louis Children's Hospital and is an investigator with the Alvin J. Siteman Cancer Center of Washington University School of Medicine and Barnes-Jewish Hospital.

After Gutmann joined the School of Medicine faculty in 1993, the Schnucks helped to support the neurofibromatosis program at St. Louis Children's Hospital. "He's a very talented man," Schnuck says, "and so dedicated to learning about this disorder."

Donald Schnuck and his brother, Edward, developed the family grocery business, which was started in 1939 by their parents, into a thriving company with more than 90 stores in St. Louis and the Midwest. A tireless leader, Donald Schnuck dedicated substantial effort to social service organizations, including the United Way, Salvation Army, Boy Scouts and Girl Scouts. In 1990, he was named St. Louis Man of the Year. Before his death, he passed on the title of chief executive officer to his eldest son, Craig D. Schnuck, who continues to head the company.

Donald's widow, Doris, is active in the community, with particular interest in research and treatment for neurofibromatosis on behalf of a family member with the disorder. In addition to her work with the National Neurofibromatosis Foundation, she served on the Friends boards of the St. Louis Art Museum and the Magic House, and is active in the I Have a Dream
The Schnucks have six children, all of whom hold leadership positions in the family business, as well as with various community organizations.

Craig Schnuck continues to lead Schnucks Markets Inc., as chairman of the board and chief executive officer. In addition to serving on Washington University’s Board of Trustees and chairing the Board of the United Way of Greater St. Louis, he is president-elect of Civic Progress.

Scott C. Schnuck joined the family business in 1975 and has been the company’s president and chief operating officer since 1991. He serves on the boards of such local institutions as the St. Louis Regional Chamber and Growth Association, St. Louis Children’s Hospital and the Missouri Botanical Garden.

Terry E. Schnuck is Schnuck Markets’ secretary and general counsel, overseeing legal and governmental affairs as well as the company’s charitable giving programs. His civic positions include chair of the Better Business Bureau Foundation and a director of The Municipal Theatre Association of St. Louis.

Mark J. Schnuck is president and chief executive officer of other Schnuck family businesses, the DESCO Group and NAI DESCO Commercial LLC. Created in 1993 and named in honor of Donald and Edward Schnuck, the DESCO Group handles commercial, industrial and retail real estate transactions. He is a member of the International Council of Shopping Centers and is an advisory commissioner for the St. Louis Zoological Park Commission.

Todd R. Schnuck is corporate vice president and chief financial officer of Schnuck Markets Inc., and is responsible for the company’s accounting, budgeting, internal audit and treasury functions. He serves as the treasurer of the Urban League of Metropolitan St. Louis and is a member of the executive committee of the Urban League board. He is past president of the development board of St. Louis Children’s Hospital.

Nancy Schnuck Diemer is director of community affairs for Schnuck Markets Inc. In that position, she manages corporate charitable contributions, food donations to food banks, and partnerships with non-profit organizations. She serves on the Missouri Chapter Neurofibromatosis Foundation’s advisory board, the John Burroughs School alumni board and the Operation Food Search board. She also lends her name to Schnucks’ “Nancy Anne” line of bakery goods.

The six siblings meet once a month, and each feels free to express opinions and make suggestions about all areas of the family business. “They’re all dedicated,” Doris Schnuck says of her children. “They have a common goal to succeed.”
Eliot Society membership on the rise

Jo-Ellyn M. Ryall, MD ’75, assistant clinical professor of psychiatry, hosted the 24th annual Eliot Society Kickoff event for the School of Medicine in October.

The Eliot Society Membership Committee comprises 40 volunteers who provide public support by encouraging new members to join the Eliot Society. Volunteers came together at the kickoff event to renew acquaintances and to discuss plans for strengthening membership in fiscal year 2002.

William A. Peck, MD, executive vice chancellor for medical affairs and dean, was on hand to describe the current state of the medical school and to extend his appreciation to the dedicated individuals who sustain the Eliot Society.

Thanks to the efforts of last year’s membership committee, the number of new Eliot Society members reached 178. Past members renewed their memberships at a high level, reaching an 80 percent renewal rate.

The end result: The School of Medicine’s Eliot Society increased its membership by 9 percent to 726 members in fiscal year 2001.

Join the celebration at Reunion 2002!

Reunion 2002 for MD alumni will be held May 16–18, 2002. Activities will begin at noon on Thursday and run through Saturday. The reunion hotel will be the Ritz-Carlton in Clayton, where the class dinners and alumni banquet will be held on Friday and Saturday evenings. The welcoming reception on Thursday evening will at the Starlight Roof atop the Chase Park Plaza.

Registration materials for the event will be mailed in February. In the meantime, you may find reunion information on the web at: medschool.wustl.edu/alumni.

Mark your calendars now and come back for the celebration!

1942 Robert Royce, MD, social chair
1947 George Sato, MD, social chair
1952 John Davidson, MD, social chair
1957 Jack Kayes, MD, and Frederick Peterson, MD, social chairs
1962 Bruce Horwitz, MD, social chair
1967 Ira Kodner, MD, social chair
1972 Walter Benoist, MD, social chair
1977 Stuart Schlanger, MD, social chair
1982 Mary Murphy, MD, social chair
1987 Laura Bierut, MD, social chair
1992 Susan Laenger, MD, social chair

1947 William Landau, MD, gift chair
1952 Edward Lansche, MD, and Charles Miller, MD, gift chairs
1962 William Gondring, MD, gift chair
1967 Stephen and Sharon Van Meter, MDs, gift chairs
1972 Timothy Holekamp, MD, Julian Mosley, MD, and Robert Fry, MD, gift committee
1977 Keith Bridwell, MD, and Barbara Reynolds, MD, gift chairs
1982 John Niemeyer, MD, gift chair
1987 John Baird, MD, gift chair
1992 Jon Morris, MD, gift chair

1957 Larry Pakula, MD, gift chair
1982 Edward Lansche, MD, gift chair
1992 Jon Morris, MD, gift chair
Second Century Award recipients honored

The 2001 Second Century Awards were presented on September 22, 2001, at a dinner held at St. Louis’ Ritz-Carlton Hotel. The awards have been presented annually since 1991 and mark Washington University School of Medicine’s entry into its second hundred years of leadership in patient care, teaching and research. Honorees this year were Robert C. Drews, MD, William M. Landau, MD, and Richard J. Mahoney.

Robert C. Drews, MD ’55, is professor emeritus of clinical ophthalmology at the School of Medicine. He retired from private practice in 1997, but continues to be active in his profession. He currently serves as president of the American Ophthalmology Society. A Life Fellow of the American Academy of Ophthalmology and a Fellow of the American College of Surgeons and of the Royal College of Ophthalmology, Drews is internationally known for his expertise in cataract surgery and lens implantation. His many honors include medals from 11 professional societies in five countries.

Drews has served on Washington University’s Board of Trustees and has been a leader in many successful fund-raising efforts. He is a member and former chair of the Alumni Board of Governors, a member of the School of Medicine’s National Council, and past president of the Washington University Medical Center Alumni Association.

William M. Landau, MD ’47, is professor of neurology at the School of Medicine. He served as head of the Department of Neurology for 21 years, until 1991. Currently, he continues to engage in clinical practice, consultation, teaching and research.

Respected for his clinical acumen, Landau is also known for his research. He is internationally acclaimed for his critical analyses of clinical neurological concepts, which most recently have dealt with a range of subjects including breast cancer, environmental contaminants, obesity and cholesterol, and cardiac resuscitation.

Landau has been president of the most prestigious neurological societies and boards, including the American Board of Psychiatry and Neurology, the American Neurological Association, the Association of University Professors of Neurology, and the National Committee for Research in Neurological and Communicative Disorders. He is a Fellow of the American Academy of Neurology.

Richard J. Mahoney is the Distinguished Executive in Residence at the Weidenbaum Center on the Economy, Government and Public Policy at Washington University. Mahoney accepted that appointment in 1995 after retiring as chairman and chief executive officer of Monsanto Company, a position he had held since 1983. He had been with Monsanto in various capacities since 1962.

Active in many civic and charitable organizations, Mahoney has been a director of the Council for Aid to Education and vice president of the Board of Managers for Central Institute for the Deaf. He is a trustee of the Missouri Botanical Garden and of Washington University.

Mahoney chairs the School of Medicine’s finance committee and has provided invaluable counsel on financial planning. As head of Monsanto, he supported the successful research collaboration between the university and Monsanto that has provided the School of Medicine with more than $100 million in research funding.
Robert M. Hardaway, MD ’39, retired from the Army as a brigadier general in 1975. Since then he has been professor of surgery at Texas Tech University School of Medicine where he teaches and does research, particularly on shock and disseminated intravascular coagulation. He recently received a Citizen of the Year Award and another award “for lifetime service for research and teaching.” Hardaway lives in El Paso TX.

Georgia Melsheimer Bartosch, OT ’40, writes that she is “mother of five, invertebrate Elderhosteler, world traveler, resident of a total life care community for 18 years.” Her husband has been retired for 25 years and is her “built-in travel agent.” They are enjoying the good life in Memphis TN.

G. Russell AufderHeide, MD ’43, attended the reunion of the World War II 273rd Field Artillery Battalion in Topeka KS, in August. AufderHeide, the battalion surgeon, says “Those other vets look older every time!” He also recently attended the 66th reunion of his Beaumont High School Class of 1935 in St. Louis, where he lives. He writes that his grandson is now pursuing a doctorate in biomedical engineering at Rice University.

Bruce W. Armstrong, MD ’44, says that he is “totally retired since March 1998 except for an hour or so at a clinic in Reno.” He “loves this leisure!” and enjoys having time to write.

E. P. (Pete) Inglis Jr., MD ’46, is the author of a new book, *Restored to Honor, Georgia’s B-29 “Sweet Eloise.”* It is a history of the B-29 bomber in World War II and of one B-29 “in combat, rescued, wrecked, restored, renamed ‘Sweet Eloise’ and placed on display at Dobbins Air Reserve Base in Marietta GA.” Inglis served as a flight surgeon in Japan and, after the war, practiced family medicine in Marietta for 38 years. He led the effort to restore the plane as a memorial and a symbol of the war effort at Marietta, where the B-29s were assembled at Bell Aircraft. The book costs $20 (Inglis is donating $10 of that to Washington University School of Medicine) and can be obtained by contacting him at 80 Lindley Avenue, Marietta GA 30064.

Margaret McChesney, MD ’49, and John McChesney, MD ’49, have moved to Williamsburg VA, where “Mac” continues to teach cardiology to third-year students at the University of Virginia in Charlottesville. “Marty” has retired and loves Williamsburg. They write: “As time goes by, we both more and more appreciate the superlative teaching we received at Washington University. The matchless, unexcelled teaching from Barry Wood, the Coris, Evarts Graham and countless others prepared us for our life’s work.” The McChesneys would love to hear from any of their classmates.

Will Harrison, PT ’53, is retired but continues his interest in promoting wellness for elderly men. He is a charter member of the National Wellness Institute and lives in New Berlin WI.

Edgar Draper, MD ’53, received the annual Distinguished Service Award from the Mississippi Psychiatric Association in April 2001. Draper lives in Jackson MS.

Kenneth R. Smith Jr., MD ’57, has been honored by the establishment of the K.R. Smith Endowed Chair in Neurosurgery at Saint Louis University, where he is director of the division of neurosurgery. At his request, the chair also honors three additional “K.R. Smiths”: his father, Kenneth R. Smith Sr.; his nephew, Kurt R. Smith, DSc, principal director of Healing Rhythms Inc., and his son, K.R. Smith III, a leader in medical science training for area high school students. Smith recently traveled with a volunteer team of St. Louis area physicians and nurses to Nairobi, Kenya, where they spent two weeks performing surgeries and procedures and teaching advanced techniques to Kenyan surgeons. This was the second year they have donated their services at Kenyatta National Hospital.

Bruce L. Dunn, MD ’62, of Capitola CA, retired in 1999. He is now associated with Assist International and has been doing urology and missionary medicine in Romania since 1995. With some local help, he set up a “baby home” for abandoned infants in Oradea, Romania. He “saw so many beautiful abandoned babies and, as a urologist knowing the increasing infertility in the United States, saw the hope for adoptions as a win-win situation.” Regrettably, some months ago the Romanian government banned all “out-of-country adoptions” for a year while they study the problem. The Western Section of the American Urological Association gave Dunn an Outstanding Member Award in 2000.

Joshua Grossman, MD ’65, wrote a memorial tribute to deceased classmate Dennis P. Cantwell, MD ’65, which was published in “Images in Psychiatry,” *American Journal of Psychiatry,* in April 2001.

Lawrence E. Holder, MD ’68, has been appointed by the American College of Radiology to a four-year term on the board of trustees of the American Registry of Radiologic Technologists. Holder is adjunct clinical professor of radiology at the University of Florida in Jacksonville and also clinical professor of radiology at the University of Maryland, where he was director of the division of nuclear medicine from 1993-2000. He is a trustee of the American Board of Nuclear Medicine.
William F. Sasser, MD, HS '68, is president of the Southern Thoracic Surgical Association and secretary of the board of governors of the American College of Surgeons. Sasser lives in St. Louis.

Harvey Blumenthal, MD, HS '70, a neurologist in Tulsa OK, was invited to review the concept of a "Clinical Spectrum of Migraine," published in Medical Clinics of North America, July 2001. He is a two-term member of the board of directors of the American Headache Society.

Toby L. Simon, MD '70, has accepted a position as chief medical officer/chief operating officer of TriCore Reference Laboratories in Albuquerque NM. He is also clinical professor of pathology at the University of New Mexico School of Medicine and is "delighted to be back in the Southwest!"

Bruce A. Snider, MD, HS '75, has been in the private practice of clinical psychiatry in northern Kentucky for 26 years and is a member of the American Academy of Clinical Psychiatrists. He has been married to Marjorie, who worked at Renard Hospital with Richard Hudgens, MD '56, whom they were in St. Louis, for 33 years. The Sniders are proud of their two daughters: Stacey, who is a preschool teacher, and Lauren, an equestrian who participates in three-day events and is a member of the Young Riders of North America, United States Combined Training Association.

Capt. James W. Steger, MD '77, of the United States Navy Medical Corps, was appointed chairman of the Navy's largest dermatology department and residency training program (15 residents and six full-time academic staff) at the Naval Medical Center in San Diego CA, on June 1, 2001.

Robert Lustig, MD, HS '83, recently accepted a position as associate editor for Physical Therapy, APTA's scientific journal, and as an editorial board member for Clinical Rehabilitation.

Shari Works, PT '85, is living in Bigfork MT, where she owns a small solo practice and "loves it!"

Karen M. Mathews, MD '85, is a family practitioner in the U.S. Air Force at Edwards Air Force Base in CA.

Renee Graham, OT '86, continues to live in Natick MA, with her three children, whom she "enjoys immensely." She does a lot of volunteer work at their schools. Graham sends greetings to classmates.

Andrew Chan, MD, PhD '86, has been appointed senior director of immunology in the research department of Genentech, Inc., in San Francisco CA. He had been associate professor in the division of rheumatology and in the departments of medicine and pathology.
Karen Good, PT '90, has joined the inpatient spine rehab team at the Rehabilitation Institute of St. Louis.

Suzanne Francavilla Graham, PT '90, lives in Asbury NY, with her husband, Glenn. Their first child, Judson, was born July 14, 2001. He "fits right in with our two dogs, Jake and Fiona." Graham works for Kessler Rehab Institute as senior physical therapist/manager in an outpatient satellite in Clinton NJ, and plans to be a full-time mom.

Lt. Col. Ronald H. Pearson, HA '90, has assumed the position of commander and chief executive officer of Buckley Air Force Base Clinic in Aurora CO.

Rebecca Wolfer, MD '90, has accepted a position as associate professor in the department of surgery at Marshall University in West Virginia. She completed a general surgery residency in 1996 at the University of Maryland and a cardiothoracic fellowship in 1998 at the Medical College of Wisconsin. She is board-certified in both general and cardiothoracic surgery and will be practicing thoracic surgery, trauma surgery and surgical critical care at Marshall.

Angie Wright Knapp, OT '93, and husband, Tim Knapp, welcomed daughter Allison on July 5, 2001. Angie works for a private practice therapy group and contracts to the local school districts for occupational therapy services. The Knapps live in Bellefontaine OH.

Roger E. Turbin, MD '93, has been appointed an assistant professor of ophthalmology in the divisions of neuro-ophthalmology and orbital surgery at the University of Medicine and Dentistry, New Jersey Medical School in Newark NJ. He is doing research on the treatment of optic nerve sheath meningioma, a chronic tumor, and on therapies for the treatment of fungal orbital disease. He and his wife, Shari, celebrated their first anniversary in September. They met while rollerblading in Manhattan's Central Park. She is a 1989 graduate of the University of Maryland and works as a district manager for The Body Shops.

Erica Y. Davis-Johnson, PT '95, has settled in Atlanta GA, "after traveling as a contract therapist for 2+ years, getting married in Jamaica in 1998, and giving birth to a gorgeous, now 15-month-old baby boy, Tarran Johnson IV." Her husband, Tarran Johnson III, is also a physical therapist.

Bryan Gibby, PT '95, was awarded board certification as a Certified Wound Specialist by the American Academy of Wound Management in May 2001. He is employed at Blessing Hospital in Quincy IL.

David Risiu, PT '95, works at an outpatient clinic in the Little Rock AR area. He and his wife, Christy, are celebrating the birth of their first child, Allison Ann Risiu, born May 22, 2001.

Melissa Curtis, PT '96, writes that they are expecting their first child in February. They live in Saginaw MI.

Elizabeth Tucker Echlin, PT '97, is an ergonomics specialist with Caregroup Occupational Health Network at New England Baptist Hospital in Boston MA.

Tim Bhattacharyya, MD '98, is a senior resident in orthopaedic surgery at Boston University Medical Center. He recently won the prestigious Zimmer Travel Award for Orthopaedic Residents from the American Orthopaedic Association.

Katherine Ballmann, PT '99, was a volunteer for the Avon three-day walk from Kenosha WI, to Chicago IL, in June 2001. Sixteen volunteer physical therapists cared for 800 acute injuries during the 60-mile walk.
Crystal A. Bingham, OT ’99, is employed by RCI Inc. as a job assistance counselor at ACAp, the U.S. Army’s program that assists soldiers and family members’ transitions back into civilian life. Bingham was sworn into the Army Reserves in March and is awaiting assignment to a California unit.

IN MEMORY

Henry L. Barnett, MD ’38, died August 14, 2001, in New York at the age of 87. He was well known for his pioneering work in pediatric nephrology. Early in his career he was the resident pediatrician for the Manhattan Project in Los Alamos NM, and he was on the first American inspection team to travel to Japan after the atom bomb was dropped on Nagasaki. Later, he was on the faculty at Cornell University Medical College, and in 1955, he started the pediatrics department at Albert Einstein College of Medicine. He founded the International Study of Kidney Disease in Children. In 1981, he became medical director of the Children’s Aid Society, working to improve health care for disadvantaged children in New York. In 1993, the American Academy of Pediatrics honored him by establishing an annual award in his name. He is survived by his wife of 60 years, a son and a daughter.

C.S. “Burr” Lewis Jr., MD ’45, died June 1, 2001, in Tulsa OK. At the time of his death, he was director of the International Studies in Medicine Program at the University of Oklahoma College of Medicine.

Nathan Wayne Groce, MD ’48, died April 18, 2001, in Phoenix AZ. A Missouri native, he practiced in Missouri after graduation, then served in the U.S. Army Medical Corps during the Korean War. He moved to Arizona in 1953 and was a co-founder of the Occupational Medical Clinic, one of the first such practices in the state. The clinic served employees of the City of Phoenix and Maricopa County and other major corporations for 30 years. During his lifetime he donated more than 10 gallons of blood to the Red Cross, and the family suggests that memorial gifts be made to local blood banks. Among his survivors are his wife, Betty, three sons and a daughter, one stepson and one stepdaughter.

William Monroe Daily, MD, HS ’49, of Dallas TX, died September 29, 2001, at the age of 83. He had practiced internal medicine at Baylor Medical Center and taught at its medical school for a number of years. During World War II he served as a battalion surgeon in Panama, Australia, New Guinea and the Philippines. Among his survivors are his wife, Sarah McLean Daily, a daughter, Melinda Kirk, and a son, David Daily.

Robert Moore, MD ’49, died at his home in Lubbock TX, on April 4, 2001, at the age of 75. At the time of his death he was a pediatric allergist with Pediatrics Associates of Lubbock and a clinical professor of pediatrics at Texas Tech School of Medicine. Moore developed and chaired the department of pediatrics at Texas Tech in the 1970s and also started the first Allergy Immunology Clinic there. During the Korean War, he served as a captain in the U.S. Medical Corps at Fort George G. Mead Hospital in Maryland. He received many honors, including several international awards for lifetime service in immunology, and the Dean’s Distinguished Service Award and the Outstanding Professor in Clinical Science Award at Texas Tech. The American College of Allergy, Asthma, and Immunology named him a Distinguished Fellow in 1998. During 1983-84, he served as president of the Texas Allergy Society, of which he was a founding member. Moore had a great interest in the arts and rare books and had served as president of the Friends of Texas Tech University Library and Southwest Collection and had donated a collection of rare historical medical documents to the Moody Medical Library at the University of Texas Medical Branch at Galveston. He also had been president of the Book Club of Texas and vice president of the Manuscript Society, as well as a board member of the Lubbock Symphony. Among his survivors are two daughters, a brother and two sisters.

Catherine Roosel, PhD ’51, died August 13, 2001, in Augusta GA. She was professor emerita in the department of cell and molecular biology at the Medical College of Georgia and had been retired since 1990.

Cecil Auner, MD ’52, died October 14, 2001. He had been an internist in Springfield MO.

Paul Herron, MD ’54, of Salem OR, died January 9, 2001. He was a general surgeon.

A. Zachary Apfel, MD ’57, of Monroe Township NJ died June 4, 2000, in New York NY, at the age of 70. He was a lifetime member of the American Academy of Pediatrics and past president of the Pediatric Section of Kings County Medical Society. He served in the U.S. Army during the Korean War. He is survived by his wife, four sons and 15 grandchildren.

Jean Yuriyo Kubo Tsaai, OT ’57, died in Hawaii on May 26, 2001, at the age of 66. She had been director of occupational therapy at the Jewish Institute of Geriatric Care in New York and an occupational therapist at several nursing homes in Hawaii.

Raymond Ferrier, MD, HS ’66, died January 21, 2001. He had lived in Fort Lauderdale FL, for the past 21 years and had practiced cardiovascular surgery at Northridge and Holy Cross hospitals. He is survived by a son and two daughters.
Seeking fixed income?  
Try a Washington University Gift Annuity. Here's how...

As you review your personal financial plan, you may find that a Washington University Charitable Gift Annuity can be helpful to you if you are age 60 or older. Here's one way you can receive guaranteed income for life and make an enduring gift to the University.

If you are age 72 and create a $10,000 Gift Annuity with cash, you will receive the following benefits:

<table>
<thead>
<tr>
<th>Rate of return</th>
<th>7.4%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Guaranteed annual income for life</td>
<td>$740</td>
</tr>
<tr>
<td>Tax-free portion</td>
<td>$417</td>
</tr>
<tr>
<td>Taxable portion</td>
<td>$323</td>
</tr>
</tbody>
</table>

(The entire amount becomes taxable income after the first 14.5 years.)

**Immediate federal income tax deduction** $3,952

(amount of charitable deduction may vary slightly)

You may also fund a gift annuity with appreciated securities.

**Sample Rates of Return**

<table>
<thead>
<tr>
<th>Single life</th>
<th>Double life</th>
</tr>
</thead>
<tbody>
<tr>
<td>age</td>
<td>rate</td>
</tr>
<tr>
<td>60</td>
<td>6.4%</td>
</tr>
<tr>
<td>65</td>
<td>6.7%</td>
</tr>
<tr>
<td>70</td>
<td>7.2%</td>
</tr>
<tr>
<td>75</td>
<td>7.9%</td>
</tr>
<tr>
<td>80</td>
<td>8.9%</td>
</tr>
<tr>
<td>90</td>
<td>12.0%</td>
</tr>
</tbody>
</table>

For further information or to request a personalized example, please call 1-314-935-5848 or 1-800-835-3503, complete the attached reply card, or e-mail us at plannedgiving@aismail.wustl.edu. Visit us at our Web site at http://aisweb.wustl.edu/Alumni/PlannedG.nsf.

Seek advice from your tax or legal advisor when considering a Charitable Gift Annuity.

Design by Jeffrey St. Pierre '01/Create Studio at Washington University
Washington University in St. Louis
SCHOOL OF MEDICINE

☐ Washington University is already included in my estate plans—I would like to become a Robert S. Brookings Partner.

☐ I am age 60 or over. Please send me a personalized, confidential calculation using the following birthdate(s) to illustrate the very attractive benefits that I will receive from a Washington University Charitable Gift Annuity.

☐ I would like a calculation based on a theoretical gift of:

$______________________, (minimum $5,000)

☐ Cash ☐ Securities

$______________________  (Cost Basis)  (Acquisition Date)

First Beneficiary
Birthdate______Relationship______

Second Beneficiary
Birthdate______Relationship______

☐ Please send me your booklet on Charitable Gift Annuities.

☐ Please send me your booklet on other Life Income Plans at Washington University.

☐ Please send me information on making a bequest to Washington University School of Medicine.

☐ Please have Paul Schoon or Lynnette Sodha from the Washington University Planned Giving Office call me.

Name ______________________________
Address ______________________________
City/State/Zip ______________________________
Daytime Phone ______________________________

Use this postage-paid card to let us know what's new with you.

Share your news about awards and honors, promotions, community activities and more. Contact Chad Ittner at (314) 286-0020 or e-mail Ruth Bebermeyer at ruthab@onemain.com.

Update Yourself!

Name ______________________________
Address ______________________________  City/State/Zip ______________________________
Specialty ______________________________  Class/HS Year ______________________________
E-mail ______________________________ (May we list your e-mail address in our web page directory?)  ☐ Yes ☐ No

Signature ______________________________  Daytime phone ______________________________

The University reserves the right to contact contributors to verify entries.
Cheerier exterior  Brightly colored whimsical characters greet visitors at the new entrance to St. Louis Children’s Hospital at Washington University Medical Center. A copper elephant serves as a downspout. The newly renovated entrance, six-story parking garage and pedestrian skywalk opened recently to enhance access by patients, physicians and staff. Construction has begun on a fountain, a canopy and other features that will contribute to the vibrant, friendly atmosphere.
Pathogen Portrait  This electron micrograph shows three *E. coli* bacteria (yellow) of a strain that causes urinary tract infections. The bacteria are attached to the membrane (blue) of a host bladder cell by pili (white strands). To learn how scientists at the School of Medicine are investigating this and other infectious agents, please turn to page 20.