Bringing Dialysis Home
Sealed with a Kiss  2002 graduates Maitraya Patel, center, Elise Krejci, left, and Vivian Pao, right, share the love and their enthusiasm at the recent Commencement Recognition Ceremony. The School of Medicine conferred 109 degrees on May 10: 90 students received the MD degree, 15 received the MD/PhD degree, and four received the MD/MA degree.
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Washington University in St. Louis
SCHOOL OF MEDICINE

Class Notes
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Washington University in St. Louis
SCHOOL OF MEDICINE
Joseph Kimack is one of a growing number of end-stage kidney disease patients who are learning to perform in-home dialysis. Brent W. Miller, MD, assistant professor of medicine, and his staff at the Barnes-Jewish Hospital Dialysis Center find that the procedure, nocturnal dialysis, saves both time and money. For more on this story, please turn to page 16.

Inheriting an abnormal gene for disease doesn't necessarily mean the worst. With early preventative treatment, many who are genetically predisposed can sidestep serious illness.

St. Louis Children's Hospital Child Development Center allows kids to be kids and provides peace of mind to Washington University Medical Center parents.

Performing dialysis at home allows patients with kidney disease better overall health and more free time. And, they literally get to sleep through the procedure.

A simple food makes inroads into a complex problem—feeding young children in Malawi a peanut butter supplement helps them to survive and thrive.

Physicians' songfest: "On top of McMillan, one sunny day..."
School of Medicine third in nation

Among the best is where Internal Medicine, fourth (tie); Microbiology, sixth; Molecular Biology, 10th (tie), and Pediatrics, sixth. Other active rankings, computed in previous years, include Physical Therapy, first; Occupational Therapy, third (tie); Audiology (Central Institute for the Deaf), sixth (tie); Health Services Administration, 12th (tie), and Clinical Psychology, 19th (tie).

Beebe named new Becker Professor

David C. Beebe, PhD, has been named the new Janet and Bernard Becker Professor of Ophthalmology. Beebe, who also is a professor of cell biology and physiology, directs the School of Medicine's Cataract Research Center, one of the largest groups in the world working on the biology and pathology of cataracts.

"This professorship stands as a tribute to the legacy and generosity of Bernie and Janet Becker," says William A. Peck, MD, executive vice chancellor for medical affairs and dean of the School of Medicine. "Dr. Becker's glaucoma research and his record as a teacher and administrator are unsurpassed. Together with Janet, the Beckers' work in the community is legendary."

The Beckers have a long history of involvement with education, the arts and social causes in St. Louis. The Becker Professorship is an endowed chair in the Department of Ophthalmology and Visual Sciences, one of two chairs originally instituted in 1983 in recognition of the service and leadership of Bernard Becker, MD, professor emeritus and former head of ophthalmology.

Reeve speaks at Commencement

Actor, director and activist Christopher Reeve addressed graduating students at the School of Medicine's 2002 Commencement Recognition Ceremony held on May 10.

In his address, Reeve noted the high regard in which he holds doctors. He also expressed his frustration with the politics that sometimes get in the way of advancing medical science in the United States.

"Why do we have to make research, science, medicine, the best care for patients—why do we have to make that political?" Reeve implored the audience.

A proponent of therapeutic stem cell cloning, Reeve likened the controversy surrounding cloning to that focused on in vitro fertilization in the 1970s. He noted that despite the initial backlash against the procedure, today in the United States there are 400 infertility clinics and about 178,000 Americans who were conceived via in vitro techniques.

Because what we fear today may be commonplace tomorrow, it is critical to encourage research. "The purpose of government is to do the greatest good for the greatest number of people, he added, and it must live up to its obligation to provide the best medical technology to its citizens.

"I believe in doctors. I have the greatest admiration and reverence for doctors," Reeve told the graduates. "Now we've just got to get out of the way and let you do your work. Thank you so much for being willing to take the journey that you're taking and for doing that work. I applaud each and every one of you."
Genetic epidemiology program added to curriculum; new GEMS degree offered

Genetic epidemiology, an interdisciplinary field concerned with examining how genes and environments act together in causing disease or risk factors for disease, soon will be offered as a two-year course of study at the School of Medicine. The new Genetic Epidemiology Master of Science (GEMS) program will begin in fall 2002.

"One cannot study genes except as they are expressed in people living in certain environments, and it is important to study environmental factors as they affect people with a particular genetic makeup," says D.C. Rao, PhD, professor of biostatistics, genetics and psychiatry. Rao, who serves as director of the division of biostatistics, also will direct the GEMS program.

The challenges and opportunities afforded by the Human Genome Project and new technologies, such as gene-expression profiling, require solid interdisciplinary training. Understanding the genetic underpinnings of human diseases, such as diabetes or cancer, will lead to better prevention, diagnosis, prognosis and treatment.

Molecular Biology and Pharmacology

Chemical messenger controls bone growth in embryos

Scientists for the first time have identified a chemical messenger that regulates bone development in the growing embryo. The finding was reported by School of Medicine researchers in the April 1, 2002, issue of the journal Genes and Development.

"This signaling molecule puts the brakes on the cartilage growth that determines the length of bones," says David M. Ornitz, MD, PhD, professor of molecular biology and pharmacology, who led the study. First author on the paper was Zhonghao Liu, a graduate student at the School of Medicine.

The messenger, known as fibroblast growth factor 18 (FGF 18), also appears to regulate bone hardening, or ossification.

"This suggests that FGF 18 coordinates the process by which bones lengthen with the process by which they harden," Ornitz says. "That came as a surprise to us."

He believes the study may lead to a better understanding of congenital and genetic diseases that cause bone malformation, and perhaps of cancer and bone diseases such as osteoporosis.

Mouse embryos that Ornitz and his research team engineered to lack the genes for FGF 18 showed increased growth activity in the bones. For example, in embryos that lacked FGF 18, the growth regions, or growth plates, of the femur were 37 to 60 percent broader than those in normal mouse embryos.

This and other changes seen in the embryos lacking FGF 18 mimic the condition of embryos that lack a receptor molecule known as fibroblast growth factor (FGF) receptor 3. This led Ornitz and his colleagues to conclude that FGF 18 is the messenger molecule for FGF receptor 3.

Receptors are molecules on the surface of cells that trigger some change in the cell when activated by molecules such as hormones or growth factors. Scientists have known for 10 years that FGF receptors are important for skeletal development. For example, mutations in FGF receptor 3 cause achondroplasia, the most common form of dwarfism in humans. But they did not know which of the 22 known fibroblast growth factors activate the receptors associated with developing bone.

But while embryos that lacked FGF 18 were very similar to embryos that lacked FGF receptor 3, there also was an important difference: The bones of mice lacking FGF 18 didn't begin to harden as soon as they should have, suggesting that FGF 18 also influences a second receptor.

Ornitz and his colleagues now are working to identify that second receptor and will soon begin studying how FGF 18 is regulated.

The nuclei (black dots) of dividing cells are revealed in developing bones. This mouse embryo lacks the gene for fibroblast growth factor 18 and has an excessive growth of cartilage cells.
Santoro named first Conan Professor in Laboratory Medicine

SAMUEL A. SANTORO, MD, PHD, has been named the first Conan Professor in Laboratory Medicine. The professorship was established by Jack H. Ladenson, PhD, the Oree M. Carroll and Lillian B. Ladenson Professor of Clinical Chemistry, in honor of his research team. The team devised a way to use a monoclonal antibody they discovered, Conan-MB, as a tool for diagnosing heart attacks. The chair is funded in part by royalties from the licensing of Conan-MB, which now is one of the standard diagnostic methods for detecting myocardial infarctions.

The new Conan chair is believed to be only the second endowed professorship in laboratory medicine in the United States, a discipline dedicated to the development, selection and interpretation of laboratory tests for diagnosing and monitoring disease. The other such chair also was created using royalties from the Conan-MB license and was named in honor of Ladenson’s father-in-law and mother, both deceased. Ladenson holds that chair.

Santoro, who also is the director of the division of laboratory medicine at the School of Medicine and medical director of clinical laboratories at Barnes-Jewish Hospital, is renowned for his work on how cells latch onto each other. Much of his research focuses on collagen, proteins that form a mesh around the outside of many cells. Cells stick to this matrix via integrins, proteins that sit on the cell surface. These attachments play an important role in the development of artery-clogging plaque in atherosclerosis, wound healing and the invasive behavior of tumor cells.

Refractive laser eye surgery center opens in Center for Advanced Medicine

A Refractive Surgery Center offering a comprehensive treatment program has opened in the new Center for Advanced Medicine at Washington University Medical Center.

Cornea specialist Michael S. Conners, MD, PhD, assistant professor of ophthalmology and visual sciences, is the center’s medical director. As the popularity of refractive laser eye surgery, such as LASIK, continues to soar, Conners and the new Washington University Refractive Surgery Center will take a conservative, cautious approach.

"Our turn-away rate probably will be higher than it is at some places," Conners says. "There are some patients who still aren't good candidates for these procedures, and although the vast majority of patients don't have any problems following surgery, we have to remember that LASIK is a surgical procedure, not something that you enter into lightly."

LASIK (LAsker In-Situ Keratomileusis) and other laser procedures are used to correct nearsightedness, farsightedness and astigmatism (uneven curvature of the cornea). During the procedure, the surgeon uses precision instruments to create a flap in the cornea. The flap is folded back, and then the laser reshapes the cornea to more precisely focus light onto the retina of the eye. After the LASIK procedure is completed, the flap is replaced, the eye is treated with antibiotic drops, and the patient is sent home.

Some patients experience minor pain or light sensitivity, but that usually subsides within a few hours. Most who undergo the procedure have vision between 20/20 and 20/40 by the next day.

Conners believes large numbers of potential patients are interested but cautious about refractive surgery. He encourages them to learn more about the surgery and other procedures the center offers.

"This is not just a LASIK practice," he says. "We can handle many more things than refractive surgery, and we are very careful not to operate if there is any abnormality of the cornea that might make surgery risky."

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Nerbonne, Ornitz recognized as Molecular Biology Alumni Endowed Professors

MOLECULAR BIOLOGY AND PHARMACOLOGY professors Jeanne M. Nerbonne, PhD, and David M. Ornitz, MD, PhD, have each been named an Alumni Endowed Professor of Molecular Biology.

Alumni professorships combine unrestricted gifts from medical alumni and former house staff with gifts from friends of the School of Medicine. The Washington University Medical Center Alumni Association launched the professorships in 1978 to help attract and retain renowned physicians and scientists.

Nerbonne's research focuses on defining the molecular mechanisms that control electrical activity in the heart and the changes that occur in heart disease. Ornitz' work examines a form of chemical communication between developing cells throughout the body.

Douglas is associate vice chancellor for Center of Technology Management

MICHAEL G. DOUGLAS, PHD, has been named associate vice chancellor for technology management, according to Theodore J. Cicero, PhD, vice chancellor for research at the School of Medicine. He succeeds P. Andrew Neighbour, PhD, in the position.

Douglas joins Washington University after serving as vice president and chief scientific officer at Novactyl Biopharmaceuticals Inc. in St. Louis. He will head the university's Center of Technology Management and further develop the technology transfer program, a strategic, comprehensive effort that encourages companies to convert the university's discoveries into products and processes the public can use.

In fiscal year 2001, the university earned more than $9.2 million from technology transfer initiatives and successfully negotiated more than 265 new license agreements for the development of products such as software, computer and communication technology, and pharmaceuticals, bringing the total number of active licenses under management to 882.

Draft of mouse genome now available

A DRAFT SEQUENCE OF THE MOUSE GENOME—the genetic blueprint for the mouse—has been completed and is available to the public through databases accessible on the Internet. Researchers at the School of Medicine's Genome Sequencing Center played a major role in the landmark event, as they did with the sequencing and mapping of the human genome.

"This is a major achievement, because the mouse plays a central and fundamental role in the study of human biology and human disease," says Robert H. Waterston, MD, PhD, director of the Genome Sequencing Center and a leader of the project.

The map of the mouse genome will help scientists better understand the human genome by allowing them to compare the mouse and human genomes. Areas that are similar in both are likely to be particularly important, because evolution has retained those regions in both organisms.

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NIH Support to U.S. Medical Schools

In 2001, the School of Medicine received $268.5 million in support from the National Institutes of Health and achieved fourth place among all U.S. medical schools in NIH funding. In addition, Barnes-Jewish Hospital received $15.5 million in NIH support and Central Institute for the Deaf received $1.5 million.
**Waterston garners international accolades with two honors**

**Robert H. Waterston, MD, PhD**, director of the Genome Sequencing Center at the School of Medicine, is one of eight scientists to receive the 2002 Gairdner International Award, which this year recognizes exceptional achievement in genomics science.

Waterston, together with Eric S. Lander, PhD, professor of biology at the Massachusetts Institute of Technology and head of the Whitehead Institute Center for Genomic Research in Cambridge, MA, and Sir John E. Sulston, PhD, founder of the Sanger Institute in Cambridge, United Kingdom, were recognized for their “major seminal contributions to sequencing of human and other genomes.”

Waterston also was honored recently with the first Dan David Prize (pronounced Da-veed) for achievements that hold great promise for improving the future. The prize is an international competition endowed by the Dan David Foundation at Tel Aviv University.

Waterston shares the prize with Sulston and Sydney Brenner, PhD, Distinguished Research Professor at the Salk Institute for Biological Studies. The three scientists were recognized for their groundbreaking work with *Caenorhabditis elegans*, a 1-millimeter-long roundworm, in the mid-1970s.

**Sanes receives prestigious honor**

**Joshua R. Sanes, PhD**, Alumni Endowed Professor of Neurobiology, has been elected to the National Academy of Sciences, one of the highest honors that can be bestowed on an American scientist or engineer. Sanes is one of 72 new members chosen earlier this year, bringing the total number of active members to 1,907.

The National Academy of Sciences (NAS) is a private organization dedicated to advancing science and its use for the general welfare. New members are chosen in recognition of their distinguished and continuing achievements in original research.

Sanes is known for his work on the development of the nervous system. His research investigates the molecular mechanisms that lead nerve cells, or neurons, to establish multiple connections, or synapses, with other neurons and muscle cells.

**Strunk becomes Strominger Professor**

**Childhood asthma expert** Robert C. Strunk, MD, has been named the Donald Strominger Professor in Pediatrics. The professorship was established in 1997 to honor the memory of Donald B. Strominger, MD, professor of clinical pediatrics, who died in 1983 at age 54.

Strunk, a 1953 School of Medicine graduate, gained nationwide prominence for his work with cystic fibrosis patients and his activities in the National Cystic Fibrosis Association.

Strunk has worked to discover which children are at high risk of dying from asthma. He also studies long-term outcomes of childhood asthma, community approaches to improving asthma care in economically disadvantaged children, and emergency department interventions to promote routine pediatric care for asthma.

Since 1992, Strunk has directed the St. Louis site of the Childhood Asthma Management Program. He also is the St. Louis site director of the Pediatric Asthma Clinical Research Network, a National Institutes of Health consortium, as well as the founder and director of the Community Asthma Program, a joint effort of the School of Medicine and BJC HealthCare.
PULMONARY RESEARCH

Helium Imaging Detects Emphysema Changes

Changes caused by emphysema, even in the smallest airways of the lung, can now be shown using an experimental imaging technique, say School of Medicine researchers. The technique, known as helium-3 diffusion magnetic resonance imaging (3He diffusion MRI), is more sensitive than computed tomography (CT) or any other imaging method currently available for examining the lung.

The findings were published in the Proceedings of the National Academy of Sciences. The lead author is Dmitriy A. Yablonskiy, PhD, professor of physics and assistant professor of radiology at the School of Medicine's Mallinckrodt Institute of Radiology.

"Our findings suggest this may be a new means for the early detection of emphysema by demonstrating the enlargement of the air spaces in the lung," says Stephen S. Lefrak, MD, professor of medicine and a co-author of the paper. "I suspect it also will help in understanding the development, evolution, progression and physiological effects of many lung diseases including emphysema, asthma and perhaps pulmonary fibrosis."

Joel D. Cooper, MD, Evarts A. Graham Professor of Surgery and head of the division of cardiothoracic surgery, adds: "This technique may well help us refine our selection criteria and better predict the outcome of emphysema patients undergoing lung-volume reduction surgery."

3He diffusion MRI uses a nonradioactive and highly magnetically polarized—hyperpolarized—form of helium gas. Hyperpolarizing the gas, done with lasers, makes the helium detectable by MRI.

To perform the technique, a patient in an MRI machine inhales the gas and holds his or her breath for 10 seconds. The resulting image shows how far the atoms of helium travel, or diffuse, within the lungs during a period of two thousandths of a second. The method reveals the distance traveled both along and across the airways.

These distances are recorded as colors ranging from red (the smallest distance traveled) to violet (the largest distance traveled). The experimental technique also indicates the physical diameter of the airways and the alveoli.

Colorful Lungs: 3He diffusion MRI evaluates thermal motion of helium atoms in the lungs of patients with pulmonary disease, giving physicians new insight into lung structure. This diffusivity along and perpendicular to airways is recorded as colors ranging from red (the smallest distance traveled) to violet (the largest distance traveled). The experimental technique also indicates the physical diameter of the airways and the alveoli.

Emphysema progressively destroys the walls of the alveoli, the smallest spaces of the lung and the area where the blood releases its load of carbon dioxide and takes up a fresh supply of oxygen, says David S. Gierada, MD, assistant professor of radiology. The disease results in a loss of lung elasticity and an enlargement of alveolar spaces. The larger space gives the helium atoms more room for movement.

"Diffusion in emphysemic lungs can be five to six times greater than in normal lungs because of the enlargement of the airways," says Yablonskiy. "That's why this technique is sensitive; it tells us the radius of the airways."

"It is a powerful method, telling us about lung structure on the 0.1 to 0.5-mm scale," adds Mark S. Conradi, PhD, professor of physics and another co-author of the paper.

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THE HEIRS OF MEN

DELICATE SURGERIES AND GENETIC DISCOVERY CAN INHIBIT A DEADLY INHERITANCE

BY CANDACE O'CONNOR
ABBIE CAMERON HAS BIG BLUE EYES, a mischievous grin, and the non-stop energy of any healthy two-year-old. What is not so evident is that she also has an abnormal gene, inherited from her father, Andy, that produces a disorder called Multiple Endocrine Neoplasia Type 2A (MEN 2A). That means she faces a 100 percent chance of someday developing medullary thyroid carcinoma (MTC), a rare but aggressive disease that accounts for 10 percent of all thyroid cancers or 1,500 new cases in the United States each year.

Abbie Cameron and her father, Andy, are both genetically predisposed to medullary thyroid carcinoma (background, facing page).

At the opposite end of the disease spectrum from Abbie are MEN 2A patients with advanced MTC, which has spread to nearby lymph nodes and triggered elevated levels of calcitonin, a hormone secreted by thyroid tumors. Surgery is the only effective treatment for MTC, yet many of these advanced patients have undergone multiple surgeries and their calcitonin levels still have not decreased—which means the disease is not yet under control.

From across the United States and as far away as Saudi Arabia, patients at all stages of disease converge on the Alvin J. Siteman Cancer Center at Washington University School of Medicine and Barnes-Jewish Hospital to consult its endocrine cancer program,
Thyroidectomy: 20 grams of prevention
Surgery forestalls Medullary Thyroid Carcinoma (MTC)
Although it produces one of the endocrine system's important regulatory hormones, removing the thyroid will inhibit later development of cancer in MEN 2A patients; the gland's necessary work is then performed through a lifetime of medication.

A feared complication of thyroidectomy is damage to the nearby and delicate recurrent laryngeal nerve—a patient's voice could be permanently impaired. A lateral or "back-door" approach, pioneered by Jeffrey F. Moley, MD, helps to identify the critical nerve (shown at left in blue) and keep it out of harm's way during thyroid re-operations.

Unchecked, MTC may spread to attack the lymphatic system, the brain and the bones.

Among patients newly diagnosed with MTC, says Moley, the cure rate after surgery is between 50 and 60 percent. Even in advanced cases, he has achieved a remarkable 25 percent biochemical cure rate among patients who undergo re-operation before the cancer has spread to distant sites, such as the lungs or liver. There is a special thrill, he says, in performing preventative thyroid removal in children, known to be carrying the gene for MTC, before cancer can develop. Abbie Cameron, for example, will likely undergo a thyroidectomy when she is five years old.

"It is very satisfying to treat these young patients," says Moley, professor of surgery, chief of endocrine and oncologic surgery and associate director of the Siteman Cancer Center. "Year after year, we watch them and test them, and they are still doing fine. You get to know them as people—and you get to see them grow up."

Within her family, Abbie has lots of genetic company. Her great-grandfather developed MTC, but thought he had the non-hereditary, "sporadic" version of the disease—until his son also developed it. So the next generation, Andy and his brother, were prepared; physicians in their hometown of Cincinnati closely monitored their levels of calcitonin, and at ages 11 and 13, they underwent successful back-to-back surgeries to remove their newly diseased thyroid glands.

Still, it was a surprise to find that Abbie had the MEN 2A gene, says Andy Cameron. He and his wife, Jessica, knew that she had a 50 percent chance of inheriting it. "But she was the first female in our family to have it, so we had never thought she would get it," he says.

The gene that Abbie inherited was identified in 1993 by a School of Medicine research group, headed by Samuel A. Wells, MD, former chairman of the Department of Surgery, who had been working toward...
this breakthrough for 25 years. Wells and his team, which included Moley and Paul J. Goodfellow, PhD, discovered that small but critical abnormalities in a gene called "RET" are associated with MEN 2 syndromes. In 1994, they developed a genetic test for MEN 2A and began performing preventative thyroid removals in young patients at risk for the disease—the first instance of a genetic test leading to surgery intended to prevent cancer.

In small children with MEN 2A—or even infants when the case involves MEN 2B, another syndrome in the MEN family—surgery requires meticulous technique. The adult thyroid gland, located in the lower part of the neck just above the windpipe, has two lobes the size of walnuts; its four neighboring parathyroid glands are no bigger than grains of rice. In children, all these glands are almost unimaginably small.

"And in kids, the pressure is greater than when your patient is someone with an established tumor," says Moley. "It is especially important that the operation be done perfectly, because the patient does not yet have cancer. For the surgery to be worthwhile, there can't be any complications."

But there are also special pressures when the patient needs a re-operation, he says. One challenge is preserving the blood supply to the parathyroids or, if necessary, transplanting them in pieces to muscle pockets of the neck or forearm. Another is the painstakingly delicate business of removing affected lymph nodes—an essential step in returning calcitonin levels to normal and ensuring the best hope of a cure.

A third is guarding against damage to the recurrent laryngeal nerve, which controls vocal cord function. Once injured, nerve repair has limited success; the patient is left with vocal cord paralysis and permanent hoarseness. Yet the nerve is only the size of a thread and, in patients who have already undergone surgery, may be encased in scar tissue and very hard to find.

Moley has perfected his own, "back-door" approach to solving this problem. He approaches the nerve from behind and at an angle, locating it far down in the neck and tracing its route upward while clearing away muscle and other surrounding tissue. By isolating it in this way, he can avoid it while he proceeds with the rest of the surgery.

Moley's interest in hereditary cancers developed during his residency at Yale, when he found a large colon tumor in a young man who mentioned that others in his family had also experienced this form of cancer. "It turned out that they had an inherited colon cancer syndrome and didn't know it. There was a 50 percent incidence in each generation," says Moley, who was recruited by Wells to come to St. Louis in 1988.

Today, his endocrine group—which also includes L. Michael Brunt, MD, Terry C. Lairmore, MD, and new member, Bruce L. Hall, PhD, MD—handles a variety of endocrine cases, along with general surgical oncology. Another key team member is Mary DeBenedetti, RN, MEN coordinator, who keeps in touch with some 5,000 MTC patients worldwide, many of whom have received treatment at Washington University Medical Center.
One of those patients is Andy Cameron, now 30, who has been coming to the Medical Center since his move to St. Louis six years ago. Like half of those with MEN 2A, he needed to have one adrenal gland removed due to early-stage tumor growth; soon he will face removal of the other. Both surgeries, performed at Siteman, are being done laparoscopically—a far easier operation for the patient, but tricky for the surgeon.

Through their research, Moley and colleagues at the School of Medicine are working to better understand the MEN syndromes. Moley recently has embarked on a clinical protocol in which advanced MTC patients with distant metastases receive a new tyrosine kinase inhibitor. With a National Institutes of Health grant, he and his wife, Kelle H. Moley, MD, are trying to identify novel glucose transporters in cancer, especially MTC, with the goal of developing new therapies. And Moley's endocrine group is collaborating with Jeffrey D. Milbrandt, MD, PhD, professor of pathology and immunology and of medicine, who wants to trace the downstream signal pathways of RET and other genes expressed in these thyroid cancers.

On the clinical side, the work of Moley and his colleagues has already been very successful. In parathyroid transplantation, their success rate is close to 100 percent; they have had no recurrent laryngeal nerve injuries in adults or children. And they have had no deaths during surgery, nor have they needed to give any patient a blood transfusion.

Pictures from grateful patients are bundled in Moley's desk drawer. One shows a smiling young man, posing with his wife and four small children, the youngest of whom are twins. The father had surgery in 1993, including lymph node removal, but his calcitonin levels were still high; after a second operation, they decreased to normal and have remained there ever since. Today, says Moley, "he is doing just great."

Early diagnosis is the key, Moley adds, combined with aggressive treatment and strong follow-up. Since one in four cases of MTC result from hereditary syndromes, it is crucial for families to undergo genetic testing, as the Cameron family did through Siteman's Hereditary Cancer Core. Andy Cameron's DNA sample will serve a dual purpose: It also will be used to test his brother's son, now one year old, to determine whether he has inherited MEN 2A.

If a family is affected, they should "look on the bright side," says Andy Cameron. "It could be much worse. You just get the tumor out, go back for checkups, and take a pill for the rest of your life. Other than that, no one can tell you have it."
Rooms to Grow In

Their parents keep the Medical Center running while these kids giggle and grow in the action-packed learning environment at St. Louis Children's Hospital Child Development Center

BY DAVID LINZEE
"Kids learn best when they're active," says Rose Rudert, "involved in fun and meaningful activities."

Rudert, who has worked at the center for 20 years, directs one of two day care facilities on the Medical Center campus. She has a special connection to the center—her daughter Blair, now 17, attended the day care center as a preschooler. At the time, Rudert was teaching kindergarten at the center. But her daughter's attitude was, "This is my school—what are you doing here?"

It's natural for children to feel the center belongs to them, says Rudert, because they are allowed to take the lead in planning their activities.

Often, the children will choose a theme to investigate, and their teacher will devise activities based on it. Teacher Bonnie Jernigan recalls a day on the playground, when one child traced another's shadow with chalk. "That led to a week of activities with light and shadow, the sun and the moon."

Some themes are perennial favorites: dinosaurs, the body, outer space, the rainforest, pets. When Sue Healey's class of 3- and 4-year-olds focused on that last theme, the children drew their pets and told stories about them while Healey took dictation. Being the children of parents in the health care profession, they naturally set up a "vet's office."

More than just a fun way to learn about pets, these activities lay a foundation for later success, says Rudert, Pets occupied Healey's class for a month, but other themes might last only a few days or hours. When the children begin to lose interest, the teacher changes the subject.

"It's the great skill of the day care worker to gauge the mood of the room," says teacher Marcia Reed. She has 22 years of experience doing just that and currently works with infants and toddlers.

One of Reed's favorite activities is reading. "I love to read, even to the smallest children," she says. Even toddlers take in a lot, says Reed; they bring her their favorite books and are eager for her to get to the "best" parts. She remembers with a smile seeing one 18-month old "reading" to a classmate: holding the book upside down, turning the pages backward and babbling.

In addition to a well-stocked library, a variety of art supplies is always available, as are games and educational activities, a fun environment and opportunities for social development are hallmarks of the St. Louis Children's Hospital Child Development Center (right).
blocks, and each classroom contains a computer.

"The goal of the teachers is to present information in various ways," Rudert explains. "One child might have a verbal bent, another an artistic one, while a third might take naturally to numbers. Our teachers strive to identify and work with any of these learning styles."

But that doesn't mean playing exclusively to a child's strong side. If a boy draws all the time, for instance, a teacher will ask him to tell her about the picture, inviting him to say what is going on in his mind while he draws.

Teachers try to reach the whole child through all of his or her strengths, Rudert explains. That way, when children move up to kindergarten, "They go with the sense that learning is fun and the confidence that comes from having learned things already."

The center's other location is run by Traci Napier, who praises her dedicated staff.

"We work very hard to provide developmentally appropriate activities and to take care of people's kids while they're at work," she says.

Keeping parents informed and involved is a top priority. Notice boards in the corridors inform parents about activities and events. Children take home a slip each evening noting what they ate, how long they napped and what they did.

Favorite art projects go in a binder that is taken home at the end of the year, providing parents with an overview of their child's development.

The center also publishes a newsletter, in which Rudert, who has a master's degree in early childhood development, writes about topics parents have suggested, such as discipline, sibling rivalry or travel with children.

Parents' and grandparents' days are regular entries on the school calendar, as is the annual picnic. The popular event is held on a summer evening, for the convenience of parents whose schedules don't allow them to attend activities held during the day.

"The staff wants you to be involved, but they understand you have to work," says Kim Donermeyer, coordinator of alumni and constituent relations at the School of Medicine and mother of two.

Joanne Nelson, a programmer analyst in the Genome Sequencing Center, also has two children at the center. She especially appreciates the room set aside for nursing mothers.

"It was great that I could spend time with my baby," she recalls. "It sure beat filling bottles."

Donermeyer learned that the center could handle an emergency when her daughter, dehydrated after a bout of the flu, had a seizure. The staff called Donermeyer, and she arrived within minutes to find the situation under control. "The staff had called the ambulance and knew what to do for her until it arrived. The other children had been moved into another room and a teacher was explaining what had happened and keeping them calm. In a scary situation, the staff performed very well. And they called later to make sure she was all right."

The incident did not change the way her daughter feels about the center, Donermeyer says. "She loves it. Often, when I go to pick up Erica, she says, 'You're here so soon! Can I play a little longer?' If you need day care for your child, that's the kind of place you want."

outlook.wustl.edu
More about Children's Hospital Child Development Center
Technology and training are helping renal patients take back their lives as a complex, expensive medical procedure comes home.

By Betsy Rogers

The dialyzer is the blood filter that replicates kidney function in both clinical and in-home dialysis machines.

Within the home of Krista Havlin are all the comforts and some: a renal dialysis machine, above, with supply lines running to a water purification system in the basement, right. Shown at left is a kit of supplies used during each nightly procedure.
HEY WERE STRIKINGLY DIFFERENT
from typical end-stage kidney disease patients who go to
dialysis centers three times a week to have their blood
removed, cleansed and returned to their bodies. "These
people were remarkably healthy for people on dialysis. They looked
normal, they felt good, they were involved with their families, they
could do what they wanted."

That was the impression of Brent W. Miller, MD, upon first
meeting nocturnal dialysis patients in Toronto in October 2000.
Miller knew immediately that he wanted to offer this new procedure
and its dramatic benefits to his own renal patients at Washington
University Medical Center.

Miller, an assistant professor of medicine, had gone to Toronto
to meet nocturnal dialysis pioneer Andreas Pierratos, MD, who intro­
duced Miller to eight of his patients. He was stunned by their robust
health. "I came away from that meeting thinking, 'I don't know how
we're going to do this, but we need to move forward,'" Miller recalls.

For people with healthy kidneys, cleansing of the blood is
a continuous process; toxins don't build up to dangerous
levels. Dialysis patients have malfunctioning or non­
functioning kidneys and, even with dialysis three times
a week, toxins have an opportunity to accumulate in
the blood between treatments and cause a variety of
damaging effects from high blood pressure to fatigue
to reduced cognitive function.

Nocturnal, or in-home, dialysis revolutionizes the
process. Patients prepare for the procedure at bedtime
and dialysis occurs overnight while they sleep, using the
same equipment found in dialysis centers. And because
it's done more frequently, the cleansing is more thorough,
eliminating between-treatment "peaks and valleys."
Renal Dialysis: Night and Day

Kidneys filter the bloodstream 24/7, maintaining optimal levels of fluids and regulating chemical balance. For decades, “artificial kidneys,” or hemodialysis machines, have made life possible for kidney disease patients, but a patient’s health ebbs and flows with each treatment. In-home nocturnal dialysis provides greater benefits at lower cost; still, not all patients can assume its many responsibilities.

**FREQUENCY** Three times weekly.

**FACILITY** The Barnes-Jewish Hospital Dialysis Center serves 32 patients at a time in a large room banked with dialysis machines.

**PROCEDURE** Patient travels to clinic, medical personnel attach lines to a blood access port, then monitor progress. During the three- to four-hour procedure patients may read, watch TV or sleep.

**HEALTH EFFECTS** The thrice-weekly regimen—first established in the 1960s—is far from ideal in that it puts kidney patients’ health on a roller coaster. Prior to treatment, the toxin and fluid buildup causes patients to feel increasingly fatigued, bloated, itchy and short of breath; immediately following, the patient’s body struggles to readjust to the sudden change. Homeostasis—an ongoing feeling of wellness—is never achieved.

**SOCIAL ASPECTS** Patients structure their lives around the endless cycle of clinical treatments. A sense of community develops among patients who spend hours at a time together in the clinic, and the medical personnel provide not only physical treatment but emotional support.

**EXPENSE** $70,000 annually per patient.

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**FREQUENCY** Six to seven nights per week.

**EQUIPMENT** Dialysis machine in patient’s bedroom; lines run to water purifier in basement. Setup kits include tubing, hookups, the dialyzer filter and saline.

**PROCEDURE** Patient initiates sterile hookup procedure which takes about 1/2 hour. The machine quietly works overnight while they sleep, or a patient may move as far as the lines allow, read or watch TV. It takes another 1/2 hour in the morning to disconnect.

**HEALTH EFFECTS** With ongoing nocturnal treatment, the body most nearly approaches its normal, healthy balance of fluids and chemicals. Still, the patient experiences some physical and mental changes as the blood toxins accumulate prior to bedtime.

**SOCIAL ASPECTS** The in-home patient still receives regular medical care, including monthly tests and quarterly in-home visits. Social workers monitor each case closely to help ensure a healthy outcome.

**EXPENSE** $60,000 annually per patient.
Indeed, results show that nocturnal dialysis cleans the blood virtually as well as normally functioning kidneys. “It’s very close to having normal kidneys,” says Pam Lurkins, one of Miller’s patients, who has been performing the procedure at home since September 2001.

Lurkins had been on dialysis for 25 years when Miller suggested trying nocturnal treatments. She had undergone two unsuccessful transplants in 1976 and 1977 and had tried every available form of dialysis. Though she admits she was skeptical when Miller first approached her, she’s a believer now.

“I feel so much better,” she says. “I can eat whatever I want. My blood work is fabulous. I’m off all dialysis medications, and I have more energy.”

She also has more free time. A resident of Pocahontas, IL, Lurkins had to spend two hours on the road, in addition to three-plus hours at the dialysis center each time she had a traditional dialysis treatment.

Additionally, many in-center dialysis patients experience vomiting, agonizing cramps and other symptoms while on the machines. At best, the procedure leaves patients feeling drained and weary. They typically need to allot an entire day for a treatment and its aftermath.

And because the procedure is so hard on the system, the typical patient has more doctor’s appointments, more hospitalizations, and more need for medication. For all these reasons, very few in-center dialysis patients are able to work full time.

Nocturnal dialysis patients, on the other hand, show dramatic improvement in these quality-of-life issues as well as in their health. Just ask Krista Havlin, a dialysis patient who holds a demanding assistant nurse manager position at the university’s General Clinical Research Center (GCRC).

It was Havlin’s unique combination of nursing education, research involvement and kidney disease that made her the ideal first candidate for the nocturnal dialysis program here. She has had two kidney transplants, one from her brother and one from her mother. Both failed. Because transplants sensitize a patient, prompting the development of antibodies against foreign tissue and making future transplants problematic, Havlin will not be a good candidate for another transplant for many years to come. She was looking ahead to a long period of in-center dialysis.

As her second kidney began to fail in 1999, Havlin went to the Internet, where she discovered nocturnal dialysis in articles from Europe. She took the idea to Miller, her new doctor. “He was awesome,” she says. “I’ve never met anyone who is such a patient advocate and someone who was truly looking for the best treatment for the patient.”

For his part, Miller gives much of the credit for the new program to Havlin. “She’s very spunky,” Miller says. “She kept pushing for things to be done. That’s what you want in a first patient to try a new procedure.”

Havlin began nocturnal dialysis training in January 2001. Two months later, she took the procedure home.

Visits to the Barnes-Jewish Hospital Dialysis Center are a way of life for many St. Louis renal patients.

Havlin trained with Lisa Koester, a nurse practitioner with experience in both acute and chronic dialysis and another key player in the program’s development.

Developing the program has been truly a team effort, according to Koester, involving social workers who make home visits and conduct psychological screening assessments and the technical support staff who keep the machinery humming and help to train patients.

The training is critical. Home dialysis requires medical knowledge, an understanding of the equipment, a commitment to complying fully with the procedure, and a real measure of courage.
Candidates for nocturnal dialysis undergo four to six weeks training. They learn to set up the machine, to tape down the tubing securely to prevent disconnection during sleep, to understand the fail-safe devices and respond to warnings, to break down and clean the equipment in the morning, and to draw their own blood. For the final week of training, patients spend each night at the CCRC performing dialysis themselves under Koester’s watchful eye.

“I would never send anyone home unless I knew that they were completely safe,” Koester says.

The benefits are well worth the effort. In nocturnal dialysis patients, Koester a night-and-day transformation. “It gives patients so much autonomy—they regain control over their lives.” Miller believes that perhaps as many as half of all dialysis patients ultimately will choose the new procedure. Those who don’t will have a variety of reasons: They might be intimidated by the equipment, or concerned about undergoing dialysis without supervision. A few might be unable to master the procedure.

But within 20 years, with the development of advanced equipment and better software, Miller expects 50 percent of end-stage kidney disease patients to be using nocturnal dialysis at home. Havlin agrees; she expects Washington University to become a major center for nocturnal dialysis in the region.

Currently, four of Miller’s patients are on nocturnal dialysis. He hopes to add 10 more in the coming year, perhaps 40 to 50 more in the year after that. Does he believe this procedure will replace transplants? Miller, a transplant physician himself, won’t go that far. “The nocturnal dialysis patients I have,” he explains, “are all sensitized—they’ve all had transplants. They want to stay as healthy as possible until transplant techniques are better.” Still, he notes that only 30 percent of all dialysis patients ever get referred for transplant, and of those, only a third actually receive new kidneys.

For her part, Havlin is so enthusiastic about nocturnal dialysis that she doesn’t rule out substituting the procedure for another transplant. “This would not be a horrible thing to do for the rest of my life,” she observes.

Are there disadvantages? “I have two concerns,” Miller acknowledges. “First, any procedure involves risks, so when you go from three times a week to six you’ve doubled the risks. Second, we don’t really know why dialysis works. We don’t know which toxins are critical. So we wonder, ‘Are we taking off good substances?’”

But his patients see only the benefits of nocturnal dialysis. Krista Havlin sums it up: “There really isn’t much of a downside.”

Funding the “overnight” revolution in renal care

Nocturnal dialysis, which now serves only about 300 patients worldwide, will expand dramatically in the United States when Medicare agrees to pay for it, according to Brent W. Miller, MD.

Private insurance companies have already figured out that overall costs for nocturnal dialysis are lower than those for in-center treatment. The “upfront” costs are higher, because patients receive six treatments instead of three. Private insurers, though, have taken a broader view to include all related medical costs—doctor’s visits, hospitalizations and medication—in the total annual expense. Studies show that in-center dialysis costs $70,000 a year; nocturnal dialysis costs about $10,000 less. Blue Cross and Aetna willingly pay for it.

But fully 6 percent of Medicare’s budget funds dialysis, and in an effort to control these huge expenditures, Medicare has limited treatments to three times a week. However, two bills in Congress, S1301 and HR1759, would end these restrictions and fund the new procedure.

It can’t happen soon enough for end-stage kidney patients.

“It really is important that this be an option for people,” says patient Krista Havlin. “It’s basic common sense. We should be embracing nocturnal dialysis instead of arguing about it.”
It’s ooey, gooey, good:
Most American kids grow up enjoying tasty, nutritious peanut butter.
A malnutrition research initiative uses this inexpensive food to get Malawian children to their next birthday.

BY DIANE DUKE WILLIAMS

THE PEANUT BUTTER PROJECT
The outcome for starving children was dismal when Mark J. Manary, MD, began studying malnutrition in Malawi, Africa. The most severely malnourished were treated with milk diets at inpatient feeding centers. Back at home, they resumed eating the traditional diet—corn dough boiled over an open fire and mixed with beans or green vegetables. Only a fourth of these children recovered fully.

"This is happening all over sub-Saharan Africa and other poor places in the world, and no one really follows up with these kids," says Manary, an associate professor of pediatrics in the division of emergency medicine.

Manary and his fellow health care workers in Malawi agreed: Simply reviving children at the feeding centers and then sending them home wasn't enough. They determined that a more nutritious food should be sent home with these young patients to improve their chances of survival.

Manary consulted a French nutritionist working with the international group, Doctors Without Borders, who was developing recipes involving peanut butter. In January 2001, Manary started the yearlong Peanut Butter Project at Queen Elizabeth Central Hospital, Malawi's largest health care facility.

Children treated for malnutrition in the Peanut Butter Project were discharged with packets of a peanut butter mixture to eat three times a day for the following five weeks. The conveniently packaged mixture included peanut butter, vitamins, minerals, sugar and vegetable oil.

Milika, a child who weighed only 11 pounds at 18 months of age, was one of the children who motivated Manary to try this different approach. After six weeks of eating the peanut butter mixture, she had made tremendous health progress, doubling her weight.

"When children like Milika start the program, they look like very small, ill babies that you have a hard time being hopeful about," says Manary. After treatment, Milika began to walk and play like other healthy children.

Ninety-three percent of the Malawian children who received the peanut butter mixture recovered fully, reaching 100 percent of their weight for height.

Manary was pleasantly surprised with the study's results. "I thought the recovery rate would definitely be
better than 25 percent," he says, "but when it was 93 percent, I thought, 'This is really quite impressive.'"

Six months later, children who were fed the peanut butter mixture continued to develop normally, indicating the special food is only necessary when children are critically ill.

Alan L. Schwartz, PhD, MD, the Harriet B. Speicher Professor and head of the Department of Pediatrics, says Manary's studies are changing the way people think about childhood nutrition.

"Mark's work has the potential to better the lives of thousands of children in the developing world," says Schwartz.

**Working together as doctor and nurse** at a rural hospital in Tanzania, Manary and his wife, Mardi, first visited Africa in 1985. Additional short work stints in Africa followed over the next few years. In 1994, Manary spent a year in a faculty exchange program at the University of Malawi's College of Medicine. It was then that he became interested in the problem of severe malnutrition.

Using dietary therapies such as adding large amounts of potassium to children's diets, Manary and his staff decreased the case fatality rate from 40 to 10 percent in local children.

When he returned to the School of Medicine—having developed significant research interests and ties to colleagues in Malawi—Manary knew he wanted to return to the country for a part of each year. He now travels to Malawi several times a year, staying for a few weeks. Mardi and the couple's two children, Megan, 14, and Micah, 12, often accompany him.

The majority of Malawians make their livings by farming, usually on a couple of acres. Extended families live together in homemade mud and thatch buildings, grow their own food, and spend time each day searching for firewood and collecting water. Electricity and modern transportation are not a part of their lives; most people have never ventured more than 30 miles from home.

Most children in Malawi don't become malnourished until they are between 18 and 30 months old—the time frame in which breastfeeding stops, says Manary. Because food is scarce, most families eat just once or twice a day, gathering around a pot and grabbing pieces of a corn dough mixture. "So a two-year-old who just stopped breastfeeding a month ago may be right next to his 26-year-old uncle and his eight-year-old brother," says Manary. "Physically, the child can't compete."

Ill children are taken to one of the country's 100 inpatient feeding centers, established solely for the treatment of starving children. Those designated as severely malnourished are referred to Queen Elizabeth Central Hospital, home of Manary's Peanut Butter Project.

Operating in a sparsely furnished clinic room in the hospital's outpatient section, Manary and his family, two nurses and a faculty member from the hospital enrolled about 500 children in the project.

The mothers of the children who received the peanut butter mixture were surprised at the results. After the standard treatment for malnutrition, children typically survive and return home but show no growth. Those who received the peanut butter mixture did much better.

"In addition to surviving, they were thriving," says Manary. "We got some big smiles out of moms."

Once they determined the treatment was working, Manary and his staff began to produce the peanut butter mixture themselves (peanuts are grown locally) using a large mixer in a corner of the clinic room.

Manary now plans to conduct studies similar to the Peanut Butter Project in district, rural and mission hospitals throughout Africa. He has the backing of two international groups—the World Health Organization and the U.S. Agency for International Development—both of which have contacted him about continuing and expanding the Peanut Butter Project.

Manary believes his studies may change the way children in the developing world are fed, possibly in as little as five years.

"Our goal is to make this type of treatment available to everyone who's interested," he says. "If we can do that, it will mean that I've done my job successfully."
IT'S A MATCH! The annual Match Day ceremony was held on March 21, 2002, and 96 of the 109 graduating medical students took part in the National Resident Matching Program (NRMP).

Each year on Match Day, senior medical students in the United States learn which residency programs they will enter. School of Medicine graduates are highly successful in obtaining competitive residency training programs. In 2002, 33 percent of the graduating class selected a primary care field (pediatrics, internal medicine, family practice) for residency training; 14 percent successfully matched into highly competitive surgical subspecialty training positions (orthopaedic surgery, otolaryngology, plastic surgery, neurosurgery).

Rosalie Truong, MD/PhD '02, reads her results with a smile while husband James McCarter, MD/PhD '99, and baby look on.
Outlook Summer 2002

2002 MDs Attuq Küymen and Eva Hurst

Top: John Alan Marrini, Pediatrician, Henry Ford Hospital Program, Detroit

Bottom: Amye Julieta Tenarwiek, Tanya Marya Wildes, Obstetrics-Gynecology, Wayne State University/Detroit Medical Center

2002 Residents

Detroit
Henry Ford Hospital Program
Internal Medicine/ Emergency Medicine
John Alan Marrini

Wayne State University/Detroit Medical Center
General Surgery
Kacy Alvarez Phillips

Rochester
Mayo Graduate School of Medicine
Internal Medicine
Edward Christian Miner

Boston
Beth Israel-Deaconess Medical Center
Internal Medicine
Laura Hyes Zemany

Boston University Medical Center
Internal Medicine-Primary
Tien-Han Cynthia Chi

Children's Hospital Pediatrics
Thalia Andrea Farazi
Michael Ching-sun Wei

Harvard/Massachusetts Eye and Ear Infirmary Otolaryngology
Aaron Chengrung Lin

Massachusetts General Hospital Anesthesiology
Robin Kelly Guilly

Ann Arbor
University of Michigan Hospitals Dermatology
Abena Obenewa Ofori

Diagnostic Radiology
Felix Yichung Peng

Radiation Oncology
Mary Van-Sian Lin

Columbia
University Hospital
Orthopedic Surgery
Roberto Augusto Miki

St. Louis
Barnes-Jewish Hospital
Neurosurgery
Kristina Marie Ryan

Troy Shepard Wildes

Dermatology
Paul Alan Kekorka
Alison Sue Klein
Margaret Wing Yan Mann

Diagnostic Radiology
Joseph Patrick Einijer
Phoebe Elizabeth Freer
Shao-Pow Lin
Michael Ted Smith
Heather Leonora Valhonom

Internal Medicine
Robert Morris Blanton Jr.
Shan Li Cheng
Tammy Peshkin Cheng
Charles Andrew Harris
Jeffrey Parker Henderson
Christina Hood Skale
Raghav Ram Tadikamalla

Washington University School of Medicine
Neurological Surgery
Francis Joseph Claran
James Michael Johnson Jr.

Neurology
Michelle Anne Burack

Ophthalmology
Gurunadh Arumaran
Vemulakonda

Jennifer Tong-young Yu

Otolaryngology
Mueed Ahmad
Margaret Allison Ogden

Plastic Surgery
Marissa Morningstar
Jaggers

Urological Surgery
Alan William Shindel

Springfield
Com. Medical Center
Family Practice
Sid Ping Low
Generosity of Spirit

Holden trust provides for future endowed professorship

The Raymond F. and Gertrude K. Holden Professorship in the Department of Medicine represents the gift of a couple whose association with Washington University and the Medical Center goes back more than 70 years.

Raymond Holden received his medical degree in 1933 and was a clinical instructor from 1941 to 1956, as well as serving on the staff at Barnes Hospital. His wife, Gertrude, who died in 2001, received her bachelor's degree from the School of Nursing in 1930. She then served as head nurse at Barnes Hospital and the Washington University Eye Clinic.

"Happy memories of my student days are my chief motivation for giving to the medical school," Raymond Holden says. In their later years, the Holdens were unfailingly generous. Both belonged to the Robert S. Brookings Partners and Raymond Holden was a member of the William Greenleaf Eliot Society. In 1994, the Holden Challenge matched gifts to the School of Medicine Annual Fund $2-for-$1. The challenge was a notable success; the couple's generosity encouraged many alumni to participate for the first time or at a higher level.

Raymond Holden was born in 1910 in St. Louis. He attended Central College, now Central Methodist College, in Fayette, Missouri, where he studied chemistry and was a keen sportsman. His father's interest in medicine and in Washington University guided him to enter the medical school.

"Returning to the Medical Center in recent years, I am struck by the changes—in particular, by the growth in the physical plant. But other things, like the teacher-student relationship, have remained nearly the same," Holden says. His best memories of his student days have to do with his relationships with distinguished faculty members, notably Carl Cori, Joseph Erlanger and Edward West. Holden recounts that he didn't make a favorable impression on every faculty member. He ruefully recalls an incident in 1932. When he and another student went to a rooftop pen to give the laboratory animals their evening feeding, a rhesus monkey escaped. They searched until darkness fell, without success. The monkey reappeared next morning, popping out of a ventilator duct in a lecture hall and interrupting a particularly imposing professor.

Gertrude K. and Raymond F. Holden
UPON GRADUATION, Holden went on to an internship at Barnes Hospital. It was there that he met his wife-to-be, who was head nurse on a men's ward. Gertrude Kies Holden, a native of Jackson, Missouri, had gone into nursing because of her admiration for a favorite aunt who was a nurse. She attended Southeast Missouri State College for two years before entering Washington University. A great-uncle, Ernest F. Tiedemann, MD, was a professor of pathology and bacteriology at the School of Medicine.

During World War II, Raymond Holden served in the United States Army Air Force. He was a flight surgeon whose duties were medical supervision of active pilots. He was stationed in Nebraska, Georgia and Washington DC, and rose to the rank of Lieutenant Colonel. “I recommend that young physicians starting out carefully consider a career in government service — particularly the military,” Holden says, adding, with tongue in cheek, “in addition to travel opportunities, this can provide real insight into socialized medicine — as it has been practiced in this country for 200 years.”

During the war years, Mrs. Holden was on the homefront with three young children — literally keeping the homes fires burning as she shovelled coal into the furnace of their large two-story home.

Dr. Holden’s war work gave him an interest in industrial medicine and particularly in disorders characteristic of people in aviation. His main research interest was hearing loss caused by jet engine noise, about which he published several papers. After the war, he returned to St. Louis and became medical director of the Mallinckrodt Chemical Works. In 1956, this led to a position with Boeing, which caused the Holdens to move to Wichita KS.

The family decided to stay in Wichita after Holden left Boeing to go into private practice as an internist. He was associated with the Wesley Medical Center and the Veterans Administration Regional Medical Center. A member of the American Geriatrics Society, he found caring for the elderly to be the most interesting challenge. Believing that the practice of medicine has become overspecialized, he advises young physicians to keep their horizons wide. The lesson he learned in medical school that he found most valuable in his later career was that a physician needs to be a good listener. Gracious, modest and unhurried, Holden often strikes his juniors as the very image of an “old-fashioned doctor.”

AFTER LEAVING NURSING to raise her family, Gertrude Holden was active in her church and as a volunteer with a special interest in projects for the blind. She served as a school nurse and later assisted Dr. Holden occasionally in his medical office.

The couple have three children, Philip, a retired teacher and beekeeper who lives in Bellevue, Michigan; Rebecca, an office manager in Wichita; and Raymond III, a loan officer at a financial institution in Independence, Missouri. They have six grandchildren, one of whom is a second-year surgical resident at Cornell University Medical Center in New York.

In retirement, the Holdens indulged a shared love of travel, visiting Scotland, Mexico, the Bahamas, Venezuela and Canada, as well as taking frequent trips throughout the Midwest. Raymond Holden was devoted to fishing, even though it caused him a good deal of frustration. One of his favorite streams was the White River in the Missouri Ozarks. Holden has many happy memories of Missouri rivers, going back to float trips with medical school friends and colleagues.

“The ongoing opportunity for students to interact with world-class teachers and investigators is what has made me proudest to be an alumnus of the School of Medicine,” he says. “I hope that the future chair of the School of Medicine,” he says. “I hope that the future chair of the School of Medicine, Gertrude and I have provided for will help another distinguished teacher.”
MEMORIES, LAUGHTER AND CELEBRATION were the order of the day at the School of Medicine's Reunion on May 16, 17 and 18, 2002. Medical alumni ranging from the Class of 1992—honoring 10 years since graduation—to the Class of 1942—celebrating their 60th—traveled from near and far to tour the old haunts, catch up on each others' lives, and even earn some CME credit.

Special awards to eight alumni/faculty topped off the weekend's festivities. The camaraderie began with educational sessions by alumni, faculty and students, sailed on through starlit receptions and Medical Center tours, and didn't stop until the singing had faded and the dancing shoes came off.
Reunion participants Judith Thain and Jacob Leptich, MD '57, get a taste of the Eric P. Newman Education Center, the Medical Center's lecture and meeting facility.

The "Charcot Triad" of musically inclined medical students gently ribbed their professors with witty tunes in the 1950s. In a partial reprise, MD '52s Brent Parker, John Davidson and Sherman Schachter sing songs that stand the test of time.

Classmates Dale Hooper, MD '52, Doris Rowe, MD '52, and John Rowe, MD '52, were delighted at their class' great turnout.

MD '62s Christine Mackert and Nancy Newlin pick out familiar faces from their graduation photos. "What ever happened to this guy...?"

Reunion participants Judith Thain and Jacob Leptich, MD '57, get a taste of the Eric P. Newman Education Center, the Medical Center's lecture and meeting facility.

Michael Adams, MD '57, gets a signed copy of the new book about Evarts Graham from author C. Barber Mueller, MD '42.

Alan Shindel, MD '02, spoke on behalf of his class, the newest members of the alumni association.

"What's Poppin' on Campus?"
Solomon Kamson, MD '82, enjoys dinner with his wife, Diane, and daughter Marayo—one of the freshest faces at this year's reunion.

Brian Skop, MD '92, Anita Beck, MD, PhD '97, Michele Samin, MD '92, and Ingrid Skop, MD '92, compare the miles they trekked to reunion.

J. William Campbell, MD '77, and president of the Washington University Medical Center Alumni Association, admires the community service contributions of medical students Vivian Yu and Laurin Lester.

Dean William A. Peck, MD, talks with renowned poet John Stone, MD '62, at the Dean's Luncheon.

Jonathan Gitlin, MD, the Helene B. Roberson Professor of Pediatrics, guides alumni and guests through the inner workings of the McDonnell Pediatric Research Building.
WELL-EARNED HONORS

Alumni Achievement Awards

Ewald W. "Bud" Busse, MD '42, is Dean Emeritus of Medical and Allied Health Education at Duke University School of Medicine and Professor Emeritus of Psychiatry at Duke.

Robert D. Fry, MD '72, is Gerald Marks Professor of Colon and Rectal Surgery at Thomas Jefferson University's Jefferson Medical College in Philadelphia.

Charlotte D. Jacobs, MD '72, is the Drs. Ben and A. Jess Shenson Professor of Medicine at Stanford University School of Medicine.

Alumni/Faculty Awards

Marc R. Hammerman, MD '72, is Chromalloy Professor of Renal Diseases in Medicine and professor of cell biology and physiology at Washington University School of Medicine.

Clifford B. Saper, MD, PhD '77, currently serves as James Jackson Putnam Professor of Neurology and Neuroscience and chair of the Department of Neurology at Harvard Medical School and Beth Israel Deaconess Medical Center.

Distinguished Service Awards

William S. Coxe, MD, is professor emeritus of neurological surgery at Washington University School of Medicine.

James P. Keating, MD, HS '69, the W. McKim Marriott Professor of Pediatrics at Washington University School of Medicine, directs the Division of Diagnostic Medicine and the Pediatric Residency Program for the Department of Pediatrics.

Standing, from left, James P. Keating, MD, HS '69, William S. Coxe, MD, Allan E. Kolker, MD '57, Charlotte D. Jacobs, MD '72, Marc R. Hammerman, MD '72, Ewald W. "Bud" Busse, MD '42.

Seated, from left, Clifford B. Saper, MD, PhD '77, and Robert D. Fry, MD '72.

Gary Rachelefsky, MD '67 (right), looks over reunion materials while Frank Vinicor, MD '67, studies the latest student recruitment brochure. Thinking of re-enrolling, Frank?

Carly Gomez, MD, Charlie Roberts, MD, Susan Gudeman Laenger, MD, and Dietmar Laenger share stories at the Class of 1992 dinner.
Grinning for the camera are Christine Mackert, MD '62, Barbara Shaw Clark, MD '62, James Sweatt, MD '62, and Mary Lois Sweatt.

James Herz, MD, and Herman Blumenthal, MD, enjoy the elegant atmosphere at the Ritz-Carlton Hotel during the Class of 1942 dinner.

W. Edward Lansche, MD '52, enlivens the reunion banquet.

Pediatric posse: Marvin Cornblath, MD '47, Alan Schwartz, PhD, MD, and James Keating, MD, HS '69, live it up at reunion banquet.

Helen Nichols dances with Dale Hooper, MD '52, to the tunes of Code Blue—a popular Medical Center combo with a big band sound.

Charles Miller, MD '52, and Chas Miller, MD '72, (not related) and Chas' wife Pat enjoy St. Louis' beautiful night sky atop the Chase Park Plaza.
C. Barber Mueller, MD '42, professor emeritus of surgery on the McMaster University Faculty of Medicine in Hamilton, Ontario, Canada, has published a new book, *Evan A. Graham: The Life, Loves, and Times of the Surgical Spirit of St. Louis* (see box, page 34). Mueller carries the distinction of serving as Graham's last chief resident. He is a recipient of the Alumni Achievement Award from Washington University and has been awarded with an honorary degree from the State University of New York (SUNY).

James H. Foster, MD, HS '55, has authored *A Doctor's Shakespeare*, published in 2001 by Xlibris. It is a collection of 740 Shakespeare quotations of medical interest, which Foster annotated and illustrated. He is a retired general surgeon living in Avon CT.


Marjorie J. Tillman, DT '58, retired in 1993 and is living on her husband's home farm at Clinton MO, where she is active in civic affairs. Their daughter and family live in Key West FL; their son, who has a PhD in pharmacology, lives in Denver CO.

Bennett A. Shaywitz, MD '63, has been elected to the Institute of Medicine of the National Academy of Sciences. Shaywitz is professor of pediatrics and neurology and chief of pediatric neurology at Yale University School of Medicine, where he has been on the faculty since 1972. He and his wife, Sally Shaywitz, MD (she was elected to the Institute of Medicine in 1998) established and co-direct the National Institute of Child Health and Human Development-Yale Center for the Study of Learning and Attention. In the late 1980s, Shaywitz brought the new technology of functional magnetic resonance imaging (fMRI) to the study of children with dyslexia, and he currently leads a research group that is using this technology to investigate the neural basis of reading, dyslexia and attention deficit hyperactivity disorder. These ongoing studies have resulted in the first demonstration of sex differences in the functional organization of the brain for higher cognitive function.

James McCulley, MD '68, recently received the Distinguished Alumnus Award for 2001 from the Alumni Association of Texas Christian University. The award is designated for an alumnus whose career and endeavors have achieved prominence in his or her field. McCulley is chairman of ophthalmology at the University of Texas Southwestern Medical Center in Dallas.

Richard Trackler, MD, HS '68, has published his first novel, *The Roll-Call Vote*. Published by Pentland Press, Inc., it is a political suspense drama about the nomination of the first Hispanic woman to the United States Supreme Court, with plentiful elements of ambition, intrigue and passion. It won the runner-up award in the suspense category from the San Diego Book Awards Association in May 2002. Trackler, now retired, lives with his wife, Karen, in La Jolla CA. The Tracklers spent four years in St. Louis while he completed his radiology residency at the Mallinckrodt Institute of Radiology and his wife worked in Washington University's art and archaeology library. They then moved to California where he was a founding partner of San Diego Diagnostic Radiology Medical Group and, until his retirement, served for 22 years as volunteer medical director of the San Diego Mesa College Radiological Technology Program.

Wallace Mendelson, MD '69, professor of psychiatry, medicine and clinical pharmacology at the University of Chicago, has retired and is enjoying life with his wife, Miho, on Galveston Island TX, and wherever their boat takes them.

Fran Block, PT '71, continues her career in hippotherapy—"healing on horseback," providing physical therapy to the disabled community of children and adults with special needs. She has a daughter, Sarah, age six, and lives in Cotati CA.

Diane Merritt, MD, HS '80, and Katherine Uraneck, MD '84, are among the contributors to *This Side of Doctoring: Reflections From Women in Medicine*, edited by Eliza Lo Chin, MD, and published by Sage Publications. It is a collection of stories, poems and essays from 151 women ranging from pioneer women physicians to today's medical students who reflect on their personal and professional lives. Merritt, who is professor of obstetrics and gynecology at Washington University School of Medicine, contributed a poem, "Memories of Our Mother," written soon after her mother died from Alzheimer's disease. Urianeck has two essays in the book: "In Between Before and After," and "Job Description." After practicing emergency medicine for 16 years in Pennsylvania, New York and Vermont, Uraneck decided to devote full-time to what had been her avocation, and is now a freelance writer and producer of documentary films. She earned a master's degree from the Columbia University Graduate School of Journalism in New York City in May and says, "I think I have found my calling as a physician/journalist. Now all the cutting I do is on my own work."
David J. Baltzer, HA ’81, is the recipient of the New Mexico Hospitals and Health Systems Association’s 2001 Frank Gabriel Award. Baltzer and his wife, Jody, recently celebrated their 30th wedding anniversary. They live in Gallup NM.

Robert T. Brodell, MD, HS ’84, has been elected to serve as a director of the American Board of Dermatology for a three-year term beginning in 2003. Brodell is in dermatology private practice in Warren OH, where he is also director of Skin Pathology Services, Inc., an independent, certified dermatopathology lab. He is professor of internal medicine, clinical associate professor of dermatopathology in pathology; master teacher, and head of the dermatology section at Northeast Ohio Universities College of Medicine, as well as associate clinical professor of dermatology at Case Western Reserve University School of Medicine. His daughter, Lindsey, will be attending Washington University as an undergraduate in the fall.

Aurelia Natliv, MD ’85, is an associate professor in the University of California at Los Angeles’ department of family medicine (division of sports medicine) and in the department of orthopaedic surgery. She is also a team physician for the UCLA athletes and director of the UCLA Osteoporosis Center.

Gina Musolino, PT ’87, EdD, has joined the division of physical therapy at the University of Utah in Salt Lake City as assistant professor and director of clinical education.

Jacquie Welkener, PT ’89, is one of four co-owners and operators of “Healing Paws Rehab, LLC,” a company providing canine rehabilitation specialty services in St. Louis.

Kristi L. Rambis, OT ’88, recently completed the Honolulu Marathon, running for “Joints in Motion,” affiliated with the Arthritis Foundation. The marathon raised more than $4 million. Rambis has passed the hand certification exam and is now one of 3,000 certified hand therapists in the United States and Canada. She lives in Richmond IN.

Peter L. Petrich, HA ’90, is chief of patient administration at Iron Mountain Veterans Administration Medical Center in Michigan.

Lisa Cruttenden, HA ’90, was recently promoted to public sector manager with Merck Vaccine Division and has moved from Austin to Houston TX. She writes, “While I have left health administration, I have found my niche in pharmaceutical promotion. I love vaccines and their impact on public health!” In February, she married Harry Breda Jr. in Santa Fe NM.

Keith Brandt, MD, HS ’92, is one of four Washington University School of Medicine faculty included in the April 2002 Ladies Home Journal list of “Top Doctors for Women from Coast to Coast.” Brandt is associate professor in the division of plastic and reconstructive surgery. The other faculty included are Diane Merritt, MD, HS ’80, professor of obstetrics and gynecology; Joanne Mortimer, MD, associate professor of internal medicine; and Timothy Eberlein, MD, Bixby Professor of Surgery. Eberlein also directs the Alvin J. Siteman Cancer Center.

Robin Fuller Hall, OT ’97, and her husband, Sonny, are the proud parents of twins, Cody James and Riley Marie, born September 20, 2001. Hall recently accepted a new position as a hand therapist at Des Moines Orthopedic Surgeons in West Des Moines IA.
IN MEMORY

Edgar H. Keys Jr., MD '39, died January 3, 2002, at St. Vincent's Hospice in Indianapolis at the age of 88. Keys earned his undergraduate degree from Harvard University. After graduating from medical school he completed his internship at St. Luke's Hospital and his residency at Barnes Hospital in St. Louis. During World War II he served in Europe and the Middle East as an Army hospital surgeon. He practiced obstetrics and gynecology at the Physicians and Surgeons Clinic in Quincy IL from 1948 to 1983, assisting at the births of nearly 7,000 babies and serving as chairman of obstetrics and gynecology at Blessing and St. Mary's hospitals. From 1983 to 1988, he served as the first medical director at Blessing Hospice in Quincy. He was a founding Fellow of the American College of Obstetricians and Gynecologists and a Fellow of the American College of Surgeons. His wife, Katherine Stuart Keys, survives, along with two sons, Peter and John "Nick," a daughter, Elizabeth, and seven grandchildren.

Harry W. "Pete" Sawyer, MD '40, died January 29, 2002, in Burlingame CA, at the age of 87. He was the son of Drs. Bula Belle Sawyer and Harry W. Sawyer Sr., and brother of Milo Sawyer and former Nevada Governor Grant Sawyer. Following medical school and internship, he served five years in the U.S. Army Medical Corps during World War II. He then practiced obstetrics and gynecology in San Francisco for 36 years, where he served in a number of positions at St. Francis Memorial Hospital. He was a Fellow of the American College of Obstetricians and Gynecology and of the International College of Surgeons. During his career he brought over 6,000 babies into the world, finally retiring in Burlingame at age 75. He was active in a number of community groups, including the Shriners, the Masons and Kiwanis. Among his survivors are his wife of more than 60 years, Elizabeth "Buzzie" Best Sawyer; a daughter, Laeta Sawyer Siri; a son, Tom Sawyer, and five grandchildren.

Frederick W. Knoke Jr., MD '43, died September 18, 2001, in Virginia. He was a retired radiologist and had practiced in Marion IL. He is survived by a son, Gary.

Gene Kundermann Speckert, OT '45, died January 7, 2002, at the age of 79. She had lived in Crestwood MO.

Harvey Walker Jr., PhD, MD '53, died January 28, 2002, of congestive heart failure at his home in Bridgeston MO. He was 76. He earned his undergraduate degree in chemistry from Ohio State University and soon thereafter was drafted into the U.S. Army, where he served as a junior scientist on the project to build the atomic bomb. Later he completed a doctorate in chemistry at OSU prior to entering the School of Medicine at Washington University. After completing his medical degree and a fellowship in clinical pathology at The Jewish Hospital in St. Louis, he opened an internal medicine practice in Clayton MO. He began incorporating complementary alternative treatments into his practice and, in 1967, named it Preventive Medicine Inc. He was a former board member and a Fellow in the American College for Advancement in Medicine. Among his survivors are his wife of nearly 16 years, Elizabeth Ann Miller Walker, six sons and five daughters.

John M. Eisenberg, MD '72, MBA, died March 10, 2002, at his home in Potomac MD, of a brain tumor. He was 55. For the past five years, he had been the director of the Agency for Healthcare Research and Quality (AHRQ) in the U.S. Department of Health and Human Services, where he led the federal government's efforts to support research designed to improve the quality of health care, improve patient safety, address medical errors and broaden access to essential services. Prior to his appointment to AHRQ, he was chairman of the department of medicine and physician-in-chief at Georgetown University's School of Medicine and previously had been chief of the division of general internal medicine at the University of Pennsylvania. From 1986 through 1995, Eisenberg was a founding Commissioner of the Congressional Physician Payment Review Commission, which he chaired from 1993 to 1995.

He was a magna cum laude graduate of Princeton University (1968) and Washington University School of Medicine. After his residency in internal medicine at the University of Pennsylvania, he was a Robert Wood Johnson Foundation Clinical Scholar and earned a Master of Business Administration degree at the Wharton School with distinction. Georgetown University gave him an honorary Doctor of Science degree in 1999. Eisenberg was a member of the Institute of Medicine of the National Academy of Sciences. Eisenberg's survivors include his wife of 32 years, DD Rudner Eisenberg; two sons, William Rudner Eisenberg and Michael Rudner Eisenberg; his mother, and three brothers. The family requests that memorial contributions be made to the Dr. John M. Eisenberg Healthcare Fund of the Community Foundation for the National Capital Region, 1112 16th Street, NW, Suite 340, Washington, DC 20036. The fund will support health care initiatives for research, education, service and policy.

Michael G. Murphy, MD, HS '72, died February 8, 2002, in Belleville IL, at the age of 63. He had been a neurosurgeon for 25 years before he retired from the Neurological Services of Belleville, Inc. in 1999. His survivors include his wife, Rena; a son, Jack, and a daughter, Elizabeth.
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"The Fall" is one of 11 sculptures by artist Zigi Ben-Haim currently on display at the Medical Center campus. "Journey with Me," co-sponsored by the School of Medicine and International Arts and Artists, will be on exhibit through the end of 2002. To learn more about this exciting collection, please visit outlook.wustl.edu.
Long and Short of It  How do developing bones “know” when to stop growing and begin hardening? School of Medicine researchers have identified a chemical messenger — highlighted here in pink—that regulates this process in the growing embryo. For more on this story, please turn to page 3.