

Winter 1986

## Focal Spot, Winter 1986

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# FOCAL

SPOT

M A G A Z I N E

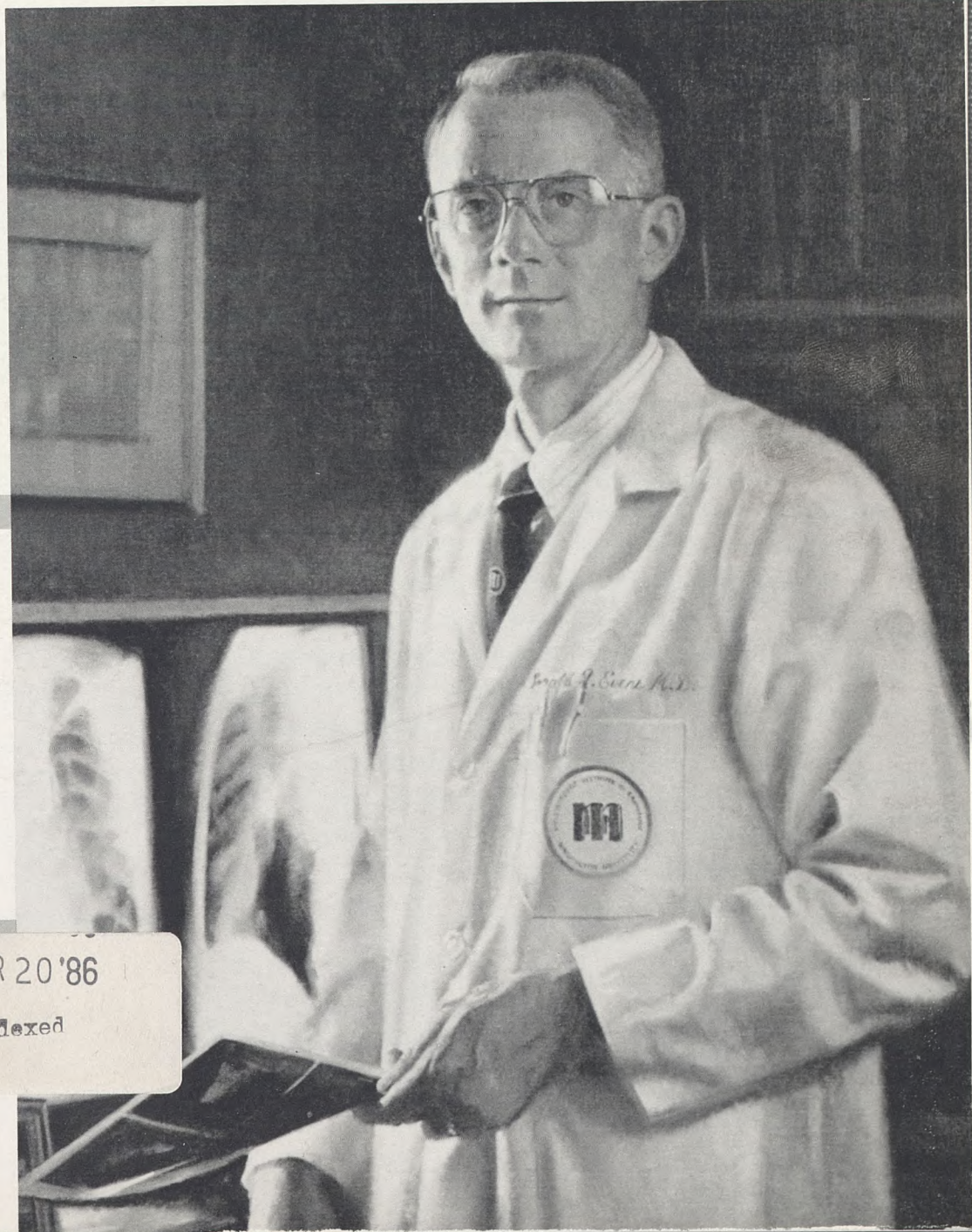
Mallinckrodt Institute of Radiology

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Winter 1986



Ronald G.  
Evens, M.D.  
Portrait  
Dedicated

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# Staff Honors Director

**Ronald G. Evens, M.D.**, Elizabeth Mallinckrodt professor and head of the department of radiology at Washington University School of Medicine and director of Mallinckrodt Institute of Radiology, was honored in ceremonies on December 3 in Scarpellino Auditorium.

In appreciation and recognition of Dr. Evens' leadership and advancement of radiology and medicine, a portrait of Dr. Evens was commissioned by staff and friends through a committee headed by **Michel M. Ter-Pogossian, Ph.D.**, **Carlos A. Perez, M.D.**, **Barry A. Siegel, M.D.**, and **William H. McAlister, M.D.** The portrait was presented to Mallinckrodt Institute of Radiology by William H. Danforth, M.D., chancellor of Washington University.

Dr. Ter-Pogossian, director of radiation sciences, welcomed the overflow audience of colleagues, family and friends. "While portraits are most often presented following retirement, we wanted to break tradition and express our feelings now about his exceptional performance as director," he said.

In his presentation, Dr. Danforth related Dr. Evens' contributions to Washington University and stated that under Dr. Evens' direction, "The Institute's growth has been imaginative as well as solid. He has used his talent to make Mallinckrodt Institute of Radiology one of the best radiological research and clinical facilities in the world." Since 1971 when Dr. Evens became director of the Institute, Dr. Danforth related that Dr. Evens' collaboration with others has resulted in five-fold space expansion, a faculty which has doubled, and patient flow which has tripled.

Dr. Evens expressed his gratitude to Dr. Danforth and to associates in the audience. Accepting the honor, he reminisced, "Life is a set of steps, each depending on what has happened the



*Dr. and Mrs. Ronald G. Evens admire the portrait presented to Dr. Evens by MIR staff. The portrait hangs permanently in the Institute's first floor lobby.*



*Chancellor William H. Danforth congratulates Dr. and Mrs. Ronald G. Evens at ceremonies recognizing Dr. Evens' leadership of the Institute.*



*Scarpellino Auditorium was filled to capacity when associates and friends gathered to view Dr. Evens' portrait presentation on December 3.*



## *Fourteen Years of Achievement*

### RONALD GENE EVENS, M.D.

step before." Relating to a radio serial, he said, "I am that small boy from the small town who really did find happiness."

Among those who influenced his life, he cited family members who "emphasized education and training and that it is important to make contributions, not just work."

Dr. Evens recognized his "great" educational opportunity at Washington University and thanked his teachers who "taught medicine as well as how to interact with people."

"You are the head of Mallinckrodt Institute of Radiology. It has a great tradition. You can either be good or bad in that position," he was told by nationally recognized radiologist **Alexander R. Margulis, M.D.** shortly after his appointment as director of the Institute.

Dr. Evens capsulized a philosophy which directs his achievement by concluding, "I don't say 'no' to many things. I see them as opportunities... I promise you this is not the end of my career as I hope to be involved with all of you as part of this medical center!"

The portrait of Dr. Evens is permanently displayed in the main lobby of the Institute. It was painted by noted St. Louis artist Gilbert Early. A graduate of Washington University School of Fine Arts, Mr. Early had a brief career in New York City as an illustrator before returning to St. Louis where he has served on the faculty of Washington University and has devoted his talent full-time to portraiture. His work includes the portraits of eight Missouri Supreme Court justices, three former St. Louis mayors, a former governor of Missouri, and numerous corporate leaders and other prominent individuals.

In addition to the portrait, the overwhelming response to the recognition of Dr. Evens will help fund a new library to be located on the tenth floor of Mallinckrodt. To be dedicated the "Ronald G. Evens, M.D. Library," it will be used primarily for teaching purposes and will feature state-of-the-art audio-visual systems. ■

Ronald Gene Evens was born on September 24, 1939, in Herculaneum, Missouri, a small town on the Mississippi River, thirty miles south of St. Louis. His grandparents and parents, Dorothy and Robert Evens, encouraged his early achievements, which included lettering in high school sports, becoming an Eagle Scout, serving as chief of the Order of the Arrow Lodge for the entire St. Louis area, and graduating from Herculaneum High School as valedictorian of his class.

In 1957, Dr. Evens enrolled at Washington University with a full academic scholarship. Three years later he was a Phi Beta Kappa graduate with a bachelor's degree in economics and a letter of acceptance from the Washington University School of Medicine. Among the honors he received during medical school were the Alpha Omega Alpha award for highest scholastic standing and the Sheard-Sanford Prize of the American Society of Clinical Pathologists, a nationwide award for meritorius student research.

Graduating first in the 1964 medical school class, Dr. Evens completed an internship in medicine at Barnes Hospital, followed by a residency in radiology and training in nuclear medicine at Mallinckrodt Institute. His radiology training included a two-year appointment to the Clinical Endocrinology Branch of the National Heart Institute in Bethesda, Maryland, and a fellowship from the American Roentgen Ray Society to the Armed Forces Institute of Pathology. Dr. Evens served as chief resident during the 1969/70 academic year, and then studied in the graduate schools of business administration and education at Washington University through an Advanced Academic Fellowship from the James Picker Foundation.

On August 1, 1971, Dr. Evens was named professor and head of the department of radiology at the Washington University School of Medicine, director of Mallinckrodt Institute of Radiology, and radiologist-in-chief at Barnes and Children's Hospitals. He was the youngest ever appointed to these positions, and the medical school's youngest department chairman. The following year, he was named the first Elizabeth Mallinckrodt Professor of Radiology, the first endowed chair in the department.

A national leader in radiology, Dr. Evens has been elected to the presidency or vice presidency of The Society of Chairmen of Academic Radiology Departments, the Missouri Radiological Society, the American Roentgen Ray Society, the Washington University Medical Center, and the Barnes Hospital Society. Most recently he was named president and chief executive officer of Children's Hospital in St. Louis.

The author of over 140 articles in journals and textbooks, Dr. Evens is a director or trustee of the Boatmen's National Bank of St. Louis, Healthcare Network, and the American Roentgen Ray Society. He has also served as a director or trustee of the Society of Nuclear Medicine and the Washington University Medical Center. In 1984, the National Council of the Boy Scouts of America honored him with the Distinguished Eagle Scout Award.

This year, Dr. Evens celebrated twenty-five years of marriage to his wife, the former Hannah Blunk. Their son Ron and his wife Nancy live in St. Louis, where Ron is a graduate student at Washington University. Daughters Christine and Amanda are also Washington University students.





Photo by John O'Connor, Guarantee Electrical Company

For six hours in sub-freezing weather a tandem-rotor helicopter hoisted materials for reconstruction at MIR. Here a 1,700 pound primary switch from Guarantee Electrical Company is lifted. Segments of the project were carried by local television stations.

## Helicopter Aids Construction

In early January a giant twin-blade helicopter hovered over Mallinckrodt Institute of Radiology as it hoisted a total of almost 100,000 pounds of equipment in the air onto Mallinckrodt's 12th floor roof.

"The equipment is for Mallinckrodt's new cooling system, which will be completed this spring," according to **Armand Diaz**, technical administrator and director of the project. Three cooling towers, ductwork and an electrical sub-station comprised the lift.

A specially-equipped Boeing helicopter was brought from Oregon to

St. Louis for the project. This was the second of three hoists required for the installation.

Using a helicopter rather than a crane is often the preferred method of construction when space and access limitations exist. Strategic planning, calm winds and low humidity are critical to a successful hoist, indicate project engineers.

The utility of helicopters in construction was established following the Vietnam war when veterans purchased surplus helicopters and refitted them for building purposes. ■

# Beyond Fractures

If someone were to survey the general public about the most common medical diagnosis made with X-rays, the top response would probably be "bone fractures." Nearly everyone has had an examination at sometime for a possible fracture of one of the 206 bones in the human body.

AT MIR, radiographic examinations of bone are going a step further.

Aided by assistant professor **William R. Reinus, M.D.**, of the musculoskeletal section, radiologists are using sophisticated computed tomography (CT) techniques to perform detailed studies of the innermost part of bone, called trabecular bone. Trabecular bone is the highly convoluted, porous-looking matter at the center of bone. It forms the superstructure of the marrow space, which contains mostly fat and blood-forming elements, and is surrounded by the hard cortical bone.

The researchers are interested in the trabecular bone because its composition and high level of metabolic activity make it the portion of bone most sensitive to change. Changes in bone mineral, i.e. gain or loss of mass, can be most readily determined through studies of the trabecular bone.

Several bone diseases that are significant to these studies involve a decrease in bone mass below normal, or a change in the overall bone composition. Osteomalacia, which is



known as rickets when it affects children, is the softening of bone due to impaired mineralization. Usually the protein matrix of the bone is sufficient, but there is a shortage of bone mineral, or calcium. (The disease is associated with deficient vitamin D, which may result from problems in the liver, kidneys, intestines, skin, or other organs.)

Even more common is osteoporosis, a disease involving the overall loss of bone tissue mass, both protein and calcium. Associated with high morbidity, osteoporosis is gaining the reputation of being "the silent epidemic" in America's rapidly growing population of postmenopausal women. It is believed to be the leading cause of physical disability in old age, resulting in about 250,000 hip fractures annually, and is estimated to require over \$4 billion a year in health care expenditures.

Physicians have attempted to follow the course of these and other bone diseases through the measurement of bone mineral since the early days of X-rays. Radiologic methods of measuring bone mineral have included: combined cortical width measurements, spine index, Singh index, photon absorptometry, Compton scattering, and neutron activation analysis. Today, bone biopsy, a procedure associated with patient discomfort and possible morbidity, is the only clinical means for making the final determination of bone disease.

For the past two years, Dr. Reinus and his associates at MIR have used CT to measure bone mineral. The most important advantages of CT are that it is sensitive to change, reproducible, and noninvasive. It is also able to distinguish cortical bone from trabecular bone, and is capable of imaging the axial skeleton (spine), which is the area most relevant to a number of bone diseases.

CT provides a quantitative measure of bone mineral by one of two tech-

niques. The original CT technique uses a single energy X-ray beam (SECT). This method yields a precise, reproducible measurement, but the figures are often inaccurate due to error caused by fat and cellular marrow in the marrow space. A second technique, using two different energy beams (DECT), has been implemented recently. DECT corrects for the majority of fat-induced error and beam hardening error encountered in SECT, but it is significantly less precise.

In one study, Dr. Reinus, together with **Dr. Scott Nadel**, a second-year resident in diagnostic radiology, developed a method to refine the measurement of bone mineral with SECT, and to correct for error caused by fat. Using set theory and threshold analysis, they were able to narrow the range of numbers into which an accurate measurement would fall, and thereby to improve the "certainty level" of the measurement. This technique proved to be most successful when mineral was decreased, and although the research is still in preliminary stages, the results indicate that the new threshold analysis technique may enable SECT to be more sensitive to the early detection of osteoporosis.

Dr. Reinus is also working on a theory which shows how quantitative CT may be capable of differentiating osteoporosis from osteomalacia. At this time, no noninvasive means of clinically differentiating the two has ever been successfully implemented; clinical diagnosis is dependent upon a bone biopsy.

The basic approach combines SECT and DECT to separate conditions that characterize osteoporosis from those that characterize osteomalacia. Dr. Reinus' theory predicts in numerical terms how fluctuations in bone mineral measurement relate to changes in particular bone conditions. For example, in osteoporosis a given patient will have higher DECT measurement than SECT measurement.

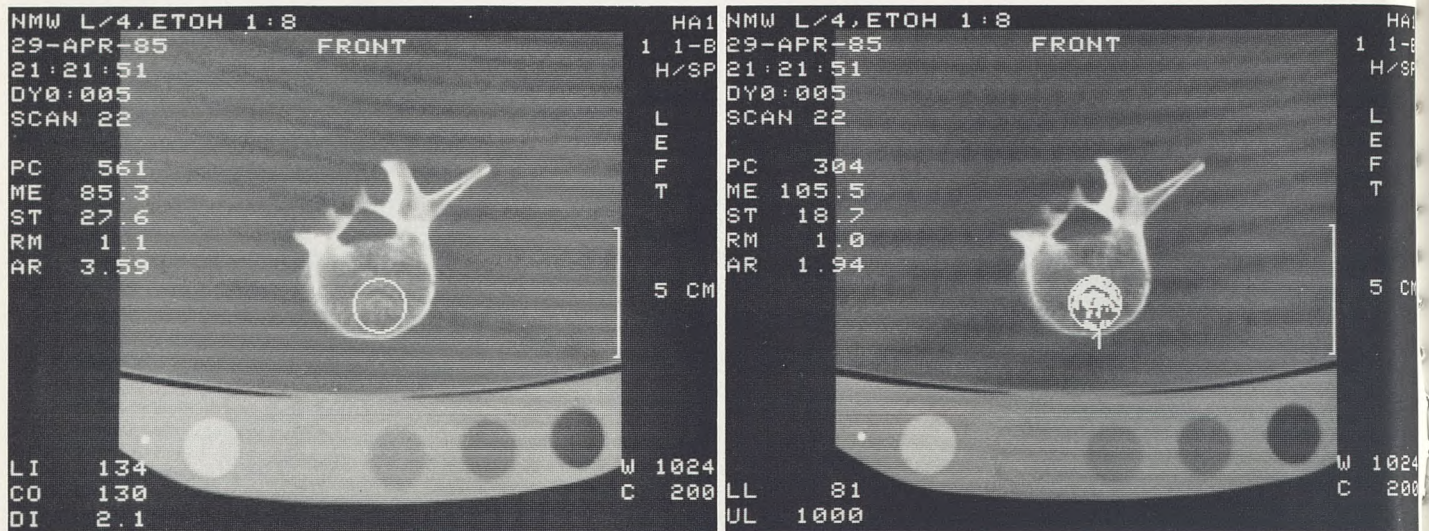


William R. Reinus, M.D.



## Beyond Fractures

Figure A



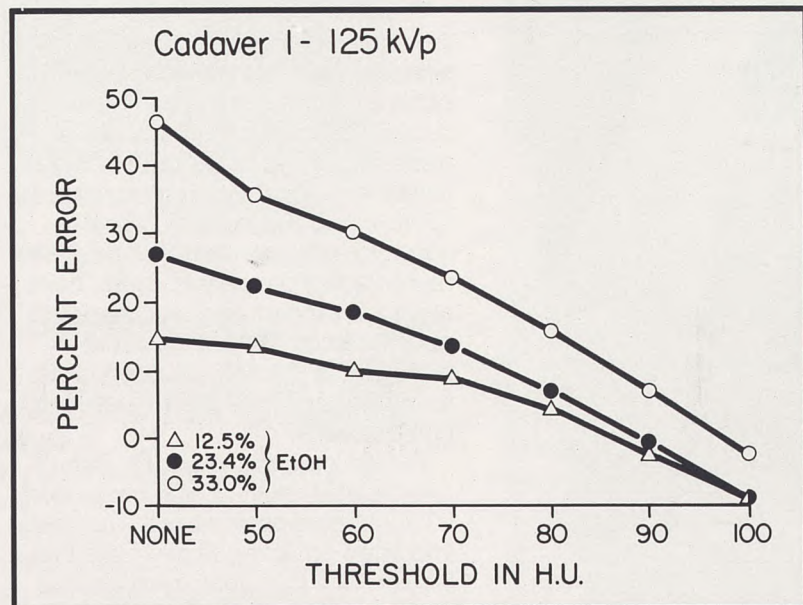
Figures A and B are identical single energy computed tomography (SECT) scans of a fourth lumbar vertebra. In both images, a circular area in the marrow space has been designated for bone mineral measurement. As the numerals superimposed on the image indicates, the average bone mineral count in Figure A is 85.3 (measurements are given in Hounsfield Units—H.U.). In Figure B, a threshold of 80 H.U. has been selected, and the pixels in the circular area whose values are higher than 80 are highlighted. This threshold raises the mineral measurement to 105.5 by eliminating some of the fat error from the original measurement.

The theory is in the testing stage. Its success may mean the end to many painful bone biopsies, which is the ultimate goal of this long-term research project.

Dr. Reinus received his medical degree from New York University Medical School in New York City in 1979. He completed a one-year internship in internal medicine at Barnes Hospital, before coming to Mallinckrodt in 1980 to begin a residency in radiology. In 1983, Dr. Reinus served a musculoskeletal radiology fellowship at MIR, and has since remained on the Institute's staff. ■

***With osteoporosis threatening an increasing proportion of the population, several treatment recommendations have evolved. These include:***

- Calcium supplements
- Exercise
- Vitamin D supplements
- Fluoride treatments
- Estrogen replacement, the most effective to date



Measurement of bone mineral using SECT always includes some error due to the presence of fat in the marrow space. The graph shows that the percent of fat error decreases as the threshold (lower bound) is increased. The choice of threshold is determined by mathematical analysis of the region of interest.



## Tolmach Will Present Failla Lecture

Radiation biologist **Leonard J. Tolmach, Ph.D.**, has been selected by the Radiation Research Society to deliver the 1986 Failla Memorial Lecture, at the Society's annual meeting in April. Since its inception in 1963, the Failla Lectureship has become one of the highest honors awarded nationally in the field of radiation research. Dr. Tolmach, who is a professor of radiation biology in MIR's division of radiation oncology, is the first from Washington University to receive this honor.

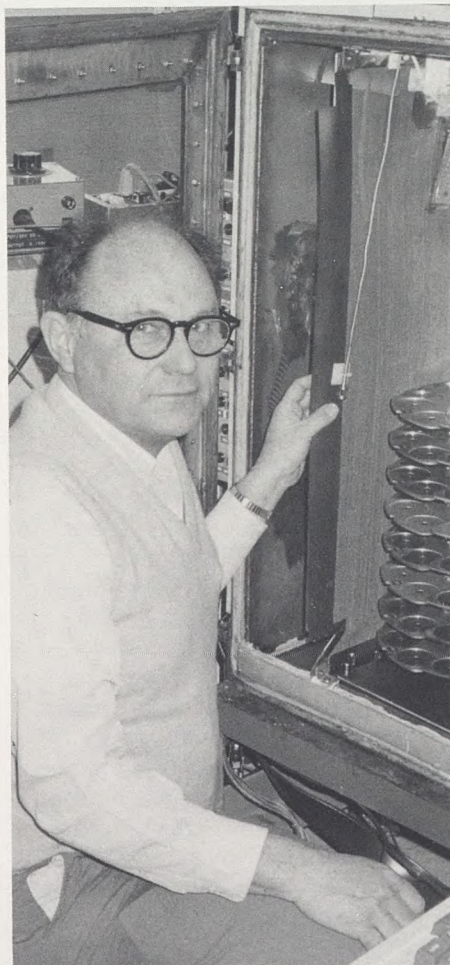
Dr. Tolmach is recognized for his outstanding contributions to radiation biology. Among his earliest achievements was the development in 1963, with Dr. Toyozo Terasima, a post-doctoral fellow from Japan, of a gentle but powerful technique for isolating cells that are all in the same phase of the cell reproductive cycle. This permitted synchronization of large numbers of cells with respect to their movement through the cycle, and has facilitated quantitative studies of cell cycle events by many laboratories.

At Washington University School of Medicine, Dr. Tolmach and his colleagues have used the technique to study the effects of radiation and of chemicals on cells at specific times during the cycle. They were the first to identify variations in cell responses to X-rays at different points in the cycle, and to establish the correlation between "cell-age" and various radiation responses. These results enhanced fundamental concepts behind the treatment of cancer with radiation therapy—the basis of which is the inactivation of cells by ionizing radiations.

In the late 1960s, Dr. Tolmach, together with Dr. Robert A. Phillips, then a Washington University graduate student, was the first to describe the repair of potentially lethal damage in mammalian cells. His later research, and that of other scientists, has focused in depth on how radiation affects DNA (genetic material) repli-

cation, a process that occurs during each cell generation cycle, and also on a number of agents and conditions that can modify these effects.

Collaborating with Washington University engineers in 1975, particularly with Dr. Robert J. Arnzen, then with the Biomedical Computer Laboratory, Dr. Tolmach developed AUDRI, an automated device for delivering reagents to culture dishes. AUDRI provides computer-controlled manipulation of the dishes and reagents on a programmed basis, thereby allowing experiments to run



*Dr. Leonard J. Tolmach and AUDRI, an automated device for delivering reagents to culture dishes. AUDRI allows experiments with cells to run for days without human assistance.*

for days without human assistance. This has proven to be extremely useful for studying the time-course of changes in cell viability caused by various postirradiation treatments.

In addition, Dr. Tolmach coordinated the development of a system for the simultaneous production of several time-lapse films of cells growing in culture, using a single microscope and camera. The films have provided considerable information about the cellular effects of irradiation.

Studies with caffeine, carried out in collaboration with **Dr. Karen L. Beetham**, a research associate in radiology at MIR, comprise most of the current research in Dr. Tolmach's laboratory at the Washington University School of Medicine. In his long-term quest to understand the effects of radiation on cells, Dr. Tolmach has focused his studies on the repair of damage in irradiated cells. Caffeine is significant to these studies because, at concentrations considerably higher than that which can be tolerated by people, it has the ability to prevent cellular repair—although no one yet knows why.

Dr. Tolmach received his doctorate in physical chemistry at the University of Chicago in 1951. He was an instructor and assistant professor of biophysics at the University of Colorado School of Medicine for seven years, before coming to Washington University in 1958 to set up the School of Medicine's first laboratory of radiation biology utilizing cultured animal cells.

The Radiation Research Society was founded in 1952, to encourage the advancement of radiation research and professional cooperation between the four scientific disciplines directly involved in radiation studies. It has a national membership of over 1600 chemists, biologists, physicists, and physicians. The Failla Lecture was established in 1963, as a living memorial to the Society's founder and second president. ■



## MIR Hosts Radiation Researchers

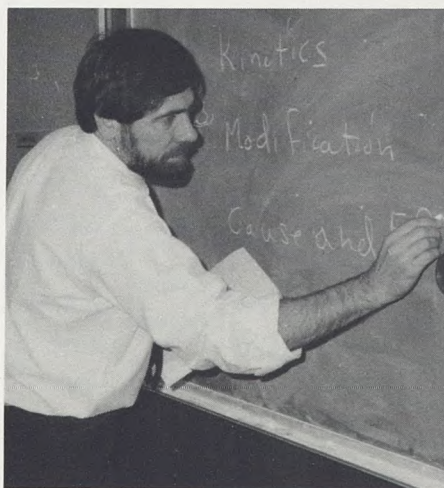
On November 8-9, MIR's division of radiation oncology hosted the First Annual Midwest Regional Meeting for Radiation Research. Organized by the division's cancer biology staff, the meeting gave area scientists the opportunity to share their recent research results and to discuss the current state of knowledge of principal topics in radiation research.

According to **Joseph L. Roti Roti, Ph.D.**, chief of cancer biology, "This type of meeting has been needed for a long time. We are hopeful that it will be a first step toward ongoing communication and continued programs of this kind. MIR will probably have a key role in these activities because of the size and strength of our cancer biology section."

Many of the 30 participants who traveled to St. Louis for the weekend meeting were from large university medical centers in Kansas, Illinois, Iowa, and Tennessee. Others were from governmental and industrial laboratories where radiation research focuses on occupational and environmental health issues.

The program, which was held at the radiation oncology facility at 4511 Forest Park Blvd., included lectures, discussions, and three workshops. In the first workshop "Mechanism of Recovery from PLD (potentially lethal damage) and SLD (sublethal damage)," the role of DNA damage repair was discussed as being the underlying factor in the phenomenon of recovery from PLD. Although this was considered to be the most likely possibility, the participants concluded that several questions remain unanswered.

The workshop "Mechanisms of Heat-Induced Cell Destruction" included a discussion of possible targets for the lethal action of hyperthermia against cancer cells. The targets under consideration included the subcellular organelles, the plasma membrane cytoskeleton,



*Cancer Biology Chief Joseph L. Roti Roti, Ph.D., moderates discussion of the molecular effects of radiation on the cell during a workshop at the First Annual Midwest Regional Meeting for Radiation Research.*

and the nucleus; and it was agreed that in fact the lethal mechanism may involve all three.

Participants analyzed the clinical future of chemical modification (protection or sensitization) of the radiation response in the third workshop "Modification of Radiation Response." **Todd H. Wasserman, M.D.**, reviewed the progressive clinical trials of this strategy for cancer treatment, and all agreed that radiosensitizers will continue to be the subject of extensive research.

In addition to Drs. Roti Roti and Wasserman, other Mallinckrodt staff who participated were **Karen L. Beetham, Ph.D.**, **Ryuji Higashikubo, Ph.D.**, **Shin I. Hsu, Ph.D.**, **Andrei Laszlo, Ph.D.**, **Hsiu-san Lin, M.D., Ph.D.**, **Balakrishna Lokeshwar, Ph.D.**, **Leonard J. Tolmach, Ph.D.**, and **William D. Wright, B.S.** Oncology administrator **James "Pat" Patterson** and administrative assistant **Kathy McDonald** rounded out the cancer biology team that developed and managed this innovative program. ■

## New Radiosensitizing Drug Being Studied

MIR's division of radiation oncology is one of 20 medical facilities in North America that have begun clinical studies of a new radiosensitizing drug called SR-2508.

SR-2508 will be used in the treatment of cancer to improve the effectiveness of radiation therapy. The drug makes the hypoxic, or oxygen-depleted, cells within tumors less resistant to radiation treatment, and thereby prevents these cells from regenerating the cancer's growth.

A variety of tumors will be treated in the trials, including advanced bladder, prostate, and head and neck tumors. In most cases, the drug will be administered during the standard five-to-six-week radiation treatment program. The study will involve hundreds of patients and may take as long as five years to complete.

To date, SR-2508 is the most effective radiosensitizing drug ever developed. It is hoped that the drug will increase the efficacy of cancer radiotherapy, as it has an additional advantage in that it causes fewer side effects than other radiosensitizers.

Radiotherapist **Todd H. Wasserman, M.D.**, of the division, is chairman of the Radiation Therapy Oncology Group (RTOG) committee that is conducting the clinical studies. He has been a leader in radiosensitizer research for the past ten years. ■



# Cancer Psychiatrist To Deliver Freund Lecture

Psychiatrist Jimmie C. Holland, M.D., in her office at the Memorial Sloan-Kettering Cancer Center in New York City.

New York psychiatrist **Jimmie C. Holland, M.D.**, will discuss "Psychological Problems in Cancer:

Recognition and Management" at the fourth annual Julia Hudson Freund Memorial Lecture to be held on March 27, at 5:30 p.m., in the Scarpellino Auditorium.

The chief of the psychiatry service at the Memorial Sloan-Kettering Cancer Center, Dr. Holland is credited with the establishment of the nation's first full-time psychiatric unit in a cancer hospital, with major teaching, research, and clinical care responsibilities, in 1977. She has also led and collaborated in numerous investigations of the psychological, social, and behavioral aspects of cancer, radiotherapy, and life-threatening illnesses, such as AIDS. She additionally serves as a professor of psychiatry at Cornell University Medical College in New York and as a result of the numerous training programs she has developed for the National Cancer Institute and the American Cancer Society, has come to be known as a leader in the field of primary care education and psychiatry.

Active in professional organizations, Dr. Holland is a founding fellow of the Academy of Behavioral Medicine Research, a fellow of the American Psychiatric Association and the American College of Psychiatrists, and a member of the American Society of Clinical Oncology. She is also listed in the Who's Who of the East and the Who's Who of American Women. Graduating with the highest honors, Dr. Holland received her bachelor's degree from Baylor University at Waco and medical degree from Baylor University School of Medicine at Houston, in her native Texas.

The Freund Lecture, which was established by funds donated by the Freund family of St. Louis in memory of Julia Hudson Freund, recognizes meritorious research in clinical oncology and is coordinated by the division of radiation oncology at Mallinckrodt Institute under the directorship of **Carlos A. Perez, M.D.** ■





## 28,000 Radiologists and Scientists Meet in Chicago, Nov. 17-22

The latest technological advances in magnetic resonance imaging, computed tomography, nuclear medicine, and ultrasonography were among major topics of discussion by radiologists from sixteen different countries at the 71st Scientific Assembly and Annual Meeting of the Radiological Society of North America (RSNA).

The meeting, which included sessions in joint sponsorship with the American Association of Physicists in Medicine (AAPM), was held in Chicago, Illinois, November 17-22, 1985, at McCormick Place. Approximately 28,000 radiologists and allied scientists attended.

In all, more than 1,000 scientific papers covering all nine sub-specialties and more than 250 scientific exhibits were presented and as in the past, the meeting served to be the world's largest forum for the presentation of technological and scientific advances in radiology. More than 380 technical exhibits represented the largest and most complete collection of advances in radiologic equipment, technology, and services. Nearly fifty presentations, in various sessions, courses, and exhibits, were made by Mallinckrodt Institute staff.

One of the meeting's highlights was a series of special focus sessions on topics ranging from interventional radiography to breast cancer imaging, hyperthermia, and the health policy agenda for the American people. Mallinckrodt physicist **Gilbert H. Nussbaum, Ph.D.**, served as a panelist on the hyperthermia special focus session entitled, "Hyperthermia: Is it Ready for the Community?" The treatment of cancer was also the topic of the address given by RSNA president Luther W. Brady, Jr., M.D., of Philadelphia, which was entitled "Cancer Cure with Organ Preservation using Radiation Therapy."

A new feature of the meeting included the announcement of the recipients of 1986 fellowships awarded under the RSNA Research and Education Fund. A new venture for RSNA, this fund is intended to help fill the void left by decreasing availability of research funding and initially supports the scientific development of promising young men

and women embarking on a career in academic radiology. Recipients of this year's awards were: Evan Fram, M.D., a resident in the department of radiology at Duke University Medical Center in Durham, North Carolina, who is investigating the integrated use of in vitro spectroscopy and imaging in the study of cerebral diseases; and Scott F. Rosebrough, B.A., a graduate research assistant in the department of pharmacology at the State University of New York, Upstate Medical Center, Syracuse, New York, who is studying radioimmuno-imaging of venous thrombi.

RSNA is the largest scientific radiological organization in the world and is dedicated to the advancement of scientific education. It is headquartered in Oak Brook, Illinois, and has a membership of over 18,000. ■

### SCIENTIFIC SESSIONS

- SpS** Special Session
- PS** Plenary Session
- RC** Refresher Course
- SS** Scientific Session
- AP** Associated Programming
- WP** Works in Progress
- Ex** Exhibit

### DIAGNOSTIC RADIOLOGY



**SpS/Ex Film Interpretation Session**  
Bruce L. McClennan, M.D., panelist

### Abdominal

**RC Oncologic Imaging of the Genitourinary Tract** Bruce L. McClennan, M.D., Dennis M. Balfe, M.D.

**RC Diagnostic Radiology of the Biliary Tract** Robert E. Koehler, M.D., G. Leland Melson, M.D.

### Bone and joint

**RC The Imaging Gist for the Painful Wrist** Louis A. Gilula, M.D.

**RC Imaging of the Hip: New Concepts and Techniques** William A. Murphy, M.D., William G. Totty, M.D.

### Digital Imaging



**PS Electronic Radiology: Image Archival, PACS, and Teleradiology (RSNA/AAPM Symposium)** Gilbert R. Jost, M.D., presiding

**AP Computer Applications in Radiology** Rexford L. Hill, M.S. (SNM-TS)

**SS Computer-User Interface for Diagnostic Imaging Systems** Michael W. Vannier, M.D., Ronald G. Evens, M.D., Carolyn J. Offutt, B.A., R.T.



# RSNA Meeting

## SS Routine Radiography Using a Large Field Image Intensifier

R. Gilbert Jost, M.D., Robert G. Levitt, M.D., Stuart S. Sagel, M.D., Dennis M. Balfe, M.D., John O. Eichling, Ph.D., Ronald G. Evens, M.D.

## Ex Selected Computer Software for the Practicing Radiologist

Ronald Arenson, M.D., Joseph H. Gitlin, D.P.H., R. Gilbert Jost, M.D., Robert Greenes, M.D., Roger H. Shannon, M.D.

## Neuroradiology

### RC Neuroradiologic Evaluation of Brain and Spine Surgery

Mokhtar H. Gado, M.D.

### SS Serendipity of the Apophyseal Rim

Charles L. Abramson, M.D., Klaus Sartor, M.D., Derek C. Harwood-Nash, M.D.

### SS Efficacy of Postmyelography CT of Lumbar Spine: A Review of 120 Consecutive Cases

Gary A. Press, M.D., Mokhtar H. Gado, M.D., Fred J. Hodges, III, M.D., Klaus J. Sartor, M.D.

### SS Radiologic Investigation in Suprasellar Mass Lesions: What Does MR Imaging Add?

Michael Karnaze, M.D., Klaus Sartor, M.D., James D. Winthrop, M.D., Mokhtar H. Gado, M.D., Fred J. Hodges, III, M.D.

### SS MR Imaging in Mass Lesions of the Spheno-Occipital Region

Klaus Sartor, M.D., Michael Karnaze, M.D., James D. Winthrop, M.D., Mokhtar H. Gado, M.D., Fred Hodges, III, M.D.

## Nuclear Medicine

### RC Cisternography and Other New Studies

Barry Siegel, M.D.

## Pediatric Radiology

### SS Wilms Tumor: CT and US Study in Diagnosis and Staging

Threasa A.H. Reiman, M.D., Marilyn J. Siegel, M.D., Gary D. Shackelford, M.D.

### RC Pediatric Uroradiology

William H. McAlister, M.D.

### SS CT Appearance of the Normal and Abnormal Pediatric Thymus

Thomas E. St. Amour, M.D., Scott N. Nadel, M.D., Marilyn J. Siegel, M.D., Harvey S. Glazer, M.D.

### SS CT and MR Imaging of Mediastinal Tumors in Children

Scott N. Nadel, M.D., Marilyn J. Siegel, M.D., Harvey S. Glazer, M.D., Stuart S. Sagel, M.D.

## COMPUTED TOMOGRAPHY



### PS CT a Decade Later: Past, Present, and Future

Joseph K.T. Lee, M.D., panelist

### SS Artifacts in Three-Dimensional CT Reconstruction Images and Their Removal

Michael W. Vannier, M.D., Jeffrey L. Marsh, M.D., Robert H. Knapp, B.M., R.T., Carolyn J. Offutt, B.A., R.T.

### SS CT Examination of Soft Tissues of the Foot

Charles K. Keyser, M.D., Louis A. Gilula, M.D., Steven J. Adler, M.D., Michael W. Vannier, M.D.



### RC CT of the Mediastinum

Stuart S. Sagel, M.D.

### RC CT of the Retroperitoneum

Joseph K.T. Lee, M.D.

## MR IMAGING

### SS MR Imaging of the Adrenal Glands

Akemi Chang, M.D., Joseph K.T. Lee, M.D., Harvey S. Glazer, M.D., Jay P. Heiken, M.D., David Ling, M.D.

### SS MR Imaging of the Scrotum

Kenneth Rholl, M.D., Joseph K.T. Lee, M.D., David Ling, M.D., Jay P. Heiken, M.D., Harvey S. Glazer, M.D., G. Leland Melson, M.D.

### SS MR Imaging of Breast and Axillary Tissue at 0.6 T: A Correlation of Signal Intensities and Relaxation Times with Pathological Findings

Jonathan I. Wiener, M.D., Alexander C. Chako, M.D., Charles W. Merten, M.D., Harry L. Stein, M.D.

### SS MR Imaging of Soft-Tissue Musculoskeletal Tumors

William G. Totty, M.D., William A. Murphy, M.D., Joseph K.T. Lee, M.D.

### SS MR Imaging of the Posttreatment Neck

John H. Niemeyer, M.D., Harvey S. Glazer, M.D., Dennis M. Balfe, M.D., Bahman Emami, M.D., V. Rao Devineni, M.D., Robert G. Levitt, M.D., Dixie J. Aronberg, M.D., Richard E. Hayden, M.D., Michael P. Ward, M.D., Joseph K.T. Lee, M.D., Stuart S. Sagel, M.D.



## **SS Diseases of Psoas Muscle: A New Concept Based on MR Imaging**

**Observations** Joseph K.T. Lee, M.D., Harvey S. Glazer, M.D.

## **SS MR Imaging Evaluation of Ischemic Necrosis of Carpal Bones**

William F. Conway, M.D., Ph.D., William R. Reinus, M.D., Louis A. Gilula, M.D., William G. Totty, M.D., William A. Murphy, M.D., Paul R. Manske, M.D., Paul M. Weeks, M.D., V. Leroy Young, M.D.

## **SS Postoperative Evaluation of Mediastinal Vessels by MR Imaging**

Michael E. Katz, M.D., Harvey S. Glazer, M.D., Fernando Gutierrez, M.D., Marilyn J. Siegel, M.D., Robert G. Levitt, M.D., Dixie J. Aronberg, M.D., Joseph K.T. Lee, M.D.

## **SS Staging of Bladder Neoplasms by MR**

Joseph K.T. Lee, M.D., Kenneth Rholl, M.D., Jay P. Heiken, M.D., David Ling, M.D., Dennis M. Balfe, M.D., Harvey S. Glazer, M.D., Bruce L. McClennan, M.D.

## **SS MR Imaging of the Neck: Normal and Pathologic Anatomy**

Harvey S. Glazer, M.D., Dennis M. Balfe, M.D., John H. Niemeyer, M.D., V. Rao Devineni, M.D., Bahman Emami, M.D., Dixie J. Aronberg, M.D., Robert G. Levitt, M.D., Richard E. Hayden, M.D., Michael P. Ward, M.D., Stuart S. Sagel, M.D., Joseph K.T. Lee, M.D.

## **WP Differentiation of Proximal Bronchogenic Carcinoma From Postobstructive Lobar Collapse Using MR Imaging: Comparison With CT**

**Imaging: Comparison With CT** Jerry Tobler, Ph.D., M.D., Robert G. Levitt, M.D., Harvey S. Glazer, M.D., Jon Moran, M.D., Edward Crouch, M.D., Ronald G. Evens, M.D.

## **Ex Interpretation of MR Images of Normal and Abnormal Postmortem Brain: A Radiologic-Pathologic Study**

Gary A. Press, M.D., Mokhtar H. Gado, M.D., Keith Fulling, M.D., Fred Hodges, III, M.D., Klaus J. Sartor, M.D.

## **Ex MR Imaging of Breast and Axillary Tissues**

Charles W. Merten, M.D., Alexander Chako, M.D., Jonathan I. Wiener, M.D., Stanley Gross, M.D., Edward L. Coffey, M.D., Alan Wecksell, M.D., Harry L. Stein, M.D.

## **WP Liposomal Gadolinium-DTPA as a Potential MR Contrast Agent for the Liver and Spleen**

Evan C. Unger, M.D., Joseph K.T. Lee, M.D., Michael Welch, M.D.

## **PHYSICS**

### **SS Slanted Beam Technique for Total Body Irradiation**

Pin-Hua Huang, Ph.D., James R. Geurin, M.D.

### **SS Point Dose Calculations for Mantle Fields in Hodgkin's Disease**

Perry Grigsby, M.D., Russell L. Gerber, M.S., Todd H. Wasserman, M.D., James A. Purdy, Ph.D.

### **WP Lanthanide Chelates as Potential Intravascular Contrast Agents**

Evan Unger, M.D., Fernando Gutierrez, M.D., Michael Vannier, M.D.

## **THERAPEUTIC RADIOLOGY**

### **SpS Physics and Instrumentation of Deep and Superficial Heating**

Gilbert H. Nussbaum, Ph.D., panelist, at "Hypothermia: Is It Ready for the Community?"

### **SS Preoperative Radiation Therapy and Surgery versus Radiation Therapy Alone in Treatment of Carcinoma of the Esophagus**

David A. Trenkner, M.D., Bahman Emami, M.D., Mary Ann Hederman, B.S.

### **SS Cure of Early-Stage Hodgkin's Disease without Laparotomy or Total Nodal Irradiation**

David A. Trenkner, M.D., Todd H. Wasserman, M.D., Barbara Fineberg, B.A.

## **SS Signal Intensity in Assessing Results of Treatment in Central Nervous System Tumors**

Gary Press, M.D., Mokhtar Gado, M.D., Klaus Sartor, M.D., Fred Hodges, III, M.D.

## **ULTRASONOGRAPHY**

### **SS High-Resolution US of Primary Testicular Neoplasms: Accuracy, Unusual Findings, and Pitfalls**

David Ling, M.D., G. Leland Melson, M.D., Russell Tackett, M.D., William J. Catalona, M.D.

## **MIR Calendar of Events**

### **MAR. 16-23**

JOHNS HOPKINS RADIOLOGICAL ALUMNI ASSOCIATION AND EUROPEAN ASSOCIATION OF RADIOLOGY  
Davos, Switzerland

### **MAR. 27**

FREUND MEMORIAL LECTURE:  
Jimmie C. Holland, M.D.  
Scarpellino Auditorium,  
Mallinckrodt Institute, 5:30 p.m.

### **APR. 6-10**

AMERICAN RADIUM SOCIETY  
San Francisco, Calif.

### **APR. 13-18**

AMERICAN ROENTGEN RAY SOCIETY  
Washington, D.C.

### **MAY 12-16**

22nd NATIONAL CONFERENCE ON  
BREAST CANCER  
Boston, Mass.



# RSNA Meeting

## Clinical MR Imaging Manual Makes Debut



Two years after the installation of Missouri's first magnetic resonance imaging (MRI) system, a team of Mallinckrodt radiologists has written the first practical guide for using the new machine. **Manual of Clinical Magnetic Resonance Imaging** describes step-by-step how to perform MRI examinations of all areas of the body.

**Dr. Jay P. Heiken**, assistant professor of radiology at MIR, spearheaded the book's production.

"In a very short time," says Dr. Heiken, "MRI has gained acceptance as a clinically useful imaging tool. The number of institutions acquiring MR imagers is increasing despite the one million plus cost."

"The purpose of the book is to share what we have learned about MR imaging at Mallinckrodt Institute over the past two years," says Dr. Heiken. "In over 4,000 clinical studies to date, we have developed effective MR imaging approaches to a

Dr. Jay P. Heiken showed the first copy of the *Manual of Clinical Magnetic Resonance Imaging* to a visitor attending the 71st meeting of the RSNA in Chicago, November 17-22. The book came off the press during the week of the RSNA meeting.

number of medical problems. By using our guidelines to plan MRI exams, physicians with less experience in MRI will be able to obtain diagnostically useful studies without having to go through the long process of developing these techniques on their own."

The manual contains an introductory section describing the physical principles and techniques of magnetic resonance imaging and the most common artifacts, or image distortions that occur. The remaining section consists of 45 tables, each of which presents a list of guidelines for MR imaging of a specific disease or medical problem, followed by comments about the rationale and possible variations on the approach.

Recommendations are given for MR exams of the spine, head, neck, chest, cardiovascular system, abdomen, pelvis, musculoskeletal system, and breast. The recommendations are applicable to all intermediate field strength (0.3T-0.7T) MR imaging systems. For studies of the central nervous system and musculoskeletal system, recommendations for use of a high field strength (1.5T) system are also included.

Compact, portable, and organized for easy reference, the manual is designed for use at the MRI console during examinations. In addition to Dr. Heiken, authors include Mallinckrodt radiologists: **Harvey S. Glazer, M.D.**, assistant professor of radiology, chest section; **Joseph K.T. Lee, M.D.**, associate professor of radiology and co-director of computed tomography (CT); **William A. Murphy, M.D.**, professor of radiology and co-chief of the musculoskeletal section; and **Mokhtar Gado, M.D.**, professor of radiology and chief of the neuroradiology section.

Initial distribution of the manual coincided with the 71st Scientific Assembly and Annual Meeting of the Radiological Society of North America (RSNA), held in Chicago, November 17-22. ■

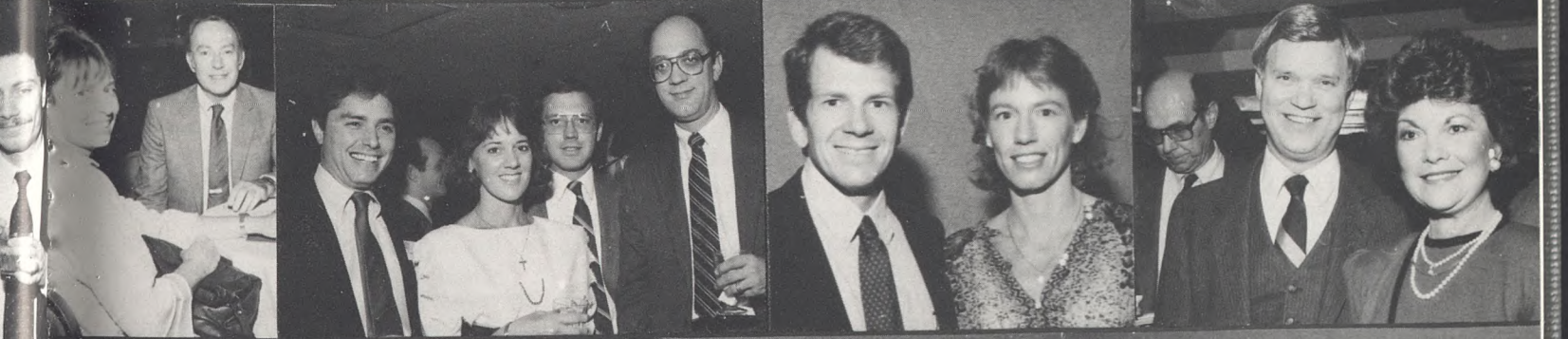
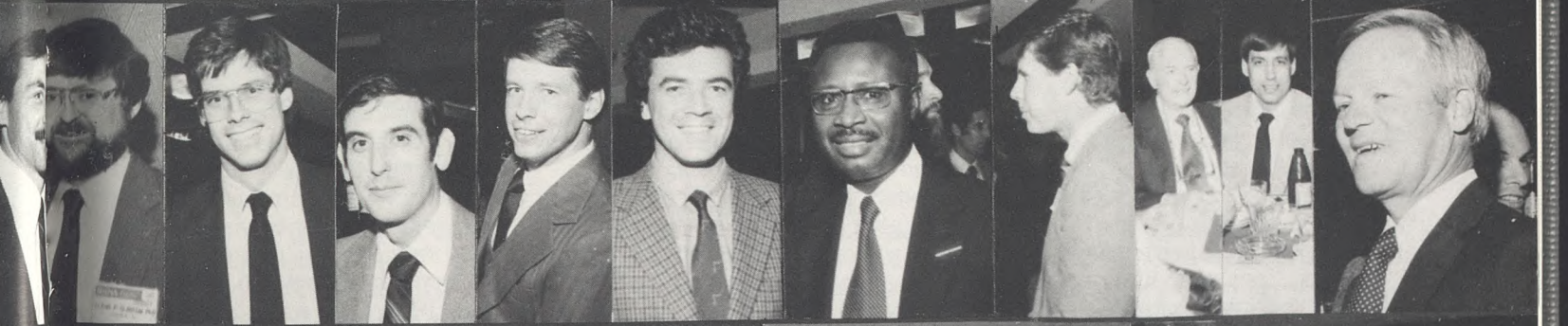




RSNA Washington University Medical Center Alumni Reception









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## Breast-Conserving Treatment

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# A CHANCE TO REMAIN WHOLE

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by Ria Munoz

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In her 18th floor office overlooking busy downtown St. Louis, Mary Phelan (Fay-lan) almost looks out of place. Though she is a seasoned public relations counselor, she looks more like a long-distance runner. She's long and lean. She strides rather than walks. And she looks years younger than a woman facing fifty this year. But she is also undergoing treatment for a disease that takes the lives of some forty thousand women a year in the United States alone.

The disease is breast cancer and because it was caught early, Mrs. Phelan is one of a growing number of informed women with primary breast cancer who are able to benefit from a technique that rids the body of cancer but spares the breast, offering what one patient calls "a chance to remain whole."

Called breast conservation therapy, the technique was first developed over forty years ago by French, English, and Finnish physicians. Though it has undergone some change and refinement since first practiced in Europe, its basic provisions and steps remain the same.

Breast cancer must be detected in the early stages and the woman's tumor must be small in relation to the size of her breast which, in most cases, means the tumor is no larger than 4 centimeters.

The technique requires both surgical and radiotherapeutic expertise so a surgeon and radiotherapist (a physician who specializes in the use

of radiation in the treatment of cancer) must work hand in hand. The surgeon will remove the cancerous lump in a procedure which is called a tylectomy, commonly referred to as a "lumpectomy." In order to initiate radiation treatment at the same time as the tylectomy (a time-saving process which prevents the patient from having to go through a second surgical procedure), the radiotherapist threads catheters, thin plastic tubes, into the tissue surrounding the area from which the lump was removed. When filled with iridium wires, the catheters emit an amount of radiation strong enough to penetrate and destroy remaining clusters of cancer cells but not so strong that it will harm the rest of the breast.

After one to two weeks, the patient begins radiation treatments to the whole breast and perhaps to the lymph nodes located beneath the arm. These external treatments are intended to destroy cancer cells in other areas of the breast and are given in brief, outpatient visits over the course of several weeks.

Comparing results obtained in a mastectomy with those of breast-conserving treatment, the director of the Institute's division of radiation oncology, **Carlos A. Perez, M.D.**, says, "Though both techniques offer the same survival rates and tumor control, breast-conserving treatment additionally offers improvements in the resulting quality of life and in the cosmetic appearance of the patient.

Because the breast is preserved, the patient's self-image is strengthened at a time when she is already coping with a life-threatening disease."

The preservation of the breast is an important issue to women but not for all of the same reasons. Mrs. Phelan says, "I am the genetic double of my mother who twenty years ago was diagnosed with breast cancer. I saw my mother experience a double mastectomy and get cured and go on to live a very healthy life into her nineties. I'm grateful my breast cancer was caught so early and that medicine has come so far in the last several years. And I am grateful I had options. There is breast conservation therapy or (modified) mastectomy and they offer similar results. The conservation therapy seemed the best road to follow; it was the only alternative that offered a chance to remain whole."

Barnes Hospital social worker Karen Greening, A.C.S.W., says, "For many women, the idea of preserving one's breast also means protecting our womanhood and our sense of who we are. Single women wonder how the men they date may view them. Young, married women contemplate whether their husbands and children will respond to them differently. And older women, who have been married to the same partner for many years, view the loss of a part of their body as something which may lead to death. The option of having a lumpectomy changes this and also emphasizes the importance of regular breast self-examination in the early detection of cancer." Mrs. Greening counsels breast cancer patients at Mallinckrodt Institute of Radiology as part of her work as coordinator of Barnes' SHARE (Sharing Has a Reinforcing Effect) support group.

Having a healthy body was important to another patient, Jeanne Brogan, who is 42-years-old and resides in Overland, Missouri. Mrs. Brogan comments, "When I learned I had





*St. Louis public relations counselor Mary Phelan says she's grateful that breast-conserving treatment has allowed the chance to stay healthy and whole.*

options, I took the time to think things through. I realized that breast-conserving treatment would mean getting the treatment I needed and then it would be behind me. With a mastectomy, I would lose a part of me and that would be a constant reminder that something was wrong." Though cancer's spread to distant regions within her body required that she undergo chemotherapy (in addition to the breast-conserving treatment used to treat local cancer), Mrs. Brogan says she felt healthy and strong throughout her treatment period. She remained on the job as a cashier for Schnuck's Supermarkets and occasionally spent evenings out with her 12-year-old son, Joey.

Patients also have fears associated with receiving radiotherapy. Breast cancer specialist **Robert R. Kuske** (Kus-key), **M.D.**, says, "Most patients have four basic fears. First, they fear

they may lose their breasts. Secondly, they think they will lose their hair. Third, that they will become nauseated and ill (from the treatment involving radiation). And finally, they are afraid that their health will degenerate and they could die. Fortunately, these four myths do not occur with breast-conserving treatment." Dr. Kuske is a radiation oncologist with over five years experience in breast-conserving treatment, who joined the Mallinckrodt staff in the summer of 1984.

These and other success stories make breast-conserving treatment a proven alternative to disfiguring surgery in women with early cancers. And while the momentum for this option has been quite strong in Europe over the last twenty-five years, it wasn't until early last year that the technique gained wider acceptance among American physicians.

In March 1985, renown cancer

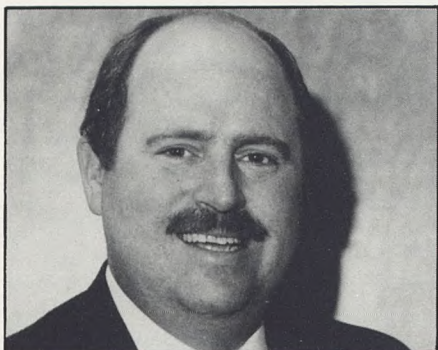
specialist Bernard Fisher, M.D., announced findings from a five-year study involving nearly two-thousand patients with early breast cancer at eighty-nine different hospitals and institutions in the United States, Canada, and Australia. Using firm scientific controls, the study concluded that patients with breast-conserving therapy had the same survival rates, tumor control, and recurrence rates as patients undergoing a mastectomy. These results, according to Dr. Kuske, were so significant that they spurred a dramatic rise in the use of breast-conserving treatment at cancer centers throughout the country.

Though Mallinckrodt's division of radiation oncology has promoted the technique for more than ten years, Dr. Perez notes that in the last two years it has tripled the number of cases calling for breast-conserving treatment. Other cancer centers, according to Mrs. Greening, are also expanding their work in this area. She says, "At a breast cancer support group office in Chicago, the phone is ringing off the hook with women's requests for more information on breast conservation therapy as well as early breast screening techniques. We are feeling similar effects. In fact, this is one reason why the SHARE group has expanded its work in breast cancer care at the medical center as well as in the area of community education."

The recent increase in breast-conserving treatment cases performed at Mallinckrodt is largely a result of the work performed by Dr. Kuske who is assisted by residents in the division of radiation oncology. Since July 1984, they have treated over sixty patients and currently see approximately twenty patients a day under this kind of care. This work, according to Dr. Perez, combined with the preliminary experience of the last ten years, has made Mallinckrodt Institute a regional leader in the field. ■



## New Business Manager Appointed



Mr. Donald R. Stone

In November, MIR Director **Ronald G. Evens, M.D.**, appointed **Mr. Donald R. Stone** to direct the Institute's expanding business office and accounting departments.

A certified public accountant (CPA), Mr. Stone brings to Mallinckrodt eleven years of experience in hospital financial management. For the past three years, he served as controller at Jefferson Memorial Hospital in Crystal City, Missouri, where he directed the implementation of programs to address the Medicare Prospective Payment System (PPS), changes in Medicare legislation, and other regulations affecting health care financing.

Previously, Mr. Stone was an audit manager for eight years with Deloitte, Haskins and Sells, one of the Big Eight international CPA firms. Working primarily with medical care providers, he was the manager responsible for all audit, pension, tax, specialty, and third-party reimbursement services for Barnes Hospital, and managed all auditing and consulting services provided to the Missouri Department of Social Services in the area of long-term reimbursement.

Among Mr. Stone's new duties is responsibility for handling Mallinckrodt's patient accounts, which involve over 300,000 examinations and treatments each year.

"The business office should support the Institute's primary function of patient care," says Mr. Stone.

"My goals are to stay on top of health care financing regulations, to provide information that is needed for informed decision-making in MIR's financial sector, and to encourage good patient/customer relations."

Mr. Stone holds a bachelor's degree in business administration from the University of Missouri-St. Louis. A member of the American Institute of Certified Public Accountants and the Missouri Society of Certified Public Accountants, he has completed over 1,000 hours of formal continuing education credits. His professional associations include the American Hospital Association and the Hospital Financial Management Association (HFMA). As a member of the Greater St. Louis Chapter of the HFMA, he serves as the Publications Committee chairman and, effective May 1986, will assume the office of treasurer.

St. Peters, Missouri, is home for Mr. Stone, his wife Chris, and their five-year-old son Daniel. ■

## Conferences/Symposia/ Meetings/Seminars/Courses

**Michael W. Vannier, M.D.**, presented a talk on "Surgical Applications of Computer Graphics" at Perspection '85, the 39th Annual Meeting of the Association of Medical Illustrators, held in Cincinnati, Ohio, on Oct. 5-9.

**Bruce L. McClennan, M.D.**, spoke on "CT of Acute Renal Inflammatory Disease," "CT/MRI Correlation in the Retroperitoneum," "CT/MRI Correlation of Renal Neoplasms," and "Oncologic Imaging of the Prostate" at Computed Tomography: Head to Toe, a postgraduate course sponsored by New York University, New York City, on Oct. 19-21.



Leading clinical researchers in the radiosensitizer field at the Fifth International Conference on Chemical Modifiers of Cancer Treatment included left, Drs. Todd H. Wasserman, Raul Urtasun, Norman Coleman, and Ted Phillips.

**Todd H. Wasserman, M.D.**, serving as opening session chairman, discussed results gained from the first phase, as well as plans for the second and third phases, of a clinical trial studying the newest hypoxic cell radiosensitizer SR-2508 at the Fifth International Conference on Chemical Modifiers of Cancer Treatment held in Clearwater, Florida, on Oct. 20-24. Dr. Wasserman is chairman of the Radiation Therapy Oncology Group Committee coordinating this trial. During the conference, he was elected by the organizing committee to serve as chairman of the U.S. delegation at the next international meeting to be held in Paris, France, in the spring of 1988.

**Mokhtar Gado, M.D.**, presented the following talks: "Orbital Pathology" and "CT/MR Correlation: Update" at the Fourth Annual Course on Head and Neck Imaging, New York, on Oct. 17-20, and "CT and MR Anatomic Correlations in the Brain," "CT and MR of Disease of the Spinal Canal and Intervertebral Discs," and "MR in the Diagnosis of Lesions of the Neck and Paranasal Sinuses" for the Twelfth Annual Course on Computed Tomography and Magnetic Resonance Imaging of the Head, Neck, and Spine, Chicago, Oct. 24-25.



# SUPDATE

**William A. Murphy Jr., M.D.** presented "Clinical Magnetic Resonance Imaging" at the Tenth Annual Memorial Lecture, St. Anthony's Medical Center, St. Louis on Nov. 7. In 1977, **Ronald G. Evens, M.D.**, the director of MIR, presented the Second Annual Lecture entitled "Computed Tomography, A Major Breakthrough for Patient Care" at the Medical Center. Dr. Murphy is the third of ten lecturers who have presented lectures on the specialty of radiology.

**Carlos A. Perez, M.D.**, attended meetings and spoke on: "Non-Small Cell Carcinoma of the Lung: Dose-Time Parameters," at the IASLC Workshop of Radiotherapy for Lung Cancer, Cambridge, England, on Jun. 26-30; "Irradiation and Hyperthermia in the Treatment of Recurrent and Metastatic Malignant Tumors, An Overview" and "Definitive Irradiation of Localized Carcinoma of the Prostate" at the I Congreso Ibero Americano de Oncologia, Madrid, Spain, on Nov. 3-6; "The Role of Radiotherapy in the Management of Carcinoma of the Ovary," "Irradiation Alone or Combined with Surgery in the Management of Carcinoma of the Uterine Cervix," "Controversy in the Management of Carcinoma of the Breast: Conservation Surgery Plus Radiotherapy," and "The Present Management of Ewing's Sarcoma" at the IX Congreso Peruano de Cancerologia, in Lima, Peru, on Nov. 24-28.

**Klaus Sartor, M.D.**, presented "CAT Scan of Lumbosacral Spine" for the Washington University Continuing Medical Education course on Low Back and Sciatic Pain, St. Louis, Dec. 13.

**Evan Unger, M.D.**, spoke on "MRI of Stroke: A Model in Experimental Animals" at the meeting of the American Society of Neuroradiology, San Diego, California, on Jan. 21.

## Elected

**Jay P. Heiken, M.D.**, was elected a lifetime member of the Society of Gastrointestinal Radiologists during the annual meeting of the Society held in Acapulco, Mexico, on Jan. 19-24. The Society is a professional organization made up of some two hundred radiologists from all over the world.

## Grand Rounds

**Judy Destouet, M.D.**, discussed the early detection of breast cancer at the Surgery Grand Round at Christian Hospital Northeast, St. Louis, on Jan. 24.

## Visiting Professors/ Guest Lecturers

**Klaus Sartor, M.D.**, served as a visiting professor and spoke on "Magnetic Resonance Imaging of the Sellar Region" at the University of Hanover, Indiana, Oct. 22, and the University of Hamburg, Oct. 24.

**John W. Wong, Ph.D.**, spoke on "Three Dimensional Radiotherapy Treatment Planning" as a guest lecturer at the Harvard Medical School Joint Center for Radiation Therapy, Boston, Massachusetts, on Oct. 31.

**Todd H. Wasserman, M.D.**, serving as a visiting professor, spoke on "Treatment of Early Stage Hodgkins Disease" and "Liver Metastases Treated With Radiation" at the Rambam Medical Center in Technion, Haifa, Israel, on Dec. 3.

**Mokhtar Gado, M.D.**, served as a visiting professor at Columbia University in New York on Dec. 11-12.

**Gilbert H. Nussbaum, Ph.D.**, presented a colloquium on "Hyperthermia in Cancer Therapy: Current Practice and Future Prospects" while serving as a visiting professor at the Los Alamos National Laboratory, New Mexico, on Oct. 22-25. He additionally served as a visiting professor at the Hospital Saint Louis in Paris, France, on Dec. 9-13.

**Joseph K.T. Lee, M.D.**, discussed "Folds, Ligaments, and Spaces: All You Want to Know but Are Afraid to Ask" as an invited speaker at the Citywide CT/US Club in Detroit, Michigan, on Oct. 15, and presented a lecture on "MRI of the Pelvis" as well as a series of case studies while serving as a visiting professor at the Henry Ford Hospital in Detroit, Oct. 15-16. Dr. Lee also spoke on "Chemical Shift Imaging of the Liver," as a guest speaker, at the Society of Gastrointestinal Radiology meeting in Acapulco, Mexico, Jan. 19-24.

**Bruce L. McClennan, M.D.**, as guest lecturer, spoke on "MRI of the GU Tract" at the Greater Miami Radiological Society meeting, on Jan. 15, and "CT Staging of Renal Neoplasm: Pitfalls and Problems" at the Philadelphia Radiological Society meeting, on Jan. 28. He additionally served as visiting professor at Yale University Medical Center, where he taught resident courses, on Oct. 11-12; at the University of Miami on Jan. 13-17; and at the Hospital of the University of Pennsylvania in Philadelphia, where he discussed "Renal Inflammatory Disease: CT/Ultrasound Correlation," on Jan. 29.

**Judy Destouet, M.D.**, serving as an invited speaker, presented "Breast Imaging 1985" at a meeting of the Greater St. Louis Society of Radiologists, on Nov. 12, and additionally discussed the early detection of breast cancer on the following media programs: "To Your Health," KMOX Radio, Dec. 12, 1985; "At Your Service," a news feature aired in forty states which is sponsored by KMOX Radio, Jan. 13; and with **Robert R. Kuske, M.D.**, "Cancers Which Affect Women," one of two MIR episodes on the Health Matters television series sponsored by MIR and other institutions at the Washington University Medical Center, Feb. 11.

## Workshops

**Jay P. Heiken, M.D.**, presented "Magnetic Resonance Imaging of the Abdomen and Pelvis" at the Postgraduate Workshop in Magnetic Resonance Imaging and Spectroscopy, Baylor College of Medicine, Houston, Texas, on Oct. 25.

## New Staff

In the division of radiation oncology, **Sharon Keown, M.B.A.**, has joined the staff as patients/accounts manager reporting to division administrator, **Beverly Kobeissi, M.B.A.** Ms. Keown was recently employed at the Regional Medical Center in Madisonville, Kentucky, and her background includes experience in accounting, data processing, and financial and data collection systems in a hospital environment. She additionally has a bachelor's degree in accounting.



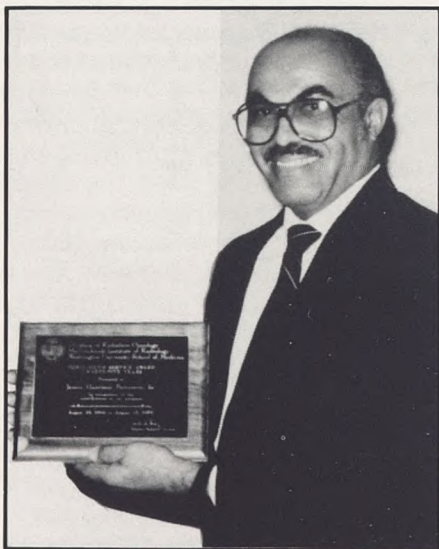
## News Update *continued*

### Honors/Awards

**John W. Wong, Ph.D.**, has been awarded a three-year grant of \$190,000 from the National Cancer Institute to conduct research on accurate photon dose calculations for radiotherapy in the treatment of cancer.

**Bruce L. McClennan, M.D.**, was named The Abbey Foundation Visiting Professor by the department of radiology at the University of Miami/Jackson Memorial Medical Center on Jan. 17. This award recognizes Dr. McClennan's many contributions to the training of residents specializing in radiology at the Medical Center.

Administrator **James "Pat" Patterson, M.A.**, was recently honored as the first staff member in MIR's division of radiation oncology to receive a Meritorious Service Award commemorating twenty-five years service. The division director, **Carlos A. Perez, M.D.**, presented Patterson with a silver plaque during the division's 1985 Christmas party held on December 13. Joining the division staff in the summer of 1960, Patterson first worked as a lab worker and was subsequently promoted to research technician, scientific coordinator, and then supervisor. He now serves as an administrator for biological research in the cancer biology section.



Administrator James "Pat" Patterson proudly displays his 25-year Meritorious Service Award.

### Appointed

Two MIR physicians have been named associate editors for **Radiology**, a monthly journal devoted to clinical radiology and allied sciences which is published by the Radiological Society of North America. As of January this year, **Joseph K.T. Lee, M.D.**, was listed as an associate editor in magnetic resonance imaging and **Bruce L. McClennan, M.D.**, an associate editor in genitourinary radiology.



The coordinator of the Cancer Information Center (CIC), **Lois J. Howland, R.N.**, has been named public information chairperson for the American Cancer Society's Central Metro Unit, District 7.

As public information chairperson, Mrs. Howland serves on the board of directors of the local American Cancer Society and is responsible for promoting cancer awareness and coordinating volunteers in information efforts. The Central Metro Unit includes Barnes, Children's, Jewish, and Bethesda Hospitals.

As the CIC professional coordinator, Mrs. Howland oversees the Center's activities, including preparation and distribution of cancer-related information, support groups for cancer patients and their families, physician referral services, and recruitment and training of volunteer staff. The CIC is co-sponsored by the division of radiation oncology at Mallinckrodt Institute and by Barnard Hospital at the Washington University Medical Center.

### Refresher Courses

**Carcinoma of the Larynx** J.E. Marks

**Clinical Applications of Local Hyperthermia** C.A. Perez

### Papers

**Misonidazole Combined with Radiation Therapy or Radiation Therapy Alone in the Treatment of Locally Advanced Non-Small Cell Lung Cancer** C.A. Perez, M. Bauer, S. Silverman, J. Cox, T. Phillips, L. Brady, M. Zininger, P. Garoner, S. Edelstein

**High Dose Radiotherapy: Locally Advanced Non-Oat Cell Carcinoma of the Lung. A Preliminary Report from a Pilot RTOG Study.** B. Emami, C.A. Perez, A. Herskovic

**Volumetric Interstitial Brachytherapy of Brain Tumors** V.R. Devineni, J.R. Simpson, J.A. Marchosky, F.A. Abrath, C. Moran

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**Point Dose Calculations for Mantle Field in Hodgkin's Disease** P. Grigsby, R.L. Gerber, T.H. Wasserman, J.A. Purdy

**A Slanted Beam Technique for Total Body Irradiation** P. Huang, J.R. Guerin

**MIR Administrator Heads SROA Meeting**

An administrator in the division of radiation oncology, **Beverly Kobeissi, M.B.A., M.A.**, presided over the second annual meeting of the Society of Radiation Oncology Administrators (SROA) which was held in conjunction with the annual ASTRO meeting. During the SROA meeting, speakers discussed a range of administrative topics and issues which included: CPT-4, Product Line Cost Accounting, Tax Law Changes, Preparing a Business Plan, Financial Modeling, as well as Opening a Free Standing Radiation Facility. And the executive director of the American College of Radiology (ACR), John Curry, spoke on mutual problems and how they are being addressed. At the close of the annual meeting, Ms. Kobeissi assumed the office of SROA board chairman.



*Mallinckrodt Marathoners Drs. Ronald G. Evens, left, and Gary Shackelford, right, with marathon excursion organizer Richard Aurelio of Picker International.*

**Evens and Shackelford Place High at New York Marathon**

by Kenneth Rholl, M.D.

On October 27 this past Fall, **Drs. Ronald G. Evens** and **Gary Shackelford** participated in the annual New York Marathon which included over 19,000 participants and world-class runners. Dr. Evens recorded his second best time for the full 26.2 miles, finishing in 3 hours and 25 minutes. This placed him in the top 15% overall, and in the top 13% for his age group. This was particularly rewarding in view of the warm temperatures and large field of runners. Dr. Shackelford also finished strongly with a time of 3 hours and 15 minutes.

Both runners expressed their enthusiasm for the event, commenting on both the outstanding organization and the historic course itself. The marathon began early in the morning on Staten Island, and was designed to run through all five New York boroughs. The course traveled through

sections of Brooklyn, Queens, The Bronx, and Harlem, encompassing many different ethnic neighborhoods. The finish line was at the renowned Tavern on the Green in Central Park. Literally millions of spectators lined the entire course, cheering and inspiring the runners. Over 7,000 volunteers were present to help with aid and water stations as well as with the immense task of keeping track of participants.

The runners were also cheered on by their wives, Hannah and Penny, who accompanied them on the marathon excursion. The trip was largely arranged by Richard Aurelio, the national sales manager for Picker International and a member of the New York Track Club. At age 42, his time of 2 hours and 34 minutes placed him second in his division. For all three runners, it was certainly a memorable experience. ■





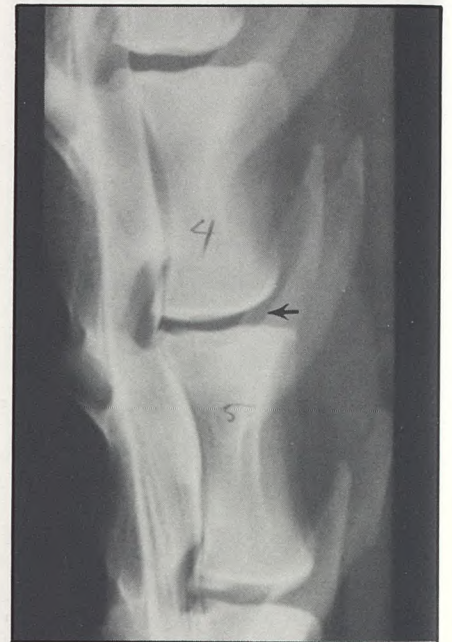
**“Usually research done on animals is used to help humans. In the case of Harpo, the cheetah, technology developed for humans was used to help an animal.”**

Louis A. Gilula, M.D.

Mallinckrodt neuroradiologist Mokhtar H. Gado, M.D., right, with zookeeper Michael Lynch of the St. Louis Zoo, prepares to shave and cleanse “Harpo” the cheetah for a myelographic examination.

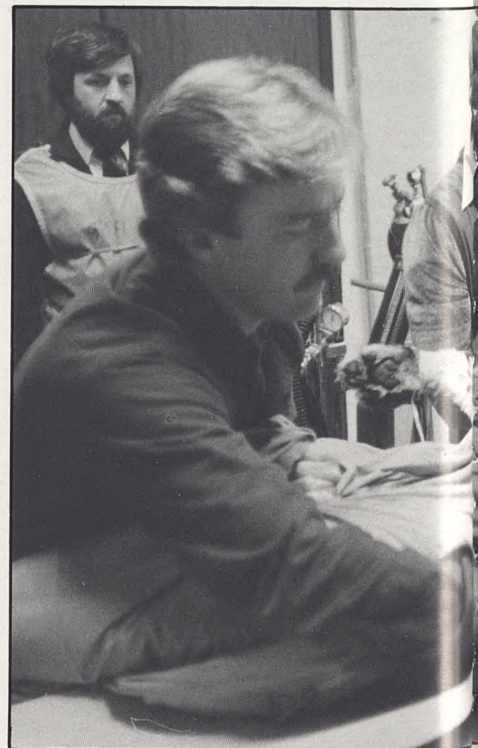
This myelographic image shows a narrowed disc space (arrow), between the fourth (4) and fifth (5) lumbar vertebral bodies, which suggests a slipped disc, a not uncommon occurrence among humans suffering from degenerated disc disease.

# Cheetah Helped by



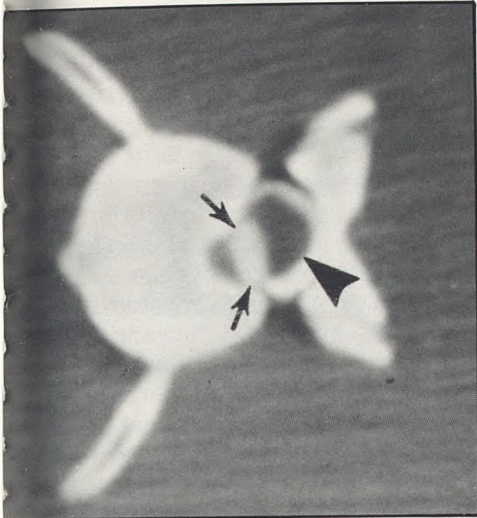
## CT SCAN

With the 90-pound cheetah still under anesthesia, zookeeper Lynch and zoologist Steve Bircher





# MIR Radiologists



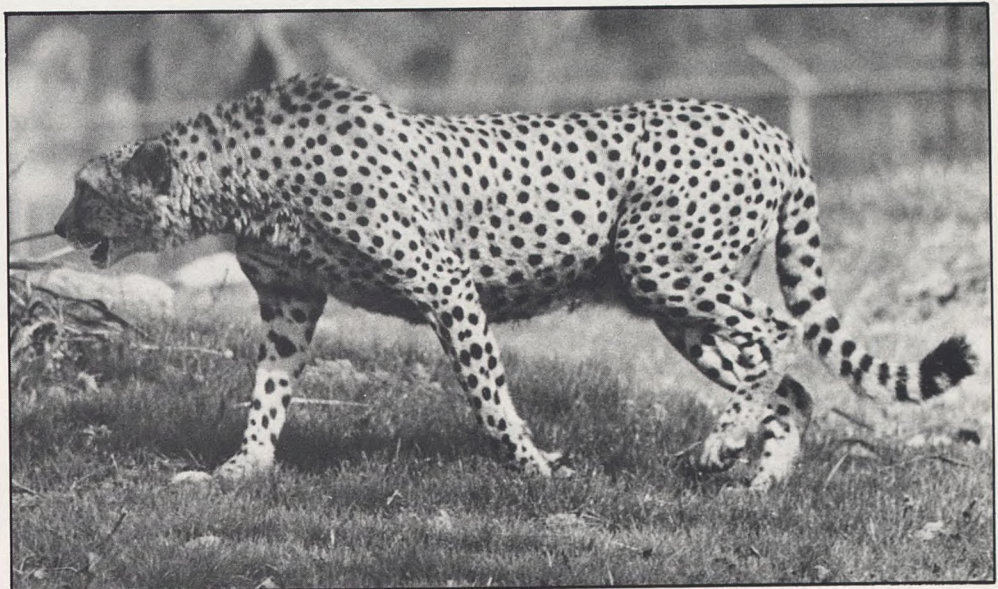
*This CT image reveals something unseen in the myelographic image: a fragment of bone (arrows), measuring less than a centimeter long, has broken away from the fifth lumbar vertebral body and is nearly touching the spinal cord.*

*After four hours of radiological testing, a caravan of anesthetic equipment and specialists wheels the sleeping cheetah out of MIR. Mallinckrodt radiologist Louis A. Gilula, M.D., who is a consultant to the Zoo, leads the way.*



*of the St. Louis Zoo, right, are able to carefully position Harpo on the CT table.*

*Because of man's increasing numbers and the conversion of wilderness areas to farm land in Eastern and Southern Africa, the world's cheetah population has greatly decreased and the animal is now considered an endangered species. This healthy cheetah is one of 22 cheetahs currently held in captivity at the St. Louis Zoo.*



*Courtesy St. Louis Zoo*



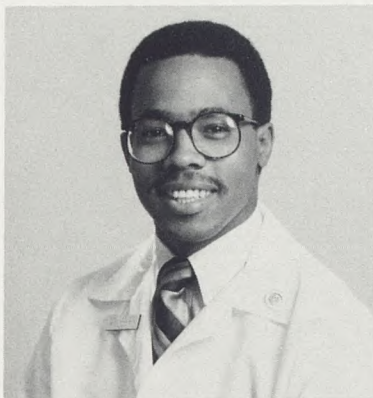
## From the



## Technical Administrator

Armand Diaz, R.T., R.N., FASRT

## Ward Named to Two Offices



Assistant Program Director **Michael D. Ward, R.T., B.S.**, of MIR's School of Radiologic Technology, is one of two Missouri delegates elected to the newly established ASRT House of Delegates. Mr. Ward will also serve on the board of directors of the Missouri Society of Radiologic Technologists (MSRT) during the next two years, and will represent the MSRT as its Eastern Counselor, responsible for approving all district-level continuing education programs located in the eastern half of the state.

In addition, the St. Louis Community College has appointed Mr. Ward to serve a two-year term on the College's Quality Control Technology Committee. Mr. Ward will advise SLCC officials in the planning, revision, and maintenance of radiologic technology curricula with the ultimate goal of preparing SLCC students for useful careers and job placement. According to SLCC Chancellor Richard K. Greenfield, the program serves as an important link between College faculty and representatives of other professions and industries.

Mr. Ward has written a number of articles describing the professional role of the radiologic technologist.

A recent publication, "The Radiologic Technologist's Role in Patient Care," is an in-depth look at technologists' responsibilities to their patients. Effective communication, both with other health professionals, as well as with patients, is emphasized.

Mr. Ward writes, "Communication alone cannot produce well-coordinated and continuous care, but technologists must come to realize that the lack of good communication can very often result in inferior care." And he adds, "A genuine sense of empathy is essential to caring for all patients. Providing an empathetic response conveys to the patient that the technologist is aware of his feelings, anx-

eties, and concerns."

Following established exam protocols, observing hospital policies, and properly explaining radiographic procedures and equipment to patients are also discussed as ways to improve work proficiency and professionalism. Mr. Ward stresses the importance of maintaining respect for each patient's individuality, and notes that patients should always be addressed by name.

Mr. Ward concludes, "Each technologist must develop within himself or herself a personal motivation and dedication to their patients and to their own professional and self image. A true sense of 'good patient care' starts on the inside."

## MIR Techs Begin Book



Robert H. Knapp, R.T., B.M.



Carolyn Offutt, R.T., B.A.



Michael W. Vannier, M.D.

MIR radiation technologists **Robert H. Knapp, R.T., B.M.**, and **Carolyn Offutt, R.T., B.A.**, in collaboration with Associate Professor **Michael W. Vannier, M.D.**, are writing a textbook that describes practical approaches to advanced digital image processing. Slated for production later this year,

the book is a collection of manuscripts the three have written and includes an introduction to digital image processing in radiology, a primer of digital subtraction angiography, and guides to several different uses of three-dimensional surface reconstructions with computed tomography (CT).



# IT'S THE LITTLE THINGS THAT COUNT

## Notes from a Physician Patient

by William A. Murphy, Jr., M.D.

Madeira, a volcanic island about five hundred miles from the coast of Portugal, has a semitropical climate and is known world-wide for the wine produced from grapes grown there. Though small in square miles and population, it is a fine place to hold a medical meeting, the reason for my being there. Vegetation is lush, flowers beautiful, people kind and friendly, food wonderful and climate pleasant.

Because of the small size of the island and its distance from Europe, everything has to be brought to the island to construct and furnish buildings, therefore facilities are limited and expensive to build. Nonetheless the hotel and meeting room facilities were adequate, and the radiological course began well. Registrants and faculty enjoyed each others company and were treated to a fine reception by the island's government.

An all-day bus tour of the island emphasizing its volcanic mountainous terrain, small villages and natural beauty drew a crowd early Tuesday morning. Shortly after boarding the bus, I developed a nagging right flank pain that seemed like a cramp caused by sitting in the wrong position except that it wouldn't go away. In fact, it became worse and worse until there was no comfortable position I could find. By late morning, I no longer notice the island's natural beauty and only wish for relief.

Shortly after noon the bus arrived at a restaurant on the opposite side of the island on the other side of the mountains. There, in great pain, I was helped into the office and Portugese radiologists traveling with the tour made arrangements for an ambulance to come from a village twenty minutes away to transfer me to the island's hospital in Funchal. The ambulance was a subcompact station wagon fitted to loosely hold a stretcher, but it got me to the hospital after more than an hour of rapid bouncing and screeching over narrow mountain curves. I was



accompanied by a dear friend and internist from Cleveland, Cheryl Weinstein. She kept a close eye on me and administered intravenous fluids.

Portugese radiologists attending the meeting met us at the hospital emergency room and provided translation for the first several hours of my hospitalization. By then we all had made a clinical diagnosis of renal colic and all that remained to be administered was a pain medication. That came almost immediately and one grateful American radiologist had what seemed like instantaneous pain relief after six hours of agony.

The hospital was not elegant, but it was certainly efficient and well staffed. When medication or testing was needed, it was supplied rapidly. Little personal comforts or minor protections of personal privacy were not overlooked. Kindness and competency existed in this small island hospital.

The pain spontaneously remitted during the night and I was discharged the next day. The entire episode including the ambulance ride, the tests (even an IVU), the medication and the physician care was covered by the social medical system. All I was responsible for was a basic entry and a few small additions and at discharge paid my \$30.00 bill.

It's frightening to be ill, but doubly so in a country where you do not speak the language and where medical care as you know it is thousands of miles away. This experience taught me something about being a patient, but more importantly, it reaffirmed that it is not the appearance of the surroundings that imparts quality to medical care. Rather it is the attitude, dedication, and training of the people who provide that care. We should all be determined to provide the highest level of personal care of which we are capable. As I discovered, it is efficiency and attention to personal details that matters. ■



*Editor's Note: On the evening of January 8, 1986, Mallinckrodt Institute employees Jean Barbier, a research engineer, and his wife Beverly, a film librarian, were killed in an automobile accident on a rural road in St. Charles County, Missouri. Both the Barbier family and Institute staff felt a great loss at this tragic event. To pay lasting tribute to Jean and Beverly Barbier, a permanent scholarship fund for radiologic technology students was established by the couple's children and is now being coordinated by the office of the director, Ronald G. Evens, M.D. The following are excerpts from the speech made by Dr. Evens during the memorial service held in Graham Chapel at Washington University on January 18.*



*Jean and Beverly Barbier*

## In Memoriam

A university has different meanings to different people. Many think of a university as a campus of buildings. An example is our beautiful Graham Chapel at Washington University where we are attending this memorial service.

I think of a university as a composite of the people who work, learn, or contribute in other ways to the great system and institute of learning that we call a university. **Jean and Beverly Barbier** were two individuals who were important contributors to Washington University and its Mallinckrodt Institute of Radiology.

The School of Medicine at Washington University traditionally describes its responsibilities in three areas: clinical care, research, and teaching. Both Barbiers were important to one or more of these responsibilities in their employment at Mallinckrodt Institute.

Beverly Barbier served as an

important member of our clinical team on the third floor of neuroradiology. Always pleasant and understanding how her work related to taking care of patients, she continually strived to do her best in aiding our neuroradiologists and residents.

Jean Barbier joined the Mallinckrodt Institute of Radiology in 1971, the same year that I became head of the department and director of the Institute. He was educated at Washington University, Purdue University, and the University of Indiana in both mechanical and electrical engineering. More importantly in many respects, he grew as an engineer through the ranks. During his lifetime, he was a pipefitter, a welder, a building contractor for both residential and commercial projects, and eventually a project engineer for Intertherm, Inc. where he was responsible for the work of several

individuals that ultimately developed heating and other electrical projects. At Intertherm, over a ten-year period, his work resulted in several products and seven patents.

When Jean came to Mallinckrodt as our first full-time research engineer, he quickly became known as a great engineer and an exceptional collaborator. He was always willing to help others in providing the special skills necessary to bring an idea into an actual piece of equipment that would work for patient care. The units of equipment he made would fill a large room, and no one could count his many adjustments or special attachments on equipment used by our scientists and radiologists. He was a co-author of ten papers in medical literature and has at least five patents for various inventions during his time at Mallinckrodt. Among his inventions



## Contributors to Cancer Information Center

at MIR of particular note are: a special Xenon isotope delivery system for use in pulmonary studies; a specially designed heating unit to keep small infants warm while undergoing X-ray tests; a unit to comfort patients and hold their heads in a proper position while undergoing temporomandibular joint radiology; and a series of devices for computed tomography scanning to obtain special views for clinical and research use. Recently, he and colleagues at the Mallinckrodt Institute designed and developed a specialized unit to allow high precision biopsies of the brain under computed tomography control.

I predict that Jean will be remembered by most of his friends at the Institute as an exceptional teacher. He took great pride in helping young students progress into X-ray and nuclear medicine technology skills, and contributed to the training of at least fifteen classes of technology students who are now caring for patients in all parts of the United States.

The descriptive words that come to my mind for both Jean and Beverly are: sincere, dedicated, helpful, innovative, and concerned for others. Their friends and colleagues at Washington University grieve with their family and friends in this unexpected and tragic loss. We can be grateful for their participation in the medical care of our patients and their commitment to the future with technical inventions and the service to others by students of Jean and Beverly.

I cannot think of a more fitting memorial to Jean and Beverly than a Scholarship Fund for X-ray Technology Students at the Mallinckrodt Institute. Washington University is grateful to their family for this decision.

Ronald G. Evens, M.D.  
Professor and Head

From September 1985 through January 1986, several contributions were made to the Cancer Information Center which is co-sponsored by Mallinckrodt Institute of Radiology and the Barnard Free Skin and Cancer Hospital at the Washington University Medical Center. The list of donors includes:

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**From  
the Editor:**

Since first published in the fall of 1971, FOCAL SPOT has served a primary purpose: to report on Mallinckrodt Institute's advances in radiology and the related sciences, commitment to teaching, and dedication to providing the finest possible patient care.

Though this purpose has gone unchanged, the magazine has experienced change in other areas. Its news coverage has been expanded to include reports, features, and com-

mentary on wide-ranging subjects. The format and design has also been changed to better reflect a modern Institute which serves as a leader in the field of medical imaging.

The magazine's audience has also changed. It has grown in size and stature as the Institute's staff, alumni, and associates continue to carry out noteworthy research and achievements and as graduating residents and technologists leave to embark upon new careers in radiology. I like to think that FOCAL SPOT is the "tie that binds" you wonderful people together to the Institute.

For me, as editor, this publication represents countless hours of writing, editing, research, and creative effort. It has also involved other professionals who have contributed to the magazine's competence and integrity through their journalistic and creative skills. I am glad to say that, as a result, FOCAL SPOT has gained special recognition and won awards.

It has also greatly enhanced the Institute's international reputation for research and clinical work of the highest caliber.

But change comes in other ways. I have accepted a new position as Vice President of Children's Hospital at the Washington University Medical Center in charge of marketing and public relations. This offers exciting new challenges, and as I have been asked to remain as marketing/public relations consultant at MIR, it also affords the opportunity to maintain my close association with the Institute.

And so, after 15 years and 45 issues as editor of FOCAL SPOT, I am now "signing off!" To each of you, I send my warmest regards and thanks for your continued interest and support.

Sincerely,

*Virginia Trent*  
Virginia Trent

**MALLINCKRODT  
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AT WASHINGTON UNIVERSITY MEDICAL CENTER

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