Education and Research Foundation for the SNM, Inc.: A Strategic Alliance

The Society of Nuclear Medicine Education and Research Foundation (ERF) celebrated its 30th anniversary in 2003 by looking forward to the formation of a new strategic alliance of its goals with those of the Society. “The Society as a whole was reshaping its strategic plan to fulfill its mission to be ‘the recognized world leader in providing knowledge that advances and promotes the use of nuclear medicine’,” said Ken McKusick, MD, who served as president of the ERF. “The ERF had already made substantial commitments of time and resources in advancing this cause since its founding in 1973, through the creation of a number of awards, fellowships, grants, and other funding mechanisms to encourage innovation and commitment to nuclear medicine endeavors. Working with the SNM and the SNMTS, however, we identified specific strengths on which the ERF can build and with which we can work together in new ways to enhance these efforts.”

One of the results of the alliance is that the ERF changed its official name to the Education and Research Foundation for the Society of Nuclear Medicine, Inc. The new name indicates a new organizational status, with the ERF now solely focused on development and fundraising. The SNM has assumed responsibility for the grants and awards introduced and previously administered by the ERF.

“With the recent unprecedented restructuring and strategic planning process, the SNM, SNMTS, and ERF are now well synchronized and jointly committed to an entirely new level of fundraising in support of nuclear medicine research and education,” said Michael Devous, MD, current ERF president. “With rapid developments in molecular imaging, PET, and SPECT instrumentation and in small animal imaging, our discipline is poised to experience tremendous growth. Moreover, seamless integration with the most exciting developments in medicine—including genomic and proteomic science—is not only an important goal for the SNM but is both essential and completely achievable. However, this range of extraordinary opportunities will be missed if we do not invest in our field to support the highest level of research; educate our scientists, practitioners and technologists; and attract new, young talent into our discipline.” The strategic alliance formed by the ERF, SNM, and SNMTS has resulted in a joint development office that will focus on providing the funding and infrastructure to support the 3 areas of investment cited by Devous. The office is headed by Kathleen Bates, SNM Director of Development.

The ERF elected an 11-member board of directors earlier this year. Members of the board will include a president, president-elect, treasurer/secretary, 4 members-at-large elected from a nominated slate, 2 members appointed by the SNM president, and 2 members appointed by the SNMTS president. A special orientation for board members was held in May and helped to refine and define the role the ERF will play in its new relationship with the SNM and SNMTS. “We will invest both corporately and personally in the necessary human and fiscal resources to accomplish these goals and work hand in hand to achieve them,” said Devous. “It is an honor to be among the leadership engaged in this exciting enterprise, and I look forward to the new era of cooperation and progress.”

Building on Past Successes

The ERF continues to build on its past successes. In the first half of 2004, the SNM awarded $57,350 to 49 physicians, scientists, technologists, and students in support of their education, research, and accomplishments in nuclear medicine. In addition, the ERF also funded a total of $50,000 for the 2 Cassen awards (see p. 20N). Development efforts in 2003 and 2004 have exceeded expectations. One example is the campaign for donors to the 50th anniversary celebrations for the Society. To date, more than 209 donors have given $56,450 in support of the campaign. “One part of our new development effort is to make sure that donors are recognized for their generous efforts on behalf of the Society,” said Bates. “Donors who gave $500 or more to the 50th Anniversary Campaign
will be listed on a plaque at SNM headquarters in Reston. At the SNM meeting in Philadelphia in June, we highlighted an Honor Wall of Donors.” Bates also distributed the first edition of Contributor, a newsletter for and about donors to the nuclear medicine community.

New SNM President Mathew Thakur, PhD, notes elsewhere in this month’s Newsline (p. 36N) the importance of spreading the word about the various awards and honors that the ERF efforts make possible. “Through the SNM/ERF coalition, we will attempt to enhance the visibility and prestige of these fellowships and those who receive them, so that every young scholar will be aware of and encouraged to compete,” he said. In support of this initiative, Newsline this month includes both a list of awardees and a list of donors to the work of the new strategic alliance. Congratulations to all—both recipients and contributors—for being vital parts of the work that will lead nuclear medicine to explore new and expanding horizons in the coming years.

Grants, Fellowships, Scholarships, and Awards

The Cassen Prize. This major award was made possible by funds from the estate of Mary Wylie Cassen in honor of her husband, Benedict Cassen. His invention of the rectilinear radioisotope scanner, the first instrument in nuclear medicine to make an image of an organ in a patient, was seminal to the development of the field. The first honoree was Hal O. Anger, DSc (1994), for his invention of the scintillation camera. The 2004 Cassen award was given to Michael Welch, PhD, at the SNM annual meeting in June. A profile of Welch and his contributions will appear in the August issue of Newsline.

The Cassen Postdoctoral Fellowship. Also made possible by funds from the Cassen estate, this award enables recent doctoral degree recipients to participate in research activities at an institution other than their degree-granting institution. The 2004 Cassen Fellow is Deborah Pareto-Onghena.

Mark Tetalman Memorial Award. Established by the family and friends of Mark Tetalman, MD, whose promising career was cut short, this annual award recognizes the work of young investigators pursuing research in nuclear medicine. The 2004 Mark Tetalman Award recipient is Habib Zaidi, PhD, head of the PET Instrumentation and Neuroscience Laboratory, Division of Nuclear Medicine, Geneva University Hospital, Switzerland.

Alavi-Mandell Awards. These awards recognize nuclear medicine resident or PhD trainees who have served as senior authors of scientific articles published in The Journal of Nuclear Medicine. Awards are given to honor the memory of the fathers of Drs. Abass Alavi and Gerald Mandell and are intended to encourage young physicians and scientists to pursue a career in academic and research nuclear medicine. 2004 awardees and their articles are: Gerald Antoch, MD (Focal tracer uptake: a potential artifact in contrast-enhanced dual-modality PET/CT scans); Adey Ayalew, PhD (201TI and 99mTc-MIBI retention in an isolated heart model of low flow ischemia and stunning: evidence of negligible impacts of myocyte metabolism on the tracers kinetics); Viviane Boutilier, MD, PhD (Correlation between PET and siccom in temporal lobe epilepsy); Nicolas Boussion, PhD (Automated detection of local normalization areas for ictal-interictal subtraction brain SPECT imaging); Vincent Frouin, MD (Correction of partial-volume effect for PET striatal imaging: fast implementation and study of robustness); Bernard Gerber, MD (Myocardial blood flow, metabolism, and inotropic reserve in dogs with dysfunctional noninfarcted collateral-dependent myocardium); Steffen Hoft, MD (Fine-needle aspiration cytology of the sentinel lymph node in head and neck cancer); Sam Kim, MD (Natural history and distribution of bone and bone marrow infarctions in children with sickle hemoglobinopathies); Adam Kirton, MD, MSc (Evaluation of pediatric CNS malignancies with 99mTc-MIBI SPECT); Takashi Kurizaki, MD, PhD (Potentiation of radioimmunotherapy with response-selective peptide agonist of human C5a); Lori McDonald, MD (Deposition of cigarette smoke particles in the lung: evolution with ventilation scan using technetium-99m-labeled sulfur colloid particles); Alexander Matthes, MD (Dual time point FDG-PET scanning for the evolution of pulmonary nodules): Jean-Christophe Richard, MD (Comparison of PET with radioactive microspheres to assess pulmonary blood flow); Shartini Sankaran, MS (Optimum compensation method combination and filter cutoff choice in myocardial SPECT: an human observer study); Lalitha Shanker, MD, PhD (Comparison of 123I scintigraphy at 5 and 24 hours in patients with differentiated thyroid cancer); Sakari Tovanen, MSc (Fluorine-18-fluoromisonidazole radiodensity in head and neck cancer); Sam Kim, MD (Natural history and distribution of bone and bone marrow infarctions in children with sickle hemoglobinopathies); Adam Kirton, MD, MSc (Evaluation of pediatric CNS malignancies with 99mTc-MIBI SPECT); Takashi Kurizaki, MD, PhD (Potentiation of radioimmunotherapy with response-selective peptide agonist of human C5a); Lori McDonald, MD (Deposition of cigarette smoke particles in the lung: evolution with ventilation scan using technetium-99m-labeled sulfur colloid particles); Alexander Matthes, MD (Dual time point FDG-PET scanning for the evolution of pulmonary nodules): Jean-Christophe Richard, MD (Comparison of PET with radioactive microspheres to assess pulmonary blood flow); Shartini Sankaran, MS (Optimum compensation method combination and filter cutoff choice in myocardial SPECT: a human observer study); Lalitha Shanker, MD, PhD (Comparison of 123I scintigraphy at 5 and 24 hours in patients with differentiated thyroid cancer); Sakari Tovanen, MSc (Fluorine-18-fluoromisonidazole radiodensity in cancer studies); and Koenrad Van Laere, MD, PhD, DSc (Analysis of clinical brain SPECT data based on anatomical standardization and reference to normal data: a ROC-based comparison of visual, semiquantitative, and voxel-based methods).

Student Fellowship Awards. These fellowships support students’ full-time participation in clinical and basic research activities in nuclear medicine, with the expectation that this exposure will serve as an incentive to consider a career in the field. The program is open to students enrolled in medical school, pharmacy school, or graduate school, and undergraduates who demonstrate outstanding competence in the physical and/or biological aspects of radioactive tracers. The top 2 candidates each year are named as Bradley Fellows, in honor of Dr. Stanley E. Bradley, a professor of Medicine at Columbia University College of Physicians and Surgeons until 1978 and a prominent researcher in the fields of renal physiology and liver disease. The 2004 fellowship recipients and their topics include: Kaylund Chan (Studies of molecular biologic mechanisms underlying lymphoma radioimmunotherapy [90Y-Zevalin and 90Y-LYM-1] and immunotherapy (rituxan and LYM-1) as a basis for enhancing
radioimmunotherapy); April Eryou (Development of $^{111}$In-labeled immunoconjugates of trastuzumab [hereceptin]; Megumi Ito (Imaging apoptosis using $^{99m}$Tc-labeled annexin V); Matthew Loe (Biokinetics of DTPA-adenosylcobalamin, $^{18}$F-deoxyglucose, and $^{18}$F-thymidine in multiple transplanted human tumors), and Trevor Peterson (Development of modular tumor targeting molecules: motifs for both pretargeted therapy and PET imaging).

**Pilot Research Grants.** These grants support clinical and basic research by young investigators who are interested in testing innovative ideas while other major grant support is being sought. The funding supports essential materials outside the areas of salaries, major equipment purchases, and institutional overhead or travel. Two of these grants have been awarded in 2004. The awardees and their topics are Terri Edwards-Lee, MD, Assistant Professor of Neurology at Harbor-University of California at Los Angeles Medical Center (Imaging muscarinic receptors in Alzheimer’s disease: Prediction of therapy response and identification of post therapy changes); and Fang Lui, MD, Assistant Professor of Physics, Richard Stockton College of New Jersey (Surgical proof-of-principle of prototype 64-pixel positron-sensitive imaging device).

**Paul Cole Scholarships.** These scholarships provide support for nuclear medicine technology students and honor the memory of a champion of student education, Paul Cole, who died in 1986 when he was serving as president of the SNMTS.

2004 Paul Cole Scholarship recipients include Sara Ahmedi, Tiffany Barfer, Blaine Beining, Ashley Bucher, Kimberly Clifton, Donna Clapp, Alexandra Govea, Peter Granovetter, Jacqueline Gray, Miles Herndon, Dawn Hill, Karen Johnson, Suzanne Karzoun, Lawrence Kuch, Kathryn Morris, Jillian Pellow, Anthony Silvio, Danielle Sprech, Sindy Sun, and Jerri Walters.

**Technologist Award.** Two awards recognize technologists’ contributions to nuclear medicine research and practice: the SNMTS Scientific Paper Award and the SNMTS Best Paper Award. 

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CNMT • Cheryl A. Beegle • Rajan Behal, MD • Carlos Bekerman, MD • Francy Belizaire • Brigitte B. Bokinsky,
CNMT • Russ M. Bergeron • Elazar A. Bienstock • Lawrence D. Black • Kwaena Boakye-Afful •
Rebecca S. Bock, CNMT • Trudy M. Bonilla, AS • Frederick J. Bonte, MD • Boudewijn T. Brans, MD •
Marcia R. Boyd, CNMT, FSNMTS • Brennan D. Bradshaw, CNMT • Charles A. Brennanman • Paul Bretzius,
Marisa A. Brice, CNMT, RT(N) • Robin J. Bridgman • Thomas C. Briggs, CNMT • Matthew W. Brown, CNMT •
Kelly Mack Brown, RT(T) • Steven S. Brown, CNMT • Duncan C. Burdick, MD • Richard J. Campeau, MD •
Neil J. Canada • Ana L. Canizales De Valentine, MD • Brian, F. Caputo, BA, CNMT • Lisa V. Carfano, CNMT
• Vicente J. Caride, MD • Eileen P. Catino, CNMT • William M. Chatoff • Ralph A. Chilcott, CNMT • Young
S. Choice, MD • Jeffrey W. Chudoba, MD • Charles J. Chung, MD • Sonia P. Cielo, CNMT • Luc Cinotti, MD
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• Karen W. Cox, CNMT • John J. Coyle, Jr., MD • Tim S. Crews, MA • Janice C. Cronin • Mark H. Crosthwaite,
CNMT • Lynnda S. Cruz, CNMT, RT(N) • Thomas Dalessandro, MD • Glenn V. Dalrymple, MD • Kathryn G.
Davis, CNMT • Bhaskar R. Dawadi, PhD • Mark R. DeGalan, MD, PhD • Michael D. Devous, Sr., PhD
• Kenny C. Dexter, AS, RT(N) • Pablo E. Dibos, MD • Thomas W. Dickinson, CNMT • Delval Didier, MD
• Mary E. Dilworth, BS • Richard Dobben, MD • Stephen PMJ Downey • Eddy K. Dunn, MD • Dennis J. Dunn,
CNMT • Lisa T. Durand, CNMT • Lisa L. Easterling, CNMT • James P. Edlin, MD • Howard J. Eisen, MD
• David A. Ellis, MD • Alexander Ervanian, Sr., MD • David G. Estanque, RT(N) • Judy A. Evans, CNMT
• Kristin A. Evans, CNMT • David G. Evans, MD • Ferruccio Fazio, MD • Adriana Fernandez, BS, MS, RPh
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PhD • Jeff A. Galen, CNMT • Fang-yun Gan • Paul E. Gandy, MD • Bineyam M. Gebrewold • Stephen K.
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• Robert E. Sonnemaker, MD • Susann Stearns • Michael L. Stewart, MD • Richard E. Stewart, MD • Carol Stimson • James D. Stone, MD • Stephen D. Streker, CNMT • David D. Stuart, MD • Daniel F. Sulser, MD • Heather Sutyak, CNMT • Yutaka Suzuki, MD • Richard S. Steffens, Jr., MD • Erika L. Sweger, CNMT • Thomas H. Tapke, CNMT • Lucille P. Taverna, MD • Patricia J. Tenhundfeld • Marcos Tepper, MD • Michael Teters, MS, ABR, RT(N) • Gerrit J. Teule, MD • Gladys M. Thomas, CNMT • Harry W. Thomas, RT(N), RT(R) • Kathy E. Thompson, CNMT • Kenneth L. Thronberry, CNMT, RT(N), RT(R) • Brenda L. Tilghman, CNMT • Julie K. Timins, MD • Eriko Tsukamoto, MD • David B. Turton, MD • S Richard Underwood, MD • Ronald I. Veatch, MD • John S. Velardo, CNMT • Nagammal Venkatesh, MD • Kathryn C. Vermoch, CNMT • Jean M. Vinot, MD • Shigetoshi Wakasugi • Victoria A. Walton, CNMT • Dieter M. Wanjura, MD • Tami S. Ward • Shasta R. Ward, CNMT • Heidi R. Wassef, MD • William A. Wegener, MD, PhD • Paul N. Weiss, MD • Marcia R. West • Randall S. Winn, MD • Linda J. Winters, CNMT • Josephine C. Wiseman, MD • Kristina M. Wittstrom • Brian Y. Wong • James M. Woolfenden, MD • Dirk J. J. Wyndaele, MD • Rhonda A. Wyatt, MD • Christin Young • Kirk Young • Ha Y. Yum, MD • Elizabeth Yung, MD • Darlene K. Zelmer, CNMT • Albert L. Zens, MD • Yongqiang Zhang, CNMT • Evie M. Zimmerman
Howard J. Dworkin, MD: Raising Expectations for Continuing Education

Howard J. Dworkin, MD, has worked for more than 3 decades to enhance nuclear medicine education and, in so doing, has become a trusted and respected figure in the wider world of continuing medical education (CME) and certification. Today, as a practicing nuclear medicine physician in his 35th year at William Beaumont Hospital (Royal Oak, MI) and an adjunct professor of radiology at the University of Michigan, this past president of the SNM (1986–1987) continues to expand on a remarkable record of accomplishment and innovation in medical education. He talked with Newsline in May about his career and about changing trends in both nuclear medicine training and continuing medical certification in general.

Advancing Medical Education

In 1986 when Dworkin was elected as president of the SNM, he already had considerable national experience working with educational issues in nuclear medicine. He had served as president of the American College of Nuclear Physicians (1978 and 1979), as chair of the American Board of Nuclear Medicine (ABNM) Committee on Certifying Examinations (1983), as ABNM representative to the American Board of Medical Specialties Committee.

From Internal Medicine to Nuclear Imaging and Therapy

Dworkin was born in Brooklyn, NY. He received an undergraduate degree in chemical engineering from Worcester Polytechnic Institute (MA) in 1955 and his medical degree from Albany Medical College (NY) in 1959. During his internship at Albany Hospital (1959–1960) and residency at Rochester General Hospital (NY; 1960–1962), he enjoyed training in his chosen field: internal medicine. “I really liked the patient contact,” he said. “This was what medicine was supposed to be. On the other hand, I missed the opportunity to apply the basic scientific background that I had learned as an undergraduate.” It was during his time at Rochester that he saw a notice on a bulletin board about a research fellowship at the University of Michigan (UM). It was at Michigan that William Beierwaltes, MD (SNM president, 1965–1966), was heading up an active group of nuclear medicine physicians. His book (coauthored with Johnson and Solari), Clinical Use of Radioisotopes (1957), was the first textbook of nuclear medicine practice. “I was familiar with Beierwaltes’ book,” said Dworkin. “And when I saw the notice, I thought this would be a very interesting field to pursue.”

Dworkin went to UM in 1962 and, although his teaching associate and third-year residency positions were nominally in internal medicine, he pursued his interests in nuclear medicine. From 1963 to 1965 he held a fellowship in cancer research at the UM Medical Center, earning a masters degree in radiation biology during the same period. He also served as the assistant coordinator of the nuclear medicine unit (1963–1966) and an instructor in the Department of Medicine (1965–1966). During this period, he published a number of papers with Beierwaltes and other UM researchers. After a year in Toronto, Canada, as head of nuclear medicine and associate professor at the Princess Margaret Hospital, Dworkin was drafted in 1967 during the Viet Nam war.

As a naval commander, he served as head of nuclear medicine in the Department of Radiology at the National Naval Medical Center in Bethesda, MD, from 1967 to 1969. “We did the routine sorts of nuclear medicine imaging that were done in most other hospitals at that time,” he said. “What was unusual (and perhaps prophetic for nuclear medicine in general) was the discovery that the military was extremely short on trained nuclear medicine technologists. I participated in a program designed to train technologists who would be able to work effectively and sometimes independently.” The program would evolve into the Nuclear Medicine Technologist Training Program at Portsmouth, VA, and would encourage the establishment of a number of other military educational efforts in nuclear medicine.
on Study of Evaluation Procedures (1983), and in a number of committee and council positions with the SNM.

“After my tenure as president, I served in several capacities with the SNM Education and Research Foundation,” said Dworkin. “In 1991, the SNM asked if I would serve as a representative to the American Medical Association Section Council on Nuclear Medicine. This was a period when the hottest topic in organized medicine was the coming requirements for recertification and continuing education. Many physicians simply couldn’t believe that this was going to become an ongoing part of their practice lives. Organizations like the SNM understood what was coming but were scrambling to identify appropriate ways to identify and serve their members’ CME needs.” At the same time, the SNM asked Dworkin to use his growing body of knowledge about recertification and education processes as a representative on the Council of Medical Specialty Societies (CMSS).

CMSS, in turn, needed a representative to the Accreditation Council for Continuing Medical Education (ACCME), the national collaborative body that was assuming increasing responsibility and oversight for the many disparate efforts to meet CME needs. As the ACCME grew, Dworkin was called upon to participate in roles of increasing responsibility. He has served as a member of the ACCME appeals panel since its inception, as a full member of the ACCME since 1995, as vice chair in 1997, and as chair in 1998. Today he is a recognized international authority on quality and planning issues associated with the CME process across the spectrum of medicine disciplines. In addition to continued work with the ACCME, including site visits to training centers, he is a member of the board of directors of the Alliance for Continuing Medical Education. He is also chair of the Michigan State Medical Society’s Committee on CME Accreditation.

“Time and money are the two biggest challenges we see to the development and maintenance of CME programs in any discipline,” he said. “Developing the test instruments, administering the examinations, maintaining a valid certification program—all of these are very costly, and much of that cost is passed on.” Moreover, the time it takes to develop a CME course and test in a rapidly changing discipline may make the knowledge outdated in a short time. “The biggest time issue, however, is the sticky question of whether even the best practitioners can master new techniques in the very short amounts of time allotted by many CME courses,” said Dworkin. Increasingly, practitioners, professional organizations, and, in some cases, even regulatory bodies are asking for measurable outcomes of CME testing. “One of the real problems right now is that no one has produced evidence that CMEs and the recertification process actually make better physicians,” he said. “It’s an urgent task that the ACCME and other groups have now taken on—to bring valid outcomes measures that assess what is and is not being

(Continued on page 47N)
From the original 1988 SNM Highlights Lecture
The Future is Now

This year I have chosen the theme “The Future is Now” because what was anticipated in the past has become a reality. Today both positron emission tomography (PET) and single photon emission computed tomography (SPECT) are major forces in the field of nuclear medicine. Forty-two percent of all the presentations at this meeting involve tomography with equal numbers of PET and SPECT. Two organ systems, the brain and the heart, continue to dominate much of the field, accounting for nearly half of the papers presented. We have new brain tracers, new heart tracers, uniquely useful studies, studies that can be performed by no other modality, and cost-effective studies. Medicine in general has accepted the orientation of nuclear medicine toward function and chemistry. More and more radiologists are becoming increasingly interested in function and chemistry. The chemical orientation of nuclear magnetic resonance (NMR) spectroscopy has proven to be a major force in pointing out the advantages of positron emission tomography to the scientific and medical communities. In the four years between 1984 and 1988, the number of PET papers has doubled. In the last three years there has been a fourfold increase in the number of SPECT papers, and a tripling of cardiac PET papers since last year. We now have three major SPECT brain agents: iodine-123 iodoamphetamine with 21 presentations, technetium-99m hexamethylpropyleneamine oxime (HMPAO) with 27 papers, and technetium-99m ethyl cysteinylate dimer (ECD) with 12 papers. We now have technetium-99m isonitrile compounds and boronated agents and indium-111 anti-myosin for heart studies.

Advances made initially by PET chemistry are translated into compounds for SPECT. There were 67 clinical studies with PET, indicating that PET is moving steadily into clinical practice. It is easier to make a variety of compounds using cyclotron-produced carbon-11 than it is to prepare either iodine-123 or technetium-99m labeled compounds. One of the major forces in the advancement of nuclear medicine is the development of new compounds. Using principles established in universities, extensive research is now being conducted by the pharmaceutical industry, and the success is reflected in the results presented at this meeting.

Recognition Sites

At this meeting, it becomes increasingly clear that iodine-123 and technetium-99m ligands can be developed that will bind to recognition sites, including transport processes, enzymes and receptors. A major principle in modern biomedicine is that communication among cells depends on such recognition sites. The question to be answered now is whether iodine-123 and technetium-99m ligands and SPECT can be used to quantify these receptors. We need to learn how quantitative such measurements can be, and how these recognition sites integrate and regulate biochemical processes in health and disease.

The usual sequence of developments in the field of nuclear medicine today is that the drug industry and basic science departments develop and evaluate tritiated or carbon-14 compounds. If useful, they...
can subsequently be labeled with carbon-11, fluorine-18 or iodine-123. At times putting an iodine on a molecule not only does not inhibit the binding to the receptor, but may in fact increase its affinity. Often, the talented chemists in nuclear medicine can incorporate the iodine at a position where deiodination is no longer a problem.

What about technetium-99m? Results reported at this meeting give reasons for optimism that technetium-99m-labeled ligands can be developed that will bind to recognition sites. Some chemists had doubted whether a technetium-labeled compound could cross the blood-brain barrier and still react with specific recognition sites, such as enzymes or receptors. This has been accomplished with technetium-99m ECD. . . . The enzymatic reaction occurring in the brain has been characterized by kinetic analysis. These results offer great encouragement to chemists trying to develop technetium-99m compounds to bind the receptors.

**Image of the Year**

Every year, I select what I believe is the most significant image presented at the meeting (Fig. 1). It is a SPECT study, reflecting the increasing role of SPECT not only in clinical practice, but also in nuclear medicine research. It is also a SPECT image performed with a new generation of SPECT instruments. These images were obtained by Devous et al. using a three-detector SPECT scanner. The tracer is technetium-99m ECD, which binds to a specific recognition site inside the brain, an esterase.

Figure 2 shows technetium-99m HMPAO images obtained with another advanced SPECT system. Looking at the spatial resolution of these SPECT images, we can’t tell them from PET images. For the first time, in preparing for this talk, I have often had to look twice to see whether the images were obtained by SPECT or PET. This work with technetium-99m has been done by Kimura of Osaka University Medical School.

Using technetium-99m-labeled HMPAO, Momose and others at Tokyo University presented a new approach to SPECT imaging with technetium-99m HMPAO. An initial injection of technetium-99m HMPAO is made at rest and then ten minutes later, a second injection is made while the subject is performing a memory task. Because the initial tracer remains fixed, the initial residual activity can be subtracted from the activity obtained after the second injection. In a patient with Alzheimer’s disease, the two sets of images are hardly different, while in a normal person, several areas, such as the frontal cortex, reflect increased blood flow . . .

Nuclear medicine continues to be a vigorous area of medical research. This year’s meeting has brought yesterday’s promise of the future closer to everyday practice.

*Henry N. Wagner, Jr., MD*

*The Johns Hopkins Medical Institutions*

*Baltimore, Maryland*
Leadership Update
From the New SNM President

The SNM has turned 50 years old. During this half century, it has created an illustrious history, witnessed phenomenal growth in usefulness in patient care, established numerous milestones, and become one of the world’s leading health care organizations. These strong achievements have been made by the Society’s gifted and visionary members, who have, based on the tracer principle, developed ingenious techniques so that the discipline of nuclear medicine is now positioned to serve its patients better than ever before. Designed to follow physiology, molecular biology, and biochemistry of diseases, these techniques are noninvasive, applicable both to diagnose and treat diseases, and are readily amenable to quantifying results. At the same time, however, the entire medical field is undergoing a profound transformation that has created challenges for our specialty, despite its deep roots, uniqueness, and strengths.

Scientific organizations at the most fundamental level are about solving problems. We must address our own problems one at a time. It is a great honor to serve as president of the SNM, but I am keenly aware that the office of the presidency of this great organization is bigger than any one individual. As I take on this responsibility, do I feel lonely at the top? No. I feel confident that together we will steer this ship in the right direction, whether through storm or calm.

To prevail in storms, whether predicted or unforeseen, we must continue to remain strong and build upon our strengths. During recent years, I have seen remarkably improved communication among and more frequent dissemination of information to our membership, a change that has been widely appreciated. Our enhanced communication with professional organizations with common goals has formed a solid foundation for trust and cooperation. Open and frequent communication is essential for effective governing in any leading organization.

Our restructured governance has paved the way for better handling of emerging issues and has also provided the ability to foster strategic planning that will shape the future of our organization. Our PET Center for Learning and the recently established PET Center of Excellence, led by SNM President-Elect Peter Conti, MD, are contributing to the advancement of molecular imaging, consistent with the recently revised Society mission and logo. Our councils, committees, and chapters are better focused than before and are making excellent contributions to many of the SNM activities and goals. We will continue to nurture these strengths and build upon them.

What distinguishes us from all other imaging or therapeutic modalities is the minimally invasive tracer technique, which permits us to determine and monitor physiologic, pharmacologic, and biochemical modulations at the cellular level that form the basis of disease. As the entire imaging world is embracing molecular imaging, we must remember (and not allow others to forget) that the roots of this effort are the deepest in nuclear medicine. Based on these capabilities, we can not only diagnose diseases but also treat them and determine the effectiveness of a wide range of therapeutic interventions—from chemotherapy to radiation therapy to surgery—all with minimal intervention. These abilities combined are unparalleled in any other field. Building upon this strong foundation ought to make us stronger. It is with this concept in mind that I have formed a task force that includes molecular imaging experts from all disciplines who, during the next few months, will make recommendations as to how SNM can build a platform that will promote research, education, and applications in molecular imaging for nuclear medicine physicians and scientists, while still working in close harmony and synergy with other imaging organizations and modalities.

Science enhances the art of medicine. To stimulate the growth of molecular imaging and capitalize on all of its potential, we need not only novel radiopharmaceuticals but also the development and introduction of radionuclides that promise to provide radiopharmaceuticals with innovative applications. With the consultation and support of my predecessors, Drs. Gelfand and Royal, we have revived the national radionuclide availability issue through a task force chaired by Dr. Michael Welch. We will prepare a platform to work with other organizations, seeking their support and cooperation. Our goal is to seek help from a range of resources, including industry, appropriately equipped academic institutions, and government agencies. I realize that this goal is neither new nor easy to accomplish, nor can the solutions be obtained quickly. I believe, however, that this is an important issue for us. As national security regulations tighten restrictions on international transfers of even beneficial radioactive materials, the need is more compelling than ever to pay attention to this topic, even though some of our industrial partners have done so well in producing and supplying medically useful radionuclide across the borders.

As we continue to encourage research in molecular imaging for development of new radiopharmaceuticals...
for future use and work to modify the processes that will accelerate their approvals, we must embrace newly approved radiopharmaceuticals, whether for diagnosis or therapy. It is only through their widespread use that we can contribute to improved health care and patient management and encourage our investigators in academia and our industrial partners to work harder and do better.

Our practice depends upon patient referrals. Many physicians in primary care, clinical oncology, neurology, and cardiology, for example, may be unaware of the full range of benefits that nuclear medicine can offer their patients; other physicians simply rely on the modalities they have been using and may be unwilling to try new ones. To make our referring community aware of nuclear medicine’s advances, I intend to approach our giants, the SNM past presidents, to form a think tank to reach out to referring physicians in a mass appeal.

Patient outreach is equally important, especially efforts to alleviate the phobias surrounding the words “nuclear” and “radioactivity.” The past presidents’ think tank will seek ways to reach the general population through the news media, talk shows, or popular magazine articles. These approaches will be complementary to our ongoing efforts aimed at such goals. This think tank subcommittee will provide guidance in current public relations undertakings and serve as an advisory committee in strategic planning for the future of our organization.

We are leaders in the field. The rest of the nuclear medicine world, particularly those in developing countries, looks to us for educational material and technology that can be put to good use in their medical centers. We need to partner with them and create resources to provide helpful material in such a way that it will not only support our leadership position but also enhance friendship and encourage SNM membership. As one example of such an effort, through the generosity of Dr. Abass Alavi and the consent of our Education and Research Foundation (ERF), we will begin to dispatch a number of current hardcopies of The Journal of Nuclear Medicine every month to 9 developing countries. This is in addition to an ongoing program to distribute 12 copies of the journal to leading medical institutions in India each month. None of these donated journals goes to an individual. It is my dream to be able to add to this effort by providing young scholars from developing countries with fellowships for training in the leading nuclear medicine centers in our country.

We must not, of course, forget our own young scholars. Our ERF efforts provide several awards and fellowships each year to deserving young scholars, but we rarely hear about their innovative research. Through the SNM/ERF coalition, we will attempt to enhance the visibility and prestige of both these fellowships and those who receive them, so that every young scholar will be aware of and encouraged to compete for these fellowships.

We must also raise our funding base, actively seeking financial support, just as do many other professional organizations. One of the tasks of our think tank committee will be to help us raise funds.

We must continue to partner with other professional organizations and work closely with them. Such partnerships provide a platform for dialogue, an exchange of knowledge and technology, and a means to address common problems. It is my goal to hold a summit of all leaders of our nuclear medicine–related organizations (national and international) and invite those who were once active in our Society but hold leading positions elsewhere today.

How will I accomplish this during the next 12 months? It is unclear. I do know, however, that at SNM we have a galaxy of stars, and I have been lucky to know many of them. I trust that the best decisions are evidence based and are made collectively and not individually. No individual can solve all problems, but collectively we can solve some of them.

Implementing these ideas will call for strong administrative support. The Society’s administration, including outstanding individuals and led by our dedicated, experienced, and conscientious Executive Director Virginia Pappas, is a great and reliable asset. I am confident that together we will steer the ship in the right direction, whether through storm or calm.

Mathew Thakur, PhD
SNM President
CMS Proposes Expanded Coverage for PET in Alzheimer's Disease

The Centers for Medicare & Medicaid Services (CMS) announced late on June 15 that it intends to expand Medicare coverage of PET to include some Medicare beneficiaries with suspected Alzheimer’s disease (AD). CMS will accept public comments on the draft decision memorandum for 30 days and will make the decision final within 90 days.

The announcement came more than a week after the anticipated date of the decision and almost 6 weeks after the National Institute on Aging (NIA) and CMS convened an expert panel meeting in Rockville, MD, to “assess the value of neuroimaging technology including 18F-FDG PET scanning in the diagnosis and management of patients with dementia or mild cognitive impairment who have undergone a previous standard evaluation as described in the American Academy of Neurology guidelines.” Based on its scientific review, CMS determined that use of PET for the diagnosis of suspected AD would be covered for patients when a specific diagnosis remains uncertain despite a thorough clinical evaluation. In addition, in view of indications of the potential benefit of PET, Medicare will also cover PET in other patients with early dementia or unexpected memory loss who are enrolled in clinical trials with certain safeguards for patients, including informed individualized analysis and evaluation of test results and health status.

Although the NIA experts endorsed reimbursement for PET in individuals who have undergone standard neurologic workups but whose diagnoses remain uncertain, the panel expressed concerns about a perceived lack of evidence supporting the value of PET in early diagnostic evaluation of cognitive impairment. As a result, these experts also recommended that CMS support a community-based, practical clinical trial to determine whether a PET scan contributes to the effective diagnosis and management of individuals with early dementia or adds information that will help patients and their families in managing the disease. According to the June 15 announcement, “CMS is now working with the NIA, the Agency for Health Research Quality [AHRQ] and Alzheimer’s experts to encourage the development and implementation of such a trial.”

This latest incremental approval of indications for PET technology came almost 1 year after CMS released a decision memorandum stating that it would retain its previous noncoverage decision for PET for AD. At that time, the agency’s analysis concluded that “the addition of an FDG PET scan to the standard evaluation of AD does not result in improved patient outcomes.” On October 7, 2003, CMS accepted a request from nuclear medicine physicians from the University of California at Los Angeles School of Medicine for a more restrictive coverage determination for 18F-FDG PET to distinguish patients with AD from those with other causes of symptoms confounding the diagnosis of dementia or to assist with the diagnosis of early dementia in beneficiaries for whom the differential diagnosis included 1 or more kinds of neurodegenerative disease. The following month, CMS broadened the scope of the review to include PET imaging for suspected dementias.

As part of its standard review process, CMS requested input from the public on the proposed extension of coverage. The recent meeting with NIA included reviews of these comments as well as formal presentations and open group discussions among the participants, including practitioners, clinical researchers, methodologists, provider and patient advocates, and reimbursement specialists. On May 25, 2004, the final technology assessment on the request was submitted to CMS by the AHRQ (available at: www.cms.hhs.gov/coverage/download/id104b.pdf).

“To increase access of Medicare beneficiaries to innovative technology that will improve health outcomes, we will use the best and latest clinical evidence in our coverage decisions—and we will work to improve the evidence when important questions remain,” said CMS Administrator Mark McClellan, MD, PhD. “In addition to expanding PET coverage today, Medicare will collaborate with the National Institutes of Health to develop needed evidence on the role of PET scans in guiding treatment and predicting the course of Alzheimer’s disease.”

The full text of the draft decision can be accessed at the CMS coverage site at www.cms.hhs.gov/coverage.

CMS invites public comments on the draft and specifically on the clinical criteria proposed to identify patients eligible for coverage of a PET scan for suspected AD. CMS also is interested in suggestions about the design and implementation of a practical clinical trial to determine the value of PET for a broader patient population. Comments can be submitted until July 15 through the CMS Web site cited previously, by clicking on “NCAs Open for Public Comment” and then scrolling to “Positron Emission Tomography (FDG) and Other Neuroimaging Devices for Suspected Dementia.”

40N THE JOURNAL OF NUCLEAR MEDICINE • Vol. 45 • No. 7 • July 2004
NM Image Profile Ready for Testing

The SNM Digital Imaging and Communications in Medicine (DICOM) working group, in collaboration with nuclear medicine and picture archiving and communications (PACS) vendors, has finalized a set of specifications to facilitate seamless connectivity and interoperability between nuclear medicine systems and PACS. The Nuclear Medicine Image Profile was developed in coordination with the Integrating the Healthcare Enterprise (IHE) initiative and was released to the industry for implementation in May, with testing scheduled for January 2005.

SNM members and industry representatives attended a 20-minute presentation on the new profile on June 21 during the SNM annual meeting in Philadelphia, PA. The presentation was part of the SNM Computers and Instrumentation Council business meeting.

The IHE initiative is designed to advance the state of data integration in health care. Sponsored by the Radiological Society of North America and the Healthcare Information and Management Systems Society, it brings together medical professionals and representatives from the health care informatics and imaging industry to agree upon, document, and demonstrate standards-based methods of sharing information in support of optimal patient care.

ACR Honors Maynard and Welch

The American College of Radiology (ACR) honored 2 SNM past presidents, C. Douglas Maynard, MD, and Michael Welch, PhD, on May 9 during the ACR’s 81st Annual Meeting in Washington, DC. Maynard, chair of radiology at Wake Forest University (Winston-Salem, NC) and SNM president in 1978 and 1979, was awarded the ACR Gold Medal. “Doug Maynard played a vital role in the establishment of the National Institute for Biomedical Imaging and Bioengineering,” noted James E. Youker, MD, professor and chair of radiology at the Medical College of Wisconsin (Milwaukee) in the Journal of the American College of Radiology. “Doug believed that a strong research presence for radiology was required and, working with his local congressman and other ACR members, coordinated the effort that ultimately led to the creation of the NIBIB.” Michael Welch, PhD, codirector of the Division of Radiological Sciences at the Mallinckrodt Institute (St. Louis, MO), was named an ACR honorary fellow. Welch was SNM president in 1984–1985. A press release noted that Welch is widely known “as a preeminent radiation chemist who has been highly productive in advancing the field of radiochemistry and, more important, creatively expanding the experimental field of the discipline, including newer approaches to the use of radioisotopes clinical medicine.”

American College of Radiology

CMS Proposes FY 2005 Hospital Changes

The Centers for Medicare & Medicaid Services (CMS) announced on May 15 a proposed rule that would implement major payment and policy changes for acute care hospitals, required by the comprehensive Medicare modernization legislation signed into law on December 8, 2003. “The proposed inpatient payment rule that we are announcing today includes many specific changes created by the Medicare modernization legislation, such as updating the labor markets that are used to determine hospital payment rates in fee-for-service Medicare,” said CMS Administrator Mark B. McClellan, MD, PhD. “The bottom line, particularly for rural hospitals, is significant increases in hospital payment rates.”

CMS projects that the combined impact of the inflation update and other proposed changes will yield an average 4.7% increase in payments for urban hospitals in fiscal year (FY) 2005 and that rural hospitals will see an average increase of 6.0%. In FY 2005, Medicare payments to approximately 3,900 acute care hospitals under the inpatient prospective payment system are projected to be $105 billion, up from a projected $100 billion in FY 2004.

Among many other items, the proposed rule includes several important changes that would affect payments to teaching hospitals for direct and indirect medical education (IME). CMS is proposing to implement a provision of the Medicare Modernization Act that redistributes unused residency slots to teaching hospitals for purposes of calculating both direct and indirect graduate medical education (GME) payments. The additional slots will be allocated first to rural hospitals, then to hospitals in other-than-large urban areas, and then to hospitals using the slots to train residents in a program that is the only program in that specialty in the state. Hospitals that have been training fewer residents than their GME resident cap would have their caps reduced.

The proposed rule also discusses and invites public comment on a possible change in the way CMS pays a hospital for residents pursuing specialty residencies. The proposal discusses allowing the hospital to receive full payment for the duration of specialty residencies when a resident matches simultaneously to a generalized, preliminary year of training and a subsequent specialty training program. The proposed rule also would eliminate the requirement that a hospital have a written agreement with a nonhospital site if the hospital wants to count the time a resident spends in the nonhospital
site in its IME and direct GME full-time equivalent count.

The proposed rule was published in the May 18 Federal Register. Comments will be accepted until July 12, and a final rule will be published later in the year. The proposed rule can be viewed at: www.cms.hhs.gov/providers/hospital.asp.

Centers for Medicare & Medicaid Services

Physician Perceptions of Teratogenic Risks in Imaging

Results of a study published in the May issue of the American Journal of Roentgenology (2004;182:107) indicate that family physicians and obstetricians perceive the risk of major deformation to developing fetuses as a result of abdominal radiography or CT scans to be much higher than any evidence suggests. Savithiri Ratnapalan, MD, and colleagues from the Hospital for Sick Children (Toronto, Canada) and the University of Toronto sent structured questionnaires to 400 family physicians and 100 obstetricians across Ontario. The physicians were informed about the 1%–3% baseline risk for major malformations and were asked about their perceptions of the risk to the fetus associated with an abdominal radiograph and an abdominal CT scan during early pregnancy and whether they would recommend a therapeutic abortion after such exposure.

Of the 55% of the target group who responded to the questionnaire, 44% of family physicians and 11% of obstetricians estimated the risk associated with an abdominal radiograph to be 5% or greater, and 61% of family physicians and 34% of obstetricians estimated the risk associated with an abdominal CT scan to be 5% or greater. Among family physicians, 1% would recommend an abortion if the fetus were exposed to radiation from radiography and 6% would do so after fetal exposure to radiation from CT. Corresponding figures for obstetricians were 0% and 5%.

Ratnapalan noted that the widespread misconception about the risks involved in routine radiography and CT “is important to dispel, because it can lead to increased anxiety among pregnant women inadvertently exposed to diagnostic imaging and unnecessary terminations of otherwise wanted pregnancies. In addition, not having certain types of imaging performed could hinder diagnosis for some illnesses, delaying needed treatment to the patient.” She added that education is necessary to correct such misconceptions. “Review articles in general medical journals may be the most practical and efficient way of communicating with a large group of physicians,” she said. “Discussing radiation doses and effects in seminars and rounds may also be necessary to consolidate the knowledge.”

American Journal of Roentgenology

BIRN Develops Data Sharing Infrastructure

The Biomedical Informatics Research Network (BIRN), a consortium of 14 university and 22 research groups supported by funding from the National Institutes of Health and the National Science Foundation (NSF), is establishing a cyberinfrastructure, or integrated information technology configuration, to facilitate health care research for large-scale data sharing and analysis in neuroscience, physics, and other fields. When completed, the infrastructure will allow participants to share and compare massive data sets, such as MR brain scans or high-resolution electron microscopy images, in the investigation of Alzheimer’s disease, depression, schizophrenia, multiple sclerosis, and other disorders.

“The BIRN has great promise to provide a collaborative working environment that promotes the growth of interdisciplinary science as well as an advanced biomedical cyberinfrastructure,” said Mark Ellisman, director of the BIRN Coordinating Center. “The NSF middleware layer is essential to providing many of the underlying mechanisms critical to achieving this integrated environment.” By emphasizing open-source solutions that simplify resource sharing, the middleware is making it easier for scientists, engineers, and educators to work with colleagues on a worldwide scale through high-speed networks. The integrated tools facilitate collaborations across organizations, information technology architectures, operating systems, and security policies.

Since 2002, NSF has issued twice-yearly releases of software, services, and documentation supporting the effective use of information technology for research and education. The newest was issued on May 24 and consists of contributions from a wide range of middleware developers.

For more information on open source software in medical informatics and the BIRN initiative, see www.cise.nsf.gov/ and search for “NMI.”

National Science Foundation

PET Cost Effective for NSCLC in Canada

A study published in the May issue of the Medical Science Monitor (2004;10:MT73–80) indicated that not only is PET/CT more accurate than CT alone in staging non-small cell lung carcinoma (NSCLC) but that (at least in Canada) it is more cost effective. The study by Sloka et al. from Memorial University of Newfoundland (St. Johns) used quantitative decision tree modeling and sensitivity analysis to assess the cost effectiveness of both a CT- and a PET/CT-based management strategy for staging NSCLC. A survey of recent literature was used to construct a metaanalysis of available studies for the accuracies of CT and PET in staging NSCLC. Life expectancies were determined from recent Canadian statistics, and life expectancies with disease were calculated from published

42N  THE JOURNAL OF NUCLEAR MEDICINE  •  Vol. 45  •  No. 7  •  July 2004
survival rates. Management costs were determined from estimates of the installation cost of PET facilities in Canada, management costs from Canadian institutions, and recently published Canadian cost estimates of various procedures. The authors identified cost savings of $1,455 per person with the PET/CT strategy, along with a very small increase in life expectancy (3.1 days) when compared with CT alone.

**Medical Science Monitor**

### From the Literature

Each month the editor of Newsline selects articles on therapeutic, diagnostic, research, and practice issues in nuclear medicine from a range of international publications. Most selections come from outside the standard canon of nuclear medicine and radiology journals. These briefs are offered as a monthly window on the broad arena of medical and scientific endeavor in which nuclear medicine now plays an essential role.

### Diagnosis

**Value of CT in PET/CT for Colorectal Carcinoma**

Kamel et al. from the Johns Hopkins Hospital (Baltimore, MD) reported on May 27 ahead of print in *Abdominal Imaging* on a study designed to assess the contribution of separate CT interpretation to the accuracy of PET/CT imaging in patients with suspected primary or metastatic colorectal carcinoma. The study included 90 patients (50 women, 40 men; mean age, 63 years) who had undergone a collective total of 100 18F-FDG PET/CT scans covering the skull base to the midthigh. CT scans were separated out retrospectively to be read independently by consensus of 2 readers and were evaluated for primary disease, local recurrence, and distant metastases before comparison with the original PET/CT report. Both sets of reports were compared with outcomes at clinical and imaging follow-up, surgery, or biopsy. The sensitivity, specificity, and accuracy of the PET/CT reports were 0.914, 0.633, and 0.830, respectively; for the combined PET/CT with dedicated CT interpretation, 0.986, 1.000, and 0.980, respectively. The authors concluded that the CT portion of PET/CT provides "valuable anatomic and pathologic information to the functional information provided by PET and helps improve the overall accuracy of the combined study."

*Abdominal Imaging*

**In Vitro Evaluation of Radiolabeled Bone Seekers**

Researchers from the Medical University of Vienna (Austria) reported in the May issue of *Bone* (2004;34:835–844) on a study designed to devise a new method to rate the influence of various factors on the uptake of phosphonates in bone and to evaluate new radiolabeled bone seekers. In what was described as a "pre vivo" study by Mitterhauser et al., a series of radioactive-labeled diphosphonates and 18F-fluoride were added to vials containing hydroxyapatite, collagen, or amorphous calcium phosphate in a salt solution. After incubation and filtering, radioactivity was measured and the percentage of irreversibly bound radioactivity was calculated as uptake. Among the findings, which ranked a number of radiolabeled bone-seekers in order of binding, 18F and 99mTc-methylene-diphosphonic acid showed the greatest uptake increase over time. The collagen solutions showed very low uptake. The authors noted that this might explain some of the clinical differences between the 2 groups of patients and concluded that evaluation of 123I-FP-CIT uptake with SPECT is useful in investigating differences in neurodegenerative disease patterns.

*Neurology*

**SPECT in Cardio-Asymptomatic Diabetes**

The value of screening stress testing in diabetic patients with no clinically apparent cardiac disease was investigated by Miller et al. from the Mayo Clinic (Rochester, MN) and reported in the May issue of the *American Heart Journal* (2004;147:890–896). In a large retrospective study, results of stress SPECT were compared for 4 groups of patients with no previous myocardial infarction or coronary revascularization:
asymptomatic diabetic patients (1,738), symptomatic diabetic patients (2,998), asymptomatic nondiabetic patients (6,215), and symptomatic nondiabetic patients (16,214). The authors found abnormal scans in almost equal percentages of asymptomatic and symptomatic diabetic patients (58.6% and 59.5%, respectively). Both percentages were higher than those in asymptomatic and symptomatic nondiabetic patients (46.2% and 44.4%, respectively). Those scans identifying individuals at high risk were also found in almost equal percentages of asymptomatic and symptomatic diabetic patients (19.7% and 22.2%, respectively). The authors concluded that the fact that almost 1 in 5 asymptomatic diabetic patients has a high-risk scan suggests “a potentially more widespread application of screening stress SPECT” in these individuals to identify those with severe coronary artery disease.

American Heart Journal

99mTc-MIBI and Functional Significance of Coronary Stenosis

Morishima et al. from Tokyo Medical University (Japan) reported in the April issue of the Journal of Cardiology (2004;43:155–163) on a study evaluating the correlations between fractional flow reserve (FFR) and myocardial direct counts of 99mTc-sestamibi in assessing the functional severity of coronary artery stenoses. The study included 20 patients who underwent 2-day protocol 99mTc-sestamibi SPECT imaging. Visual assessment of counts in myocardial imaging showed that reversibility of 99mTc-sestamibi perfusion defects was correlated with an FFR < 0.75 (functionally significant stenosis). The authors concluded that these and other results “suggest that quantitative analysis of 99mTc-sestamibi scintigraphy enables the assessment of the magnitude of functional significance of coronary stenosis.”

Journal of Cardiology

Dynamic 123I-BMIPP SPECT in Congestive Heart Failure

In an effort to investigate the mechanisms behind progression of disease in patients with congestive heart failure (CHF), Takeishi et al. from the Yamagata University School of Medicine (Yamagata, Japan) used dynamic SPECT to examine the kinetics of 123I-β-methylidophenylpentadecanoic acid (123I-BMIPP) kinetics soon after tracer injection. The study, published in the April issue of Clinical Cardiology (2004;27:294–210), included 26 patients with CHF and 8 healthy individuals. The washout rate of radioactivity was examined by 2-minute dynamic imaging in each patient during the first 30 minutes after injection. The authors found that the washout rate of 123I-BMIPP from the myocardium was faster in patients with CHF than in healthy individuals and correlated positively with left ventricular (LV) end-diastolic volume index and inversely with LV ejection fraction. The patient participants in the study were put on candesartan, an angiotensin II type-1 receptor antagonist, for 6 months and then returned for repeated dynamic SPECT imaging. After the drug therapy, the enhanced washout rate of 123I-BMIPP in CHF was reduced. The authors concluded that not only is dynamic SPECT imaging of 123I-BMIPP washout in the early phase a potential new method for evaluating the severity of CHF, but that “improvement in fatty acid metabolism may represent a new mechanism for beneficial effects of angiotensin II receptor blockade on cardiac function and survival in patients with heart failure.”

Clinical Cardiology

SPECT and CT in Spondylolysis

Gregory et al. from Queen’s Medical Center (Nottingham, UK) reported on April 30 ahead of print in the European Spine Journal on a retrospective study to assess the quality and quantity of diagnostic information supplied by SPECT and reverse gantry CT in the investigation of spondylolysis. The study included 118 patients (ages 8–44 years) who had been imaged for low back pain. SPECT showed increased scintigraphic uptake in 80 patients, and spondylolysis was identified by CT in 53, yet subsequent analysis showed that there was little agreement between the 2 results. The authors concluded that SPECT and CT yielded mutually exclusive information, a fact that led to the establishment of 4 diagnostic categories for additional investigation: (1) those with increased scintigraphic activity on SPECT and spondylolysis on CT, for whom rest from provoking activities was prescribed; (2) those with increased scintigraphic activity but no spondylolysis on CT, which was classified as a bone stress response requiring rest; (3) those with no increased activity on SPECT and no spondylolysis identified on CT, a group that might need additional investigation, such as MRI; and (4) a small group of patients with no increased activity on SPECT but in whom bilateral, chronic-appearing spondylolyses were identified on CT, a group that could need surgery if physical therapy fails. The authors concluded that SPECT and reverse gantry CT provided complementary information that assisted in both diagnosis and selection of appropriate therapy.

European Spine Journal

Stress MPI in Asymptomatic Stent Evaluation

Sugi et al. from Hamamatsu University School of Medicine (Hamamatsu, Japan) reported in the May issue of Circulation Journal (2004;68:462–466) on a multicenter study comparing follow-up coronary angiography with stress SPECT myocardial perfusion imaging (MPI) in the evaluation of restenosis in coronary-stent implanted patients who were asymptomatic. The study included...
103 patients who underwent both SPECT and coronary angiography 4–9 months after stent implantation. Sensitiv-
ity, specificity, positive and negative pre-
dictive values, and accuracy of SPECT as verified against angiography were 65%, 78%, 51%, 91%, and 76%, respec-
tively. Accuracy was lower in territories with prior myocardial infarction (71%), in the left circumflex artery (58%), and individuals with 3-vessel disease (63%). The authors concluded that stress SPECT imaging is a useful tool for follow-up in patients with coronary stent implantation and that “follow-up coronary angiography could be omitted in patients with negative SPECT imaging, no prior myo-
cardial infarction, 1- or 2-vessel disease, and sufficient stress loading.”

Circulation Journal

Exploring SLN Mapping Failures

Sener et al., from Evanston Northwestern Healthcare (IL), reported in the May issue of the Journal of the American College of Surgeons (2004;198:732–736) on a retrospective study designed to identify patient and tumor characteristics associated with failure in sentinel lymph node (SLN) mapping as an alternative to axillary dissection for staging of breast cancer. The study included 1,094 patients with breast cancer who underwent 99mTc-sulfur colloid imaging to identify SLNs. The first 80 patients then underwent axillary dissection. Beginning with the 81st patient, the standard technique consisted of radiolabeled colloid injection in a peritumoral distribution 16–24 hours before SNL, followed by sentinel lymphadenec-
tomy alone for node-negative patients. The mapping procedure failed in 62 (5.7%) patients. Failures were associated with both anatomic and pathologic fac-
tors and included patients with more than 10 involved lymph nodes, and, among node-negative individuals, patients who were elderly. The authors suggested that decreased breast density in postmeno-
pausal women might provide an ana-
tomic explanation for mapping failure.

Journal of the American College of Surgeons

Dynamic Scintigraphy in Gastric Banding

Adjustable gastric banding is an increasingly common procedure used to treat morbid obesity and is a preferred alternative to more drastic gastric reduction surgery in most patients. In the April issue of Obesity Surgery (2004;4:520–523), Susmallian et al. from Kaplan Hospital (Rehovot, Israel) reported on a unique method of adjustment analysis using dynamic radioisotope scintigraphy. The study included 40 patients who had under-
gone laparoscopic adjustable gastric banding and were divided into 2 equal groups. In 1 group, the results of adjustment were analyzed using the conventional method of fluoroscopic image and barium swallow. In the other, dynamic radioisotope scintigraphy with 99mTc-phytate-labeled plain yogurt was used. After 6 months, the conventional assessment method group had lost 12.34% of their initial weight and 95% needed band readjustment, whereas the scintigraphic group had lost 20.34% of their initial weight and only 25% needed readjustment. Vomiting as a result of poor adjustment was more frequent in the conventional than the scintigraphic group. The authors con-
cluded that dynamic scintigraphy is a “more physiologically friendly and accurate method” of assessing gastric banding adjustment than the conventional barium swallow adjustment.

Obesity Surgery

131I Scan and Tg Levels as Prognostic Indicators

Two recent studies cast doubt on the prognostic value of 131I whole-
body scans in differentiated thyroid cancer and endorsed the use of thy-
globulin serum values (Tg) alone. In a study published in the April issue of Thyroid (2004;14:301–306), Me-
endez Torre et al. from the Hospital de Navarra (Pamplona, Spain) re-
ported on a study of 194 patients who had undergone near-total thyroidec-
tomy and 131I ablation for differ-
entiated thyroid carcinoma and who underwent evaluation and scanning at 6–12 months after ablation. They found that serum Tg levels obtained after thyroid ablation had good prog-
nostic value and permitted the selec-
tion of patients for additional diagnostic studies, whereas diag-
nostic 131I whole-body scans per-
formed at the same time did not correlate with Tg results and pro-
vided only minimal additional in-
formation.

Taylor et al. from the Royal Marsden Hospital (Surrey, UK) re-
ported in the May issue of the Euro-
pean Journal of Endocrinology (2004;150:649–653) on a similar retro-
spective analysis of 153 pa-
tients with differentiated thyroid cancer. The majority (117 patients) had negative scans, and all patients with positive scans and subse-
sequently proven disease were also identified by rising serum Tg val-
ues. The authors concluded that diag-
nostic 131I whole-body scans “add little extra information and, in our experience, do not influence patient management.” They suggested that the scans should be reserved for patients in whom serum Tg levels are unreliable because of the pres-
ence of antibodies or when there is clinical suspicion of tumor.

Thyroid European Journal of Endocrinology

Treatment

Functional Imaging Data in Dose Distribution Evaluation

A method for incorporation of 18F-FDG PET tumor imaging data with SPECT perfusion data for critical structures into a dose function histogram for distribution evaluation in intensity-modulated radiation therapy (IMRT) was published by Miften et al. from Duke University (Durham, NC) in the May 7 issue of Physics in Medicine and Biology (2004;49:
1711–1721). The method combines tumor/critical structure hetero-
genous functionality in the generalized
The concept of equivalent uniform dose (EUD). As an example, calculated and “functional” lung dose distributions in 2 patients with non-small cell lung cancer who had undergone 3-dimensional conformal external-beam radiotherapy were compared. In each patient, differences of up to 50% were observed between the calculated and functional lung EUDs. In a separate example, 2 sample IMRT plans were generated for a patient with non-small cell lung cancer. Each was generated based on the CT, 18F-FDG-PET, and SPECT treatment planning images using dose-volume objective functions. One plan was designed to use this data to increase sparing of critical structures. The authors found that the use of functional data did not enhance the target volume delivery but did provide significant critical structure function sparing. They concluded that “incorporating functional data in the calculation of EUD is important in evaluating the biological merit of treatment plans.”

*Physics in Medicine and Biology*

**18F-FETA PET for Tumor Hypoxia**

Barthel et al. from Hammersmith Hospital (London, UK) and the University of Leipzig (Germany) reported in the June 1 issue of the *British Journal of Cancer* (2004;90:2232–2242) on in vivo validation studies of 18F-fluoroetanidazole (18F-FETA) as a tumor hypoxia marker for use with PET. Research included cellular transport and retention studies and biodistribution and metabolism evaluations in mice bearing human tumor xenografts. In imaging studies, tumors were adequately visualized by small-animal PET within 30–60 minutes. Additional results led the authors to conclude that 18F-FETA “shows hypoxia-dependent tumor retention and is, thus, a promising PET marker that warrants clinical evaluation.”

*British Journal of Cancer*

**90Y-DOTATOC and Merkel Cell Carcinoma**

A case study of successful targeted radiotherapy with 90Y-1,4,7,10-tetra-azacyclododecan-4,7,10-tri-carboxy-methyl-l-yl-acetyl-d-Phe-Tyr3-octreotide (90Y-DOTATOC) in an 83-year-old woman with recurrent Merkel cell carcinoma on the left cheek was reported by Meier et al. from University Hospital Basel (Switzerland) in the May issue of *Oncology* (2004;66:160–163). The authors noted difficulties in treating these uncommon but highly malignant cancers, including the high incidence of distant metastases, the advanced age of many patients, and the high dependence of appropriate treatment on accurate staging. The patient in this study had been treated with surgery and locoregional radiotherapy for primary tumor and 2 subsequent relapses. She was treated 4 times with 90Y-DOTATOC, and 2 complete remissions were achieved. The fourth administration was ineffective and conventional chemotherapy was initiated. No side effects or toxicities were noted with the 90Y-DOTATOC. The authors concluded that because it is well tolerated, “90Y-DOTATOC therapy should be evaluated further as a new therapy for somatostatin receptor-positive MCC.”

*Oncology*

**153Sm-Lexidronam for Painful Bone Metastases**

In the May issue of *Urology* (2004;63:940–945), Sartor et al. from the Louisiana State University Medical Center (New Orleans, LA) reported on results from a phase III randomized trial designed to assess the effectiveness of 153Sm-lexidronam for palliation of bone pain in patients with hormone-refractory prostate cancer. The study included 152 men with hormone-refractory prostate cancer and painful bone metastases who were randomly assigned to 2 groups, those receiving 153Sm-lexidronam and those receiving nonradioactive 152Sm-lexidronam complexes. During a 16-week period, patients recorded daily pain and analgesic use in diaries. After 4 weeks, patients on the placebo were allowed at their discretion to switch to the 153Sm-lexidronam regimen. The authors found that those in the 153Sm-lexidronam group experienced marked pain relief within 1 to 2 weeks and reduced opioid use in the third and fourth weeks. Because of these benefits and the unblinding of the study in the fourth week, no additional statistical comparisons were made. Mild, transient bone marrow suppression was the only adverse event associated with 153Sm-lexidronam administration. The authors concluded that “these findings demonstrate that 1 mCi/kg 153Sm-lexidronam is both safe and effective for the palliation of painful bone metastases in patients with hormone-refractory prostate cancer.”

*Urology*

**186Re and Radiation Synovectomy of the Ankle**

Researchers from the Medical Centre Alkmaar (Alkmaar, The Netherlands) reported in the May issue of the *Journal of Rheumatology* (2004;31:896–901) on a study designed to evaluate the effect, duration of effect, and safety of radiosynoviorthesis of the ankle in patients with persistent synovitis that was refractory to disease-modifying antirheumatic drugs and intraarticular glucocorticoid injections. The study by van der Zant et al. included 40 patients, 14 of whom were treated in both ankles. Radiation synovectomy was performed by injection of 75 MBq 186Re-colloid and 20 mg triamcinolone-hexacetonide in a volume of about 1.5 mL. A single-head gamma camera was used to image radionuclide leakage in the treated ankle joint(s), liver, and inguinal lymph nodes at 24 hours after injection. The results of the radiosynoviorthesis process were divided into 3 categories: (1) no effect (12 joints; persistent synovitis or only minimal reduction of swelling
Focus on PET at Madrid Symposium

On May 12 and 13, an international symposium on PET in neurology was held in Madrid, Spain, under the sponsorship of the Ramón Areces Foundation, the Complutense University of Madrid, and the Centro PET Complutense. The symposium was coordinated by Francisco J. Rubia and Miguel A. Pozo (Universidad Complutense, Madrid), who welcomed attendees at the beginning of the first day. At the first session, moderated by Rubia, presenters included Hugo Liano (Hospital Puerta de Hierro, Madrid) on 18F-FDG PET in clinical practice, and Pozo on metabolic neuroimaging in the presurgical evaluation of epilepsy. All sessions included time for general discussion and exchanges of viewpoints and experience among the attendees, who came from across Europe and North America. The second session, moderated by Liano, included presentations by Antonio Maldonado (Centro PET Complutense, Madrid) on PET in brain tumors, and Javier Arbizu (Clínica Universitaria de Navarra, Pamplona, Spain) on clinical applications of PET in Parkinson’s disease. An evening roundtable discussion was moderated by Jorge Barrio (University of California at Los Angeles [UCLA]), Maldonado, and Arbizu. The next day, a session moderated by Pozo opened with a presentation by Barrio on “A Revolution at Work. Monitoring Brain Pathology in Alzheimer’s Disease with PET: Diagnostic and Therapeutic Implications.” Barrio’s UCLA colleague, Daniel H.S. Silverman then spoke on the role of 18F-FDG PET in the early diagnosis of Alzheimer’s disease. Both Barrio and Silverman discussed PET tracer binding of β amyloid and analyzed 18F-FDG detection of early, presymptomatic changes that accompany Alzheimer disease. The final presentation was made by André Luxen, who focused on PET radiotherapeutics for brain serotonergic system studies (University of Liège, Belgium).

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(Continued from page 46N)

and/or pain, or the need for intraarticular glucocorticoid injection within 3 months or arthrodesis of the treated joint within 6 months); (2) moderate effect (12 joints; significant reduction of swelling, pain, and improvement of function); and (3) good effect (30 joints; complete or almost complete remission of synovitis). The authors concluded that “radiation synovectomy of the ankle is a safe and effective treatment in persistent synovitis, although all patients eventually experienced recurrence of arthritis.”

Journal of Rheumatology

(Continued from page 33N)

accomplished in terms of actual knowledge gained and whether or not that knowledge is making its way into practice.”

He praised the CME efforts of the SNM, noting that with projects like the PET Learning Center and the PET Center of Excellence, the Society has “risen to the challenge” of providing quality educational benefits for its members and others. “As CMEs and standards of practice have become even more important, the SNM has developed a forward-thinking policy to synchronize its educational efforts with ACCME guidelines and to make CMEs an integral part of the recertiﬁcation process,” he said.

“Unclear” No More

Both nuclear medicine practice and education have grown exponentially since Dworkin entered the field in the 1960s. “When I first began practice, the old scintillation scans were so sketchy that many other practitioners referred to our specialty as ‘unclear medicine,’” he said. “Not only did the field change rapidly over the years, but now we stand on the brink of an entirely new era, where molecular imaging will combine with our other time-proven techniques to radically expand the range and scope of nuclear medicine applications. Our trainees and colleagues in the discipline will need entirely new sets of skills and a well-planned system for continuing education that is ready to present evolving knowledge and techniques. It’s an exciting time for nuclear medicine.” Nuclear medicine physicians and, indeed, all medical specialists, owe a debt of gratitude to Dr. Dworkin for his contributions to the foundations of 21st-century medical training and certiﬁcation.