

Spring 1994

## Focal Spot, Spring 1994

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SPRING, 1994

VOLUME 25, NUMBER 1

# FOCAL SPOT

INSTITUTE OF RADIOLOGY

**THE ART OF  
BREAST IMAGING**







James R. Duncan, M.D. Ph.D., (left) and Colin P. Derdeyn, M.D., are Division of Diagnostic Radiology cochief and chief resident, respectively, for 1993-1994.



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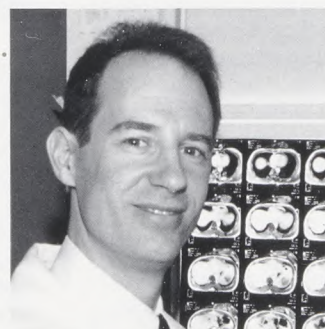


## THE ART OF BREAST IMAGING

At the Washington University Medical Center, radiologists and technologists provide a lifesaving breast-cancer screening program for women in the St. Louis area.

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A multicenter study is proving that magnetic resonance imaging techniques can noninvasively determine the malignancy or benignancy of adrenal masses.



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## IMPROVING CANCER THERAPY

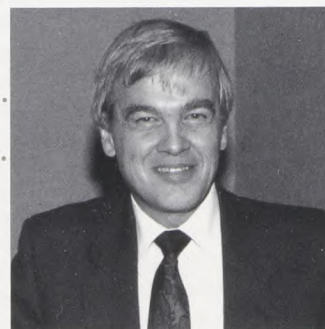
Radiation oncologists and cancer biologists combine efforts to improve treatments for patients with cancer.

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### ON THE COVER:

For every 100,000 women in the U.S., 27 will die as a result of breast cancer. Dr. Barbara Monsees, chief of the Institute's breast imaging section, and a team of radiologists and technologists want to reduce those numbers. Photography by Tim Parker.



# SPOT NEWS

## The Best Doctors in America

The results of a yearlong survey are in, and the second edition of *The Best Doctors in America* has listed eight Mallinckrodt Institute physicians as "the best and brightest" in the medical profession. Based on an extensive nationwide poll of thousands of medical specialists, the book lists 7,200 of the highest rated doctors nationwide, approximately 2 percent of the nation's 350,000 practicing physicians. Over 350 specialties are represented.

According to the book's editors at the publishing house of Woodward/White, Inc., the listing is credible because the evaluation of the best doctors was made by other doctors in the same speciality.

MIR physicians and their field(s) of expertise as reported in *The Best Doctors of America* are

■ Perry W. Grigsby, M.D., professor of radiology and clinical chief of the Radiation Oncology Center, Barnes Hospital — radiation oncology: gynecologic cancer

■ Tom R. Miller, M.D., Ph.D., professor of radiology — nuclear medicine: general nuclear medicine

■ Robert J. Myerson, M.D., Ph.D., associate professor of radiology — radiation oncology: hyperthermia

■ Carlos A. Perez, M.D., professor of radiology and director of the Radiation Oncology Center — radiation oncology: breast cancer, genitourinary cancer, gynecologic cancer, and lung cancer

■ Henry D. Royal, M.D., professor of radiology and associate director of the Division of Nuclear Medicine — nuclear medicine: general nuclear medicine, and radiation accidents and radiation injury

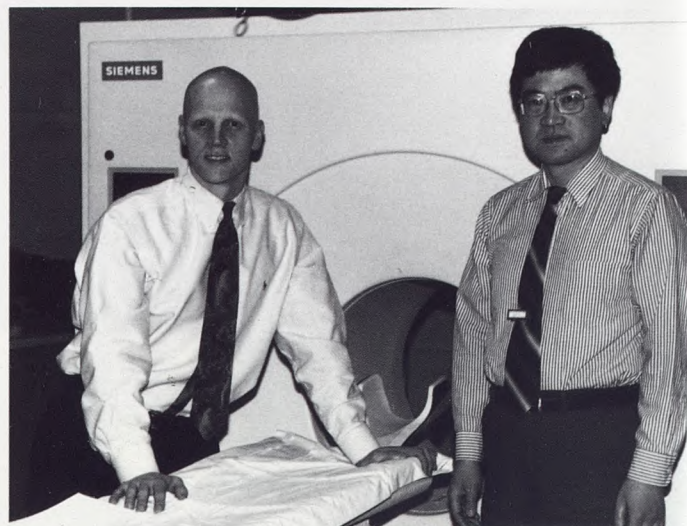
■ Stuart S. Sagel, M.D., professor of radiology, chief of chest radiology, and cochief of body computed tomography — radiology: chest

■ Barry A. Siegel, M.D., professor of radiology and director of the Division of Nuclear Medicine — nuclear medicine: general nuclear medicine

■ Todd H. Wasserman, M.D., professor of radiology and clinical chief of the Radiation Oncology Center, Jewish Hospital — radiation oncology: lymphomas.

## Evens Named to ACR Office

In January, Ronald G. Evens, M.D., director of the Institute, was elected to a two-year term as vice-chairman of the Board of Chancellors for the American College of Radiology (ACR). Evens, who in the fall of 1993 was renamed to a second term as the Board's secretary-treasurer, will assume his new office in September of 1994. The 24-member Board is the governing body of the ACR, determining policy standards for this national organization of more than 28,000 radiologists.



P. Duffy Cutler, Ph.D. (left) and Ge Wang, Ph.D.

## Researchers Earn Whitaker Foundation Awards

P. Duffy Cutler, Ph.D., assistant professor of radiology, Division of Nuclear Medicine, and Ge Wang, Ph.D., assistant professor of radiology, Division of Radiology Research, each received a prestigious Biomedical Engineering Research Grant from The Whitaker Foundation. Cutler and coinvestigator Ming Xu, M.S., received funding in the amount of \$179,496 for his research project "Clinically Viable 3-D PET Imaging of the Torso." Wang's \$166,731 grant was awarded for his project on "Spiral CT of the Temporal Bone." Coinvestigators for this grant are Michael Vannier, M.D., and Margaret Skinner, Ph.D., Division of Otolaryngology.

The Foundation is a major source of funding for research and education in biomedical engineering. Established in 1976 by U. A. Whitaker, founder and chairman of the board of the world's leading producer of electrical and electronic connecting devices, the Founda-

tion promotes research collaboration among engineers, physical scientists, biologists, and physicians for the improvement of the quality of medicine.

The Biomedical Engineering Research Grant Program was the first program initiated by the Foundation. The three-year awards were designed to help establish a scientific track for researchers who are in the early years of their career — doctorates must have been received less than eight years prior to submitting a grant application, and medical-degree applicants may apply within seven years following completion of their last residency.

Research projects must address a significant biological or medical problem and may target either the understanding of biological systems or improvements in medical care. The grants are highly sought after, with more than 300 applications submitted for the 103 grants awarded in 1993.



## NINDS Funds Study of Parkinson's Disease

There are close to one million patients in the United States and Canada who are affected by the tremor, muscular rigidity, and abnormal decrease in mobility and motor function associated with Parkinson's disease. These symptoms are caused by the degeneration of neurons deep within the brain; the degeneration subsequently leads to a deficiency of dopamine, which acts as a neurotransmitter in the central nervous system. Symptoms can be treated with an amino acid known as L-dopa, but the treatment causes involuntary muscle contractions in many patients. Consequently, effective treatment is limited.

As principal investigator, Joel S. Perlmuter, M.D., associate professor of neurology and radiology, received a \$1,349,590 grant from the National Institute of Neurological Disorders and Stroke to study the physiologic causes of L-dopa-induced involuntary movements and, subsequently, to provide improved drug therapy for parkinsonian patients. Using positron emission tomography (PET) and magnetic resonance imaging (MRI), Perlmuter and his team of researchers will assess changes in the dopaminergic pathways as well as changes in regional cerebral blood flow. Dopaminergic receptor binding in vivo will be assayed using PET methods.

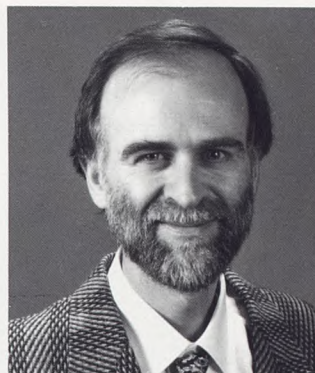
Research team members include Stephen M. Moerlein, Ph.D., associate professor of radiology and biochemistry;

Richard D. Todd, M.D., professor of psychiatry; Lee W. Tempel, M.D., research instructor in neurology; Juanita L. Carl, M.S., research instructor in neurology; and Mokhtar H. Gado, M.D., professor of radiology.

## Conturo Receives ASNR Fellowship

Thomas E. Conturo, M.D., Ph.D., assistant professor of radiology, Division of Radiology Research, received the 1993-1994 American Society of Neuroradiology (ASNR) Fellowship in Basic Science Research. The fellowship is awarded annually to a young investigator who is or has been working under the direction of a senior member of ASNR. Conturo's mentor is Daniel K. Kido, M.D., professor of radiology and chief of the Institute's neuroradiology section.

Supported by a \$35,000 grant from Berlex Imaging, the one-year fellowship was established in 1986 by ASNR as a means to stimulate the scientific development of promising young researchers and to assist them in establishing careers in academic radiology. Conturo received the ASNR fellowship for his proposed research on "Mechanisms of the Phase Enhancement Effects of Bolus-Injected Paramagnetic Contrast Agents and Applications in Quantitative Cerebral Blood Volume and Flow Imaging."



E. Mark Haacke, Ph.D.

## Haacke Heads SMR

As of January 1, E. Mark Haacke, Ph.D., professor of radiology and director of MR physics, Division of Radiology Research, became the first president of the newly formed Society of Magnetic Resonance (SMR), a merger of the Society of Magnetic Resonance in Medicine and the Society for Magnetic Resonance Imaging.

Haacke, the 1991-1992 president of the Society for Magnetic Resonance Imaging, was instrumental in facilitating the merger. He served as a member of the Joint Merger Evaluation Committee that worked out the technical details for establishing SMR. Since September of 1993, Haacke has been interim president and stepped down at SMR's meeting in Dallas on March 7.

An international scientific association, SMR is comprised of over 3,600 clinicians, physicists, engineers, and other scientists who are involved in the clinical and research applications of magnetic resonance imaging techniques. The Society provides a communication link among those clinicians and scientists as well as channels for continuing education in the field of magnetic resonance.

## New Guidelines Released for Evaluating Prostate Enlargement

Bruce L. McClellan, M.D., professor of radiology and chief of abdominal radiology, was the only radiologist on the national panel that developed new guidelines for the diagnosis and treatment of benign prostate enlargement. Doctors are now urged to use a more conservative approach to evaluate this common disorder that affects 50 percent of the U.S. male population over the age of 60. As informed participants, patients are encouraged to become more involved in choosing a treatment method. The guidelines were released in early February by the Agency for Health Care Policy and Research, a division of the Department of Health and Human Services.

With benign prostate enlargement, the prostate gland enlarges and restricts urine flow. More severe cases can lead to recurring urinary-tract infections and kidney damage. Also known as benign prostate hyperplasia (BPH), the disorder is usually treated surgically but can be treated with medication or by physician follow-up.

According to McClellan, the new guidelines may reduce the cost of diagnosis and treatment by advising physicians to use simple, inexpensive tests to evaluate potential BPH and to perform additional tests only if necessary.



# SPOT NEWS

## MIR Alum Delivers Tolmach Lecture

As the first graduate student to work with Professor Leonard Tolmach, Dr. Robert Phillips was involved in the development of the mitotic collection method for obtaining synchronous populations of mammalian cells. This research provided the basis for future breakthroughs in studies on irradiated cell survival and cellular repair.

Phillips, guest speaker for the Second Annual Tolmach Lecture, has focused his research on the effects of drugs on radiation sensitivity during the cell cycle. His talk concerned "The Role of the Retinoblastoma Gene in Normal Growth and Development."

The Tolmach Lecture was established in 1992 in memory of renowned scientist Leonard J. Tolmach, Ph.D., professor emeritus of radiation biology in radiology, who died on November 26, 1991. The lecture is presented in conjunction with the Annual Midwestern Regional Radiation Research Meeting held annually in November.

Robert Phillips, Ph.D.

## Royal to Advise on Radiation Experiments

Henry D. Royal, M.D., professor of radiology and associate director of the Division of Nuclear Medicine, was appointed by President Clinton as a member of the Advisory Committee on Human Radiation Experiments. The committee will investigate the ethical and scientific history of ionizing radiation experiments conducted from 1944 to mid-1974.

The President's action was prompted by allegations made in November of 1993 by a newspaper reporter in New Mexico, stating that patients who were uninformed about the risks of radiation exposure were injected with plutonium during experiments in the 1940s. Although the research had been conducted according to scientific investigation guidelines for that time, Department of Energy Secretary Hazel O'Leary recommended that a full investigation be made.

After a review of the experiments, the Advisory Committee will set ethical

and scientific criteria for evaluating the experiments in question and will determine if the testing was in compliance with those standards. The Committee also will recommend policies to ensure that current human radiation experiments are consistently conducted according to those set standards.

The Advisory Committee's final report will be made to the Human Radiation Interagency Working Group, comprised of the secretaries of Energy, Defense, Health and Human Services, and Veterans Affairs; the Attorney General; the Administrator of the National Aeronautics and Space Administration; the Director of Central Intelligence; and the Director of the Office of Management and Budget.

Royal's expertise in radiation exposure has earned international acclaim. At the request of the International Atomic Energy Agency (IAEA) and in cooperation with the former government of the Soviet Union, Royal performed an in-depth study of illnesses attributed to the 1986 nuclear reactor explosion in Chernobyl. He was the co-leader of the IAEA's medical effect team that travelled to Chernobyl in 1990. They conducted a health survey of inhabitants from both contaminated and noncontaminated villages to determine the incidence of potential radiation-related illnesses.

## Osteoporosis: A Possible Link to Dental Health

Charles F. Hildebolt, D.D.S., Ph.D., associate professor of radiology, received a National Institute of Dental Research grant to investigate whether osteoporosis can result in loss of bone supporting the teeth.

The 150 women participating in the study will receive free-of-charge

- annual dental examinations, cleanings, and X rays;
- calcium tablets;
- physical examinations and blood chemistry tests;
- annual examinations for osteoporosis; and
- mammograms, pap smears, and endometrial biopsies (based on medical history).

Criteria for study participation:

- last menstrual period 24 months prior to start of study,
- good health,
- no consumption of drugs that might affect bone matter, and
- have at least 10 natural teeth.

The study is conducted in collaboration with The Jewish Hospital Department of Dentistry and Washington University's Department of Medicine, Division of Bone and Mineral Diseases. For more information, call Mary Dotson, Jewish Hospital Dental Group, 314-454-5507.





## Most Prolific Reviewers

In the February, 1994 issue of *Radiology*, Stanley S. Siegelman, M.D., editor, paid tribute to the "corps of dedicated, unpaid reviewers" in a listing of the most prolific reviewers of manuscripts submitted to the journal. According to *Radiology's* statistics, 1,010 scientists and physicians reviewed 17,974 manuscripts over the four-year period of July 1, 1989, through June 30, 1993. There were 18 MIR faculty members among the 174 reviewers who each prepared 35 or more reviews:

- Dennis M. Balfe, M.D.
- Jeffrey J. Brown, M.D.
- Michael D. Darcy, M.D.
- Ronald G. Evens, M.D.
- E. Mark Haacke, Ph.D.
- Jay P. Heiken, M.D.
- Marshall E. Hicks, M.D.
- Bruce L. McClennan, M.D.
- William D. Middleton, M.D.
- Scott A. Mirowitz, M.D.
- Barbara S. Monsees, M.D.
- Daniel Picus, M.D.
- Stuart S. Sagel, M.D.
- Barry A. Siegel, M.D.
- Marilyn J. Siegel, M.D.
- Michael W. Vannier, M.D.
- Anthony J. Wilson, M.B., Ch.B.

Cited for their consistently high quality of reviews, James A. Brink, M.D., assistant professor of radiology, and Scott A. Mirowitz, M.D., associate professor of radiology and radiologist-in-chief at Jewish Hospital, each received *Radiology's* "Editor's Recognition Award for Special Distinction in Reviewing."



Arthur C. Fleischer, M.D., (left) and Bruce L. McClennan, M.D.

## RTOG Clinical Trials

As a member of the national cancer research organization Radiation Therapy Oncology Group (RTOG), MIR's Radiation Oncology Center is participating in many clinical trials, providing treatment for patients with cancer. According to Bahman Emami, M.D., Washington University's RTOG principal investigator, many patients treated during clinical trials for cervical, esophageal, anal canal, lung, and prostate cancer have remained cancer free. Many of today's standard cancer treatments are based on results of past clinical trials.

Less than 5 percent of adult cancer patients are treated as part of research studies. "If more adults participated in clinical trials, we are confident that the overall survival rates would increase," says Emami. For further information, call Emami at 314-362-8525.

## CDS Improving Detection of Ovarian Cancer

Ovarian cancer annually affects more than 20,000 women in the United States, and more than 50 percent of those women will die as a result of the disease. There is no screening examination for ovarian cancer as there is the pap smear for cervical cancer or the mammogram for breast cancer.

According to Arthur C. Fleischer, M.D., guest speaker for The First G. Leland Melson Visiting Professorship and Lecture on November 11, recent studies have provided good results in determining malignancy or benignancy in pelvic masses by using color Doppler sonography (CDS). In Fleischer's experience, CDS combined with CA-125 (a blood test for identifying ovarian cancer) produces a 91 percent diagnostic rate as compared to 82 percent with

CA-125 alone.

Known for his expertise in sonographic imaging, Fleischer, professor of radiology and radiological sciences and professor of obstetrics/gynecology at Vanderbilt University School of Medicine, said, "It's difficult to have a high level of confidence based on morphology. With the CDS approach, the physician can go from morphology to looking at whether or not there is a tumor. CDS also is a useful tool for determining patients who may not need surgery."

The Melson Visiting Professorship and Lecture was established in 1993 in honor of G. Leland Melson II, M.D., who was professor of radiology and chief of the Institute's clinical ultrasound at the time of his death on November 10, 1992. He was instrumental in introducing color Doppler sonography to the Institute.





An active member of breast-cancer screening committees at the city and state levels, Barbara Monsees, M.D., has been instrumental in developing the Institute's consistently high-quality breast imaging service.

# THE ART OF BREAST IMAGING

B Y B A R B A R A



According to statistics reported by the American Cancer Society, every 15 minutes three women develop breast cancer and one woman dies as a result of the disease. Second only to lung cancer, more women in the United States die from breast cancer than from any type of cancer. These are disturbing facts, but the numbers of lives lost can be reduced. Mammography, a breast-cancer screening test, can detect cancer even before a mass can be felt. When breast cancer is diagnosed in its early stages, the prognosis is markedly improved: The death rate from breast cancer can be reduced by at least 30 percent for women who are screened as compared to a control group of women who are not screened.

Across the nation, mammography is

being recognized  
for the critical

role it plays in women's health care.

The number of women taking advantage of routine screening mammogra-

phy is increasing, and this lifesaving test is on its way to becoming a routine part of medical checkups.



In 1986, MIR launched the area's first mobile unit.

IMAGING

R A Y O U N T



# THE ART of BREAST IMAGING

## MIR's BREAST IMAGING SECTION

In August of 1993, Ronald G. Evens, M.D., director of Mallinckrodt Institute, established a separate breast imaging section. Originally a part of musculoskeletal radiology, the new section now acts independently.

Barbara S. Monsees, M.D., chief of breast imaging, heads up a six-member clinical team: Drs. Premisri Barton, Tracy Roberts, and Peter Shile, and a mammography fellow at Barnes Hospital; and Dr. Lawrence Kotner at Jewish Hospital. These radiologists work closely with a staff of mammography technologists: Sharon Albertina, R.T., manager of radiology, who directs the entire technical staff; Roberta McQueen, R.T., supervisor

of the mammography technologists at Barnes and Jewish hospitals; Linda Schubert, R.T., supervisor at Barnes West Hospital; and Christine Focht, R.T., supervisor of the mobile mammography staff. The radiologists and technologists are a team with a common goal: saving lives through the early detection of breast cancer while providing quality care for women with symptoms that necessitate breast imaging.

For women with no symptoms of breast cancer, screening mammography is performed on the mammography mobile unit, at the Mammography Screening Center, and at the Jewish Hospital mammography service. Patients with clinical problems, breast implants, or a prior history of breast cancer can have diagnostic mammography performed at the Breast Diagnostic Center at Barnes or at the Jewish Hospital mammography service. Collectively, nearly 150 mammograms are performed daily.

With such a high volume of patients, an effective program must include teamwork and a mutual respect among radiologists and technologists. Monsees points out that a key factor in the success of the program is that all technologists work exclusively in mammography, and are either specialty certified as mammographers or are in the certification process. As a result of the mammographer's familiarity with the technique, consistently high quality images are obtained.

If images are poor, some cancers may go undetected. In the Breast Imaging section, a series of checks and balances insures that achieving quality is a daily routine. Monthly meetings among Monsees; the radiology manager and supervisors; Michael Ward, R.T., M. Ed.; Barnes quality assurance manager; and Michael Ter-Pogossian, Ph.D., and Glenn Fletcher, Ph.D., Mallinckrodt Institute medical physicists, address policies, problems, and solutions.

"We not only review and interpret standards, we make certain that all standards are met and documented. What we see as necessary to achieve quality films is accomplished," says Monsees.

Diane Radford, M.D., Washington University assistant professor of surgery and Barnes Hospital breast surgeon, frequently uses the services provided by the Breast Imaging section. "I rely on them very heavily," she says. "The quality of mammography films and interpretations are very important. I can't use too many superlatives to describe their work." □





## MIR RADIOLOGISTS CALL FOR A RADIOLUCENT BREAST IMPLANT FILLER

Augmentation mammoplasty, a breast-enlargement procedure using a sealed silicone gel- or saline-filled prosthesis, has been available to women since the 1960s. Since then, between 1 and 2 million women have undergone breast augmentation, making it one of the most frequently performed procedures in plastic surgery.

Weekly, as many as 10 women with augmented breasts come to one of the Medical Center's mammography facilities. Although screening mammography is the best diagnostic test for detecting clinically occult tumors in the unaugmented breast, implants are opaque to X rays and block 22 to 83 percent of the breast tissue.

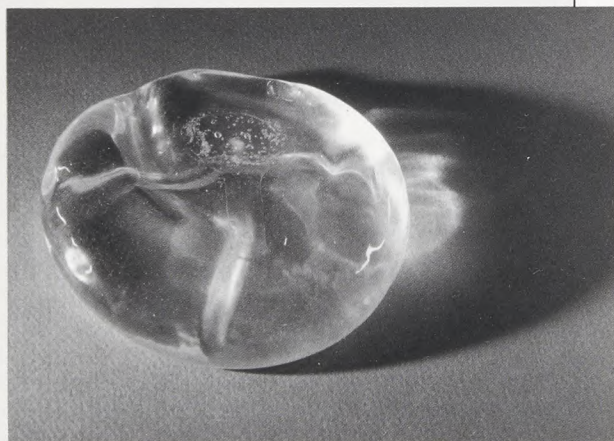
In an attempt to better visualize the overlying breast tissue, mammographers obtain special views, called "pinch" or displacement views, where the breast tissue is pulled forward from the implant and selectively compressed, in addition to the standard views. But even these do not afford the entire breast to be visualized.

In 1987, Mallinckrodt Institute radiologists decided there had to be a better way. Prompted by Louis Gilula, M.D., chief of musculoskeletal radiology, a search began for a new, radiolucent breast implant filler. Gilula, Monsees, and former colleague Dr. Judy Destouet, asked Leroy Young, M.D., a Washington University plastic surgeon, for his help in contacting implant manufacturers for collaboration on the research.

When outside suppliers expressed little or no interest in the project, the research team went to John Eichling, Ph.D., the Institute's radiation safety officer. Pulling out the textbooks, Eichling calculated the effective atomic number for breast tissue, based on the ratio of glandular fat in a normal breast.

The atomic number of various substances is the chief determinant of the final image's character. Substances with high atomic numbers, such as the silicone gel used in most implants, are more opaque and block X rays almost as much as bone does. This opacity causes all tissue overlying the implant to be hidden on a mammogram. An implant filled with a material similar to the low effective atomic number of breast tissue was clearly needed. Eichling's search for naturally-occurring materials identified several possible candidates, including triglycerides such as peanut and sunflower oils.

Subsequently, a medical manufacturer provided experimental implants and testing began: the implant shell alone; shells filled with either peanut oil or sunflower oil; shells filled with saline or silicone gel. X rays taken of each of the implants, which overlay a phantom simulating breast cancer



masses and microcalcifications, provided positive results. The implants containing peanut oil or sunflower oil were radiolucent; the silicone-gel and saline fillers completely obscured mammography while the implant shell had little or no effect on resolution.

With the help of A/W Company, which investigates commercial outlets for Washington University research, Destouet, Eichling, Gilula, Monsees, and Young now hold the patent for a radiolucent breast implant filler. Lipo-Matrix, a Palo Alto, California-based company formed through the cooperative efforts of A/W, is developing the implants and designing appropriate clinical trials. Research is in the preclinical stage, awaiting FDA approval. □



# THE ART of BREAST IMAGING

## SCREENING GUIDELINES CONTROVERSY

A recent National Cancer Institute (NCI) conference concluded that there is no proven benefit in annual or biannual mammography screening for women under 50 years of age. In a highly controversial act, the NCI removed its recommendation for routine screening mammography for women under age 50. The American Cancer Society (ACS), the American College of Radiology, and the American Medical Association continue to recommend mammography screening for women over age 40. Although the NCI advises women to seek the advice of their

personal physicians, its "Updating the Guidelines" report recommended mammography screenings for women 50 and older at one- or two-year intervals.

"It's confusing to women. If experts in the American Cancer Society and NCI can't agree on guidelines, how will women decide? It leaves room for a lot of confusion and rightly so," says Monsees. "I fear that women will not be as compliant with ACS recommendations. A consequence will be that some breast cancers will wait years to be detected, until they can be felt, and at that point it may be too late."

NCI's report was based on an evaluation of eight studies conducted during the last 30 years. Many experts point out that the studies were flawed and do not have the statistical power to provide proof even if it exists. Critics of the NCI lashed out that the recommendation was impacted by cost factors.

"I think the NCI's decision is important because it will eventually impact reimbursement for mammograms," Monsees says. "If the NCI doesn't recommend screening under age fifty, this will create a two-tiered system — women under fifty years of age who can afford to have screenings, and those who can't."

Until the guidelines for screening mammography are changed, Mallinckrodt Institute radiologists will continue to follow these recommendations:

- Ages 40 to 49 — Mammogram every one to two years, based on risk factors.
- Age 50 and up — Mammogram every year.

Monsees recommends that women over age 40 have yearly mammograms. "Younger women tend to have faster growing tumors. For this reason, two years between screenings may be too long." □

## DR. CELETTE SUGG SKINNER

The ability to tap into Mallinckrodt Institute's data base of 86,000 mammography screenings, which have been collected for over seven years, is like mining for gold to Celette Sugg Skinner, Ph.D., research instructor in radiology.

Joining the breast imaging research team last fall, Skinner specializes in public health and health behaviors but has a special interest in mammography screening utilization. Skinner's research of the effect of physician-to-patient message tailoring, conducted when she was at the University of North Carolina at Chapel Hill, appeared in the January issue of the *American Journal of Public Health*. Interest in the topic has captured national media attention.

"We knew that doctors' recommendations for screening were key predictors in whether patients followed through and had a mammogram," says Skinner.

"We wanted to determine whether printed, tailored recommendations addressing women's specific screening and risk status and their perceptions about breast cancer and mammography made a difference," she adds.

The results were that tailored physicians' recommendations did affect whether hard-to-reach populations had mammograms. More African-Americans and low-income women who received tailored messages went on to have mammograms than those who received a standard letter.

With a master's degree in communications and having worked professionally in market research, Skinner's perspective in applying basic marketing techniques to

## FACILITY ACCREDITATION

There are currently 12,000 mammography units in the country. More than 50 percent of those units, including those at Barnes and Jewish hospitals and on the mammography van, participate in voluntary accreditation through the American College of Radiology. In October of this year, the Mammography Quality Standards Act (MQSA), under the control of the Food and Drug Administration, will require that all mammography facilities be accredited.

For accreditation, mammography facilities must use dedicated mammography equipment, adhere to quality assurance programs, hire qualified technologists and physicians, and submit images for review. Noncompliance could result in a fine of up to \$10,000 for each failure or for each day a facility is noncompliant. □



health care has made an impact. "The idea is to address issues of importance to individual women," she says.

The goal of her research was to examine how to get women to continue coming for mammograms by first understanding their beliefs and perceptions about breast cancer and mammography screening. Once behavior predictors are known, it is possible to develop a means of intervention in public health, says Skinner. This can be accomplished simply by an informational brochure or a mass screening program.

Working with Maria Schmidt, M.D., and Thomas Pilgram, Ph.D., Skinner's goals for the Institute's data base are to explore whether factors such as the source of mammogram referral or women's experiences with the possibility of abnormal mammographic findings affect whether they return as often as they should for screenings.

"Many studies look at these issues but don't have the years of data we have here. It's an interesting and important question — do women have different screening patterns because of their experiences? This will help us figure out how to get patients to come for screenings," says Skinner.

While Skinner mines the data base for gold, somewhere up the road patients may reap the rewards of participating in a regular mammography screening program. □



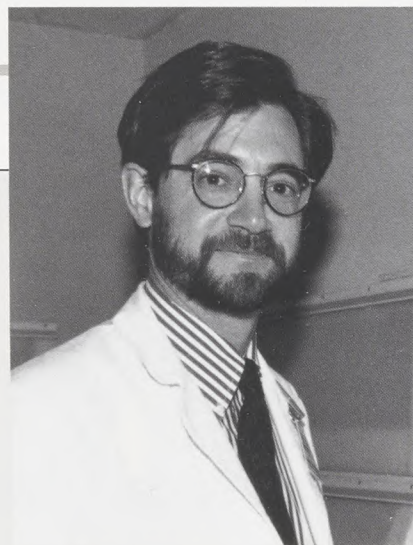
Celette Sugg Skinner, Ph.D.

## DR. PETER SHILE

**P**eter E. Shile, M.D., assistant professor of radiology, comes to Mallinckrodt Institute from the University of Pennsylvania where he completed fellowships in breast imaging and medical informatics. While interviewing for positions in breast imaging, he was particularly impressed with the quality care offered to women at the Institute's breast imaging services. He finds both the Breast Diagnostic Center and the Mammography Screening Center to be "extraordinarily comprehensive and efficient."

"I work with top-of-the-line equipment, an outstanding group of radiologists, and superb technologists and support staff," he comments. "This service offers high quality exams and thorough patient tracking and follow-up."

In addition to his clinical training, Shile brings training in radiological informatics to MIR's new breast imaging section. He defines his research interests as "the application of computers to information handling in radiology." A major portion of Shile's research training during his University of Pennsylvania fellowship involved a three-year, \$5 million National Institutes of Health study to evaluate the effectiveness of a Picture Archiving and Communications System (PACS). His work focused on evaluating the impact of PACS on the transmission of radiological information to intensive care units.



Peter E. Shile, M.D.

"Electronic communication of radiological information will almost certainly lead to more efficient patient care and, as a result, will play an important role in medicine as health-care reform advances," says Shile.

One of the Institute's attractions for Shile was the large data base of information that has been collected for mammography screening. He and Barbara Monsees, M.D., section chief of breast imaging, hope to link this data base with the tumor registries in Missouri and Illinois — a project that, according to Shile, would provide a complete source of data for doing outcome studies.

The Electronic Radiology Laboratory (ERL), headed by G. James Blaine, D.Sc., was another of the Institute's attractions for Shile: "The ERL is a world-class center of expertise and is at the forefront of implementing and developing technologies for acquiring, storing, transmitting, and displaying radiological images in digital format." Through collaboration with ERL scientists, Shile hopes to improve diagnostic accuracy in mammography by developing new ways to process and display image information in mammograms. □



THE RELIABILITY OF

# MRI

BY VICKI KUNKLER

One of the first magnetic resonance imaging (MRI) scanners in the world arrived at Mallinckrodt Institute in the summer of 1983. At that time, MRI was the newest of the imaging modalities, and Institute scientists were eager to investigate the technology. During the past 10 years, MRI has proven to be a reliable tool for clinical and research applications.

Under the direction of Jeffrey J. Brown, M.D., chief of the MRI section, the Institute now is leading a multicenter study that may provide patients who have adrenal masses with a noninvasive means for determining if the lesion is benign or malignant. Institute faculty are collaborating with researchers and clinicians from Georgetown University Medical Center, the University of North Carolina at Chapel Hill, New York University, the University of California at Los Angeles, and the University of Alabama at Birmingham. And according to Brown, the technique is working extremely well.



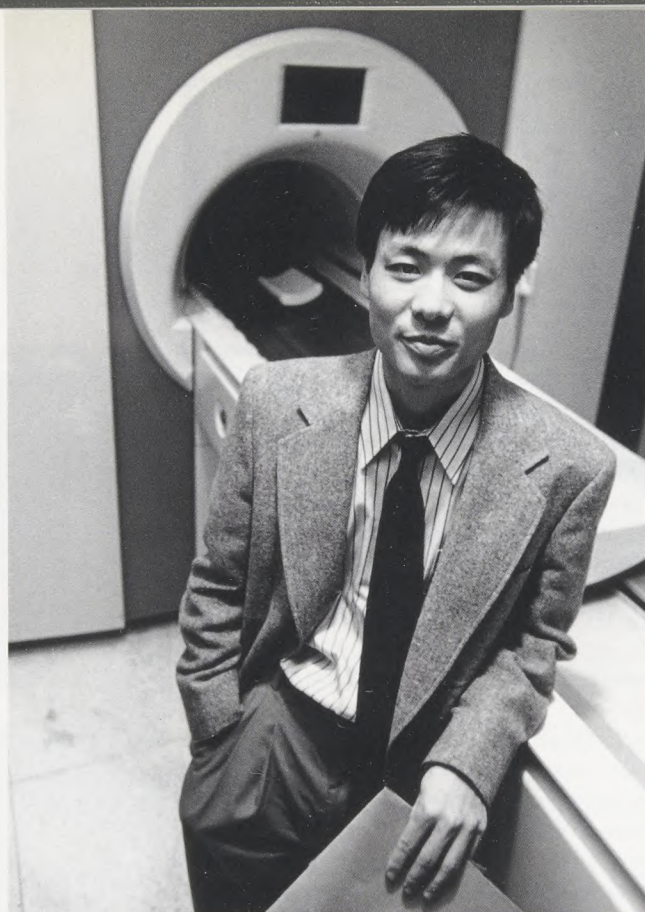
**S**ituated just above the kidneys, the adrenal glands are common sites for both benign and malignant lesions. Generally, clinicians have two options when an adrenal mass is discovered: biopsy under computed tomography (CT) guidance or following the patient while performing interval imaging studies.

The lesion often cannot be ignored because of possible malignancy, says Brown, but the physician may be hesitant to pursue aggressive diagnostic methods, such as biopsy, because the majority of the lesions are benign.

Although adrenal lesions usually are discovered incidentally on CT scans, computed tomography has limited capabilities in characterizing these lesions. Histologically, adrenal lesions contain water and a large amount of fat, roughly 40 percent. Magnetic resonance further distinguishes soft tissues: muscle, tendon, ligament, articular and fibroid cartilage, fluid, blood, flowing blood, and, most importantly in the case of adrenal lesions, fat.

Using no ionizing radiation, magnetic resonance imaging is based on interactions between a large magnetic field in the imaging equipment and the atoms in the human body. The imaging data in MRI is detected in a manner similar to the signal received by an ordinary radio with a receiver coil or antenna. The data is then processed by computer to produce the images.

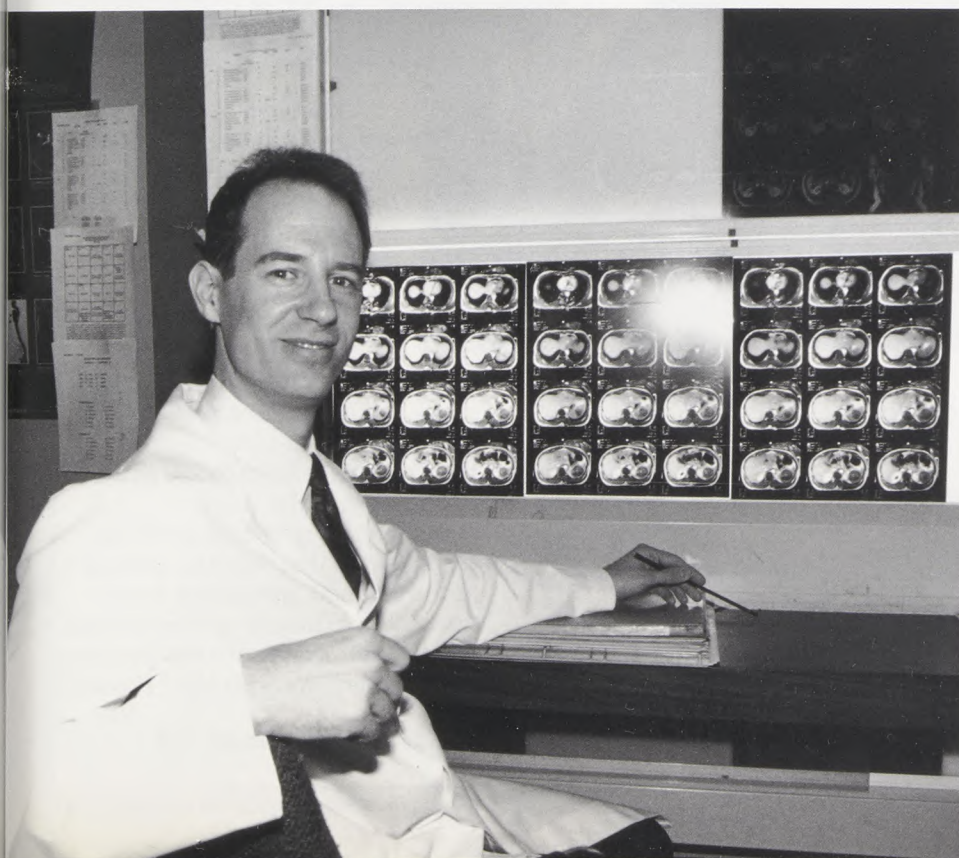
Brown points out that as far back as 1986 researchers were testing whether MRI could diagnose malignancy in adrenal lesions but because of small study population and older imaging techniques, the studies did not produce reliable results. "In the end, MR lost credibility for this type of study," he says.



As an MR physicist, Debiao Li, Ph.D., develops data acquisition techniques so that magnetic resonance images contain high resolution, less image artifacts, and the best possible signal and contrast.

**A**n article authored by researchers at Thomas Jefferson University Hospital and Jefferson Medical College, which was published in the November 1992 issue of *Radiology*, renewed Brown's interest in MR imaging of the adrenal glands. The article advocated diagnosis of adrenal lesions by chemical shift, or opposed-phase, imaging. By using this method, the imaging signal intensity from tissues is derived by subtracting the fat signal from the water signal. The article looked promising, says Brown. And since the Institute had joined the Body MR Research Group, comprised of academic institutions that use magnets manufactured by Siemens Medical Systems, he would have the opportunity to study a larger population that could produce improved results.

Under the direction of Jeffrey Brown, M.D., the Institute's magnetic resonance imaging section includes the laboratory of clinical radiology, which provides for the coordination and support of all clinical diagnostic research programs. Brown also is program director for the Institute's research residency program.





# MRI

**B**rown also had another ace in the hole — MR Physicist Debiao Li, Ph.D., assistant professor of radiology, rounded out Brown's research team of Joseph A. Borello, M.D., assistant professor of radiology, and Kevin L. Shady, M.D., MR fellow. In August of 1993 a group of MR physicists, led by E. Mark Haacke, Ph.D., professor of radiology, was recruited from Case Western Reserve University in Cleveland in anticipation of the construction of the Institute's new imaging research center. The center is slated for completion in November of 1994. The facility will be one of the best equipped centers worldwide where research will focus on the development and application of advanced MR techniques. These scientists have a broad range of research interests, including brain functional imaging, high resolution MR angiography, MR cardiopulmonary imaging, breast MR, fast imaging, general MR physics, and image reconstruction methods.

According to Li, the physicist's role in basic science research relates to the study of the fundamental theory and mechanism behind MRI. In clinical research, the physicist develops new MR techniques and modifies current techniques in order to meet the clinicians' needs. In the adrenal gland study, Li modified imaging techniques and optimized imaging parameters so the diagnostic criteria could be achieved. He was able to obtain the best signal and contrast by manipulating the system software and oversaw image quality control and image evaluation.

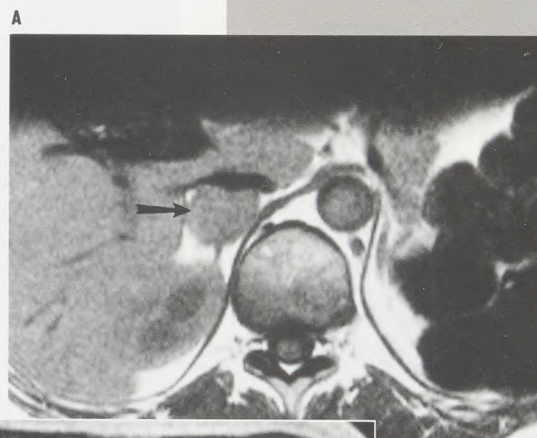


Figure 1 (left): Benign adrenal adenoma. (A) In-phase images shows a right adrenal mass (arrow) that is approximately isointense with the liver. (B) On the opposed-phase image, the mass (arrow) is markedly hypointense as compared to the liver.

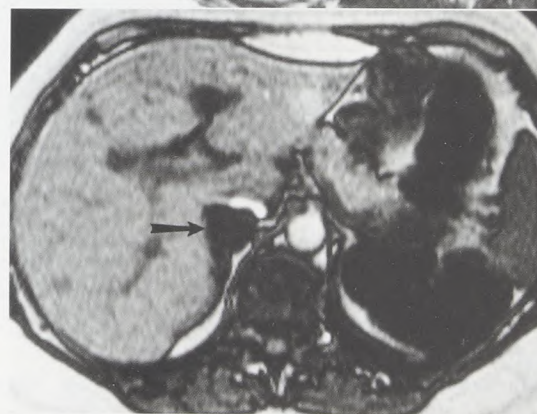
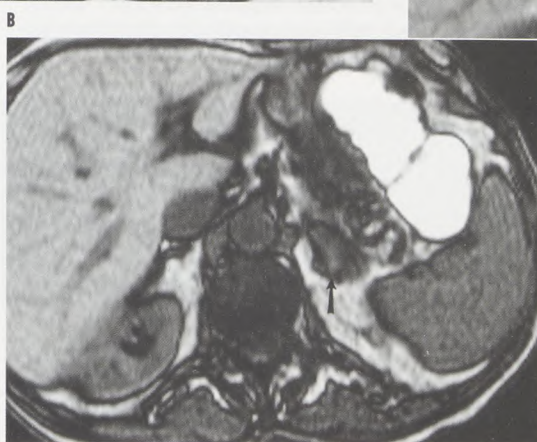
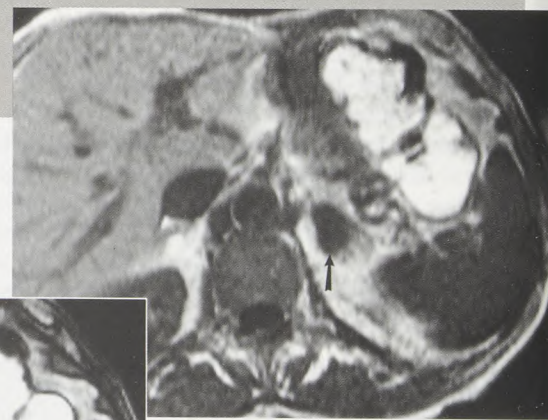


Figure 2 (below): Adrenal metastasis. (A) In-phase image shows a left adrenal mass (arrow) with a signal intensity similar to that of the spleen. (B) Adrenal mass (arrow) remains equal in intensity with the spleen on the opposed-phase image.



The black outlines around the adrenal mass and other structures are due to signal loss at fat/water interfaces and are characteristic of opposed-phase images.



The team members have examined 34 lesions at the Institute as well as 20 from the other institutions participating in the study. To date, the group's success rate for identifying benign adrenal lesions is nearly 100 percent — on one scan, the lesion

**"S**ome of the techniques are specific to the scanners," says Li. "The companies are continuously improving both the hardware and the software for their scanners. In order to achieve successful research, it is important that MR physicists establish a good working relationship with companies like Siemens."

was too small to make a definitive diagnosis; on another, metal from a surgical clip obscured the image. Brown plans to include 200 patients, collectively, in the study.

"Our goal is to have a reliable technique so that when an adrenal lesion is found, the patient won't need to go to biopsy or need to wait and see and worry. We can produce a reliable answer with MR," Brown says. □



Improving  
Improving

# Improving **CANCER THERAPY**

**T**he Mallinckrodt Institute of Radiology has long recognized that the birth of new treatment and diagnostic tools requires the marriage of researcher and clinician. The year-old Human Tumor Cell Biology Program, which brings together cancer biologists and radiation oncologists, represents another such MIR union. Among the results of this potentially fruitful partnership are tests to predict more accurately how human tumors will respond to different therapies.

Heading the program are researcher Joseph L. Roti Roti, Ph.D., associate director of the Radiation Oncology Center and chief of the cancer biology section, and clinician Todd H. Wasserman, M.D., chairman of the Radiation Oncology Center at Jewish Hospital. Participating in the cooperative venture are the entire cancer biology staff and clinicians from the Institute's Radiation Oncology Center and from Washington University School of Medicine's departments of Surgery and Otolaryngology - Head and Neck Surgery.

**BY CLIFF FROEHLICH**



# Improving Improving Improving CANCER THERAPY

**T**he seed for the joint project was planted by the biologists. "It originated," Roti Roti explains, "because the cancer biology section had a program in place to better understand the way certain cellular structures and functional components relate to how tumor cells respond to therapeutic agents." Out of this project grew the Human Tumor Cell Biology Program, a broad-based approach to developing predictive assays: tests to measure, in Roti Roti's words, "a particular function that may exist in a tumor."

The program is working on a multiplicity of assays, says Roti Roti: "We're investigating four or five different DNA damage-and-repair assays, also assays for proliferation and for certain types of oncogenic transformation, or gene mutation. There are ten different protocols already written."

Some of these assays, of course, will prove more practically applicable than others. In the best case scenario, an assay will have real clinical utility. "An assay could develop into a test that clinicians would routinely use, a test similar to the estrogen-receptor assay commonly used in breast cancer," says Wasserman. "If a patient had, say, X value on the test, then that would indicate a poorer or better prognosis, and treatment might be altered. Certainly outcome can be predicted, and sometimes the option of altering treatment may improve that outcome."



**T**he program's broad scope — its simultaneous exploration of many assays — is one of its primary distinguishing features. According to Roti Roti, other trials take an assay and run with it. Although MIR doesn't necessarily have the definitive test, the researchers are looking for assays that ought to predict response based on biological principles. "Ours is a systematic approach," he says.

"There are investigators who are conducting a trial of one assay, and they're studying it in hundreds of patients," Wasserman continues. "We've opted to stick to a more broad development of assays, not broad testing of a single assay. When we come up with an assay that we feel is really worthwhile, we'll be very happy to run with it vis a vis RTOG [Radiation Therapy Oncology Group, the radiation therapy national research group]."

Wasserman points out that the Institute's methods for developing an assay are similar to those followed by companies. And, in fact, some of the work may end up being proprietary or patented or applicable to outside support.

*"This project is a way to translate cancer biology into clinical trials and eventually clinical practice."*

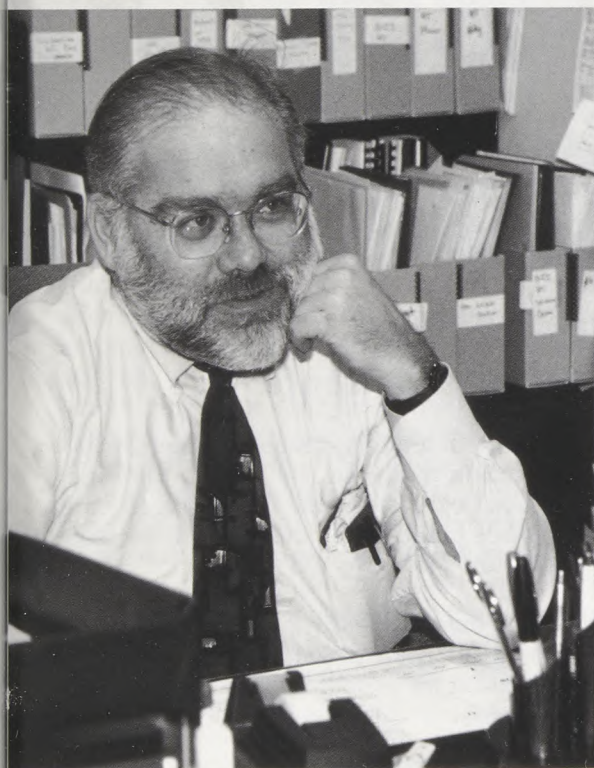
**P**otentially beneficial though the tests may prove, both Wasserman and Roti Roti emphasize that the development of new assays is not the sole benefit to be derived from the Human Tumor Cell Biology Program. The biologists also gain additional information about tumor biology, streamlining techniques, and different ways of detecting important prognostic variables.

One of Roti Roti's particular goals for the project is the scientific enhancement of future clinical trials. One of the differences Roti Roti hopes to achieve is the development



Left: Joseph L. Roti Roti, Ph.D. professor of radiology, also carries joint appointments at Washington University as professor of cell biology and physiology and professor of biochemistry and molecular biophysics.

Below: Todd Wasserman, M.D. is a recognized authority in the treatment of Hodgkin's disease and was instrumental in introducing to the St. Louis region the concept of stereotactic radiotherapy of brain tumors.



of a hypothesis-driven clinical trial. Most clinical trials now are more empirical, he says, citing as examples the failed hyperthermia and hypoxic-sensitizer trials.

In these trials, no difference was seen between patients who were given an experimental treatment and those who were not. "So we achieved what is termed 'null hypothesis.' The patients weren't harmed by it, but the treatment had no effect," Wasserman explains. "One of the problems was that with such a heterogeneous population, the potential of seeing an effect was washed out. What we'd like to have seen was the ability to define in advance which patients would and

would not benefit. Maybe then the trial would have been positive."

Researchers hypothesize that the hypoxic-sensitizer trial may have failed because of the heterogeneous population, or because human tumors do not have the type of hypoxic-cell population tested, or because in human tumors those hypoxic cells will not respond in the same way as rodent tumors respond. They also believe that the hyperthermia trial may not have been successful because the tumor was not heated or because human cells are more resistant to heat than are rodent cells.

**W**ith information provided by the Human Tumor Cell Biology Program, future trials should stand a better chance of success. "We'll try to find molecular markers," says Roti Roti. "For example, in hyperthermia, we know that certain proteins are present when cells are more resistant to heat. We might ask the question of whether those proteins are present in the human tumor population that would figure into such a trial.

Those kinds of questions are what this program is attempting to solve."

Another of the unique aspects of the Human Tumor Cell Biology Program is hinted at in its name: its use of human tumors. "For the most part, biology research has traditionally been conducted using mouse tumors," Wasserman says. "There is a great deal of sameness between a human tumor and a mouse tumor. That sameness is good from the biologist's point of view because it affords the ability to work up an assay very cleanly, but it's not clean necessarily in the reality of life."

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*"An assay could develop into a test that clinicians would routinely use..."*

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Roti Roti amplifies: "There are whole fields of treatment and modality development that are compromised by the fact that all the work done previously was on mouse tumors. In hyperthermia, for example, the way rodent cells cope with heat stress is very different from the way human cells cope. Therefore, when a clinical trial is developed based on radiation-biology experience, all of which is obtained from rodent cells and systems, it runs the risk of having a flawed rationale."

**B**ut Wasserman is quick to point out that work with human tumors by no means devalues or eliminates experimentation with rodents. "Tumor biology on rodent cells will continue," he says. "There are certain aspects in development for which the researcher cannot be dependent on human tumors to do the work."

The project heads are pleased with the progress of the project thus far. "I'd say our goal in the first year or two was to get assays up and running," says Wasserman. That accomplished, much still remains to be done. "This project is a way to translate cancer biology into clinical trials and eventually clinical practice," adds Roti Roti. "The project's in phase one of the translation process." □



# THE Challenge OF MANAGED Care AND MANAGED Competition

BY RONALD G. EVENS, M.D.,  
AND JONATHAN H. SUNSHINE, PH.D.

**P**ayment for health care in the U.S. has changed rapidly during the 1980s, with the changes often identified by three-letter acronyms such as HMO, PPO, DRG, and RVS. Changes are likely to be even more rapid and fundamental in the next few years. Managed care and managed competition are the terms principally being used to describe these changes. In this overview, the goal is to present briefly the changes that have occurred, the changes we are likely to see, the implications of these changes for radiologists, and how radiologists can respond most effectively.

## The Changing World of Health Care Payments

Conventionally, indemnity insurance payment as we knew it is already on the way to oblivion, with managed care replacing it. Managed care today comes in three broad forms that embody increasingly radical departures from the old model:

- What we'd call managed-conventional coverage in which patients or their physicians must obtain prior authorization for hospitalization and (increasingly) for expensive outpatient services, such as surgery or MRI.
- PPOs (preferred provider organizations), alternatively known as point of service (POS) arrangements. Under these, insurance typically pays in full, according to a negotiated fee schedule, if a patient uses a network or preferred physician or hospital but pays only 80 percent if the patient uses an outside provider. Purportedly, these networks were organized by selecting practitioners who are efficient in their practice patterns (use few tests, are slow to recommend surgery, etc.) and modest in their fees. In most cases, PPOs have tended to be a vehicle for obtaining discounted fees with little attention paid to practice patterns.



■ HMOs (health maintenance organizations), in which a patient has no coverage unless he or she uses a doctor or hospital that is part of the HMO. HMOs come in two basic forms: the group or staff model in which salaried physicians are involved essentially full time with HMO patients, and the more open IPA (individual practice association), in which physicians maintain their own practices and see HMO patients as only part of their workload.

The change to managed care is fueled by a desire to attack the problem of the rapidly rising cost of health care in the U.S. The pace of change is likely to accelerate as the Clinton Administration brings forth its solution — managed competition. Under managed competition, employees will have a choice among private health plans offering (more or less) standardized benefit packages. Employees will make the choice on the basis of price and quality, with any cost above that of the least expensive plan being paid by the employee rather than the employer. Quality information will presumably include patient satisfaction and health outcomes data developed by the HIPC (health insurance purchasing cooperative) that will manage the system in each area. The Clinton plan is expected also to provide for coverage of all Americans, including a requirement that an employer provide coverage for all employees and dependents regardless of company size.

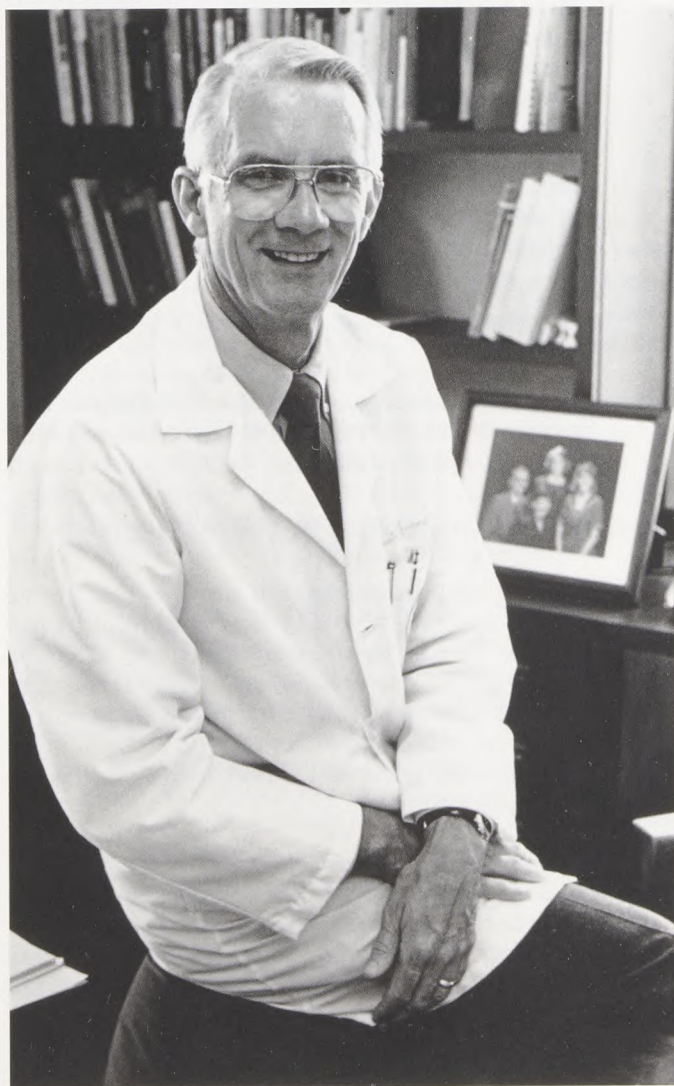
Most likely, under managed competition, HMOs will come to cover a majority of the non-elderly population, as compared to the current 15 percent. Experience with federal employees under arrangements similar to managed competition points to this prediction. The Clinton plan is expected also to include some form of global budget ceilings, which will create further pressure to contain increases in health-care spending. Moreover, even if no major legislation is enacted soon, employees will continue to seek nontraditional forms of managed care in an attempt to hold down their health-care costs. In short, we [radiologists] must expect that more and more of our work will take place under payment systems that are decidedly different from the indemnity fee-for-service system we have become accustomed to. Indeed, Clinton advisors expect that even managed conventional care (for example, self-insured large corporations) will become a vanishing arrangement, with PPOs and HMOs covering all but a small percentage of nonelderly patients. Currently, it appears that Medicare will remain in place as a health-care system for the elderly, but there will be increasingly stringent cost controls.

## Implications for Radiologists

The implications of these changes should generally be favorable to radiology by radiologists. As a profession we have emphasized good quality at moderate cost and the elimination of waste, as in self-referral. However, there will be serious problems as philosophy becomes reality. For example, cost will probably be emphasized over quality because cost is easier to measure; pressures on costs will be continuous even after major savings have been achieved; and it is easy to predict there will be more competition among radiology groups.

More specifically, the implications of payment system changes for radiologists will be the consequences of what happens with payers. Our predictions:

Ronald G. Evens, M.D.





# THE Challenge

## PPO

## HMO

- Rapidly dwindling numbers of insurers who pay billed charges.
- Growth of PPOs and HMOs.
- Increasing pressure on prices by PPOs, i.e., demands for greater discounts.
- In order for PPOs to remain competitive, they will develop a greater ability to steer patients away from practices and hospitals that don't agree to their terms, e.g., requiring patients to pay 40 percent or more of charges of non-network providers.
- All payers will increasingly use data bases to identify practice patterns in order to profile physicians and to institute practice guidelines.
- HMOs will change to meet the organizational demands of rapid growth, e.g.,
  - A desire to contract with one entity, typically a large multi-specialty group or a large primary care practice, for all physicians' services in a geographic area. Where the contract is with a primary care practice, that practice will turn around and subcontract specialty care, including radiology (preferably with a single low bidder).
  - Increasing insistence on capitation (rather than modified fee-for-service) as the method of contracting.
  - Increasing insistence that the HMO physicians practice in the hospitals the HMO has selected and on the HMO's terms.

## How Radiologists Can Respond

**A**s with previous changes in our profession, we should respond in a way that is helpful to our patients as well as to radiologists. An effective response should involve actions on several fronts and should include activity by individual radiology practices as well as by the ACR [*American College of Radiology*] and state radiologic societies. Fundamental issues we must jointly address:

- Self-referral generates excessive utilization and costs as well as undercutting radiologists. It is time to take action not only on joint ventures (physicians referring to outside facilities in which they have a financial interest) but also on nonradiologists performing radiologic studies.

- Given the cost pressures that are likely in all settings, practice efficiency has to be high.

▪ Capitation contracts or other departures from fee-for-service are likely to make the increasing volume of imaging performed by radiologists (previously considered a major plus for our profession) into something of a problem. Under capitation, more volume means radiologists do more work and have more practice costs for the same revenue. To address this problem, the College [ACR] is developing patient-care guidelines — a set of algorithms identifying the appropriate and economical diagnostic imaging procedures to be used for a patient, given the patient's presenting condition. These guidelines will enable radiologists to consult with referring physicians and point out what studies are appropriate rather than largely following orders for specific studies. Development of a set of guidelines can do much to strengthen the argument for radiology by radiologists and the argument that radiologists rather than primary-care gatekeepers should decide on what imaging studies are performed. Such guidelines will be selling points to be used in negotiations with individual HMOs and PPOs. However, using the guidelines effectively will require radiologists to interact in a more active way with referring physicians.

Negotiating managed-care contracts is a complex and difficult activity. Advice to bear in mind:

- Contracting is time-consuming and, with the health-care system changing, contracting is constantly changing. Don't short-change the time and effort required to negotiate and to manage large contracts since these can affect major parts of a practice.

▪ At least at the start, stay with short-term agreements as a trial of the population. It is hard to predict how much care a population will require. It varies from one group to another, and the managed-care entity may not have good data initially. If possible, write stop-loss agreements into the contract so that if actual utilization differs from expected by more than a certain amount (say 10 percent), payments are adjusted. Also, it will be necessary to count utilization by RVUs [*relative-value unit*] and separately by different types of procedures, so a chest X ray and a CT study will not count as the same in any analysis.

- Keep good data on the utilization actually encountered. In particular, maintain accurate records of the data as this will be the basis for developing internal financial statistics for use in negotiating.



- Be responsive to the demands of managed-care organizations in proportion to the extent they can actually deliver (or move away) patients. As noted, most PPOs currently have relatively limited ability to move patients.

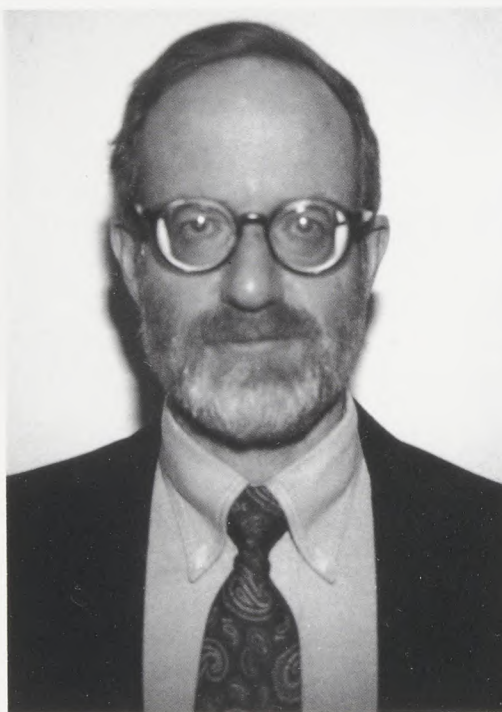
- Aim for diversification. Becoming heavily dependent on one managed-care organization makes a practice more susceptible to pressure from it.

Larger radiology groups or cooperation with other groups will be essential to meet the needs of managed-care organizations. In larger urban areas, managed-care organizations will typically want to offer services at more than one hospital and at several ambulatory sites, but they (or their principal physician group) will increasingly want to contract with only one radiology entity. The challenges will be particularly intense for solo or small-group practices located in relatively large population centers. We predict that the practice of medicine will undergo consolidation as has occurred recently in the airline industry.

Cooperative working arrangements with the affiliated hospital will become more important. Hospitals will be seeking managed-care contracts energetically and will be in no mood to have features of their exclusive contracts with hospital-based physicians become significant barriers to obtaining these contracts. Joint physician-hospital organizations (PHOs), built around a hospital's medical staff, may become a form of managed-care organization that offers physicians and hospitals a greater role and more rewards than do traditional managed-care organizations. Support of and involvement in PHOs will be a promising avenue for radiologists and other physicians. However, there are three cautions:

- Putting together a successful managed-care organization requires a good deal of skill and investment.
- If the hospital and physician partners insist on all the rewards of fee-for-service, the PHO will not succeed in a cost-competitive environment.
- Beware of the hospital-dominated PHO. Physicians should have a strong role in the governance of PHOs.

The speed and extent of changes will depend on local conditions. For example, if there is only one radiology group in an area and only one hospital in that area, competitive pressures will be much less than where radiology groups and hospitals are numerous.



Jonathan H. Sunshine, Ph.D.

But beware! Aggressive provider groups will be looking for high-cost geographic locales as green pastures. And managed-care organizations may import physicians to an area if they cannot work out satisfactory arrangements with local physicians.

Overall, we clearly face a period of major changes and pressures in health-care financing arrangements over the next few years. At this time, there are no quick, easy answers for radiologists, and the promised federal comprehensive reform plan will only make the situation more fluid — at least, temporarily.

Ronald G. Evens, M.D., director of Mallinckrodt Institute of Radiology, is secretary-treasurer and the elected vice-chairman of the ACR Board of Chancellors. Jonathan H. Sunshine, Ph.D., is director of research for the ACR. This article is an edited version of a newsletter Drs. Evens and Sunshine published for ACR members. A revised version will be published in an upcoming volume of the American Journal of Radiology.



## THE DIRECTOR'S OFFICE REPORT

### NEW STAFF

**Harold F. Bennett, M.D., Ph.D.**, assistant professor of radiology, Division of Diagnostic Radiology.

**Kim A. Deal, Ph.D.**, research associate, Division of Radiation Sciences.

**Jeffrey A. Dobkin, M.D.**, assistant professor of radiology, Division of Nuclear Medicine.

**Shantanu V. Kaushikkar, M.S.**, research associate, Division of Radiology Research.

**Steven E. Petersen, Ph.D.**, associate professor of radiology, Division of Radiation Sciences.

**Yuming Yin, M.D.**, research assistant in radiology, Division of Diagnostic Radiology.

**Yimin Zhu, D.Sc.**, research associate, Radiation Oncology Center.

**Darryl A. Zuckerman, M.D.**, assistant professor of radiology, Division of Diagnostic Radiology.

### PROMOTIONS

**Ming-shun Chen, Ph.D.**, was promoted to instructor in radiology, Radiation Oncology Center.

**Ge Wang, Ph.D.**, was promoted to assistant professor of radiology, Division of Radiology Research.

### PROMOTIONS & CHANGE IN STATUS

**Keith C. Fischer, M.D.**, was promoted to associate professor of radiology, Division of Nuclear Medicine, and appointed as a full-time staff member.

**Lawrence M. Kotner, Jr., M.D.**, was promoted to associate professor of radiology, Division of Diagnostic Radiology, and appointed as a full-time staff member.

**Scott A. Mirowitz, M.D.**, was promoted to associate professor of radiology, named chief of radiology, Jewish Hospital, Division of Diagnostic Radiology, and appointed as a full-time staff member.

**William R. Reinus, M.D.**, was promoted to associate professor of radiology, Division of Diagnostic Radiology, and appointed as a full-time staff member.

**Joseph L. Roti Roti, Ph.D.**, was named to a joint appointment as professor of cell biology and physiology and as professor of biochemistry and molecular biophysics.

### OFF STAFF

**Venkata R. Devineni, M.D.**, associate professor of radiology, Radiation Oncology Center, has accepted the position of chief of radiation oncology, DePaul Health Center, St. Louis.

**Paul W. K. Luk, M.S.**, research instructor, Division of Nuclear Medicine, completed a one-year appointment and has returned to Siemens/CTI in Knoxville, Tennessee.

**Vivek Mishra, Ph.D.**, research associate, Radiation Oncology Center, has accepted a position at Thomas Jefferson University, Philadelphia.

## VISITING PROFESSORS & INVITED LECTURERS

**Dennis M. Balfe, M.D.**, professor of radiology, presented "CT Evaluation of Hepatic Lesions: Dynamic Spiral Scans, CT Arteriography - How to Get the Most Out of Your CT Request" at the Refresher Course and Update in Gastrointestinal Surgery, Washington University School of Medicine, St. Louis, March 10 and 11.

**James A. Brink, M.D.**, assistant professor of radiology, spoke on "Spiral Computed Body Tomography: Applications in the Chest and Abdomen" at the City-Wide Radiology Conference, St. Louis, December 13. He lectured on "Spiral CT" at the Greater St. Louis Society of Radiologists' meeting, St. Louis, January 18. Brink spoke on "CT Angiography" at the New York Roentgen Society meeting, New York, January 24. As visiting pro-

fessor, Brink presented "Spiral CT of the Chest and Abdomen" at New York University, New York, January 25. He lectured on "Radiologic Imaging in Diagnosis and Management of Acute Pancreatitis" at the Refresher Course and Update in Gastrointestinal Surgery, Washington University School of Medicine, St. Louis, March 10 and 11. Brink participated in the Cross Sectional Angiography Workshop at the Society of Cardiovascular and Interventional Radiology meeting, San Diego, March 20. He presented "Spiral CT Overview" at the Orange County Radiological Society's meeting, Orange County, California, March 22. As visiting professor, Brink spoke on "CT of the Peritoneal Ligaments" at the University of California at Irvine, March 22.



**Patrick D. Datoc, M.D.**, instructor in radiology and a fellow in magnetic resonance imaging, spoke on "3D Fat-Suppressed Breathhold Imaging of the Kidneys" at the Society of Magnetic Resonance Imaging, Dallas, March 8.

**Bahman Emami, M.D., FACR**, professor of radiology and associate director for research, Radiation Oncology Center, as invited speaker, presented "Head and Neck Cancer. The Mallinckrodt Experience: 3D CRT for Head and Neck Cancers" at the The Twenty-Ninth Annual San Francisco Cancer Symposium, Washington, D.C., February 26 and 27.

**E. Mark Haacke, Ph.D.**, professor of radiology, spoke on "Applications of Contrast Agents to MRA and Cardiovascular Imaging" at Mallinckrodt Medical, Imaging Division, St. Louis, December 7. He presented "Recent Advances in MRA and Cardiovascular Imaging" at the University of Illinois, Urbana-Champaign, December 8. Haacke also spoke on "Image Reconstruction and Post Processing Problems in MRI" at the University of Erlangen, Germany, December 13.

**Jay P. Heiken, M.D.**, professor of radiology and cochief of body computed tomography, as moderator, presided over the plenary session on "MRI of the Abdomen and Pelvis" at the 12th Annual Meeting of the Society for Magnetic Resonance Imaging, Dallas, March 7.

**Myles B. Koby, M.D.**, instructor in radiology and a fellow in neuroradiology, presented "Cerebral Palsy: MRI Changes with Clinical Correlation in 236 Patients" at the Section on Pediatric Neurological Surgery, 22nd Annual Meeting of the American Association of Neurological Surgeons, San Antonio, December 10.

**Benjamin C. P. Lee, M.D.**, associate professor of radiology, presented "MRI Features of Spastic Diplegia and Quadriplegia at the Current Concepts of Cerebral Palsy Following Premature Birth Seminar, St. Louis, November 19 and 20.

**Henry K. Lee, M.D.**, instructor in radiology, spoke on "Chemoradiation for Gastrointestinal Tumors" at the Refresher Course and Update in Gastrointestinal Surgery, Washington University School of Medicine, St. Louis, March 10 and 11.

**Bruce L. McClellan, M.D.**, professor of radiology and chief of abdominal imaging, lectured on "Staging Renal Cell Cancers — Imaging Requirements" at Urology Grand Rounds, Washington University School of Medicine, St. Louis, February 5. He spoke on "Problem Cases in Renal CT" at the Sun Valley Imaging Symposium, Sun Valley, Idaho, March 3 and 4. McClellan presented "Contrast Media Reaction Update 1994," "Imaging the Retroperitoneum - Idiopathic Retroperitoneal Fibrosis and Lymphadenopathy," and "Staging Renal Cell Carcinoma — Imaging Armamentarium 1994" at the University of California, Diagnostic Course, San Francisco, March 22.

**Ali S. Meigooni, Ph.D.**, assistant professor of radiology, as visiting professor, presented "Nuclear Data Base Development for Medical Physics Application," Lawrence Livermore National Laboratory, Livermore, California, January 19 - 28. While there, Meigooni collaborated with the Laboratory's Nuclear Data Group, in conjunction with the Medical Applications Program in Livermore, to develop a Monte Carlo code for simulating dose deposition in radiation oncology. He spoke on "Clinical Applications of Radiochromic Films" at the Greater St. Louis Chapter of the Health Physics Society meeting, St. Louis, February 3.

**Stephen M. Moerlein, Ph.D.**, associate professor of radiology, presented two posters, "Compounding of [O-15]butanol for PET Blood Flow Measurements" (coauthored with **Gregory G. Gaehle, B.S.**, scientific coordinator; **Keith R. Lechner, B.S.**, senior medical research technician; and **Michael J. Welch, Ph.D.**, professor of radiology and director of the Division of Radiation Sciences) and "Robotic Preparation of [1-<sup>11</sup>C]acetate for PET Study of Diseased Myocardium" (coauthored with **Gaehle; Lechner; Charles S. Yahng, B.S.**, lab assistant; and **Welch**) at the 141st Annual Meeting of the American Pharmaceutical Association, Seattle, March 19 - 23.

**Eduardo G. Moros, Ph.D.**, assistant professor of radiology and chief of hyperthermia physics service, presented "Finite Difference Model for 3-D Cancer Therapy with Hyperthermia" (coauthored with **William L. Straube, M.S.**, instructor in radiology, and **Robert J. Myerson, M.D., Ph.D.**, associate professor of radiology) at the 114th Winter Annual Meeting of the American Society of Mechanical Engineers, New Orleans, November 28 - December 3.

**Carlos A. Perez, M.D.**, professor of radiology and director of the Radiation Oncology Center, spoke on "High Dose Rate Brachytherapy for Gynecological Cancers" and "The Present Status of Radiation Therapy in the Treatment of Cancer" at the 11th Asia Pacific Cancer Conference, Bangkok, November 16 - 19. He presented "Radiation Therapy for Carcinoma of the Uterine Cervix" and "Radiation Therapy for Carcinoma of the Endometrium" at Chiang Mai University, Chiang Mai, Thailand, November 20 - 23.



## VISITING PROFESSORS & INVITED LECTURERS

*continued from page 23*

**James A. Purdy, Ph.D.**, professor of radiology and associate director of the Radiation Oncology Center, as keynote speaker, presented "3-D Treatment Planning - A New Era in Radiotherapy" and lectured on "Volume and Dose Specifications for 3-D CRT" and "Multi-Institutional Trials - 3D CRT Quality Assurance" at The Twenty-Ninth Annual San Francisco Cancer Symposium, Washington, D.C., February 26 and 27. He spoke on "3-D Conformal Radiation Therapy: Overview of the Washington University Experience" at the XIth International Conference for Computers in Radiation Therapy, Manchester, England, March 18 - 24.

**Henry D. Royal, M.D.**, professor of radiology and associate director of the Division of Nuclear Medicine, as invited speaker, presented "Pulmonary Embolism: Scientific Challenges" at The Eighth Annual Daniel R. Biello Memorial Lecture. St. Louis, February 14. He spoke on "Health Effects of Radiation" and "Health Effects of the Chernobyl Accident" at the Bethesda Naval Medical Center, Maryland, March 7. As invited lecturer for the 10th H. Leonard Warren Lecture, Royal spoke on "Technology Assessment and Health Care Reform: Scientific Challenges," University of Maryland Medical System, Baltimore, March 17.

**Gregory R. Saboeiro, M.D.**, instructor in radiology and a fellow in vascular and interventional radiology, spoke on "Percutaneous Cholecystostomy: Experience in 200 Patients" at the Society of Cardiovascular and Interventional Radiology meeting, San Diego, March 23.

**Stuart S. Sagel, M.D.**, professor of radiology, chief of chest radiology, and cochief of body computed tomography, lectured on "Chest Radiography: Low Technology to High Technology" and "Spiral CT in the Evaluation of Thoracic Vascular Disease" at the 60th Anniversary Symposium of the Hellenic Radiologic Society, Athens, Greece, December 11 and 12. As visiting professor, he presented "Spiral CT in the Thorax," "CT of Non Vascular Mediastinal Masses," and "CT of Focal Pulmonary Lesions" to the Department of Radiology, Bowman Gray School of Medicine, Winston-Salem, January 20 and 21. As guest lecturer, Sagel spoke on "CT of Vascular Mediastinal Lesions" at the New England Roentgen Ray Society, Boston, March 18.

**Janice W. Semenkovich, M.D.**, instructor in radiology, presented "Ventilation - Perfusion Imaging: Utility in Diagnosis of Non-thrombotic Disease," at the Society of Thoracic Imaging, Scottsdale, Arizona, March 11.

**Joseph R. Simpson, M.D., Ph.D., FACR**, associate professor of radiology, presented "Salvage Treatment for Early Glottic Failure" and "Radiotherapeutic Management of Pyriform Sinus Malignancy" at the Second World Congress of Laryngeal Cancer, Sydney, Australia, February 20 - 24.

**Michael J. Welch, Ph.D.**, professor of radiology and chemistry and director of the Division of Radiation Sciences, as guest speaker, presented "Cyclotron and PET for Developing Countries" at the 25th Annual Conference of the Society of Nuclear Medicine (India) and Annual Symposium by The Indo-American Society of Nuclear Medicine, New Delhi, December 14 - 17.

**O. Clark West, M.D.**, instructor in radiology, presented "Trauma Radiography" at the 4th District of the Missouri Society of Radiologic Technologists Educational Seminar, St. Louis, February 5.

**Anthony J. Wilson, M.B., Ch.B.**, associate professor of radiology and director of emergency radiology, gave a case presentation and spoke on "Ankle Fractures" at Harborview Hospital, University of Washington, Seattle, February 11. He presented 10 lectures on "Musculoskeletal Magnetic Resonance Imaging" at the International Diagnostic Radiology Course, Davos, Switzerland, March 19 - 25.

**Franz J. Wippold, M.D.**, associate professor of radiology, lectured on "Role of MRI in Head and Neck Imaging," "Imaging the Temporal Bone," "Cystic Lesions of the Neck," "Cervical Lymphadenopathy," and "The Larynx" at the Head and Neck Symposium, Hollywood, Florida, February 4 and 5.



# SYMPOSIA

## AMERICAN SOCIETY FOR THERAPEUTIC RADIOLOGY AND ONCOLOGY

*The following Mallinckrodt Institute staff members (highlighted in boldface type) participated in the 35th Annual Scientific Meeting of the American Society for Therapeutic Radiology and Oncology (ASTRO), New Orleans, October 11 - 15.*

**Perry W. Grigsby, M.D.**, chairman, Long Range Planning Committee; member, Abstract Review Committee.

**Todd H. Wasserman, M.D.**, member, Long Range Planning Committee.

## SCIENTIFIC SESSIONS

**Perry W. Grigsby, M.D.**, comoderator, Scientific Session A, "Gynecology - I."

**Todd H. Wasserman, M.D.**, comoderator, Scientific Session T, "Chemical Modifiers."

**Walter R. Bosch, D.Sc.**; **Daniel A. Low, Ph.D.**; **Russell L. Gerber, M.S.**; **Jeff M. Michalski, M.D.**; **Mary V. Graham, M.D.**; **Carlos A. Perez, M.D.**; **William B. Harms, B.S.**; **James A. Purdy, Ph.D.**, "An Electronic Viewbox Tool for Radiation Therapy Treatment Verification."

**Bahman Emami, M.D.**, "Phase III Study of Interstitial Thermoradiotherapy Compared with Interstitial Radiotherapy Alone in the Treatment of Recurrent or Persistent Human Tumors: A Prospectively Controlled Randomized Study by the Radiation Therapy Oncology Group."

**Mary V. Graham, M.D.**; **Nilesh L. Jain, M.S.\***; **Michael G. Kahn, M.D.\***; **Robert E. Drzymala, Ph.D.**; **Michael A. Mackey, Ph.D.**; **James A. Purdy, Ph.D.**, "Validation and Clinical Usefulness of an Objective Plan Evaluation Model in the Three-Dimensional Treatment of Non-Small Cell Lung Cancer."

\*Division of Medical Informatics, Department Of Internal Medicine and Department of Computer Science, Washington University School of Medicine, St. Louis.

**Ryuji Higashikubo, Ph.D.**; **Robert S. Malyapa, M.D., Ph.D.**; **Joseph L. Roti Roti, Ph.D.**, "Flow Cytometric Studies of S1 Nuclease Digestion Kinetics and Its Application in the Determination of Intrinsic Cellular Radiation Sensitivity."

**Carlos A. Perez, M.D.**; **Mary V. Graham, M.D.**; **Bahman Emami, M.D.**; **Russell L. Gerber, M.S.**; **John W. Matthews, D.Sc.**; **William B. Harms, B.S.**; **James A. Purdy, Ph.D.**, "A Fully Integrated CT-Simulator: Conceptual Design and Clinical Applications."

**James V. Piephoff, M.D.**; **Jeff M. Michalski, M.D.**; **Walter R. Bosch, D.Sc.**; **Mary V. Graham, M.D.**; **William B. Harms, B.S.**; **James A. Purdy, Ph.D.**; **Carlos A. Perez, M.D.**, "A Method to Evaluate the Impact of Daily Treatment Variation on 3-Dimensional Dose Distribution."

**Richard Valicenti, M.D.**; **Jeff M. Michalski, M.D.**; **Russell L. Gerber, M.S.**; **Mary V. Graham, M.D.**; **Abel Y. Cheng, M.S.**; **Walter R. Bosch, D.Sc.**; **James A. Purdy, Ph.D.**; **Carlos A. Perez, M.D.**, "Comparison of Weekly Port Films and On-Line Portal Images in Estimating Treatment Variation."

## PANEL DISCUSSIONS

**Todd H. Wasserman, M.D.**, moderator, "Quality of Life: A New Endpoint in Outcome Analysis."

## POSTER PRESENTATIONS

**Perry W. Grigsby, M.D.**; **Jonathan A. Haas, B.A.\***; **Barry A. Siegel, M.D.**, "Utility of Pre- and Post-Treatment Total Body I-131 Scans in Patients with Thyroid Carcinoma." \*medical student, Washington University School of Medicine, St. Louis.

**Robert J. Myerson, M.D., Ph.D.**; **Jeff M. Michalski, M.D.**; **Maurice L. King, M.D.**; **Elisa Birnbaum, M.D.\***; **James Fleshman, M.D.\***; **Robert Fry, M.D.\***; **Ira J. Kodner, M.D.\***; **David Lacey, M.D.\*\***; **Mary Ann Lockett, MBA**, "Adjuvant Radiation Therapy for Rectal Carcinoma: Predictors of Outcome." \*Department of Surgery, Washington University School of Medicine, St. Louis. \*\*Department of Pathology, Washington University School of Medicine, St. Louis.

**Marie E. Taylor, M.D.**; **Carlos A. Perez, M.D.**; **Karen J. Halverson, M.D.\***; **Robert R. Kuske, M.D.\*\***; **Robert J. Myerson, M.D., Ph.D.**; **Joseph R. Simpson, M.D., Ph.D.**, "Factors Affecting Cosmesis After Breast Conservation Therapy." \*Department of Radiation Oncology, St. Luke's Hospital, St. Louis. \*\*Department of Radiation Oncology, Ochsner Clinic, New Orleans.

## REFRESHER COURSES

**Perry W. Grigsby, M.D.**, "Carcinoma of the Endometrium - Prognostic Factors and Management."



## SYMPOSIA

*continued from page 25*

### MIDWESTERN REGIONAL RADIATION RESEARCH

*The following Mallinckrodt Institute staff members (highlighted in boldface type) participated in the Ninth Annual Meeting of Midwestern Regional Radiation Research, St. Louis, November 12 - 14.*

**Joseph L. Roti Roti, Ph.D.**, chairperson, Organizing Committee.

**Douglas R. Spitz, Ph.D.**; **Joseph L. Roti Roti, Ph.D.**, members, Program Committee.

**Kathy Bles, James Patterson, Naima Sidiqi**, members, Local Arrangements Committee.

### SYMPOSIUM I: FREE RADICAL BIOLOGY AND GLUTATHIONE

**Michael A. Mackey, Ph.D.**, chairperson.

**Douglas R. Spitz, Ph.D.**; **John W. Phillips, Ph.D.\***; **Donna T. Adams, B.S.\*\***; **C. Michael Sherman,\*\***; **Dennis F. Deen, Ph.D.\***; **Gloria C. Li, Ph.D.\***, "Cellular Resistance to Oxidative Stress Is Accompanied by Resistance to Cisplatin: The Significance of Increased Catalase Activity and Total Glutathione in Hydrogen Peroxide-Resistant Fibroblasts." \*University of California, San Francisco. \*\*University of Virginia, Charlottesville.

**Douglas R. Spitz, Ph.D.**; **Shannon J. Sullivan, M.D.**; **Michael T. Kintner, Ph.D.\***; **Donna T. Adams, B.S.\***; **C. Michael Sherman, B.S.\***; **Robert J. Roberts, Ph.D.\***, "Mechanisms of Resistance to Oxidative Stress O<sub>2</sub>-Resistant Cells." \*University of Virginia, Charlottesville.

### SYMPOSIUM II: HYPERTHERMIA

**Ming-shun Chen, Ph.D.**; **Albert Fornace, Ph.D.\***; **Andrei Laszlo, Ph.D.**, "Analysis of an HSP 70 Related Clone from Chinese Hamster Cells Suggests that It Encodes a 33Kd Protein Related to the 67 Kd Protein Related to the 67 Kd High Affinity Laminin." \*National Institutes of Health, Bethesda.

**Nazan Turkel, M.S.**; **Joseph L. Roti Roti, Ph.D.**, "The Possibility That Incomplete Removal of HMNP Could Play a Role in Heat-Induced Cellular Lethality."

**Robert P. van der Waal, Ph.D.**; **K. George Thamby, Ph.D.**; **William D. Wright, B.S.**; **Joseph L. Roti Roti, Ph.D.**, "Heat-Induced Modifications in the Association of Specific Proteins with the Nuclear Matrix."

**Ming-shun Chen, Ph.D.**; **Andrei Laszlo, Ph.D.**, "Differential Expression of Various HSP 70 Family mRNAs in Chinese Hamster Cells."

**Andrei Laszlo, Ph.D.**; **Teri Davidson, M.A.**; **An Hu, M.S.**, "Possible Function of the Intercellular Localization of HSC 70 in Mammalian Cells."

### WORKSHOP I: MODES OF CELL DEATH

**Andrei Laszlo, Ph.D.**, chairperson.

**Robert S. Malyapa, M.D., Ph.D.**; **Xiafang Zhang, M.D.**; **Michael A. Mackey, Ph.D.**; **Joseph L. Roti Roti, Ph.D.**, "Characterization of Mode of Cell-Death after Acute Hyperthermia."

**Michael A. Mackey, Ph.D.**; **Robert S. Malyapa, M.D., Ph.D.**; **Xiafang Zhang, M.D.**, "Mode of Cell Death during Long Duration Treatment of HeLa Cells at 41.5°C."

**Yvonne C. Taylor, Ph.D.**; **Azemat J. Parsian, B.S.**, "Is the p53-Related G1 Delay a Cell Cycle Checkpoint (promoting cellular recovery) or a Cell Cycle Check-out Point (representing a terminal phenotype) in Irradiated Human Fibroblasts?"

### WORKSHOP II: CELL CYCLE DEPENDENT GENE EXPRESSION AND TUMOR SUPPRESSOR GENES

**Prabhat C. Goswami, Ph.D.**; **Clayton R. Hunt, Ph.D.**; **Weihua He, M.S.**; **Joseph L. Roti Roti, Ph.D.**, "Accelerated G<sub>1</sub>-Transit Following Transient Inhibition of DNA Replication-Possible Role of G<sub>1</sub>-Cyclins."

**Clayton R. Hunt, Ph.D.**; **Prabhat C. Goswami, Ph.D.**; **Weihua He, M.S.**; **Joseph L. Roti Roti, Ph.D.**, "Cell Cycle Regulated Expression of Topoisomerase II Is Disrupted by Heat and Radiation."

**Yvonne C. Taylor, Ph.D.**; **Azemat J. Parsian, B.S.**, "Alterations in the Nuclear (Matrix) Association of Tumor Suppressor Gene Products in Irradiated Human Fibroblasts Undergoing G<sub>1</sub> Arrest."

### WORKSHOP III: CHROMATIN STRUCTURE, NUCLEAR MATRIX AND RADIATION REPAIR

**Ryuji Higashikubo, Ph.D.**; **Robert S. Malyapa, M.D., Ph.D.**; **Joseph L. Roti Roti, Ph.D.**, "S1 Nuclease Digestion Kinetics and Its Application in the Determination of Intrinsic Cellular Radiation Sensitivity."

**William D. Wright, B.S.**; **Robert S. Malyapa, M.D., Ph.D.**; **Joseph L. Roti Roti, Ph.D.**, "Nuclear Matrix Protein Content and DNA Loop Rewinding in Cell Lines of Varying Radiosensitivity."

### RADIOLOGICAL SOCIETY OF NORTH AMERICA

*The following Mallinckrodt Institute staff members (highlighted in boldface type) participated in the 79th Scientific Assembly and Annual Meeting of the Radiological Society of North America (RSNA), Chicago, November 28 - December 3.*

### SPECIAL FOCUS SESSION

**R. Gilbert Jost, M.D.**, presiding, "The All-Digital Radiology Department: Is It Just Around the Corner?"



## **IMAGING SYMPOSIUM - SPIRAL (HELICAL) CT: PRINCIPLES, TECHNIQUES, AND CLINICAL APPLICATIONS**

**James A. Brink, M.D.**, panel member, "Principles and Technical Considerations."

**Jay P. Heiken, M.D.**, panel member, "Abdominal Applications of Spiral CT."

## **RSNA-AUR-ARRS INTRODUCTION TO RESEARCH PROGRAM**

**Stuart S. Sagel, M.D.**, "Oral Presentation of Research."

## **REFRESHER COURSES**

**Dennis M. Balfe, M.D.**; **William E. Torres, M.D.**\*, "Incidental Liver Lesion." \*Emory University, Atlanta,

**Ronald G. Evens, M.D.**; **Jonathan Sunshine, Ph.D.**\*, "Managed Competition: Current Major Proposal from the Clinton Administration." \*American College of Radiology, Reston, Virginia.

**Jay P. Heiken, M.D.**; **Janet E. S. Husband, FRCP, FRCR\***, "CT and MR Imaging of Pelvic Neoplasms." \*Royal Marsden Hospital, Sutton, England.

**Marshall E. Hicks, M.D.**; **Michael D. Dake, M.D.**\*, "Percutaneous Endovascular Recanalization Techniques for the Treatment of Chronic Occlusive Vascular Disease." \*Department of Radiology, Stanford University.

**William H. McAlister, M.D.**; **Alan S. Brody, M.D.**\*, "Pediatric Imaging: Paranasal Sinuses and Nasal Cavities." \*Department of Radiology, Children's Hospital of Buffalo.

**Jeff M. Michalski, M.D.**; **John W. Wong, Ph.D.**\*, "Real-Time Portal Imaging." \*William Beaumont Hospital, Royal Oak, Michigan.

**William D. Middleton, M.D.**, "US of the Male Reproductive System - Testes and Scrotum."

**Barbara S. Monsees, M.D.**; **Judy M. Destouet, M.D.**\*, "Practical Aspects of Performing Screening Mammography." \*Private practice, Baltimore.

**Barbara S. Monsees, M.D.**, panel member, "Imaging of the Surgically Altered Breast."

**Robert J. Myerson, M.D., Ph.D.**; **Leonid B. Leybovich, Ph.D.**\*, "Improved Methods of Hyperthermia Delivery." \*Loyola Medical Center, Naperville.

**Daniel Picus, M.D.**; **Timothy C. McCowan, M.D.**\*, **Michael J. Pentecost, M.D.**\*\*\*, "Venous Thromboembolic Disease: Fibrinolytic Therapy and Inferior Vena Cava Filters." \*Department of Radiology, University of Nebraska, Omaha. \*\*Department of Radiology, University of Pennsylvania, Philadelphia.

**Henry D. Royal, M.D.**, "Effects of Low-Level Radiation: Scientific, Political, and Social Views."

**Stuart S. Sagel, M.D.**; **Elliot K. Fishman, M.D.**\*, **Patrick F. Sheedy, M.D.**\*\*, "Fast CT Scanning: Clinical Applications of Spiral and Electro-Beam CT." \*Department of Radiology, Johns Hopkins Hospital, Baltimore. \*\*Department of Diagnostic Radiology, Mayo Clinic, Rochester.

**Marilyn J. Siegel, M.D.**; **George S. Bisset, M.D.**\*, "Pediatric Body CT and MR: Problem Areas and Pitfalls." \*Children's Hospital Medical Center, Cincinnati.

## **CATEGORICAL COURSES**

**Louis A. Gilula, M.D.**, comoderator, "Categorical Course in Musculoskeletal Radiology Advanced Imaging of Joints: Theory and Practice - General Principles," "Categorical Course in Musculoskeletal Radiology Advanced Imaging of Joints: Theory and Practice - The Wrist, Specialized Plain Films and CT Scanning: Techniques, Indications, and Findings," "Categorical Course in Musculoskeletal Radiology Advanced Imaging of Joints: Theory and Practice - The Elbow and Shoulder," "Categorical Course in Musculoskeletal Radiology Advanced Imaging of Joints: Theory and Practice - The Hip," "Categorical Course in Musculoskeletal Radiology Advanced Imaging of Joints: Theory and Practice - The Knee," and "Categorical Course in Musculoskeletal Radiology Advanced Imaging of Joints: Theory and Practice - The Foot and Ankle."

## **WORKSHOPS**

**William D. Middleton, M.D.**; **Mitzi Fields, RDMS.**\*, **Kevin P. Lee, CRT, RDMS**\*\*\*, **Philip W. Ralls, M.D.**\*, **Ronald R. Townsend, M.D.**\*\*\*, **Laurence A. Mack, M.D.**\*\*\*\*, **Edward G. Grant, M.D.**\*\*, "Practical Abdominal Color Doppler ("Hands-on" Workshop)." \*University of Alabama, Birmingham. \*\*University of Southern California - Los Angeles Campus Medical Center. \*\*\*Division of Body Imaging, University of Colorado Health Sciences Center, Denver. \*\*\*\*Department of Radiology, University of Washington School of Medicine, Seattle.

## **SCIENTIFIC SESSIONS**

**Michael D. Darcy, M.D.**, presiding, Scientific Sessions - Cardiovascular.

**Harvey S. Glazer, M.D.**, program committee member, Chest Radiology.

**Jay P. Heiken, M.D.**, presiding, Scientific Sessions - General (CT).

**Bruce L. McClennan, M.D.**, chairman, program committee, Genitourinary Radiology.

**Barry A. Siegel, M.D.**, presiding, Scientific Sessions - Nuclear Medicine (PET, Oncology).

**Todd H. Wasserman, M.D.**, program committee member, Radiation Oncology/Radiobiology.

**Anthony J. Wilson, M.B., Ch.B.**, presiding, Scientific Sessions - Bone (MR Imaging and Spectroscopy).



## SYMPOSIA

*continued from page 27*

**D. Claire Anderson, M.D.;**  
**Harvey S. Glazer, M.D.;**  
**Janice W. Semenkovich,**  
**M.D.;** Joel D. Cooper, M.D.\*;  
R. Sudhir Sundaresan, M.D.\*;  
G. Alec Patterson, M.D.\*;  
"Chest Radiography after  
Lung Transplantation: First  
10 Days." \*Department of  
Surgery, Washington Univer-  
sity School of Medicine, St.  
Louis.

**James A. Brink, M.D.;**  
**Lane A. Deyoe, M.D.;** **Jay**  
**P. Heiken, M.D.;** **Ge Wang,**  
**Ph.D.;** **Roberta L. Yoffie,**  
**R.T.;** **Michael W. Vannier,**  
**M.D.,** "Spiral CT Angiogra-  
phy for Renal Arterial Steno-  
sis: In Vitro Assessment of  
Technical Parameters."

**Clifford K.S. Chao, M.D.;**  
**Mary V. Graham, M.D.;**  
**Daniel A. Low, Ph.D.;**  
**Todd H. Wasserman, M.D.,**  
"Three-dimensional CT-  
derived Model for Estimating  
Lung Volume Irradiated from  
Simulation Films."

**Thomas E. Conturo, M.D.,**  
**Ph.D.;** John D. Strandberg,  
Ph.D., D.V.M.\*; Brian J.  
Soher, B.E.E.\*; Peter B.  
Barker, D. Phil\*; James H.  
Anderson, Ph.D.\*; "Assess-  
ment of Tumor Perfusion  
and Blood-Brain-Barrier  
Leakage with Phase-  
enhancement Effects of Con-  
trast Agents." \*Johns  
Hopkins Hospital, Baltimore.

**Michael D. Darcy, M.D.;**  
**Daniel Picus, M.D.;**  
**Thomas M. Vesely, M.D.;**  
**Marshall E. Hicks, M.D.;**  
Leanna Dick, M.D.\*; Mark  
Mayhle, M.D.\*\*; et al, "Effi-  
cacy and Complications of  
Transjugular Intrahepatic  
Portosystemic Shunts."  
\*Durham Radiology Associ-  
ates, Durham, North Car-  
olina. \*\*Rock Hill Radiol-  
ogists, Raytown, Missouri.

**Michael D. Darcy, M.D.;**  
**Darryl Zuckerman, M.D.;**  
**Daniel Picus, M.D.;**  
**Thomas M. Vesely, M.D.;**  
**Marshall E. Hicks, M.D.;**  
Thomas Bocchini, M.D.\*;  
"Evaluation of Risk Factors  
for Development of  
Encephalopathy after Tran-  
sjugular Intrahepatic Por-  
tosystemic Shunt  
Placement." \*Saint Louis  
University, St. Louis.

**Gopal R. Desai, M.D.;**  
**Ryuji Higashikubo, Ph.D.;**  
David L. Lacey, M.D.\*;  
Manuel Ribero, M.D.\*\*;  
**Robert J. Myerson, M.D.,**  
**Ph.D.;** Ira J. Kodner,  
M.D.\*\*; et al, "Predictive  
Assays in the Therapy of  
Carcinoma of the Rectum  
Treated with Preoperative  
Radiation and Correlation  
with Clinical Outcome."  
\*Department of Pathology,  
Washington University  
School of Medicine, St.  
Louis. \*\*Department of  
Surgery, Rua Augusto Lessa,  
Portugal. \*\*\*Department of  
Surgery, Washington Univer-  
sity School of Medicine, St.  
Louis.

**Richard N. Edelstein,**  
**M.D.;** **Shawn P. Quillin,**  
**M.D.;** **Bruce L. McClennan,**  
**M.D.,** "Urethrographic Eval-  
uation after Penile Gunshot  
Wounds."

**Howard P. Forman, M.D.;**  
**James A. Brink, M.D.;**  
**Dennis M. Balfe, M.D.;**  
**Frank J. Schlueter, M.D.;**  
**Jay P. Heiken, M.D.,** "Posi-  
tive-contrast Spiral CT  
Cholangiography Following  
Oral Administration of Cal-  
cium Iodate: Feasibility  
Study."

Lee A. Fox, B.S.\*; **Michael**  
**W. Vannier, M.D.;** **O. Clark**  
**West, M.D.;** **Anthony J.**  
**Wilson, M.B., Ch.B.;** Gregg  
A. Baran, M.D.\*\*; **Thomas**  
**K. Pilgram, Ph.D.,** "Imaging  
of Midfacial Fractures: Com-  
parative Study of Spiral CT,  
3D Reconstructions, and  
Multiplanar Reformations."  
\*medical student, Washing-  
ton University School of  
Medicine, St. Louis. \*\*Pri-  
vate practice, St. Petersburg,  
Florida.

**Harvey S. Glazer, M.D.;**  
**Janice W. Semenkovich,**  
**M.D.;** **D. Claire Anderson,**  
**M.D.;** Elbert P. Trulock,  
M.D.\*; G. Alec Patterson,  
M.D.\*\*; Joel D. Cooper,  
M.D.\*\*; "Complications in  
the Native Lung Following  
Single-Lung Transplanta-  
tion." \*Department of Inter-  
nal Medicine, Washington  
University School of Medi-  
cine, St. Louis. \*\*Depart-  
ment of Surgery, Washington  
University School of Medi-  
cine, St. Louis.

**Carolyn A. Haerr, M.D.;**  
**Louis A. Gilula, M.D.;**  
Frederick A. Mann, M.D.\*;  
**Yuming Yin, M.D.;** Claus F.  
Larsen, M.D., Ph.D.\*\*; "Accu-  
rate Assessment of the  
"True" Neutral Posteroante-  
rior and Lateral Projections  
of the Wrist: Importance of  
Determining Ulnar Vari-  
ance." \*Department of Radi-  
ology, Harborview Hospital,  
University of Washington  
Medical Center, Seattle. \*\*  
Odense University Hospital,  
Odense, Denmark.

**Jay P. Heiken, M.D.;** **James**  
**A. Brink, M.D.;** **Bruce L.**  
**McClennan, M.D.;** **Stuart**  
**S. Sagel, M.D.;** **Tamara M.**  
**Crowe, R.T.;** **Mary Virginia**  
**Gaines, B.S.,** "Dynamic Con-  
trast-enhanced CT of the  
Liver: Comparison of Vol-  
umes and Concentrations of  
Contrast Media."

**Daniel Keleti, M.D.;**  
V. Rao Devineni, M.D.\*;  
"Esoph-ageal Stricture: Sur-  
veillance of 20 Cases and a  
Review of the Literature."  
\*Department of Radiation  
Oncology, DePaul Health  
Center, St. Louis.

**Benjamin C. P. Lee, M.D.;**  
T. S. Park, M.D.\*; Bruce A.  
Kaufman, M.D.\*; "Single-  
Voxel Proton Spectroscopy  
of Pediatric Brain Tumors."  
\*Department of Neurological  
Surgery, Washington Univer-  
sity School of Medicine,  
St. Louis.

**Henry K. Lee, M.D.;**  
**Ganesh Ramachandran,**  
**B.S.;** **Perry W. Grigsby,**  
**M.D.;** **Ernesto Molmenti,**  
**M.D.;** **Allison Buckner,**  
**B.S.;** **Bahman Emami, M.D.,**  
"Prognostic Factors for Papil-  
lary and Follicular Thyroid  
Carcinoma: Findings at  
Long-term Follow-up."

**Debiao Li, Ph.D.;** **E. Mark**  
**Haacke, Ph.D.;** Tasneem N.  
Khimji, M.D.\*; David Miller\*,  
"MR Angiography of the  
Renal Arteries with IR and  
Fat Saturation Techniques."  
\*Case Western Reserve  
University, Cleveland.

**Gary D. Luker, M.D.;** **Mari-**  
**lyn J. Siegel, M.D.,** "Scrotal  
and Testicular Enlargement  
in Pediatric Patients: Evalua-  
tion with Color Doppler US."



**Charles T. McConnell, Jr., M.D.;** Mokhtar H. Gado, M.D.; Benjamin C.P. Lee, M.D.; Daniel K. Kido, M.D.; Michael G. Crowley, Ph.D., "Evaluation of the Clinical Utility of Fast SE in Single- and Dual-Contrast Modes."

**Charles T. McConnell, Jr., M.D.;** Joseph F. Plouffe, M.D.\*; Thomas M. File, M.D.\*\*; Charles F. Mueller, M.D.\*; Barbara J. Marston, M.D.\*\*\*; Robert F. Breiman, M.D.\*\*\*, "Radiographic Manifestations of Chlamydia pneumoniae Pneumonia." \*Ohio State University, Columbus. \*\*Akron City Hospital, Akron. \*\*\*Centers for Disease Control, Atlanta.

**Eric S. Malden, M.D.;** Daniel Picus, M.D.; Thomas M. Vesely, M.D.; Michael D. Darcy, M.D.; Marshall E. Hicks, M.D., "Comparison of Stepping DSA with Conventional Screen-Film Angiography for Evaluation of Peripheral Vascular Disease."

**Mary A. Middleton, M.D.;** William D. Middleton, M.D.; Meaghan M. O'Connor, M.D.\*; David Keetch, M.D.\*; Steve M. Dierks, M.D.\*, "Sonographic Prediction of Viability in Testicular Torsion." \*Division of Urologic Surgery, Washington University School of Medicine, St. Louis.

**Robert J. Myerson, M.D., Ph.D.;** Jeff M. Michalski, M.D.; Maurice L. King, M.D.; Elisa Birnbaum, M.D.\*; James Fleshman, M.D.\*; Robert Fry, M.D.\*; et al, "Adjuvant Radiation Therapy for Rectal Carcinoma: Predictors of Outcome." \*Department of Surgery, Washington University School of Medicine, St. Louis.

**Timothy R. O'Leary, M.D.;** Todd H. Wasserman, M.D.; Nancy A. Kucik, clinical research associate, "Treatment of Localized Supradiaphragmatic Intermediate-Grade Non-Hodgkin Lymphoma with Radiation Therapy Alone: Tumor Size as a Selection Factor."

**Shawn P. Quillin, M.D.;** Marilyn J. Siegel, M.D., "Efficacy of Color Doppler Sonography for Appendicitis," "Color Doppler US of Painful Ovary in Adolescents," "Gastrointestinal Inflammation: Color Doppler US," and "Posttransplantation Lymphoproliferative Disorders in Children: Intra-abdominal Manifestations."

**Cynthia K. Rigsby, M.D.;** Marilyn J. Siegel, M.D., "Patterns of Perirenal Spread of Wilms Tumor."

**Frank J. Schlueter, M.D.;** Ge Wang, Ph.D.; Paul S. Hsieh, M.D.\*; James A. Brink, M.D.; Michael W. Vannier, M.D., "Improved Longitudinal Axis Resolution in Spiral CT by Means of Deconvolution Techniques." \*Department of Radiology, Cedars-Sinai Medical Center, Los Angeles.

**Janice W. Semenkovich, M.D.;** Harvey S. Glazer, M.D.; D. Claire Anderson, M.D.; Joseph M. Arcidi, M.D.\*; Frank J. Schlueter, M.D.; G. Alec Patterson, M.D.\*\*, "CT Follow-up of Bronchial Anastomotic Complications after Lung Transplantation." \*Cleveland Clinic Foundation, Cleveland. \*\*Department of Surgery, Washington University School of Medicine, St. Louis.

**Felix L. Song, M.D.;** William D. Middleton, M.D.; Thomas C. Winter, M.D.\*; Paul E. Swanson, M.D.\*\*; Laurence A. Mack, M.D.\*, "Association Between Intratubular Germ Cell Neoplasia and Testicular Microlithiasis." \*University of Washington, Seattle. \*\*Department of Pathology, Washington University School of Medicine, St. Louis.

**Kirk E. Smith, AAS;** Gulab H. Bhatia, MSEE; Michael W. Vannier, M.D., "Assessment of Mass Properties of the Human Head with Use of Different 3D Imaging Modalities."

**Richard K. Valicenti, M.D.;** Todd H. Wasserman, M.D.; Nancy A. Kucik, clinical research associate, "Whole-Abdomen Irradiation in Abdominal Non-Hodgkin Lymphoma Patients."

**Michael W. Vannier, M.D.;** Paul K. Commean, B.S.; Gulab H. Bhatia, MSEE; Kirk E. Smith, AAS, "Validation of Spiral CT and Optical Surface Scanning for Use in 3D Design of Limb Prosthesis."

**Ge Wang, Ph.D.;** Michael W. Vannier, M.D., "Spiral CT Image Noise: Analytic Results."

**Ge Wang, Ph.D.;** Michael W. Vannier, M.D.; Roberta L. Yoffie, R.T., "StairStep Artifacts in Spiral CT: A Phantom Study."

**O. Clark West, M.D.;** Stuart E. Mirvis, M.D.\*; Kathirkamanathan Shanmuganathan, M.D.\*, "CT Patterns of Transsphenoidal Basilar Skull Fractures." \*University of Maryland Medical System, Baltimore.

## SCIENTIFIC EXHIBITS

**Benjamin C. P. Lee, M.D.;** Edward C. Angtuaco, M.D.; Robert C. Wood, M.D.; Daniel K. Kido, M.D.; Michael G. Crowley, Ph.D., "Frequency-selective Fat-Suppression: Principle and Clinical Applications in the Spine."

**Kevin W. McEnery, M.D.;** Anthony J. Wilson, M.B., Ch.B.; William A. Murphy, Jr., M.D.\*, "Comparison of Standard and Spiral CT in the Evaluation of Wrist Trauma." \*Division of Diagnostic Imaging, M.D. Anderson Cancer Center, Houston.

**Kevin W. McEnery, M.D.;** Anthony J. Wilson, M.B., Ch.B.; William A. Murphy, Jr., M.D.\*, "Spiral CT Evaluation of Musculoskeletal Trauma." \*Division of Diagnostic Imaging, M.D. Anderson Cancer Center, Houston.

**L. Santiago Medina, M.D.;** Marilyn J. Siegel, M.D.; Pablo A. Bejarano, M.D.\*, *cum laude* award for "Imaging and Pathologic Correlation in Pediatric Lung Transplantation." \*Department of Pathology, Washington University School of Medicine, St. Louis.

Stuart E. Mirvis, M.D.\*; Kathirkamanathan Shanmuganathan, M.D.\*; Charles S. White, M.D.\*; O. Clark West, M.D.; Michael I. Rothman, M.D.\*; Greg H. Zoarski, M.D.\*; "Current Concepts in Trauma Imaging." \*University of Maryland Medical System, Baltimore.



## SYMPOSIA

*continued from page 29*

**Allen B. Oser, M.D.; Benjamin C. P. Lee, M.D.; Daniel K. Kido, M.D.; Michael G. Crowley, Ph.D.,** "Two-dimensional and 3D High-Resolution Turbo SE of the Temporal Bone."

**Shawn P. Quillin, M.D.; Lane A. Deyoe, M.D.; William D. Middleton, M.D.; Michael D. Darcy, M.D.; Sharlene A. Teehey, M.D.; James A. Brink, M.D.,** "Evaluation of Doppler Criteria Used to Diagnose Transjugular Intrahepatic Portosystemic Shunt Complications."

**Richard M. Slone, M.D.,** "Reproducing Radiographs from Slides."

**Richard M. Slone, M.D.; Karl E. Weingarten, M.D.;** "Skeletal Disease Findings on Chest Radiographs." \*University of Florida, Gainesville.

**Nhan P. Truong, M.D.\*; Wilfred C. Peh, M.D.; William G. Totty, M.D.; Louis A. Gilula, M.D.,** "MR Imaging of Soft-Tissue Masses around the Hand and Wrist." \*St. Francis Hospital, Tulsa.

**Nhan P. Truong, M.D.\*; Frederick A. Mann, M.D.\*\*; Louis A. Gilula, M.D.; Si-Won Kang, M.D.\*\*\*,** "Tailored Wrist Instability Series and Its Cost-effectiveness." \*St. Francis Hospital, Tulsa. \*\*Department of Radiology, Harborview Hospital, University of Washington Medical Center, Seattle. \*\*\*Department of Radiology, Dae-Jeon St. Mary's Hospital, Catholic University Medical College, Dae-Jeon, Korea.

**Nhan P. Truong, M.D.\*; William G. Totty, M.D.; Louis A. Gilula, M.D.,** "Tailored Imaging Approach to Ankle Tendon and Tendon Sheath Disease." \*St. Francis Hospital, Tulsa.

**Yuming Yin, M.D.; Wang Yun Zhao, M.D.; Anthony J. Wilson, M.B., Ch.B.; Louis A. Gilula, M.D.,** "Endemic Fluorosis of Bone: A Disorder with Diverse Appearance."

### INFORAD EXHIBITS

**R. Gilbert Jost, M.D.,** member, Electronic Communications Committee.

**Stephen M. Moore, M.S.; G. James Blaine III, D.Sc.; David E. Beecher, M.S.; Sheldon Hoffman, M.S.,** "ACR-NEMA/DICOM Demonstration."

### NEMA Seminar

**Robert Hindel, Ph.D.,** cochairman\*; **G. James Blaine III, D.Sc.,** cochairman; et al\*\*, "Implementation of the DICOM 3.0 Standard." \*chairman, National Electrical Manufacturers Association (NEMA) MedPacs; representative for Philips Medical Systems; president of RH Consulting. \*\*other representatives affiliated with University of Oldenburg, Germany; Merge Technologies Inc.; Kodak Health Imaging Systems; Pennsylvania State University; RSNA Electronic Communication Committee.

### Special Presentation

**R. Gilbert Jost, M.D.,** "Wide Band Networks: Their Importance for Radiology."

### FILM INTERPRETATION SESSION

**L. Santiago Medina, M.D.,** first place award.

## HONORS AWARDS

**Clifford K.S. Chao, M.D.,** instructor in radiology, received the 1993 Resident Essay Award from the American Endocurithery Society for his paper, "Brachytherapy Related Medical Complication in Medical Inoperable Stage I Endometrial Carcinoma."

**William H. McAlister, M.D.,** professor of radiology and chief of pediatric radiology, and **Alan E. Schlesinger, M.D.,** assistant professor of radiology, as invited participants, attended the American College of Radiology Videodisc Team, February 10 - 12, in Los Angeles. The videodisc contains several thousand cases, covering all aspects of pediatric radiology. McAlister and Schlesinger developed segments on gastrointestinal tract, liver, spleen, and pancreas. The ACR plans to offer the videodisc for sale in late 1994 or 1995. The disc material is geared for senior residents studying for Boards, for pediatric radiologists taking the Certificate of Added Qualifications Examination, and for any practicing radiologist who wants to use the videodisc format to learn more about pediatric radiology.

**Bruce L. McClennan, M.D.,** professor of radiology and chief of abdominal radiology, collaborated on the development of an American College of Radiology video on the mistaken use of ionic contrast agent for myelography. The tape will be sent to all radiologists and to all hospitals where myelography is performed.

**Carlos A. Perez, M.D.,** professor of radiology and director of the Radiation Oncology Center, received the 1993 Distinguished Alumnus Award from M.D. Anderson Cancer Center, Houston, where he completed a radiation therapy fellowship in 1964. At the award ceremonies on October 1, Perez spoke on "Carcinoma of the Uterine Cervix: Past, Present, and Future."



## FELLOWSHIPS/ GRANTS

**Joseph L. Roti Roti, Ph.D.**, professor of radiology, associate director of the Radiation Oncology Center, and chief of the cancer biology section, as principal investigator, received a \$2.4 million grant from the Motorola Corporation for "Research on the Biological Effects of Non-ionizing Electromagnetic Radiation." Coinvestigators are **Michael**

**A. Mackey, Ph.D.**, assistant professor of radiology, and **Eduardo G. Moros, Ph.D.**, assistant professor of radiology and chief of hyperthermia physics service.

**Marilyn J. Siegel, M.D.**, professor of radiology, received a \$249,728 National Cancer Institute grant for the study of RDOG IV - pediatric solid tumors.

## APPOINTMENTS/ ELECTIONS

**R. Gilbert Jost, M.D.**, professor of radiology and chief of the Division of Diagnostic Radiology, was again named one of three organizers of Medical Imaging 1994, held February 13 - 18 in Newport Beach with more than 1,000 attendees. The Society of Photo-Optical Instrumentation Engineers annual symposium comprises six separate digital imaging conferences. Jost also chaired and organized one of the symposium's four-day conferences — "PACS: Design and Evaluation."

**Eric Klein, M.S.**, instructor in radiology, was elected to a two-year term (1994-1996) on the Board of Directors of the American Association of Physicists in Medicine (AAPM). He was named to the AAPM's Training of Radiologists Committee for 1994-1996.

**Ali S. Meigooni, Ph.D.**, assistant professor of radiology, was appointed to the American Association of Physicists in Medicine (AAPM) Radiochromic Film Dosimetry Task Group 55. He was named to the faculty of the 1994 AAPM Summer School to be held at the University of California, San Diego.

**Joel S. Perlmutter, M.D.**, associate professor of neurology and radiology, was appointed chairman of the External Review Committee to Evaluate the Intramural Neuroimaging Program at the National Institute of Mental Health.

## CALENDAR

### April 9 - 13, 1994

American Society of Emergency Radiology  
Orlando

### April 24 - 29, 1994

94th Annual Meeting of the American Roentgen Ray Society  
New Orleans

### June 5 - 8, 1994

Society of Nuclear Medicine Annual Meeting  
Orlando

### June 12 - 15, 1994

Computer Applications in Radiology  
Winston-Salem

### June 14 - 18, 1994

American College of Medical Physicists Annual Meeting  
Jackson Hole

### July 24 - 28, 1994

American Association of Physicists in Medicine Annual Meeting  
Anaheim



# FYI

## The MIR Reception at the Annual Meeting of RSNA

1 Michel Ter-Pogossian, Ph.D., and Anica Jovanovic, M.D., who was MIR's first female resident.



1



2

2 (left to right) Jeff Michalski, M.D.; Robert Kuske, M.D.; and Joseph Simpson, M.D., Ph.D.

3 (left to right) Robert Koehler, M.D.; Helen Totty; Ellen Vannier; and Michael Vannier, M.D.



3

4 (left to right) Jonas Singer, M.D.; Juan Taveras, M.D.; Ronald Evens, M.D.; Meredith Ragsdale; and Edward Ragsdale, M.D.



4

5 (left to right) Ben Mayes, M.D.; John Armstrong, M.A., M.D.; Ellen Mayes; and Jim Winthrop, M.D.



5

6 (left to right) L. Santiago Medina, M.D.; Edda Quintero, M.D.; Lee Fox, Washington University School of Medicine student; and Louis Gilula, M.D.



6

7 (left to right) Bruce Bower, M.D., 1988-89 cochief resident; William Horstman, M.D., 1991-92 cochief resident; and Michael Katz, M.D.



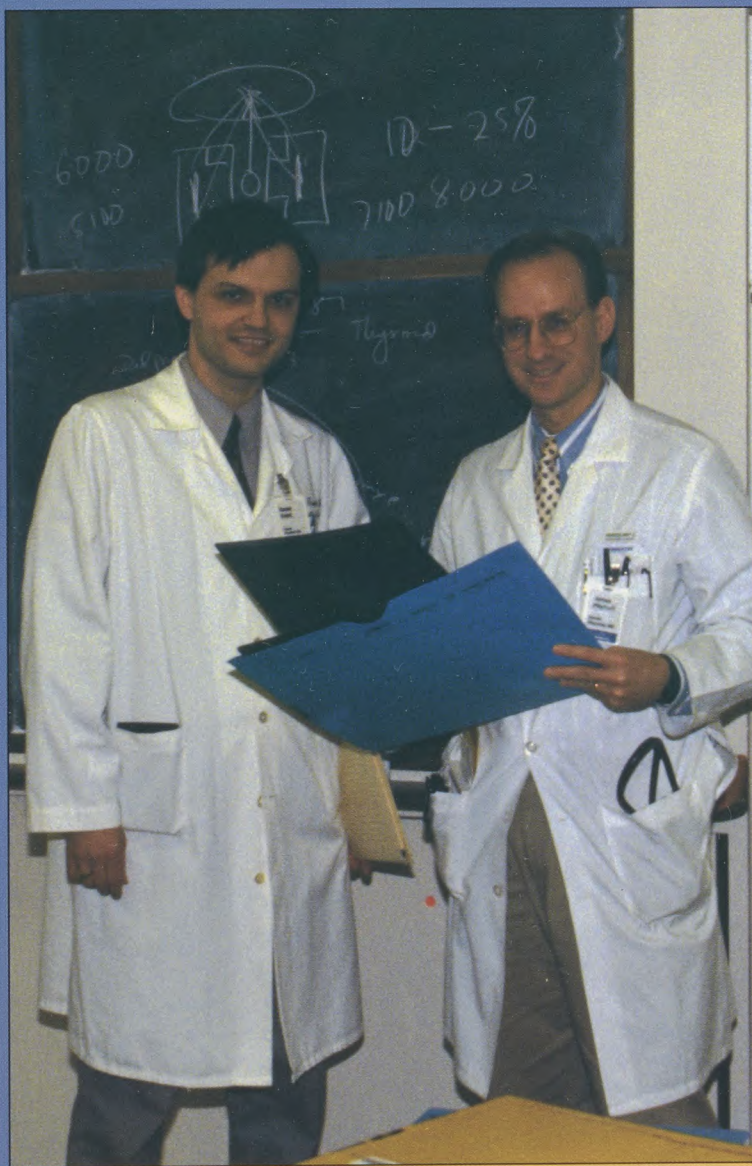
7

8 Patti Lester; Pat Lester, M.D.; Ronald Evens, M.D.; Hanna Evens; Robert Stanley, M.D.; and Sally Stanley.



8





Daniel Keleti, M.D., (left) and James V. Piephoff, M.D., are the 1993-1994 cochief and chief resident, respectively, of the Radiation Oncology Center.