

Spring 2000

## Focal Spot, Spring 2000

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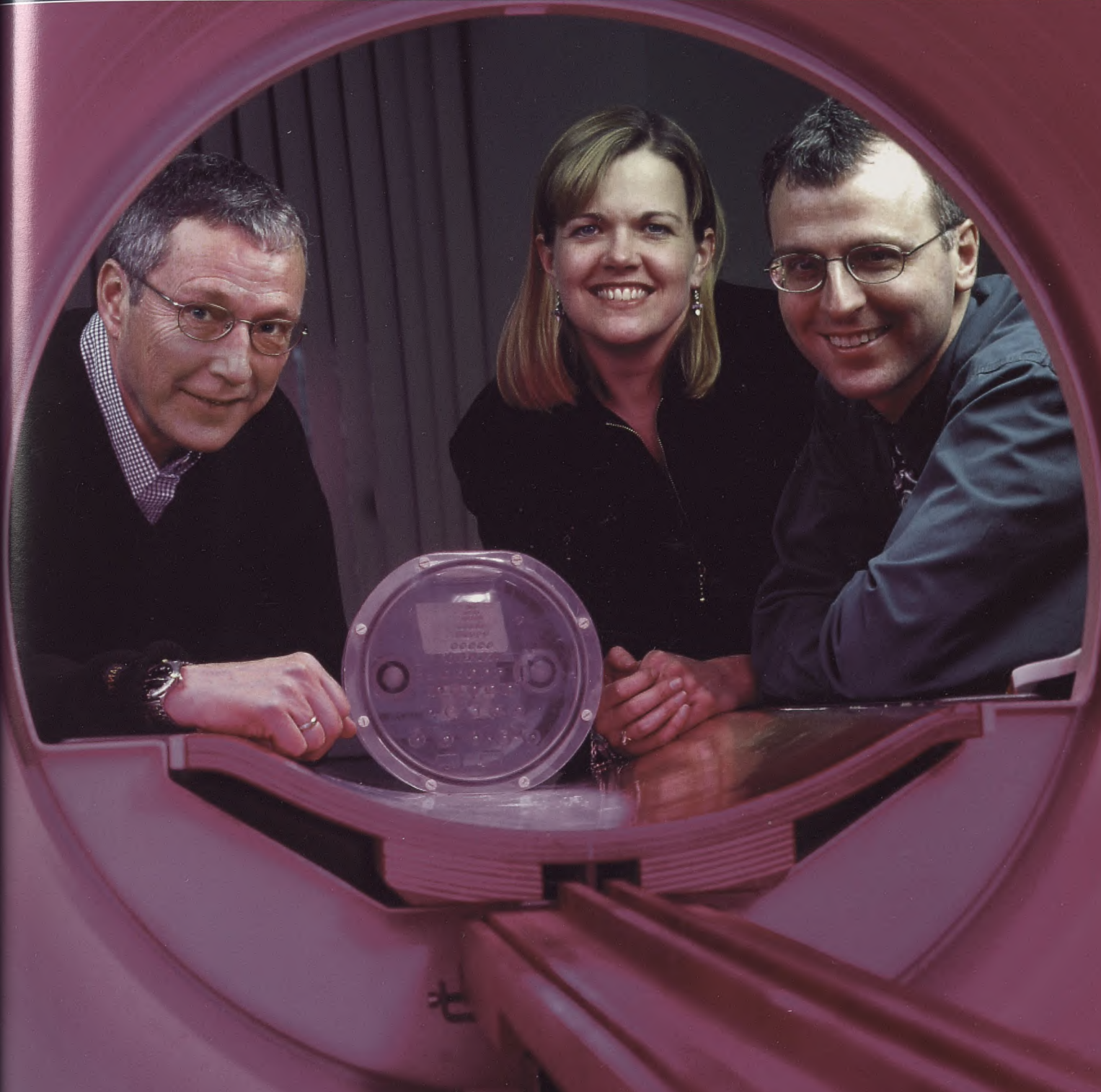
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SPRING, 2000

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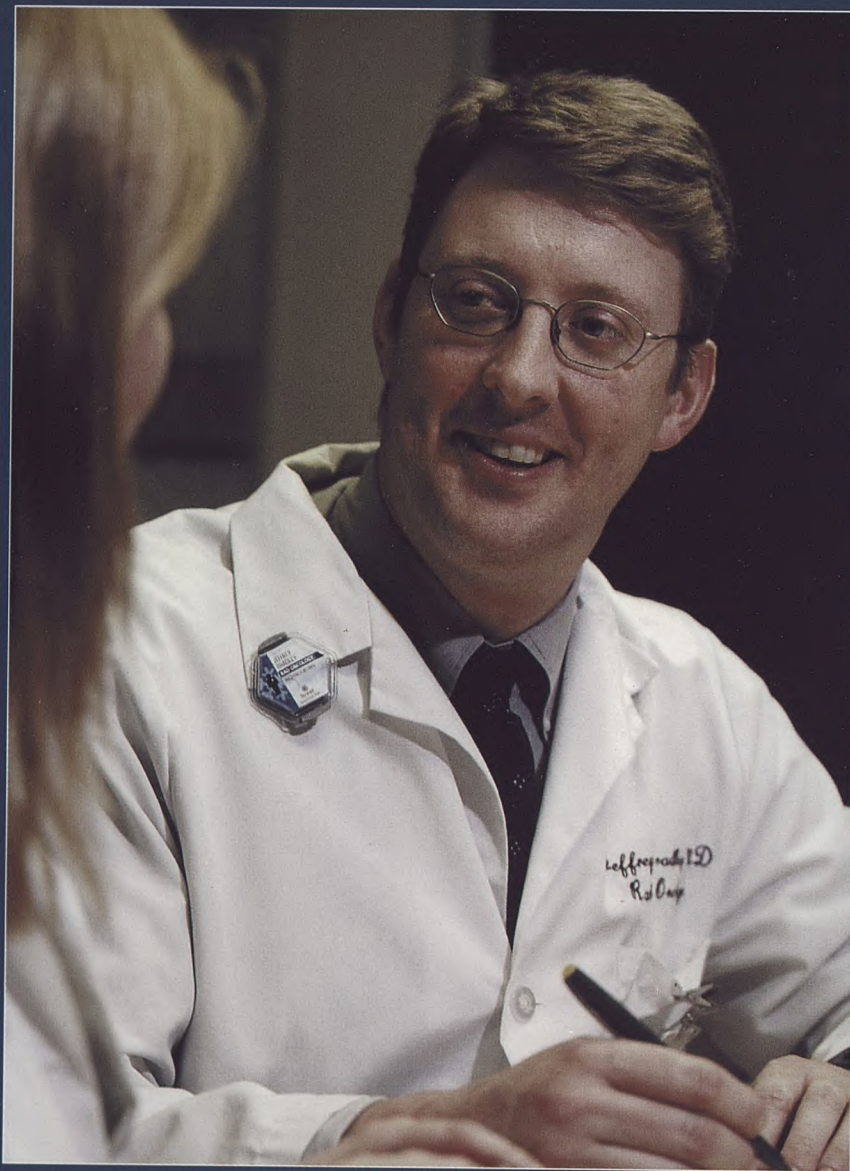
# FOCAL SPOT

MALLINCKRODT INSTITUTE OF RADIOLOGY



Charting New Territory

## BRADLEY NAMED TEACHER OF THE YEAR



Jeffrey Bradley, MD, instructor in radiology, was selected by the radiation oncology residents as the 1999-2000 Teacher of the Year. The presentation is made annually in December to honor the MIR faculty member who makes a significant contribution to radiation oncology resident education during the academic year.

Bradley joined the MIR faculty in 1998 and now serves as the Radiation Oncology Center's chief of thoracic service. He is the associate director for clinical curriculum for the radiation oncology residency training program, as well as a member of the WUSM Graduate Medical Education Committee and the Radiation Oncology Center Steering Committee.

A member of the Alpha Omega Alpha Honorary Medical Society, Bradley received a medical degree from the University of Arkansas for Medical Sciences, Little Rock. He completed a four-year residency (chief resident, 1996-1997) and a one-year ASTRO Research Fellowship at the University of Chicago Medical Center.

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SPRING, 2000

Volume 31, Number 1

MALLINCKRODT INSTITUTE OF RADIOLOGY



## 4 HOT TOPICS IN WOMEN'S HEALTH

Mallinckrodt Institute joins with the Society of Nuclear Medicine Technologist Section to provide a seminar for women on the diagnosis, prevention, and treatment of heart disease, osteoporosis, and breast cancer.



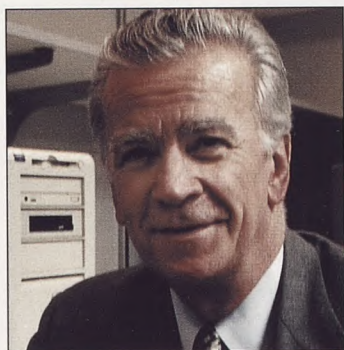
## 6 SUPPORTING CANCER RESEARCH AND PATIENT CARE

The Alvin J. Siteman Cancer Center will provide comprehensive research, patient care, and education for the Washington University School of Medicine and Barnes-Jewish Hospital cancer programs.



## 8 CHARTING NEW TERRITORY

As part of a multi-institutional, National Institutes of Health-funded study, MIR researchers are using magnetic resonance imaging to develop functional brain mapping in children.



## 14 A BETTER OUTCOME FOR PATIENTS WITH CORONARY ARTERY DISEASE

In collaboration with interventional cardiologists, the Radiation Oncology Center's physicians and physicists are studying the feasibility of using radiation to prevent renarrowing of coronary arteries following angioplasty.

## 2 SPOT NEWS

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### ON THE COVER:

Doctors Robert Almli (left), Kelly Botteron, and Robert McKinstry are shown with an MRI scanner that was constructed without a magnet specifically for their research. After playing in this mock scanner, pediatric volunteers should feel more comfortable with the equipment used during actual imaging time. Photograph by Tim Parker.

# SPOT NEWS

## Matching Program results announced

Seventeen physicians will join the Mallinckrodt Institute staff in June to begin their first year of training in diagnostic radiology; two of the 17 will participate in the Research Residency Program. These promising young trainees come to MIR from excellent medical schools in the U.S. and abroad: Johns Hopkins, Duke University, Universitat Des Saarlandes-Germany, University of Chicago-Pritzker, New York University, Washington University, University of Missouri-Columbia, University of Texas-Houston, University of Mississippi, University of Texas-San Antonio, University of Alabama, and University of Pittsburgh.

## Mirowitz named ACPE fellow

Scott Mirowitz, MD, was named a fellow of the American College of Physician Executives (ACPE) at the ACPE's annual meeting in May in San Antonio, Texas. The American College of Physician Executives Board of Directors recognized Mirowitz for his significant contributions to the advancement of medical management, as well as his regional and national stature in clinical medicine and leadership skills.

Mirowitz holds the academic title of professor of radiology and clinical titles of chief of radiology at Barnes-Jewish Hospital north and codirector of body magnetic resonance imaging. With his Master's degree in Medical Management (MMM) from the Tulane University School of Public Health and Tropical Medicine, Mirowitz is the nation's first radiologist with this specialized education. He also is certified in medical management as a Diplomate of the American College of Healthcare Executives, the American College of Managed Care Medicine, and the ACPE.

The ACPE is the nation's only educational and professional organization of and for physicians in healthcare management and is recognized by the American Medical Association as the specialty society representing physicians in management.

## WUSM ranked fourth in U.S.

Washington University School of Medicine (WUSM) was named one of the top five medical schools in the country, according to *U.S. News & World Report's* annual ranking of graduate and professional programs. The medical school ranked fourth, following Harvard, Johns Hopkins, and the University of Pennsylvania.

For the third consecutive year, WUSM was ranked first in student selectivity and has the nation's leading physical therapy program. The medical school excelled in other categories as well. The Program in Occupational Therapy was ranked third. Microbiology ranked fourth. Internal medicine ranked fifth, and neurosciences tied for fifth place.

Now in its fourteenth year, the *U.S. News & World Report* rankings are based on varying criteria, including reputation, research activity, student selectivity, and academic surveys.

## Faculty granted professorships

Associate professors Michael Darcy, MD; Mark Mintun, MD; and Scott Mirowitz, MD, were promoted to professor of radiology.

Prior to joining the Institute in 1989, Darcy was an assistant professor of radiology and the director of vascular and interventional radiology at the Medical University of South Carolina in Charleston. From 1985 to 1987, he was a faculty member at the University of Minnesota, where he previously completed radiology and surgery residencies and a fellowship in cardiovascular and interventional radiology. Darcy is a fellow of the Society of Cardiovascular and Interventional Radiology and of the American College of Radiology. He is director of the Institute's vascular and interventional fellowship program.

An alumnus of Washington University School of Medicine (WUSM), Mintun also completed a neurology research fellowship and nuclear medicine training at WUSM prior to joining the Institute faculty in 1985. Between 1989 and 1996 he was on faculty at the University of Michigan Medical School and the University of

Pittsburgh School of Medicine, where he was the PET Facility's medical director. He returned to MIR in 1997 and holds a joint appointment in the Department of Psychiatry. He serves on scientific panels for the National Institutes of Health and is associate editor of the journal *Human Brain Mapping*.

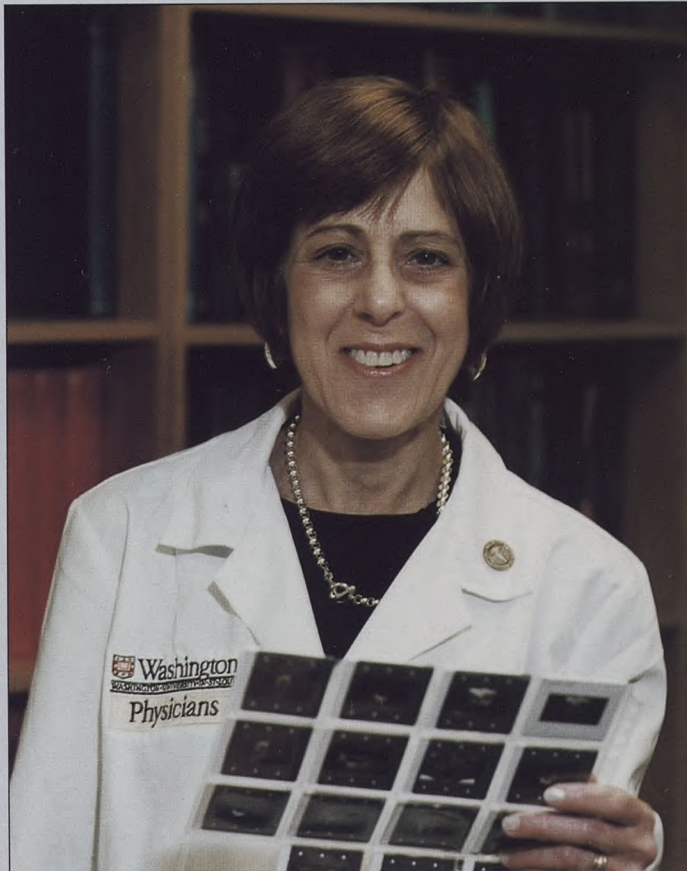
Mirowitz completed a four-year diagnostic radiology residency (cochief 1988-1989) and a one-year magnetic resonance imaging fellowship at the Institute before joining the MIR faculty in 1989 as an instructor in radiology. Mirowitz serves on numerous Barnes-Jewish Hospital and WUSM committees, including the Executive Committee and the Clinical Research Committee, and is course director for MIR's Health Policy and Practice Curriculum. He is the author of a highly acclaimed medical textbook on body magnetic resonance imaging and provides editorial services for medical and scientific journals, including *Radiology*.

## Siegel elected society president

Marilyn Siegel, MD, professor of radiology and of pediatrics, was officially installed as president of the Society of Computed Body Tomography and Magnetic Resonance (SCBT/MR) at the Twenty-third Annual Course meeting in April. She has the distinction of being the first pediatric radiologist as well as the first woman to head the Society. As president, Siegel plans to form the Society's first Strategic Planning Committee in order to assess accomplishments and goals, needs of the practicing physician, and strategies for improving and expanding the summer practicum and the annual course meeting.

Siegel has served on SCBT/MR's Research Committee, as chairperson of the Committee on Candidate Membership, and as vice president. As secretary-treasurer, she implemented the organization's first cost-reduction plan.

SCBT/MR was established in 1977 to educate practicing radiologists in the use of body computed tomography (CT) but has since changed its education goals (and name) to reflect activities in cross-sectional imaging, including magnetic resonance (MR). Affiliation with the 100-member Society is limited to those physicians who are actively involved in body CT and MR clinical practice or research.



Marilyn Siegel, MD

Siegel joins other Mallinckrodt Institute faculty (past and present) who have served as president of SCBT/MR: Stuart Sagel, MD, professor of radiology, chief of chest radiology, and codirector of body CT; Dennis Balfe, MD, professor of radiology and director of MIR's diagnostic radiology residency program; Joseph Lee,

MD, chairman of the Department of Radiology, University of North Carolina; and Robert Stanley, MD, chairman of the Department of Radiology, University of Alabama-Birmingham. Jay Heiken, MD, professor of radiology, chief of abdominal imaging, and codirector of body CT, currently serves as SCBT/MR's vice president-elect and will assume the presidency in 2003.

# Hot Topics

## in Women's Health

A seminar for women  
on the diagnosis,  
prevention, and  
treatment of heart  
disease, osteoporosis,  
and breast cancer.

Saturday  
June 3, 2000  
9:00 a.m. to 12:30 p.m.

Sponsored by the Society of  
Nuclear Medicine  
Technologist Section

Held at Edison Theatre  
at Washington University  
St. Louis, Missouri

**HOT TOPICS** will provide meaningful and accessible medical information about three diseases that are of concern for all women (heart disease, osteoporosis, and breast cancer). The seminar also will highlight nuclear medicine's important contributions to women's health worldwide.

HOT TOPICS is funded in part by an educational grant provided by The DuPont Pharmaceuticals Company and the support of Mallinckrodt Institute of Radiology at Washington University.

**Who should attend this seminar?**

- Women who want to learn more about taking care of their health, especially as they age.
- Women, family members, and friends who are interested in preventing and treating heart disease, osteoporosis, and breast cancer.
- Women who want to make informed decisions about their health care and health maintenance.

**What can you expect to learn by attending this seminar?**

- The most important risk factors for heart disease, osteoporosis, and breast cancer in women, as well as the best diagnostic tests.
- Information that enables you to ask your doctor more informed questions about your heart health and preventing future illness.
- The latest important advances in the treatment of heart disease for women.
- Information about diagnosis, prevention, and treatment of osteoporosis.
- What scientific data teaches us about preventing osteoporosis and how to decrease the rate of bone mineral loss with modern medications.
- Crucial information so you can ask your doctor more informed questions about your personal risk of breast cancer.
- The latest information about mammography and other diagnostic tests for breast cancer, including who should have them and when these tests should be performed.

**What is the Society of Nuclear Medicine (SNM)?**

SNM is a nonprofit professional organization for physicians, medical scientists, and technologists dedicated to improving the lives of

patients through the use of radioisotopes in diagnosis and therapy. Bone densitometry, cardiac stress scans, and bone scans are three of the nuclear medicine procedures commonly performed in nuclear medicine and radiology departments.

**Why is SNM sponsoring the Hot Topics seminar?**

The seminar is an outreach program for women that coincides with the Society's Annual Meeting held June 4 - 7 at the America's Center in St. Louis. More than 5,000 attendees will participate in the SNM's Annual Meeting.

**PROGRAM**

8:30 a.m. - 8:55 a.m.

**Coffee and Registration**

9:00 a.m. - 9:15 a.m.

**Welcome**

9:15 a.m. - 10:00 a.m.

**Women and Heart Disease: Truth and Fiction**

**Erica Uppstrom, MD**

**Cardiologist in private practice**

**Metro Health, St. Louis**

10:00 a.m. - 10:45 a.m.

**Osteoporosis: The Brittle Truth about Our Bones**

**Barbara Sterkel, MD, Assistant professor,**

**Washington University in St. Louis**

**Founder, St. Louis Osteoporosis Foundation**

10:45 a.m. - 11:00 a.m.

**Break (Refreshments will be served.)**

11:00 a.m. - 11:45 a.m.

**What We All Need to Know about Breast Cancer**

**Rachel Brem, MD, Associate professor,**

**George Washington University**

**Washington DC**

11:45 a.m. - 12:20 p.m.

**Questions from the Audience**

12:20 p.m. - 12:30 p.m.

**Closing remarks**

**REGISTRATION**

**Fee: \$10 (A portion of this fee will be donated to the St. Louis chapters of the Susan G. Komen Breast Cancer Foundation and the Osteoporosis Foundation.)**

Pre-registration is requested; however, registration at the door will be accepted.

A 10 percent discount per person is available for groups of 10 or more.

Registration fee may be paid by cash, check, money order, MasterCard, or Visa. Please make check or money order payable to "Society of Nuclear Medicine."

Mail this registration form and your payment by May 19, 2000, to  
Lauren Parr, Course Manager  
Society of Nuclear Medicine  
1850 Samuel Morse Drive  
Reston, VA 20190-5316

Name \_\_\_\_\_

Street Address \_\_\_\_\_

City/State/Zip \_\_\_\_\_

Number of persons attending \_\_\_\_\_

Enclosed is my payment of \$ \_\_\_\_\_

Charge to my  Visa  MasterCard

Card's expiration date \_\_\_\_\_

Credit Card Number \_\_\_\_\_

Signature \_\_\_\_\_

Free parking is available.  
Edison Theatre is wheelchair accessible.

For more information, call Mickey Clarke, CNMT, Mallinckrodt Institute of Radiology at Washington University, Division of Nuclear Medicine, at 314-362-2810

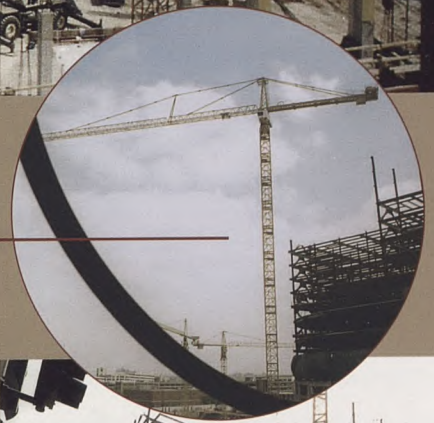


## Supporting Cancer Research and Patient Care



A \$35 million gift from Alvin and Ruth Siteman of St. Louis will support the cancer programs at Washington University Medical Center. In recognition of this generous gift, Washington University School of Medicine and Barnes-Jewish Hospital will name their combined cancer programs The Alvin J. Siteman Cancer Center. Through the Siteman's gift, the Cancer Center will support cancer research, patient care and services, community outreach, and education.

Located in the 14-story Ambulatory Care Center (ACC) under construction at the corner of Forest Park and Euclid avenues, the Siteman Cancer Center will have its own entrance, lobby, and elevators near the ACC's main entrance. Radiation oncology services and a Gamma Knife® facility will be housed in the Cancer Center's lower level. The Breast Health Center will be located on the fifth floor. An infusion center, counseling services, a clinical trials office, and other services will comprise the entire seventh floor. The facility is scheduled for completion in late 2000. MIR's Radiation Oncology Center physicians and scientists will be on staff at the Cancer Center.





# Charting New Territory:

## Studies of the Pediatric Brain

**a** first-of-its-kind study using magnetic resonance imaging (MRI) to track the normal development of the brain in children may open the doors for future research possibilities. By giving doctors a data base of normal brain development, this research can then be used as a benchmark for comparison with childhood neurological diseases or conditions, such as cerebral palsy or autism.

MRI is a diagnostic radiology procedure that uses a large magnet and radio waves to distinguish the body's soft tissues: muscle, tendon, ligament, articular and fibroid cartilage, fluid, blood, flowing blood, and fat. While traditionally MRI has been used for neurological studies in children on a case-by-case basis, no studies exist that document the same group of children's development over a specific length of time.

Robert McKinstry, MD, PhD, a neuroradiologist at Mallinckrodt Institute of Radiology, is Washington University's principal investigator for a nationwide, multi-institutional study that will create a data bank of neurological images of children in two specific age groups: newborns to four years (headed by McKinstry), and five years to 18 years (headed by Kelly Botteron, MD, assistant professor of psychiatry-child and of radiology).

"That first period of a child's life, from newborn to four years, is really uncharted territory. There are basically no documented prospective studies of normal infants and children for that period," McKinstry says.

By Chris Wayland

## Imaging the young child

Children's brains grow rapidly, paving the way for each new developmental stage. McKinstry's National Institutes of Health (NIH)-funded study will document the maturation of the brain of normal infants. In newborns the brain has not fully developed, and the tissue has more watery substance than it has white matter or nerve fibers. As the child ages and the brain develops normally, the ratio shifts and water is replaced by white matter and neurons. By measuring the brain with magnetic resonance imaging to give a three-dimensional view at specific periods throughout the study, the development of the brain can be tracked by measuring what radiologists refer to as T1 and T2 values. These values translate to the physical properties that determine image contrast in an MRI scan, similar to the way brightness and contrast are needed to distinguish pictures on a television, explains McKinstry.

"Perhaps our biggest challenge in this study will be scanning children in the newborn to four years of age group without using sedation. That has never been done," McKinstry says.

Generally infants from newborn to three months old (an age group that is not yet mobile or active) can undergo MR scans without sedation. From three months to six years, children usually are sedated. With its imposing size and steady rhythm of knocking and ping-pong noises during imaging time, the MR scanner can be intimidating to children as well as to some adults. The child must lie flat on a movable bed that slowly advances into the scanner, which resembles a large drum with an opening in the center. In order to produce high quality images, a parent cannot hold or touch the child during the time images are taken and the child must remain as motionless as possible during the scan—not a quality many toddlers possess, unless they are sleeping.

"NIH has decided it is unethical to sedate a child for research purposes because of the possible risks associated with sedation. So we have to develop creative, innovative methods for helping the children remain quiet," McKinstry says.

Anyone who has endeavored to cajole a toddler into doing something the child deems unnecessary will fully appreciate the rigors of the study. As the father of two young children, McKinstry adds, "If you think about how active youngsters are, scanning unsedated patients is not a trivial matter."

At Washington University, Robert Almlı, PhD, associate professor of occupational therapy, of neurology, and of psychology, designed and implemented a variety of methods to ensure the child's quiet participation: A mock scanner, minus the magnet, has been constructed so the children can play in it and become familiar with the machine. Children who are able to play quietly and entertain themselves are more likely to succeed as candidates in the study, explains McKinstry. Scans will be done in the evenings or late at night when children will be tired and ready to fall asleep. And, of course, there will be juice and treats as rewards.

If successful in developing methods for scanning children without sedation, "a whole line of research could open up," McKinstry says. "Since an MR scan can take up to an hour on average to complete, we also are working on methods of faster scanning."

## Imaging older children

Unique to this NIH study is a longitudinal design; that is, the same 500 children will be studied repeatedly during a five-year time period. Most of the children will be in the five- to 18-year-old range (the focus of Bottem's portion of the study). The study will look for trends, and the longitudinal component is essential because specific changes in one child's brain can be tracked. These structural changes can then be correlated to the child's behavior for an overall interpretation of the brain's development. According to McKinstry, without the longitudinal component, specific findings might be averaged out of this study.



## Charting New Territory



(above) Child psychiatrist Kelly Botteron  
(left) Neurologist Robert McKinstry

### An Internet data base

Medical facilities participating in the study are Washington University and St. Louis Children's Hospital; Children's Hospital, Boston; Children's Hospital Medical Center of Cincinnati; Children's Hospital of Philadelphia; University of California, Irvine; University of California, Los Angeles; and University of Texas, Houston. The researchers will send their findings to the Montreal Neurological Institute at McGill University in Canada, which will serve as a data coordinating center. All data forwarded to Montreal will be used to produce a data base available (via the Internet) to the community to answer research questions and to serve as an online clinical resource.

"Because Washington University Medical Center is an internationally recognized facility with a large and diverse patient base, neuroradiologists here have developed an expertise in reading pediatric MR scans. But physicians at a referral hospital or a small, community hospital may not have seen many MRI scans of children and may not have the specialized training required to recognize normal versus abnormal," McKinstry says, adding that the rapid changes in the brain of a young population causes even more difficulty in interpreting images.

"But if a physician could pull up a web browser and request a brain MRI of a normal eighteen-month-old, an online resource could help that physician to compare his or her patient's magnetic resonance scan with the image in the data base," he says.

### Patient participation

Another challenge is recruiting children to participate in the study. Many more children will be screened than enrolled in the program, says McKinstry. Finding healthy children with normal brain development and whose parents will make a time commitment for their child to have three MRI scans performed over a five-year period will require creative methods, such as using a national marketing firm for patient recruitment.

"When children are very young, parents are more apt to remain active in the study. But when the child is old enough to participate in organized activities, such as soccer, swimming, or scouting, the family's schedule may become too hectic to continue in the study and our research may suffer," McKinstry says.

To find participants for Botteron's study, a wide range of children must be screened. Those children who are diagnosed with abnormalities during the screening will be referred to the appropriate medical specialist but cannot participate in the study.

### Collaborative studies

McKinstry also collaborates with Jeffrey Neil, MD, PhD, the principal investigator of a related study of brain injury in newborns using diffusion tensor imaging, a method for tracking the movement of water in tissues—in this case, the brain. The technique can be likened to placing a drop of ink into a bucket of water and watching the ink spread.

In water, the ink will diffuse in all directions evenly. However, in the presence of a structure, the ink will move more easily in one direction over another. In the same manner, diffusion tensor imaging can see white matter developing in the newborn brain.

Tracking white matter fibers in the brain is another critical step in producing a connection diagram that associates functional activation of the brain with structural features and how they are con-



Psychologist Robert Almlí, working in the Developmental Neuropsychobiology Laboratory with a young child and her mother

nected. Diffusion tensor imaging also is sensitive to brain injury. In adults diffusion abnormalities can be seen before any other contrast property changes, indicating the earliest sign of a brain injury. Neil's research involves infants who have specific types of brain injury, such as the loss of blood supply to the brain caused by the umbilical cord being wrapped around the infant's neck at birth. Sequential imaging of the infant can be done within the first week following birth. The image findings may help doctors better target treatment for the injured newborn brain.

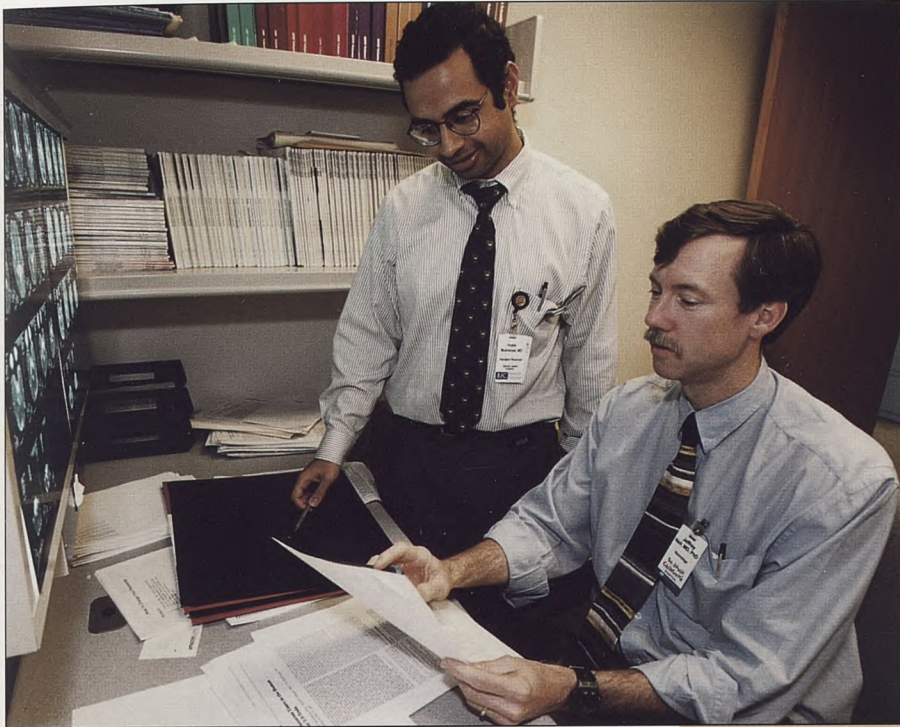
Another component of the study involves babies born prematurely with low birth weight—a population that tends to have medical problems, including brain injury. Periventricular leukomalacia (PVL), a brain lesion affecting both the cortico-spinal tracts as

well as the visual pathway, can be a condition of prematurity and is one of the causes of cerebral palsy. Neil's PVL research will help doctors determine if the brain injury occurs before birth, during delivery, or after the child is in the hospital nursery.

McKinstry and Pratik Mukherjee, MD, a radiology resident, recently completed a study of children's brain development from birth to adolescence. This study design is cross-sectional rather than longitudinal, involving children with a neurological complaint but no abnormality detected by the MR scan. In that retrospective study, trends have been uncovered that help to define brain development, McKinstry says.



## Charting New Territory




Radiologist Pratik Mukherjee (standing) and Pediatric neurologist Jeffrey Neil

There is not a large amount of mature white matter in a newborn's brain, but there are rapid developmental changes in the newborn to four-years-of-age group. As mature white matter starts to develop, vision improves. At 12 months, most infants are walking. Connections between their brain hemispheres are becoming stronger. Frontal lobe functions develop and, along with that memory, judgement and emotion become more mature. By the time children reach adulthood, complex connections have been made between the brain's cortical areas by mature white matter, making higher functioning activities such as calculus possible. Although the white matter continues to mature, the brains of chil-

dren ages four to 17 have many of the same characteristics as an adult brain. However, even subtle changes can be interpreted from McKinstry's and Mukherjee's study.

### Two decades of tremendous growth

The field of neurology has made great strides in the last 20 years; the 1990s were designated as the "Decade of the Brain," based on advances in neurologological research. McKinstry notes that Washington University was one of the first medical centers worldwide to develop functional brain mapping in adults.

"Washington University has a long history of research that explains how the adult brain is connected," McKinstry says. "Now we are extending that knowledge to how the pediatric brain learns to connect." 

## For The Record

*The following Washington University researchers are involved in the pediatric brain studies mentioned in this article.*

### PEDIATRIC STUDY CENTER FOR MRI STUDY OF NORMAL BRAIN DEVELOPMENT

**Robert McKinstry, MD, PhD**, assistant professor of radiology

**Kelly Botteron, MD**, assistant professor of psychiatry (child) and of radiology

### DIFFUSION TENSOR IMAGING OF NORMAL BRAIN MATURATION IN INFANTS AND CHILDREN

**Pratik Mukherjee, MD**, fourth-year diagnostic radiology resident

**Abraham Snyder, MD, PhD**, research scientist of radiology

**Joshua Shimony, MD, PhD**, clinical fellow in neuroradiology

**Thomas Conturo, MD, PhD**, associate professor of radiology and adjunct assistant professor of physics

**Benjamin Lee, MD**, associate professor of radiology

**Robert McKinstry, MD, PhD**

**Erbil Akbudak, PhD**, research instructor in radiology

### BRAIN INJURY IN NEWBORNS

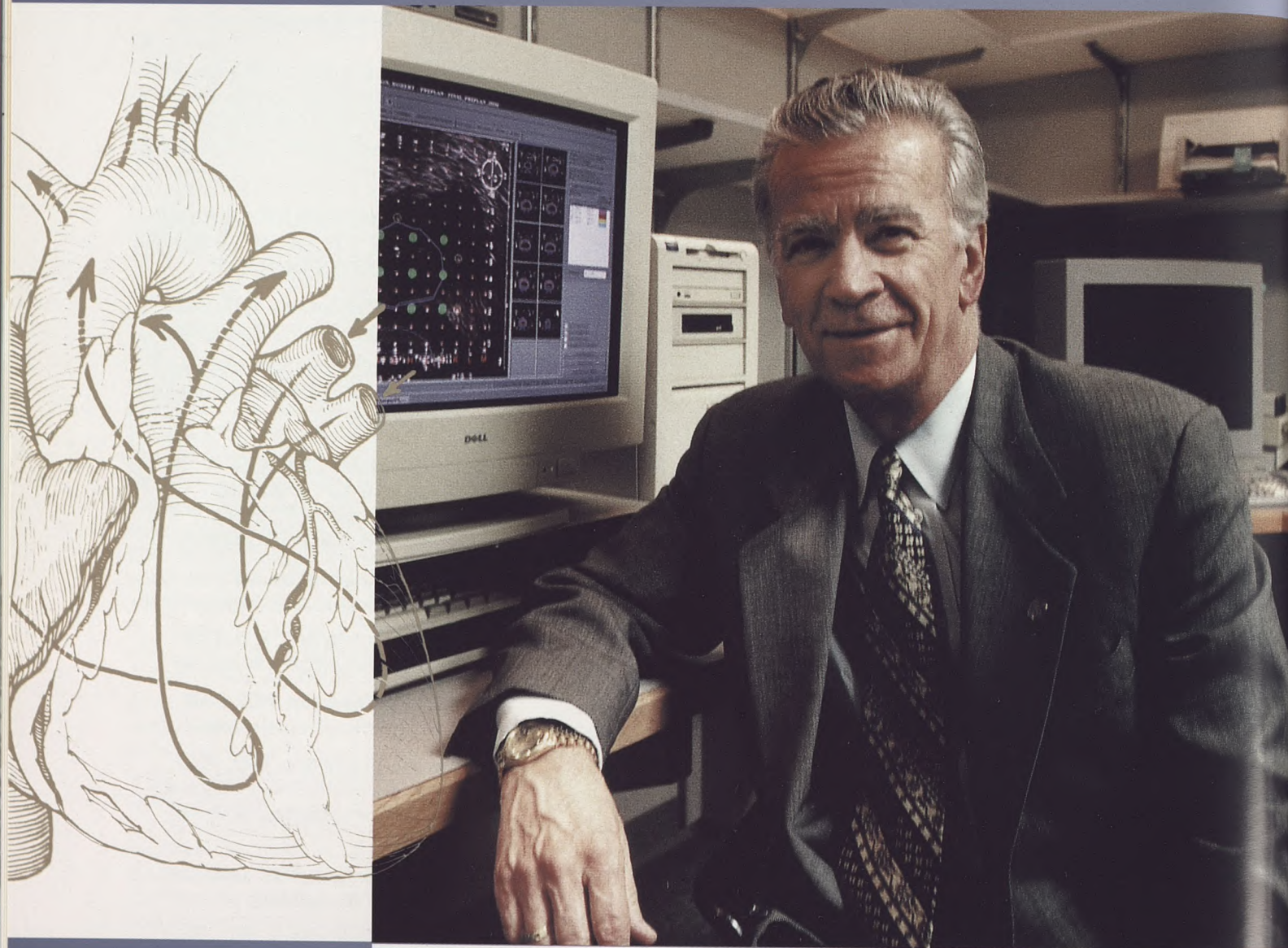
**Jeffrey Neil, MD, PhD**, assistant professor of neurology, of pediatrics, and of radiology

**Robert Almli, PhD**, associate professor of occupational therapy, of neurology, and of psychology

**Thomas Conturo, MD, PhD**

**Robert McKinstry, MD, PhD**





Radiation oncologist Carlos Perez

## A Better Outcome for Patients with Coronary Artery Disease

*Radiation oncologists and interventional cardiologists collaborate in clinical studies using irradiation to prevent restenosis following angioplasty.*

**Coronary artery disease (CAD)**, or blockage of the arteries, is the most common form of heart disease in the United States. Over the past five years patients with CAD have benefited from improvements made to a procedure called angioplasty that clears blockages in cardiac blood vessels. During the procedure, a balloon is inserted into the blood vessel via a catheter threaded through an artery in the leg. A chief reason for the recent success of angioplasty has been the use of stents (expandable metal devices permanently implanted in the artery) to support the vessel walls and help prevent future blockages. The results have been a decrease in the urgent need for bypass surgery and a reduction in the rate of thrombosis and deaths from myocardial infarction.

The only dark spot in this otherwise bright picture is the rate of restenosis (a recurrence of the narrowing of blood vessels) in patients who have undergone angioplasty. The procedure, even the stent itself, can irritate or injure the walls of the arteries, causing scar tissue to form and the vessels to narrow once again. Although restenosis can develop within six months in 15 to 40 percent of angioplasty patients, it is even more likely to occur in patients who have diabetes, renal failure, smaller blood vessels, or blockages in certain parts of the coronary tree. In these groups there is a 70 percent occurrence of restenosis.

But that picture may soon change. Radiation oncologists, radiation physicists, and interventional cardiologists at Washington University Medical Center are collaborating in multi-institutional, randomized clinical trials that focus on the delivery of radiation to prevent renarrowing of the affected coronary arteries.

*by Candace O'Connor*

## A Better Outcome

### Major step forward

Feasibility tests for a beta source called the Beta-Cath™ Device, developed by Georgia-based Novoste Corporation, were first conducted at Emory University and at Rhode Island Hospital. Mallinckrodt Institute of Radiology (MIR) at Washington University was selected as one of 25 sites to test radiation delivery.

In a collaborative effort, Carlos Perez, MD, director of MIR's Radiation Oncology Center, and John Lasala, MD, PhD, medical director of Cardiac Catheterization and Interventional Cardiology at Barnes-Jewish Hospital, uses a beta particle emitter to deliver radiation—roughly 14 to 18 Gy (or gray, a unit used to denote the absorbed dose of ionizing radiation) immediately after angioplasty is performed.

In their studies, says Lasala, irradiation has clearly inhibited the growth of new tissue in some patients. In a small number of cases, possibly two to three percent, it has also increased the patient's propensity to form a blood clot. Washington University Medical Center was one of the first study sites to report this long-term possibility of thrombosis and to propose that patients should be given anti-platelet inhibitors, not just for the usual month after angioplasty but for an additional six months after the procedure.

Despite this small risk, the irradiation treatment appears to represent a major step forward in at least two ways. It indicates that interventional cardiology has moved from perfecting the mechanical aspects of opening a blocked artery to using biological means to improve long-range outcome in patients. Interventional cardiologists are now becoming *molecular* interventional cardiologists, says Lasala. And Perez and Lasala agree that this treatment is an important advancement in the prevention of restenosis.

Radiation physicists  
(left to right)  
Gilbert Nussbaum,  
Sasa Mutic, and  
Jeffrey Williamson



"It is not a panacea, it is not going to work one hundred percent of the time," says Lasala. "In a few patients it may create a new problem, but overall the results represent the most significant reduction of restenosis by any technology, any device, any drug, any form of therapy found to date."

With the patient recruitment phase of the Beta-Cath trial completed, physicians are now performing patient follow-up to document blood flow in the cardiac vessels and to evaluate any potential side effects of the irradiation treatment. According to Perez, this data will be submitted to the Food and Drug Administration for approval of the procedure as standard therapy. Approval is likely to be granted in mid-2001.

### Encouraging results nationwide

Meanwhile, some of the other test sites have already reported their findings. Perez is especially encouraged by the results of one trial conducted by Paul Tierstein, MD, an interventional cardiologist at the Scripps Institute in La Jolla, California. Tierstein's findings, published in the journal *Circulation*, reported a 75 to 80 percent reduction of restenosis in irradiated patients at six months to one year after treatment. Over a three-year period, irradiation slowed or eliminated renarrowing in 50 percent of all patients.

"This represents a significant difference from nonirradiated patients, and it shows that this new approach to the treatment of patients with coronary disease may significantly improve their outcome," says Perez.

### A successful collaboration

Not only does the use of irradiation in postangioplasty patients represent an important clinical advance, but it also represents an unusual and highly successful collaborative effort among interventional cardiologists, radiation oncologists, and radiation physicists.

Interventional cardiologists  
John Lasala and Megumi  
Taniuchi



## A Better Outcome

### The Washington University Medical Center Team

#### Radiation Oncologists

Jeffrey Bradley, MD,  
*instructor in radiology*

Clifford Chao, MD,  
*assistant professor of radiology*

Carlos Perez, MD,  
*professor of radiology*

#### Interventional Cardiologists

John Lasala, MD, PhD,  
*associate professor of medicine*

Megumi Taniuchi, MD, PhD  
*assistant professor of medicine*

#### Radiation Physicists

Sasa Mutic, MS,  
*instructor in radiology*

Gilbert Nussbaum, PhD,  
*associate professor of radiology*

Jeffrey Williamson, PhD,  
*professor of radiology*

"This is a unique, first-time venture," says Lasala. "In the Cardiac Cath Lab, not only were interventional cardiologists scrubbed in for a procedure but also radiation oncologists. And around the periphery was a radiation physicist, who was making sure the isotope was handled properly, calculating the dose, and measuring the background levels of radiation in the lab."

Many of this study's 25 sites have found that coordinating the busy schedules of faculty from three clinical disciplines is the most difficult part of the trial. In his report, Teirstein mentioned the frustration of waiting as long as 30 to 45 minutes during a procedure for a radiation oncologist to be available. By contrast, the working relationship between the Washington University Medical Center physicians and scientists is marked by strong cooperation, efficiency, and collegiality.

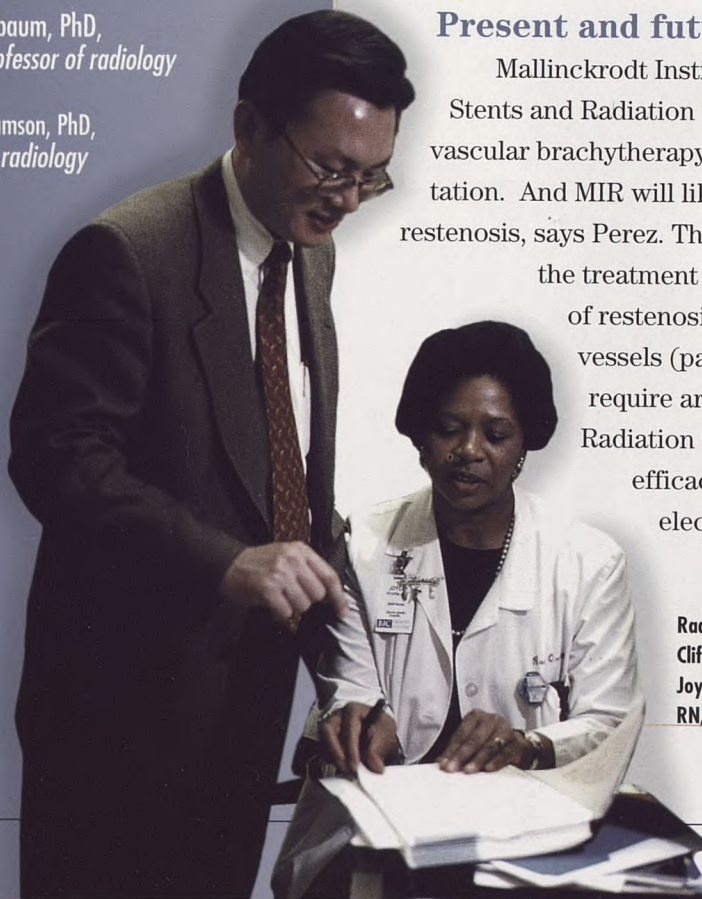
"I was very pleased by the enthusiasm, the prompt responsiveness, and the thoroughness of care provided by Doctor Perez and his associates," says Lasala. "Logistically, when there are so many busy people with their own separate schedules, it is very unusual to be able to say 'We have a case, and we need you in ten to fifteen minutes.' But the radiation oncology group was always there."

"We have worked with Doctor Lasala and his colleagues for the past two years, and it has been an excellent working relationship," adds Perez.

### Present and future studies

Mallinckrodt Institute also is participating in the clinical trial Stents and Radiation Therapy (START), which is studying the use of vascular brachytherapy to prevent restenosis following stent implantation. And MIR will likely be involved in future trials related to restenosis, says Perez. The irradiation procedure next will be applied to the treatment of other categories of patients with a high rate of restenosis, such as those with stenosis of the peripheral vessels (particularly the femoral vessels) and those who require arteriovenous access for renal dialysis. The Radiation Oncology Center also may help to evaluate the efficacy of external-beam therapy delivered with electrons as a substitute for brachytherapy. **MIR**

Radiation oncologist  
Clifford Chao and  
Joyce Taylor Haynie,  
RN, MSN



*In this section, the names of personnel who are full-time faculty or staff or who have an appointment in the Department of Radiology are highlighted in boldface type.*

## PROMOTIONS

**Carolyn Anderson, PhD**, assistant professor of radiology, was promoted to associate professor of radiology, Division of Radiological Sciences.

**Duffy Cutler, PhD**, assistant professor of radiology, was promoted to associate professor of radiology, Division of Radiological Sciences.

**David Hovsepian, MD**, assistant professor of radiology, was promoted to associate professor of radiology, Division of Diagnostic Radiology.

**Deborah McCarthy, PhD**, research instructor in radiology, was promoted to research scientist, Division of Radiological Sciences.

**Vamsidhar Narra, MD**, instructor in radiology, was promoted to assistant professor of radiology, Division of Diagnostic Radiology.

**Brian Rubin, MD**, assistant professor of radiology, was promoted to associate professor of radiology, Division of Diagnostic Radiology.

**Tom Videen, PhD**, research assistant professor of radiology, was promoted to research associate professor, Division of Radiological Sciences.

## NEW FACULTY

**Sanjeev Bhalla, MD**, instructor in radiology, Division of Diagnostic Radiology.

**Christine Menias, MD**, instructor in radiology, Division of Diagnostic Radiology.

**Nobuyuki Oyama, MD, PhD**, visiting instructor in radiology, divisions of Radiological Sciences and Nuclear Medicine.

## JOINT APPOINTMENT

**Saulo Klahr, MD**, professor of medicine, was appointed professor of radiology.

## GRANTS

**Clifford Chao, MD**, assistant professor of radiology, is principal investigator for four, one-year grants: "The impact of tumor hypoxia/reoxygenation kinetics on radiation curability in head and neck cancer" funded by a \$30,000 Alvin J. Siteman Cancer Center/BJH Cancer Research Award; and "Modulation of hypoxia inducible Factor-1 (HIF-1) expression may revert chemo/radiation resistance of malignant glioma under hypoxia" funded by a \$30,000 departmental research pilot grant, by an \$86,000 institutional research grant from Monsanto/Searle, and by a \$20,000 institutional research grant from the American Cancer Society.

**Thomas Conturo, MD, PhD**, associate professor of radiology and adjunct assistant professor of physics, as principal investigator, received a \$1.2 million five-year grant from the National Institutes of Neurological Diseases and Stroke for research on "MR methods for functional and physiologic imaging." Conturo's grant is part of the \$7.3 million program project grant "The brain and its vasculature" received by principal investigator **Marcus Raichle, MD**, professor of radiology and of neurology and neurobiology and codirector of the Division of Radiological Sciences.

**Colin Derdeyn, MD**, assistant professor of radiology, as principal investigator, received a \$1.1 million grant from the National Institutes of Health to study "The effect of HMG-Co reductase inhibitors on cerebral blood flow." Coinvestigator for the four-year grant is **William Powers, MD**, professor of neurology and neurological surgery and of radiology. Consultants are **Timothy McCarthy, PhD**, assistant professor of radiology; and Linda Peterson, MD, and Alan Braverman, MD, Washington University Department of Medicine. As principal investigator, Derdeyn also received the American Heart Association's \$400,000 Bugher Award to study "The effect of HMG-CoA reductase inhibitors on CBF in humans."

**David Gius, MD, PhD**, assistant professor of radiology, as principal investigator, received a three-year American Cancer Society grant for his research on "The role of heat shock and p38MAPK in the cellular and cytotoxicity response to ionizing radiation."

**Charles Hildebolt, DDS, PhD**, associate professor of radiology, as principal investigator, received a \$403,925 grant from the National Institutes of Health, National Institute of Dental and Craniofacial Research, to study "Osteoporotic oral bone quantification." Coinvestigators for the three-year grant are **Bruce Whiting, PhD**, instructor in radiology; Rex Coutoure, Washington University Department of Earth and Planetary Sciences; and Debra Dixon, DDS, Southern Illinois University School of Dental Medicine.

**Jacob Locke, MD**, fourth-year radiation oncology resident, received a \$10,000 MIR Division of Radiation Oncology Seed Grant for research of the cellular and cytotoxic effects of heat shock and early response genes.

**Daniel Low, PhD**, assistant professor of radiology, as principal investigator, received a two-year grant from the National Institutes of Health for research on "IMRT for gynecological malignancies." Coinvestigators for the \$709,657 grant are **Perry Grigsby, MD, MBA**, professor of radiology; **Clifford Chao, MD**, assistant professor of radiology; **Jeffrey Williamson, PhD**, professor of radiology; and Mark Haacke, PhD, independent consultant.

## GRANTS

*Continued from page 19*

**David Piwnica-Worms, MD, PhD**, professor of radiology and of molecular biology and pharmacology, and director of the molecular pharmacology laboratory, as principal investigator, received a \$1.5 million grant from the National Cancer Institute to study whether a diagnostic imaging compound called technetium-99m-SESTAMIBI can identify which women with advanced breast cancer will benefit from chemotherapy. Coinvestigators for the four-year grant are Paula Fracasso, MD, PhD, Washington University Department of Medicine, and **Farrokh Dehdashti, MD**, associate professor of radiology.

**Richard Slone, MD**, assistant professor of radiology, as principal investigator, received a National Institutes of Health subcontract for research on "Computer aided diagnosis in chest radiography." The \$230,000 award is part of a five-year RO1 grant centered at the University of Chicago.

**Bruce Whiting, PhD**, instructor in radiology, as principal investigator, received a \$210,000 Biomedical Engineering Research grant from the Whitaker Foundation for research on "Application of advanced 3D imaging techniques for improved cochlear implant electrode performance." Coinvestigator for the three-year grant is Margaret Skinner, PhD, Washington University Department of Otolaryngology-Head and Neck Surgery. Consultants are **Kyongtae Bae, MD, PhD**, assistant professor of radiology; Charles Finley,

PhD, University of North Carolina, Chapel Hill; and Joseph O'Sullivan, PhD, Washington University Department of Electrical Engineering.

**Pamela Woodard, MD**, assistant professor of radiology, is Washington University's principal investigator for a multicenter study funded by the National Institutes of Health to assess spiral computed tomography for the detection of pulmonary embolism. The \$14 million grant is shared by nine institutions, including Massachusetts General Hospital, University of Calgary, Cornell University, and Duke University. Washington University coinvestigators are **Jay Heiken, MD**, professor of radiology; **Barry Siegel, MD**, professor of radiology and of medicine; **Daniel Brown, MD**, assistant professor of radiology; **Daniel Schuster, MD**, professor of medicine and of radiology; **Brian Rubin, MD**, associate professor of surgery and of radiology; and Roger Yusen, MD, Washington University Department of Medicine.

**Dmitriy Yablonskiy, PhD**, assistant professor of radiology and professor of physics, as principal investigator, received a \$100,000 grant from the McDonnell Foundation to study "Brain temperature regulation and oxidative metabolism during functional brain activation." Coinvestigators for the two-year award are **Joseph Ackerman, PhD**, professor of chemistry, of medicine, and of radiology; **Marcus Raichle, MD**, professor of radiology and of neurology and neurobiology and codirector of the Division of Radiological Sciences; and **Larry Bretthorst, PhD**, research associate in radiology.

## APPOINTMENTS/ELECTIONS

**Thomas Conturo, MD, PhD**, associate professor of radiology and adjunct assistant professor of physics, was appointed to the Ad-Hoc Study Section/Site Visit Team to review applications for National Institutes of Health Research Resources.

**Michael Darcy, MD**, professor of radiology, was elected to a one-year term as secretary/treasurer of the Society of Cardiovascular and Interventional Radiology.

**Steven Don, MD**, assistant professor of radiology, was appointed to the Clinical Radiology Advisory Board for Acuson Corporation, a leading manufacturer and service provider of diagnostic medical ultrasound systems.

## HONORS/AWARDS

**Dione Farria, MD, MPH**, assistant professor of radiology, earned a national specialty board certification in Public Health/General Preventive Medicine.

**Louis Gilula, MD**, professor of radiology and of surgery, served as an examiner (bone) for the American Board of Radiology.

**Shervin Karimpour, MD**, radiation oncology assistant chief resident, received a \$35,000 American Society of Clinical Oncology Fellowship (a first-time award for Mallinckrodt Institute) to study "The role of p38 in the cellular response to ionizing radiation."

**Eric Klein, MS**, assistant professor of radiology, was named chairman of the Therapy Physics Track for the 2000 Meeting of the World Congress of Medical Physics and Biomedical Engineering.

**Jacob Locke, MD**, fourth-year radiation oncology resident, received the Young Oncologist Essay Award from the American Radium Society for his research on "Urinary retention after prostate brachytherapy: a perspective study." The award was presented at the Society's 82nd Annual Meeting in London, England, in April.

## Fischer receives BJH award

Keith Fischer, MD, associate professor of radiology, Division of Nuclear Medicine, was a January recipient of the Barnes-Jewish Hospital Foundation's Caring Spirit Award. The award honors individuals who "go above and beyond expectations in showing care, compassion, and service."

**Scott Mirowitz, MD, MMM**, professor of radiology, chief of radiology at Barnes-Jewish Hospital north, and codirector of body magnetic resonance imaging, received the Association of University Radiologists' (AUR) Joseph E. Whitley, M.D. Award for the year's best paper in radiology teaching and education: "Development and assessment of a radiology core curriculum in health care policy and practice." The award was presented April 7 in Orlando, Florida, at the AUR's annual meeting.

**Joseph Roti Roti, PhD**, professor of radiology, associate director of the Radiation Oncology Center, and chief of cancer biology, was elected president of the North American Hyperthermia Society.

## LECTURES PRESENTATIONS

**Daniel Appelbaum, MD**, assistant in radiology, Division of Nuclear Medicine, as guest lecturer, spoke on "Pulmonary scintigraphy," "Bone scintigraphy," "Tumor scintigraphy," and "Positron emission tomography" at the 6th Annual University of Chicago Radiology Review Course, Chicago, Illinois, April 10-16.

**Jeffrey Brown, MD**, associate professor of radiology, director of clinical research, and codirector of magnetic resonance imaging, presented "Advances in hepatic MRI" to the New England Roentgen Ray Society, Boston, Massachusetts, January 21.

**DeWitte Cross, MD**, associate professor of radiology and director of interventional neuroradiology, as invited lecturer, presented "Endovascular treatment options for cerebral vasospasm" and moderated "Scientific Symposium III: Subarachnoid hemorrhage" at the Joint Meeting of the American Association of Neurological Surgeons/Congress of Neurological Surgeons Section on Cerebrovascular Surgery and the American Society of Interventional and Therapeutic Neuroradiology, New Orleans, Louisiana, February 8. As invited lecturer, he presented "Is endarterectomy the gold standard for extracranial carotid artery disease?" at the 8th Annual Refresher Course & Update in General Surgery, St. Louis, Missouri, February 26.

**Colin Derdeyn, MD**, assistant professor of radiology, spoke on "Cost-effectiveness of PET screening prior to EC/IC bypass in patients with carotid occlusion" at the 3rd Annual Joint Meeting of the American Society of Interventional and Therapeutic Neuroradiology and the Joint Section on Cerebrovascular Surgery, New Orleans, Louisiana, February 7. He presented "Absence of selective deep white matter ischemia in chronic carotid disease" and "Time-related changes in cerebral blood volume in patients with increased oxygen extraction" at the 24th Annual American Heart Association Stroke Meeting, New Orleans, Louisiana, February 11.

**Louis Gilula, MD**, professor of radiology and of surgery, presented "Introduction to vertebroplasty" and "Percutaneous bone biopsy" at Radiology Update, University of California, San Francisco, March 23. He spoke on "Introduction to vertebroplasty," "Cervical nerve root blocks," "Radiofrequency ablation of face and nerves," and "Lesser known entities of the wrist" at the Iowa State Radiological Meeting, April 19.

**Perry Grigsby, MD, MBA**, professor of radiology, presented "Update on the role of radiotherapy in the treatment of endometrial carcinoma" and "Recent advances in the management of carcinoma in the uterine cervix" at the 5th Northern Israel Shapira Memorial Oncology Conference, Haifa, Israel, March 1-3. He spoke on "Radiation exposure and cost savings from outpatient I-131 therapy" at the American

## Senturia Lecture



On February 21, Dr. Jeffrey Weinreb, cochairman of the Department of Radiology and director of MRI at New York University School of Medicine, presented the Sixth Annual Hyman R. Senturia Lecture, "Re-engineering radiology: lessons learned." Shown with Dr. Weinreb (left) is Scott Mirowitz, MD, professor of radiology and coordinator of the Senturia Lecture.



## LECTURES PRESENTATIONS

*Continued from page 21*

Radium Society Annual Meeting, London, England, April 3-7. Grigsby presented "Radiotherapy in endometrial cancer" and "Is there any place for RT in epithelial ovarian cancer?" to the European Society of Oncology, Course on Gynecological Oncology, Ylan, Turkey, April 22-26.

**Jay Heiken, MD**, professor of radiology, chief of abdominal radiology, and codirector of body computed tomography, spoke on "Computer modeling approach to contrast medium administration and scan timing for multidetector CT" at the International Symposium on Multidetector Spiral CT, Starnberg, Germany, January 20-22. He presented "A practical approach to helical CT: single and multidetector"; "CT of the aorta: approach to rupture and dissection"; "Evaluation of the patient with small bowel obstruction"; "Hepatic masses: characterization with CT and MRI"; and "Helical CT of the urinary tract" at *Advances in Imaging: 2000*, sponsored by Louisiana State University and Tulane University, Breckenridge, Colorado, February 20-25. As visiting professor, Heiken presented "Imaging evaluation of non-traumatic emergencies of the gastrointestinal tract" and "The peritoneal spaces and ligaments: anatomy and pathology" at the University of Southern California, Los Angeles, March 7. He spoke on "Cancer of the pancreas: Are we making progress?" at

the Abdominal Radiology Postgraduate Course 2000, sponsored by the Society of Gastrointestinal Radiologists and the Society of Uroradiology, Kauai, Hawaii, March 12-17. He presented "Liver masses: characterization with CT and MRI"; "Helical CT of the urinary tract"; and "CT of the aorta: approach to rupture and dissection" at The 20th Annual Course in Computed Tomography and Magnetic Resonance Imaging, Auchterarder, Perthshire, Scotland, March 26-30. As visiting professor at Harvard Medical School, Heiken spoke on "Hepatic masses: characterization with CT and MRI" at Beth Israel/Deaconess Hospital and "Detection and staging of pancreatic carcinoma with CT and MRI" at Brigham and Women's Hospital and at Massachusetts General Hospital, Boston, April 4 and 5. As visiting professor, he presented "Hepatic masses: characterization with CT and MRI" at Boston University, Boston, Massachusetts, April 6. He spoke on "A practical approach to helical CT: single and multidetector" and "Pancreatic carcinoma: detection and staging with CT" at the Twenty-third Annual Course of the Society of Computed Tomography and Magnetic Resonance, San Diego, California, April 10-14. As visiting professor, Heiken presented "A practical approach to helical CT: single and multidetector" at New York University, New York City, April 24. As visiting professor, he presented "The abdominal aorta: evaluation of AAA rupture and the postoperative patient" and "Helical CT of the urinary

tract" at the University of Medicine and Dentistry of New Jersey, Newark, April 27.

**Fiorenza Ianzini, PhD**, research assistant professor of radiology, presented "Cell-cycle delays and mitotic catastrophe in V79 cells irradiated with low energy protons" at the 47th Annual Meeting of the Radiation Research Society, Albuquerque, New Mexico, April 29-May 3.

**Anil Khosla, MD**, instructor in radiology, presented "Extramedullary cysts of spinal canal" at the American Society of Neuroradiology Annual Meeting, Atlanta, Georgia, April 1.

**Eric Klein, MS**, assistant professor of radiology, spoke on "The impact of heterogeneity corrections on lung cancer radiotherapy prescriptions" at The University of Texas, M. D. Anderson Cancer Center, Houston, April 28.

## Biello Lecture



As the Fourteenth Annual Daniel R. Biello Memorial Lecturer, Dr. Edward Coleman, vice chair of the Department of Radiology and director of the Division of Nuclear Medicine at Duke University Medical Center, spoke on "Oncology imaging: a new era." Barry Siegel, MD, director of MIR's Division of Nuclear Medicine and the Biello Lecture coordinator, is shown (left) with Dr. Coleman at the March 13th lecture in Scarpellino Auditorium.

**Michael Mackey, PhD**, assistant professor of radiology, presented "Time-lapse digital cinematography-based study of cells undergoing mitotic catastrophe," a Refresher Course, at the 47th Annual Meeting of the Radiation Research Society, Albuquerque, New Mexico, April 29-May 3.

**William McAlister, MD**, professor of radiology and chief of pediatric radiology, presented the Herman Grossman Lecture at Duke University, Durham, North Carolina, March 9.

**Elizabeth McFarland, MD**, assistant professor of radiology, presented "Spiral CT colonography: current status and future directions" at Grand Rounds, University of Pennsylvania, Philadelphia, February 22. She spoke on "Diagnostic performance and interobserver variability in prospective comparison of spiral CT colonography and colonoscopy" and "MRI evaluation of soft palate motion during speech: comparison between cleft palate patients and pediatric control patients" at the 23rd Annual Course of the Society of Computed Body Tomography and Magnetic Resonance, San Diego, California, April 10-14.

**Robert McKinstry, MD**, assistant professor of radiology, spoke on "Health rush on the Internet," "Web site creation for physicians," and "Physicians accessing the Internet" at the American Medical Association

(AMA)/Intel Health Internet Road Show at the AMA National Leadership Development Conference, Miami, Florida, March 25-27. He presented "Practical application of perfusion imaging in adults" at the ASNR 2000 Advanced Imaging Symposium, Atlanta, Georgia, April 2.

**Jeff Michalski, MD**, assistant professor of radiology, presented "On-line electronic portal imaging," "Update of the prostate 3D-CRT dose escalation study RTOG 9406," and "3D CRT of CNS neoplasms" at the 34th San Francisco Cancer Symposium, San Francisco, California, February 19 and 20.

**Carlos Perez, MD**, professor of radiology and director of the Radiation Oncology Center, presented "Recent advances in the management of localized carcinoma of prostate with radiation therapy and indications for adjuvant hormonal therapy" to the Providence Hospital Tumor Board, Southfield, Michigan, January 27. He spoke on "Radiotherapy in the era of 3-D CRT," "Cost benefit of 3-D CRT/IMRT," and "Prostate 3-D CRT versus standard radiation therapy" at the 34th San Francisco Cancer Symposium, San Francisco, California, February 19 and 20. Perez presented "Radiochemotherapy in the treatment of cancer of the uterine cervix" at the 2000 ASTRO Spring Refresher Course, Chicago, Illinois, March 11. He spoke on "Three-dimen-

sional conformal therapy or standard irradiation in localized carcinoma of prostate: a nonrandomized comparison" at the American Radium Society Annual Meeting, London, England, April 3-7. Perez served as moderator for "Imaging dilemmas in benign disease, DCIS, and invasive cancer" at the 29th National Conference on Breast Cancer, San Francisco, California, April 8. He spoke on "Management of painful bone metastases" at the Texas Oncology, P.A. meeting, Dallas, Texas, April 9. He presented "Three-dimensional conformal radiation therapy in localized carcinoma of prostate" and "Brachytherapy in the treatment of carcinoma of uterine cervix: the American experience" at CRILA 2000, Huatulco, Mexico, April 26-29.

**Marcus Raichle, MD**, professor of radiology and of neurology and neurobiology and codirector of the Division of Radiological Sciences, as invited speaker, presented the opening remarks for the Don Snyder Symposium at Washington University, St. Louis, Missouri, January 14. He spoke on "Functional neuroimages as a tool for defining illness" at the APPA meeting, New York City, New York, March 3. Raichle presented "A window to the mind" at the Washington University Advi-

sory Council, Singapore, March 19-21. He presented "Images of mind: a meeting ground for psychologists and neuroscientists" to the Department of Psychology, University of Iowa, Iowa City, April 21.

**Stuart Sagel, MD**, professor of radiology, chief of chest radiology, and codirector of body computed tomography, spoke on "CT of the pleura" and CT of focal lung lesions" at the International Symposium on Multidetector Spiral CT, Starnberg, Germany, January 20-22. He presented "HRCT of the pulmonary parenchyma," "CT of the thorax: pitfalls and anatomic variants," "Spiral CT for pulmonary embolism," and "CT of the pericardium" at the Annual British Course in Computed Tomography and Magnetic Resonance, Glenageles, Scotland, March 26-29. Sagel spoke on "CT of non-vascular mediastinal masses" and "CT of the thorax: anatomic variants and pitfalls" at the 23rd Annual Course of Computed Body Tomography and Magnetic Resonance, San Diego, California, April 10-14.

**Maria Schmidt, MD**, assistant professor of radiology, as invited lecturer, presented "Breast ultrasound and biopsies" at the Melson Memorial Symposium, sponsored by the American Society of Radiologic Technologists, St. Louis, Missouri, March 4.

## LECTURES PRESENTATIONS

*Continued from page 23*

**Barry Siegel, MD**, professor of radiology and of medicine and director of the Division of Nuclear Medicine, as visiting professor, presented "Application of positron emission tomography in oncology" at Radiology Grand Rounds, University of Medicine and Dentistry of New Jersey, Newark, New Jersey, April 6.

**Marilyn Siegel, MD**, professor of radiology and of pediatrics, spoke on "Ultrasonography of neonatal retroperitoneal masses," "Neonatal intracranial hemorrhage and ischemic brain injury," "Retroperitoneal masses in older children and adolescents," and "Congenital brain anomalies" at the Snowmass 2000 Clinical Ultrasound Meeting, Snowmass, Colorado, February 14-16. As invited speaker, she presented "Neonatal pulmonary diseases" and "Neonatal renal imaging" at the University of California Resident Review Diagnostic Imaging 2000 Course, San Francisco, March 2 and 3. As visiting professor, she presented "CT/MR of the liver: techniques and indications" and "Ultrasonography of the acute pediatric abdomen" at Western Pennsylvania Hospital, Pittsburgh, March 27 and 28. Siegel spoke on "MR/CT of common pediatric abdominal tumors" at the 23rd Annual Course of the Society of Computed Body Tomography and Magnetic Resonance Imaging, San Diego, California, March 10-14.

**Pamela Woodard, MD**, assistant professor of radiology, as invited lecturer, presented "Coronary MR angiography" at the Symposium on Cardiovascular Applications of MR and CT, sponsored by the North American Society for Cardiac Imaging and the European Congress of Radiology, Vienna, Austria, March 4.

**Imran Zoberi, MD**, radiation oncology chief resident presented "Thioredoxin nuclear localization and interaction with Ref-1 induces AP-1 DNA binding following 1R" at the American Radium Society Annual Meeting, London, England, April 3-7.

## SYMPOSIUM

*In this section of FYI, only those faculty and staff who have MIR appointments are listed.*

### INTERNATIONAL CONGRESS OF HYPER- THERMIC ONCOLOGY

*8th Annual Meeting  
Kyong-Ju, Korea  
April 26-29, 2000*

**Eduardo Moros, PhD**, cochair, Physics Developments in Heating Technology and Treatment Planning.

**Joseph Roti Roti, PhD**, chair, North American Hyperthermia Society Advisory Committee for the Scientific Program; chair, Workshop on Mechanism of Cell Killing.

### INVITED LECTURE

**Eduardo Moros, PhD**, "The Mallinckrodt Institute of Radiology clinical technology developments for simultaneous thermoradiotherapy."

### SCIENTIFIC SESSIONS

**Eduardo Moros, PhD; Robert Myerson, PhD, MD; William Straube, MSEE**, "Temperature controller for a dual-frequency scanning ultrasound reflector array system (SURLAS) for superficial thermotherapy."

**Eduardo Moros, PhD; William Straube, MSEE**, "Techniques for estimating the complex excitation source of ultrasound transducers for accurate thermotherapy modeling."

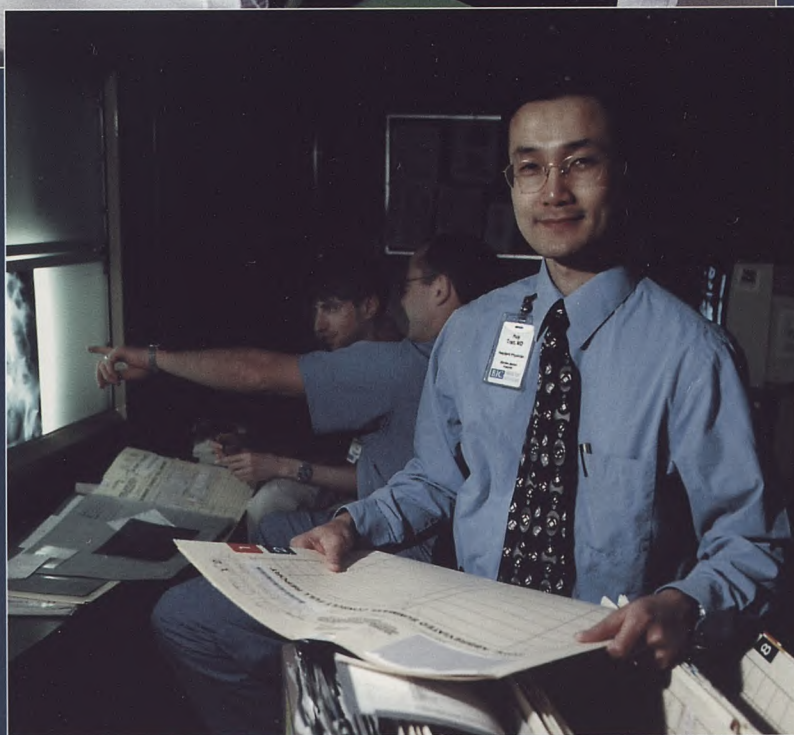
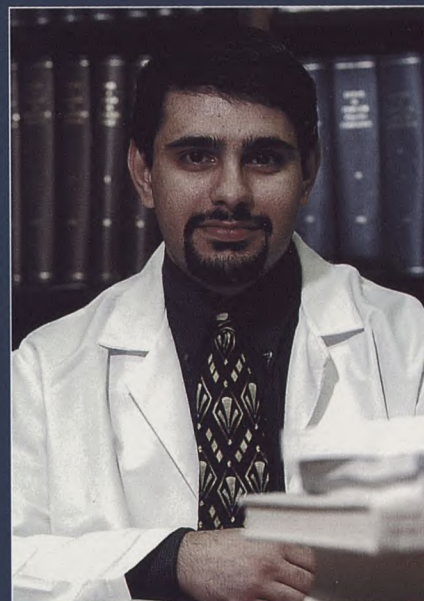
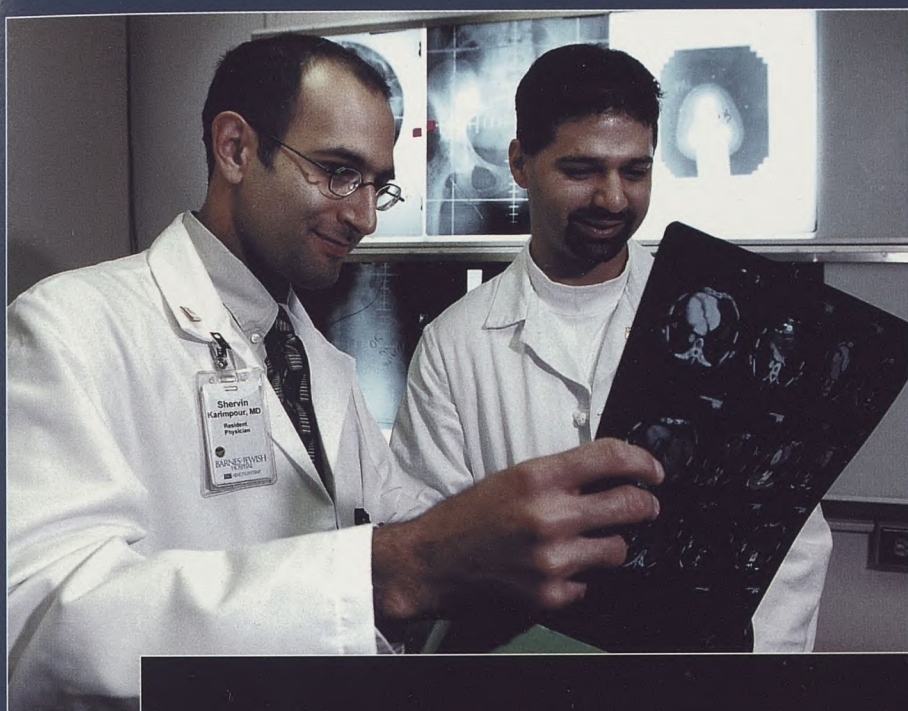
**Robert VanderWaal, PhD; William Wright, BS; Cara Humes**, research technician; **Joseph Roti Roti, PhD**, "The effects of heat shock on nuclear-matrix-associated DNA replication complexes."

**Mai Xu, MD, PhD; Prabhhat Goswami, PhD; William Wright, BS; Ruyji Higashikubo, PhD; Cara Humes**, research technician; **Joseph Roti Roti, PhD**, "Expression of E-cadherin in NSY human colon adenocarcinoma cell line and its variants with different sensitivity to 41.1°C."

## MIR receives magnetic resonance-compatible power injector

Under a research agreement between Mallinckrodt Inc., a St. Louis-based manufacturer of specialty medical products, and Thomas Conturo, MD, PhD, associate professor of radiology and adjunct assistant professor of physics, MIR received the nation's first Optistar™ magnetic resonance contrast power injector. The delivery system, which provides controlled, efficient, and fast delivery of contrast media, received U.S. Food and Drug Administration approval in December, 1999. The system will be used in MIR's East Building for research involving gadolinium MR contrast agents for contrast-enhanced anatomical imaging as well as bolus-enhanced perfusion studies in the brain and heart. For more information, visit Mallinckrodt Inc.'s web site at [www.mallinckrodt.com/imaging/MR/optistar](http://www.mallinckrodt.com/imaging/MR/optistar).

## CHIEF RESIDENTS 2000-2001



**I**mran Zoheri, MD, a Washington University School of Medicine alumnus, is the radiation oncology chief resident and an ASTRO Clinical/Basic Research Fellow. Sherwin Karimpour, MD, assistant chief resident, received his medical degree from Rush Medical College and completed an internal medicine residency at Barnes-Jewish Hospital. (top, left)

Huy Tran, MD, (left) and Faraz Khan, MD, (top, right) are the diagnostic radiology chief residents. Prior to joining the MIR residency program, Tran completed an internal medicine internship at Alton Ochsner Medical Foundation in New Orleans, and Khan completed a one-year transitional internship at the University of Texas, Houston.

# FOCAL SPOT

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