

## 3D CT Imaging Used to Evaluate Facial Aging

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- Mobile Radiology Unit Brings Hope for Fibroid Relief to Underserved Brazil
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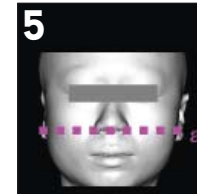
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## KLEIN NAMED RADIOGRAPHICS EDITOR

Jeffrey S. Klein, M.D., will be the new editor of *RadioGraphics* beginning in January 2012. He succeeds William W. Olmsted, M.D., who will retire as editor at the end of this year.

DR. KLEIN IS THE A. Bradley Soule and John P. Tampus Green and Gold Professor of Radiology and Associate Dean for Continuing Medical Education in the University of Vermont College of Medicine and chief of thoracic radiology at Fletcher Allen Health Care in Burlington, Vt.

"It is a tremendous honor to be chosen by the RSNA Board of Directors to serve as the next editor of *RadioGraphics* and to have the opportunity to guide the journal in the coming years," Dr. Klein said.

In addition to his expertise in lung cancer staging and detection, Dr. Klein brings vast experience in radiologic education—with an emphasis on continuing medical education—critical for the editor of RSNA's education journal. Dr. Klein's experience includes dozens of lectures delivered, courses co-directed and discussions moderated in visiting professorships and at premier chest radiology meetings

and congresses worldwide for more than 20 years.

Editor-in-chief of the *Journal of Thoracic Imaging* from 2000 to 2005, Dr. Klein is a longtime manuscript reviewer for *Radiology* and *RadioGraphics* as well as the *American Journal of Roentgenology*, *Journal of Thoracic Oncology*, *Cardiovascular and Interventional Radiology* and *Cancer*.

An RSNA member since 1986, Dr. Klein has served the Society in a number of capacities, including as presenter of numerous scientific sessions and refresher courses at the annual meeting. He has served as a member of the Refresher Course Committee and the Education Exhibits Awards Committee.



Klein

Under the guidance of founding editor William J. Tuddenham, M.D., and for the past 20 years under Dr. Olmsted, *RadioGraphics* has become the primary journal for continuing medical education in radiology, Dr. Klein said.

"My goals are to continue the editorial excellence that Dr. Olmsted has established during his distinguished tenure as *RadioGraphics* editor and to help guide the journal through its transition to a more interactive electronic publication that meets the emerging educational needs of our trainees, radiologists, radiation physicists and radiation oncologists worldwide," Dr. Klein said.

## Funding Announced for 12 QIBA Projects

As a result of the contract awarded to RSNA by the National Institute of Biomedical Imaging and Bioengineering (NIBIB) in October 2010, the Steering Committee of the Quantitative Imaging and Biomarkers Alliance (QIBA) has announced funding for 12 projects in three modality areas, CT, MR and nuclear medicine (NM), for an approximate total of \$600,000.

The projects, discovered through a competitive request for proposals issued to the QIBA community, were identified as those that most clearly support QIBA goals and priorities.

It is expected that additional projects will be funded in the next six months. For more information about QIBA and its activities, go to [RSNA.org/Research/QIBA](http://RSNA.org/Research/QIBA).

Recipients are:

CT	MR	NM
University of California, Los Angeles	MD Anderson Cancer Center	University of Washington
Duke University	VirtualScopics	The Johns Hopkins University
Columbia University	Duke University (two projects)	University of the Netherlands
University of Denver	Medical College of Wisconsin	

## Feinstein Receives Chicago Radiological Society Award

**Kate A. Feinstein, M.D.**, section chief of pediatric radiology and a professor of radiology and surgery at the University of Chicago, received the Chicago Radiological Society's Distinguished Service Award at the society's annual meeting in February. Dr. Feinstein has served on RSNA's Local Services Committee and Scientific Program Committee's Pediatrics Subcommittee. She is currently a manuscript reviewer for *Radiology*, the *American Journal of Roentgenology* and *Pediatric Radiology*.



## Society of French Radiology Honors Schnyder

The Society of French Radiology has awarded its Antoine Bécclère Medal to **Pierre Schnyder, M.D.**, the former head of radiology at the Centre Hospitalier Universitaire Vaudois in Lausanne, Switzerland. The annual award is named after the pioneering French radiologist who developed the first radiology lab in Paris in 1897. Dr. Schnyder is the former chair of the European Association of Radiology's Education Committee.

## ABR Seeks to Fill Medical Physics Position

The American Board of Radiology (ABR) is accepting applications for the position of Associate Executive Director, Medical Physics (AED-MP).

The AED-MP reports to the ABR executive director and works closely with the executive team to coordinate and operationalize the strategic plan and policy decisions made by the ABR Board of Trustees. The AED-MP also works with the ABR staff directors of Certification Services, Information Technologies, Standards (including Communications, Psychometrics and Digital Imaging), Board Affairs and Financial Services on operational matters, systems analysis and quality improvement.

The AED-MP also works with the ABR executive team to coordinate policy and the specifics of implementation across disciplines.

The AED-MP participates as a recognized ABR leader and spokesperson in various public forums. He/she also participates in ABR research activities and authors/co-authors ABR publications.

While the part-time position (40 to 50 percent) does not require relocation to Tucson, Ariz., (although desirable), regular travel is required. It is anticipated that the new AED-MP will work alongside the current AED-MP in late 2011 and assume full responsibility in early 2012.

For further information, go to [www.theabr.org/about/careers.html](http://www.theabr.org/about/careers.html).

## MITA Welcomes Radiopharmaceutical Firms as Members

The Medical Imaging & Technology Alliance (MITA) has expanded its membership to include the radiopharmaceutical industry. These new MITA members will work with established equipment member companies to form a "PET Working Group" that will endeavor to:

- Improve the regulatory environment for the approval of imaging agents
- Expand public insurance coverage to ensure that patients have access to PET
- Conduct research to broaden the evidentiary base of PET imaging cost-effectiveness
- Educate the medical community about the appropriate use and value of PET

MITA membership has grown by 20 percent in less than a year's time. The addition of the radiopharmaceutical community has the potential to equal that expansion and further demonstrates the organization's commitment to the medical imaging industry, according to a statement from MITA.



## ASTRO Publishes New Journal

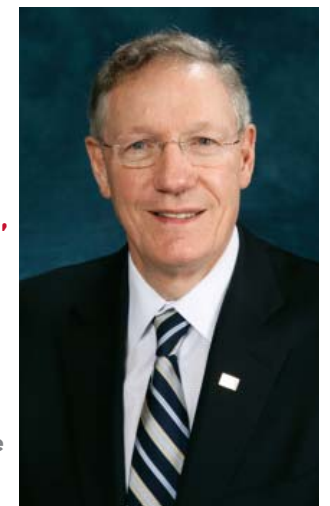
The American Society for Radiation Oncology (ASTRO) has published its first issue of *Practical Radiation Oncology (PRO)*, a new journal aimed at improving the quality of radiation oncology practice.

The editor-in-chief is W. Robert Lee, M.D., M.S., M.Ed., a professor of radiation oncology and program director at Duke University in Durham, N.C. *PRO* is what Medline defines as a clinical or practice journal, documenting the state of current practice and providing background for those in training or the continuing education of practitioners. *PRO* will initially be published quarterly in print and online at [www.practicalradonc.org](http://www.practicalradonc.org).



## Baron Named University of Chicago's Dean for Clinical Practice

Previously chair of the Department of Radiology at the University of Chicago Medical Center, RSNA Board Liaison for Education **Richard L. Baron, M.D.**, is now dean for clinical practice at the University of Chicago, Pritzker School of Medicine. Among Dr. Baron's RSNA roles is Board liaison to RSNA's Education Exhibits Committee, which he formerly chaired. Dr. Baron received the *Radiology Editor's Recognition Award* four times.



## Medical Isotopes Bill Introduced in Senate

The American Medical Isotopes Production Act of 2011 (S.99), which aims to promote sustainable domestic production of Molybdenum-99 (Mo-99), was introduced in the U.S. Senate last month. Sponsors are Sen. Jeff Bingaman (D-N.M.), chair of the Senate Committee on Energy and Natural Resources, and Sen. Lisa Murkowski (R-Alaska).

Mo-99 decays to Technetium-99m (Tc-99m), used in more than 16 million procedures each year in the U.S. There are currently no domestic facilities dedicated to the production of Mo-99 for medical uses and only six foreign producers of Mo-99 are approved by the U.S. Food and Drug Administration to import the product into the U.S. The aging foreign reactors frequently go off-line due to significant maintenance issues, leading to Mo-99

shortages. A shortage in the U.S. last year delayed nuclear medicine procedures for an estimated 50,000 patients each day, according to nuclear medicine society SNM.

The American Medical Isotopes Production Act seeks to establish a technology-neutral program to support the production of Mo-99 for medical uses in the U.S. by non-federal entities. The bill also calls for the U.S. to condition and phase out the export of highly enriched uranium for

the production of medical isotopes over a period of seven years.

SNM will join with the Council on Radionuclides and Radiopharmaceuticals and other medical groups to support passage of the bill. A similar bill is expected to be introduced in the House of Representatives in the coming weeks, according to SNM.





**RSNA Selects IVP 2012 Destinations**

Destinations have been selected for the 2012 RSNA International Visiting Professor (IVP) Program that annually sends teams of North American professors to lecture at national radiology society meetings and meet with radiology residency training programs at selected host institutions in developing nations. Destinations for 2012 are:

- Nepal Radiologists Association/Radiological Society of South Asian Association for Regional Co-Operation Countries, Kathmandu, Nepal—January 2012
- Asociacion Salvadoreña de Radiologia, San Salvador, El Salvador—October 2012
- Vietnamese Society of Radiology and Nuclear Medicine, Hanoi, Viet Nam—April 2012
- Sociedad Mexicana de Radiologia e Imagen, A.C., Mexico City, Mexico—September 2012

Teams of two or three IVPs will be appointed later this year. RSNA—which also provides educational materials to host institutions—has supported this program since 1986. The IVP program is made possible by the support of Agfa HealthCare and Fujifilm Medical Systems.

For more information about the RSNA IVP program, please go to [RSNA.org/International/CIRE/ivpp.cfm](http://RSNA.org/International/CIRE/ivpp.cfm).

**NCRP Addresses Dose Management for Fluoroscopically-Guided Interventional Medical Procedures**

Recently released Report No. 168 from the National Council on Radiation Protection & Measurements (NCRP), “Radiation Dose Management for Fluoroscopically-Guided Interventional Medical Procedures,” provides dose management recommendations and supporting information for patients and medical staff who use fluoroscopic systems to guide diagnostic and therapeutic medical procedures.

According to NCRP, the report is particularly intended for physicians and medical support staff who currently participate in fluoroscopically-guided interventional procedures but lack sufficient training in practical radiation protection aspects—for example, knowledge of equipment operation, optimal imaging techniques, dose management for patients and medical staff,

benefit-risk tradeoffs and the potential for early or late detrimental radiation effects.

The report also targets policymakers who can mandate radiation-dose management requirements with regard to:

- Optimizing imaging protocols
- Managing procedure time
- Utilizing available radiation protective equipment and dose-management features

- Tracking and trending radiation doses to patients and medical staff
- Credentialing and privileging physicians to use the fluoroscopic equipment for these specialized procedures

To view the report, go to [NCRPpublications.org](http://NCRPpublications.org).

**Numbers in the News**

4.5

Accuracy, within degrees, of CT-based ballistic wound path identification as tested in phantoms. See Page 19 to learn more about this study from the University of the Health Sciences in Bethesda, Md.

85.3

Average health-related quality of life score reported by Brazilian women receiving uterine fibroid embolization via a mobile unit, one year post-treatment. Average score pre-treatment was 41.4. Learn more about how “angiomovel” is bringing new hope to low-income women, for whom hysterectomy used to be the only option, on Page 11.

46,210

Number of RSNA members, as of Dec. 1, 2010. Included are 3,635 people who have been members for more than 25 years, 2,771 who have been members for more than 30 years, 493 who have been members for more than 40 years and 91 who have been members for more than 50 years.

582,268

Number of times interactive “wayfinder” units were used during RSNA 2010. See Page 23 to learn more about how annual meeting attendees used the new touch-screen devices to find sessions, exhibitors and other meeting features.

**My Turn**

**Diagnostic Radiology and Radiation Oncology: Turning Collaboration into Education**

Diagnostic radiologists play a key role in cancer diagnosis and treatment monitoring. Radiation oncologists have a wealth of clinical experience and knowledge about cancer biology. Both groups intersect around imaging and both have much they can share with each other, to their mutual benefit and that of their patients.

SARAH S. DONALDSON, M.D., now chairman of the RSNA Board of Directors, suggested a few years back that RSNA and the American Society for Radiation Oncology (ASTRO) collaborate on an oncologic imaging meeting that emphasizes the two-way interaction between diagnostic radiology and radiation oncology. There is no point in the course of a patient’s cancer where imaging does not play a crucial role in decision making and therapy—imaging figures prominently in screening and cancer detection, remains paramount throughout staging and prognostic determinations, and is an integral part of targeting therapy, assessing response and detecting relapse.

Anthony Zietman, M.D., a professor of radiation oncology at Massachusetts General Hospital, and I are heading up the collaboration that Dr. Donaldson envisioned. We look forward to “Cancer Imaging and Radiation Therapy Symposium: A Multidisciplinary Approach,” to be

held April 29–30 in Atlanta. Four morning sessions are scheduled—new radiographic techniques in oncology, matching pathology with imaging, imaging and outcome prediction, and image-guided therapy—featuring speakers from both disciplines.

In the afternoons we’ll address four specific cancer sites—breast, prostate, lung and central nervous system—spanning a variety of issues from diagnosis to therapy, from remission to relapse. Speakers will highlight points of intersection between the two specialties and encourage us to learn from one another as we go.

Keynote speakers are Brian Ross, Ph.D., who will talk about molecular imaging in oncology and David Jaffray, Ph.D., who will address image-guided cancer therapies. With its focus on the “nuts and bolts” of anatomic and metabolic imaging in contemporary cancer care, this collaborative meeting has also attracted nearly 150 research abstract presentations.

RSNA and ASTRO are proud to host this important multidisciplinary event and I am very honored to have been invited to participate. Our unique program offers something for every RSNA member, be they a radiologist, radiation oncologist, physicist or resident. I hope to see you in Atlanta.

Suresh K. Mukherji, M.D., F.A.C.R., is a professor and chief of neuroradiology and head & neck radiology and a professor of radiology, otolaryngology head neck surgery, radiation oncology, periodontics and oral medicine at the University of Michigan Health System.



For more information regarding the RSNA-ASTRO meeting, go to [www.cancerimagingandrt-symposium.org](http://www.cancerimagingandrt-symposium.org).

**IN MEMORIAM**

**Theodore E. Keats, M.D.**

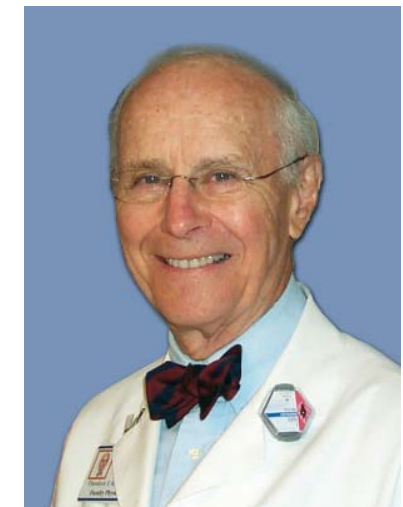
Renowned radiology educator, author and editor Theodore E. Keats, M.D., died Dec. 10, 2010. He was 86.

Dr. Keats received his medical doctor degree from the University of Pennsylvania. After completing a radiology residency at the University of Michigan, he served as a captain in the Army Medical Corps and was stationed in Japan during the Korean War. He went on to serve the University of Virginia (UVA) Department of Radiology for 47 years, including 29 as chair.

The best known of Dr. Keats’ nine textbooks, *An Atlas of Normal Roentgen Variants That May Simulate Disease*, is about to be published in its 9th edition and has been translated into more than

six languages. He served as editor for four journals simultaneously—*Skeletal Radiology*, *Current Problems in Diagnostic Radiology*, *Applied Radiology* and *Emergency Radiology*.

Dr. Keats received the gold medals of the American College of Radiology and the American Society of Emergency Radiology and was an honorary member of the Australasian College of Radiology. The Theodore E. Keats Professorship in Radiology at UVA was founded in 1992 by his residents, colleagues and friends. That same year, Dr. Keats delivered the RSNA Annual Oration in Diagnostic Radiology, “Normal Variants of the Spine that Simulate Disease.”



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## 3D CT Imaging Used to Evaluate Facial Aging

*Researchers who devised a way to use CT imaging to objectively evaluate the effect of muscles on facial aging say the results could be applied to plastic surgery procedures, such as rejuvenation surgery and facelifts, as well as muscle exercises designed to prevent facial aging.*

“IT IS NECESSARY to understand the anatomy of facial muscles and physiological changes to understand facial aging,” said Itsuko Okuda, M.D., of the Department of Diagnostic Radiology, International University of Health and Welfare, Mita Hospital in Tokyo, who presented findings in an education exhibit at RSNA 2010. “3D CT images allow the depiction of the state of facial muscles and facial aging.”

The researchers set out to answer the question, “Why are there differences in facial aging among different people?” Dr. Okuda said.

The goal of the study—performed in cooperation with the departments of radiology, aesthetic plastic surgery and anatomy at Mita Hospital—was to present clinical, radiographic and anatomic features of aging in both the young and old, Dr. Okuda said. Shirakade Yukio, M.D., a plastic surgeon, also participated in the research.

The six-month research project involved 50 case studies, with subjects ranging from 15 to 80 years old. The retrospective study used 3D CT images obtained from previous multidetector CT and MR imaging studies. “Previous studies have used ultrasound techniques to measure muscle thickness; however, 3D CT imaging provides much more detail,” Dr. Okuda said.

After discussing the anatomy of the muscles used in facial expression with Kazuaki Hirata, M.D., an anatomy professor at Mita Hospital, the pair began researching muscle activity, Dr. Okuda said.

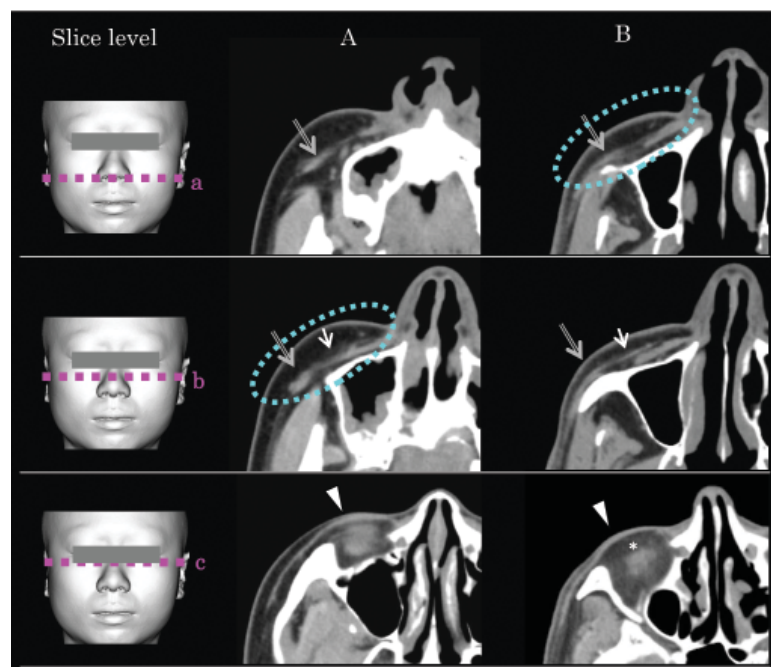
Creating facial 3D volume renderings based on CT images of patients young and old, Dr. Okuda and colleagues compared those images with the patients’ original CT and MR images and evaluated the changes in facial structure that cause aging.

“We also researched the anatomy of the subcutaneous soft tissue, which contributes to facial features, and then analyzed how these structures varied with aging,” Dr. Okuda explained.

“Based on anatomical knowledge and facial aesthetic plastic surgical knowledge, we began interpreting facial images—using CT and MR imaging—in detail again.”

By comparing those images and researching previous studies, researchers determined that facial aging is caused not only by age-related changes in the skin, but also changes in muscles, subcutaneous soft tissue and adipose tissue.

Dr. Okuda plans to continue this research over the next two years. The research will include an additional 100 case studies. □



Researchers at Mita Hospital in Tokyo set out to answer the question, “Why are there differences in facial imaging among different people?”

The facial expression muscles contributing to facial aging are mainly distributed around the eyes and mouth. Fat tissue also contributes to the level of facial aging. Malar fat pads are maximal fat pads in cheeks. Facial 3D images indicate the level of the CT slices (a,b,c).

Above: A. 20-year-old female. B. 78-year-old female. Major (long arrows) and minor (short arrows) zygomatic muscles wither. Malar fat pads (blue elliptical inside) descend, and the height of the malar mound decreases. Baggy eyelid is caused by withered orbicularis oculi muscles (arrow heads) resulting in herniation of the orbital fat (\*).

Image courtesy of Itsuko Okuda, M.D.

“Previous studies have used ultrasound techniques to measure muscle thickness; however, 3D CT imaging provides much more detail.”

Itsuko Okuda, M.D.

## Post-mortem CT Aids in Detecting Suspected Elder Abuse

**Whole-body post-mortem CT (PMCT) can detect or exclude suspicious skeletal injuries indicative of elder abuse and may be used as a triage tool to help determine the need for conventional autopsy, according to a new study.**

ALTHOUGH INCIDENTS OF elder abuse are increasing as America ages, it is difficult to determine whether such abuse is a contributing cause of death without a full conventional autopsy—even where allegations of abuse are limited to nonphysical issues, said Barry Daly, M.D., who discussed the study, “Utility of Whole-body Post-Mortem Computed Tomography Imaging in Detection of Elder Abuse and Neglect: Comparison with and Potential Substitution for Standard Autopsy,” during an RSNA 2010 presentation.

“PMCT can assist the medical examiner in investigating suspected elder abuse and help determine if a full autopsy is required, or may be avoided, on the basis of PMCT and other investigations,” said Dr. Daly, a professor of radiology, chief of abdominal imaging and vice-chair of research at the University of Maryland Medical Center in Baltimore, which has a new, \$56 million forensic medicine center on its campus.

“Elder abuse is not well understood,” Dr. Daly said. “We’re concerned that it is underdiagnosed and under-reported.”

The Office of the Chief Medical Examiner is legally allowed to determine whether a conventional autopsy is necessary in every case; however many families would prefer to forgo the procedure if possible, Dr. Daly said. While ordinary X-rays may be used to detect elder abuse, CT offers greater sensitivity, he added.

“There’s no question that we found CT to be a very helpful substitute for autopsy in detecting injuries suggestive of physical abuse and/or neglect,” Dr. Daly said. “We think this is a reliable triage tool that may help the medical examiner determine the need for conventional autopsy when allegations of elder abuse are made.”

While the law requires suspected child abuse to be reported, the law should include adult abuse, said David Fowler, M.D., Maryland’s Chief Medical Examiner and a collaborator on the study.



Daly

### PMCT Concordant with Conventional Autopsy

In the study of 52 deceased men and women with associated allegations of elder abuse, PMCT and subsequent conventional autopsy were performed within 24 hours of death. The 12 men and 40 women in the study ranged from 52 to 93 years of age.

Using conventional autopsy as the standard of reference, radiologists experienced in forensic imaging interpreted the scans for potentially suspicious injuries, evidence of potential neglect and other major findings.

Results showed that PMCT was concordant with conventional autopsy for evidence or absence of elder abuse in all cases, Dr. Daly said. PMCT found multiple previously unreported fractures of varying age consistent with elder abuse in one of the 52 cases.

Recent fractures consistent with cardiac resuscitation or typical accidental trauma were detected on PMCT in 18 out of 52 cases and five out of 52,

respectively. At conventional autopsy, those fractures were undetected in seven of the 18 cardiac resuscitation cases, and four of the five accident cases, respectively.

Findings also showed that PMCT misinterpreted an undisplaced cervical fracture in the setting of severe degenerative disease and identified decubitus ulcers in 14 out of 52 cases, nine of which were unreported at conventional autopsy.

The cause of death was determined by PMCT in 24 out of 52 cases whereas conventional autopsy made the determination in 50 out of 52 cases, results showed.

“We did not see enough positive cases to adequately test for the possibility of false negative results on the PMCT studies,” Dr. Daly said. □

“There’s no question we found that CT could be a very helpful substitute for autopsy, to detect injuries suggestive of physical abuse and/or neglect.”

Barry Daly, M.D.

**EDITOR'S NOTE:** These articles were adapted from stories that appeared in the RSNA 2010 *Daily Bulletin*. Coverage of RSNA 2010 is available at [RSNA.org/bulletin](http://RSNA.org/bulletin).



## R&E Grant is Catalyst for Merging Business, Research Opportunities

*Researchers hoping to attract funding to bring new therapies into clinical use faster might consider developing a business model to put the wheels in motion, according to Charles Peterfy, M.D., Ph.D., radiologist, RSNA Research & Education Foundation grant recipient and founder of two successful image analysis companies.*



EARLY IN HIS CAREER, Dr. Peterfy, an internationally recognized researcher in musculoskeletal imaging, developed the “self-financing” structures that funneled revenue back into multisite clinical trials in rheumatoid arthritis, osteoarthritis, fracture healing and other musculoskeletal disorders. In 1998, Dr. Peterfy co-founded San Francisco-based CCB-R-SYNARC and served as chief medical officer until leaving to form Spire Sciences, based in Greenbrae, Calif., in 2009.

“Researchers who are trying to do something new also need to find novel ways of funding their ideas,” Dr. Peterfy said. “It may seem daunting at first, but it’s really quite liberating.”

A two-year, \$90,000, Nycomed (now GE Healthcare)/RSNA Research & Education (R&E) Research Scholar Grant in 1994 served as a catalyst for merging his business and research interests, he said.

### Pharmacology Tied to Arthritis Research

After earning his doctorate in pharmacology and therapeutics along with his medical degree from McGill University in Montreal, Dr. Peterfy began his imaging research career at the University of California, San Francisco (UCSF), with a fellowship in musculoskeletal radiology. He worked alongside Harry K. Genant, M.D., co-founder of CCB-R-SYNARC and professor emeritus of radiology, orthopedic surgery, medicine and epidemiology at UCSF.

“Through my background in pharmacology and radiology, I had long contemplated using imaging to advance drug development,” Dr. Peterfy said. “When I learned that Harry Genant was using imaging in clinical trials in osteoporosis, I sought him out with the hope of working with him at UCSF and emulating his service in osteoporosis within other therapeutic areas.”

Because osteoarthritis and rheumatoid arthritis were two highly prevalent and debilitating diseases lacking effective treatments as well as serious attention from radiology researchers at the time, Dr. Peterfy opted to focus on those areas. “Those fields were trapped in the past, using last century’s imaging,” he said. “Somehow they hadn’t found a way to leverage modern imaging technologies to benefit their patients, so I targeted them—especially in terms of MR applications.”

Dr. Peterfy led the arthritis division of Dr. Genant’s Osteoporosis Research Group. As new techniques emerged, the group’s name was changed to the Osteoporosis and Arthritis Research Group.

### Business Model Springs from R&E Grant

Dr. Peterfy’s R&E-funded project laid the foundation for the Whole-Organ MR Imaging Score (WORMS) method widely used in arthritis imaging research and clinical trials today.

“R&E grants are extremely important in helping young investigators like Dr. Peterfy find their place and establish a basis for building further research support,” Dr. Genant said. “Dr. Peterfy has gone on to become a major force in introducing MR imaging to rheumatoid arthritis and osteoarthritis.”

“That project also helped move me to be more dedicated to—and to derive my income primarily from—clinical research,” Dr. Peterfy said.

Dr. Peterfy’s necessary interface with the pharmaceutical industry led to his creation of a business model that funneled revenue back into research. Just four years after receiving the R&E-funded grant, Dr. Peterfy worked with Dr. Genant and other UCSF team members to found CCB-R-SYNARC, a leading provider of medical image analysis services to pharmaceutical and biotechnology industries. “The company grew pretty quickly, peaking at around 500 employees worldwide with 17 offices in 11 countries on four continents,” Dr. Peterfy said. “Over the years, we helped bring more than 20 new



Peterfy

“Researchers who are trying to do something new also need to find novel ways of funding their ideas. It may seem daunting at first, but it’s really quite liberating.”

Charles Peterfy, M.D., Ph.D.



### Serial MRI in Rheumatoid Arthritis

Serially acquired MR images of the wrist of a patient with rheumatoid arthritis from a clinical trial show development of bone erosions in the radius (arrows) and loss of cartilage between the radius and lunate in only three months. Over the following three months, the radius erosions have enlarged and a new erosion has developed in the lunate. The scoring methods that R&E Foundation grant recipient Charles Peterfy, M.D., Ph.D., helped develop, RAMRIS and MRI-JSN, provide standardized ways of quantifying such changes in clinical trials and thus testing the efficacy of putative new therapies.

Peterfy, Olech, DiCarlo, et al. European League Against Rheumatism 2010

therapies into clinical use, and today those therapies are used by hundreds of millions of people around the world.”

In 2009, Dr. Peterfy left CCB-R-SYNARC to found Spire Sciences, which he says is unique in its exclusive focus on image analysis as opposed to image data management. The company employs in-house radiologists who specialize in clinical trials.

“By image analysis,” Dr. Peterfy explained, “I mean designing imaging protocols that allow multiple imaging facilities around the world to acquire diagnostically identical images for a clinical trial, training the imaging facilities’ technologists in that protocol, providing centralized image quality control and, ultimately, centrally reading the images using a variety of methods specialized for clinical trials research.”

### World Health Focus of Clinical Trials

In addition to the WORMS method, Dr. Peterfy helped introduce numerous methods currently used in clinical trials—the fixed-flexion knee radiography technique, the SynaFlexer positioning device and projection phantom for reproducible knee radiography and fixed-location joint-space width measurement for monitoring osteoarthritis progression.

He also co-developed the Rheumatoid Arthritis MR Imaging Score (RAMRIS) and Psoriatic Arthritis MR Imaging Score (PsAMRIS) as part of the Outcome Measures in Rheumatology Clinical Trials (OMERACT) working group. Dr. Peterfy also invented the X-frame and M-frame positioning devices designed to reduce errors in radiography and create reproducible MR imaging in arthritis clinical trials.

In addition, Dr. Peterfy chaired the Imaging Working Group of the National Institutes of Health Osteoarthritis Initiative and co-founded the International Society for Extremity MRI in Rheumatology.

### GRANTS IN ACTION

#### NAME:

Charles Peterfy, M.D., Ph.D.

#### GRANT RECEIVED:

1994 two-year, \$90,000 Nycomed (now GE Healthcare)/RSNA Research Scholar Grant.

#### STUDY:

“Quantitative Applications of MRI in the Evaluation of Arthritis.”

#### CAREER IMPACT:

Serving as a catalyst for merging Dr. Peterfy’s business and research interests, the study funded by the R&E grant laid the foundation for the Whole-Organ MR Imaging Score (WORMS) method widely used in arthritis imaging research and clinical trials today, and led to the creation of two successful image analysis companies.

#### CLINICAL IMPLICATIONS:

In addition to the WORMS method, Dr. Peterfy helped design and execute more than 50 multi-site clinical trials in rheumatoid arthritis, osteoarthritis, fracture healing and other musculoskeletal disorders.

For more information on all R&E Foundation grant programs, go to [RSNA.org/Foundation](http://RSNA.org/Foundation) or contact Scott Walter, M.S., Assistant Director, Grant Administration at 1-630-571-7816 or [swalter@rsna.org](mailto:swalter@rsna.org).

“Our overall objective is to improve world health by helping bring new therapies into clinical use faster, particularly for chronic diseases like osteoporosis, osteoarthritis, rheumatoid arthritis, cancer and Alzheimer disease, all of which still have huge unmet medical needs that could benefit from direct and specialized attention from radiology,” Dr. Peterfy said. □



# Radiologists Urged to Focus on Daily Impact of Healthcare Reform

Radiologists facing new provisions under the sweeping healthcare reform law are advised to look at them from the viewpoint of their effect on what one team of experts calls the three P's: payment, practice and patients.

"RADIOLOGISTS need to focus on provisions that affect their day-to-day duties, business practices and ability to provide quality care," said Christopher Buckle, M.D., a fourth-year radiology resident at the University of Chicago Pritzker School of Medicine, discussing his education exhibit, "When the Dust Settles: Radiology After Health Care Reform," during RSNA 2010.

Mentored by RSNA Board Liaison for Education Richard L. Baron, M.D., Dr. Buckle developed the exhibit to identify changes in healthcare reform most pertinent to radiology, including changing reimbursement, comparative effectiveness research and self-referral. Many provisions under the 10-year, \$940 billion Patient Protection & Affordable Health Care Act took effect on Jan. 1.

Skyrocketing costs are driving healthcare reform, Dr. Buckle said. He cited statistics showing how significantly Medicare spending on medical imaging has exceeded growth in other medical services, doubling between 2000 and 2008 to \$14 billion. "The rapid growth in the volume and cost of such imaging services makes advanced imaging a prime target for cutbacks," he said. "For instance, the Deficit Reduction Act of 2005 cut technical fees for freestanding outpatient MR imaging by 35 percent according to some estimates."

## Reimbursement, Compensation Rates Impacted

Medicare reimbursement for each CT and MR study will decrease in anticipation of an expected increase in the equipment utilization rate, from 50 to 75 percent. The higher the utilization rate assumption—the amount of time scanners are presumed to be used during business hours—the lower the per scan reimbursement.

Traditionally, radiology practices would simply increase imaging volume to compensate for falling reimbursement, but new approaches may be necessary, according to Dr. Baron. "Increasing demand, more appropriate utilization and an aging population will reward radiologists who use continuing education and technological innovation to improve the efficiency and expertise of their practice," he said.

The unpopular but mandated cuts in physician Medicare compensation—deferred by Congress since 2003—present another financial challenge. A permanent solution to the problem would cost more than \$300 billion and require bipartisan support. Instead, President Obama in December 2010 signed a law creating a one-year delay of the 21 percent Medicare physician payment cuts originally scheduled to take effect on Jan. 1.

Radiologists are also encouraged to practice evidence-based medicine as part of a \$300 million investment plan for comparative effectiveness research. Guided by 100 "priority" areas identified by the Institute of Medicine, comparative effectiveness research will attempt to identify the best and most cost-effective approach in areas where evidence is controversial or lacking, Dr. Buckle said.



Baron

“There is no question that medical imaging is of substantial added value in diagnosis and that insuring a greater percentage of the population will lead to greater demand for imaging services.”

Christopher Buckle, M.D.



Imaging is central to 11 of the top 100 priorities, including, for example, the frequency and indications for using PET/CT in cancer patients. "While comparative effectiveness research may reveal overutilization and put further pressure on some radiology practices, it provides an opportunity for radiologists to find better ways to demonstrate the value and cost effectiveness of new imaging methods," Dr. Baron said. "High quality radiology research will be critical to our success."

While some may argue that anti-self-referral language in the healthcare reform bill doesn't go far enough, the new provision is at least a start, Dr. Buckle said.

"Clinicians who have a financial interest in imaging equipment must disclose that interest to their patients," Dr. Buckle said. "This legislation does not eliminate the 'in-office' loophole, but it is a step in the right direction."

On the heels of a movement toward federal regulation of self-referral, the Maryland Court of Appeals in January upheld provisions of the state's self-referral law prohibiting physicians from referring patients for MR imaging, CT and radiation therapy services to providers within their own group practice—a verdict Dr. Buckle calls "an encouraging precedent on the costly self-referral issue that will hopefully be adopted by other states."

## Radiologists will Rise to the Challenge

While the current healthcare reforms are the most significant in Medicare's history, the news is not all "doom and gloom" for radiology, Dr. Buckle said. "There is no question that medical imaging is of substantial added value in diagnosis and that insuring a greater percentage of the population will lead to greater demand for imaging services," he said.

Concurred Dr. Baron: "Radiology is a field defined by its ability to adapt to new technology, processes and workflows. Healthcare reform will challenge us to use this skill to deliver quality imaging that improves patient care." □

Skyrocketing costs are driving healthcare reform, said Christopher Buckle, M.D., (right), presenting his education exhibit, "When the Dust Settles: Radiology After Health Care Reform," during RSNA 2010. Dr. Buckle encouraged radiologists to focus on changes including reimbursement, comparative effectiveness research and self-referral.

## EDITOR'S NOTE:

This article was adapted from a story that appeared in the RSNA 2010 *Daily Bulletin*. Coverage of RSNA 2010 is available at [RSNA.org/bulletin](http://RSNA.org/bulletin).



## LATIN AMERICA PRESENTS

## Mobile Radiology Unit Brings Hope for Fibroid Relief to Underserved Brazil

*A mobile uterine fibroid embolization (UFE) program implemented in Brazil achieved significant quality of life improvement and nearly 100 percent patient satisfaction, according to results presented at RSNA 2010.*

THE PROGRAM, KNOWN AS ANGIOMOVEL, offers hope as it is an alternative to hysterectomy, said Nestor Kisilevzky, M.D., who presented results of a feasibility study.

“Hope is certainly the most important feeling we can provide to these people,” said Dr. Kisilevzky, an interventional radiologist from São Paulo.

In São Paulo, there are more than 5 million women between the ages of 20 and 49—the age range in which symptomatic fibroids are most likely to develop. The vast majority of these women, Dr. Kisilevzky said, are low income and depend exclusively on the country’s public healthcare system, which offers only basic treatment procedures—in the case of fibroids, a hysterectomy.



Kisilevzky

### Mobile Unit “Feasible, Efficient and Safe”

In the study, 100 patients with symptomatic fibroids were treated with UFE at four São Paulo hospitals between October 2008 and April 2009. The ANGIOMOVEL program brought the treatment to the hospitals via a small truck transporting a mobile C-arm, radiologic table, protective aprons and small trolley containing angiography and embolization supplies.

The ANGIOMOVEL team, visiting one hospital a week for six months, comprised two interventional radiologists, a nurse and a driver. Patient outcomes were evaluated with a gynecologic exam, pelvic MR imaging, laboratory tests and a quality of life questionnaire.

Data were obtained at 12 weeks and after one year after the procedure. Pre- and post-procedure MR

imaging analysis showed complete fibroid ischemia in 92 percent of cases, with a mean uterine volume reduction of 36 percent and a mean fibroid volume reduction of 57 percent.

Health-related quality of life scores increased from a pre-procedure 41.4 points to 81.2 points after 12 weeks and 85.3 points after one year.

“Results indicate that using a mobile interventional radiology unit is a feasible, efficient and safe method to bring a successful uterine fibroid embolization program to the underserved patient community,” said Dr. Kisilevzky, adding that 98 percent of patients said they would recommend the procedure.

### Patients Happy, Grateful

About 70 percent of Brazilians are covered by the government-run public health system, where scarce resources keep interventional radiology from being as well developed as it is in the insurance-funded private sector, Dr. Kisilevzky said.

“Our hypothesis was that we could help to modify this current scenario by introducing UFE technology into those underserved communities,” Dr. Kisilevzky said. “We know that UFE is a very straightforward procedure that could be efficiently and safely performed using modern state-of-the-art C-arms. This represented a good model for running our feasibility study.”



Dr. Kisilevzky said he was surprised by the reaction and feedback from the patients. “They improved their quality of life and were tremendously happy and grateful,” he said. “It seemed they had never expected to have access to medical technology and once they were treated, they noticed how important it was to their lives.” □

“Hope is certainly the most important feeling we can provide to these people.”

Nestor Kisilevzky, M.D.

A mobile uterine fibroid embolization (UFE) program implemented in Brazil is an alternative to hysterectomy. Above, left: The team of two interventional radiologists, a nurse and a driver brought the program, known as ANGIOMOVEL, to hospitals via a small truck transporting a mobile C-arm, radiologic table, protective aprons and small trolley containing angiography and embolization supplies. Right: A patient is treated with UFE.

**EDITOR'S NOTE:** Continuing its “Presents” series at the 2010 annual meeting, RSNA offered sessions examining the latest in radiologic research and practice in Latin America and China. These features originally appeared in the *Daily Bulletin*, the official newspaper of the annual meeting.

## CHINA PRESENTS

## Acupuncture Effects Measured by fMRI

*By measuring dynamic neural responses induced by acupuncture, noninvasive functional MR imaging (fMRI) can determine physiological response—a finding that facilitates potential future neuroimaging acupuncture studies, according to the results of research presented at RSNA 2010.*

fMRI HAS OPENED A “window” into the brain, allowing researchers to investigate the central physiological functions induced by acupuncture administration, said researcher Jie Tian, Ph.D.

“MR imaging provides an integrated view of the functional aspects of acupuncture, in which both the needle manipulation and the resulting neural cascades may contribute to the overall effect of acupuncture through a dynamic reconfiguration of complex neural networks,” said Dr. Tian, a professor and director of the Medical Image Processing Group Institute of Automation, Chinese Academy of Sciences in Beijing, China.

### Effects Peak Long After Administration

At the core of the controversy surrounding acupuncture is its lack of rigorous scientific evidence, Dr. Tian said. Previous neuroimaging studies have



Tian

focused on the acute effects of acupuncture; however, many clinical reports indicate that the effects of acupuncture may actually peak long after needle administration.

“We hypothesized that due to acupuncture’s sustained effect, use of the typical block-designed model-based analysis may focus on misleading endpoints,” Dr. Tian said.

Such studies, which focused only on the relationship between acupuncture and spatial patterns, may have missed an important part in defining its mechanism, Dr. Tian said. He and his colleagues adopted the non-repeated, event-related design paradigm, combined with several data-driven analyses, to explore the spatial-temporal characteristics of acupuncture.

Dynamic neural responses induced by acupuncture express functional specificity, the study showed.

“Our study provides solid evidence that acupuncture is slow-acting and induces specific dynamic patterns on the entire nervous system,” Dr. Tian said. “We found that we can decode the central expression of brain responses to reveal the acupuncture mechanism.”

### Acupuncture Study Design Must be Applied Carefully

This emerging picture suggests that both design paradigms and statistical models used in acupuncture studies should be applied with great care.

Study results showed that needling two visual acupoints (GB37 and BL60) and a non-visual acupoint (KI8) could induce a converging brain response spatially overlapped at

the posterior cingulate cortex/precuneus, or encoding center.

“The delayed correspondence between the visual acupoints—but not the nonvisual acupoints—and the intrinsic visual networks via the encoding center indicated a temporal-spatial encoding mechanism underlying the sustained effects of acupuncture,” Dr. Tian said.

Results show that acupoint stimulation may lead to different resource distributions in both spatial and temporal domains and reflect their specific function-guide actions.

“These findings have great implications for the design and interpretation of a range of acupuncture neuroimaging studies,” Dr. Tian concluded. “Our concept may open up new ways by which the actual effect of acupuncture can be appropriately studied.” □

“Our study provides solid evidence that acupuncture is slow-acting and induces specific dynamic patterns on the entire nervous system.”

Jie Tian, Ph.D.



# Education, Infrastructure Key to Information Security

*It's every researcher's worst nightmare.*

*In 2007, someone hacked into a University of North Carolina (UNC) server holding the personal information of 180,000 mammography patients. The data—including approximately 114,000 Social Security numbers—was part of the National Institutes of Health Carolina Mammography Registry, a 15-year project compiling and analyzing data in an effort to improve breast cancer screening.*

ALTHOUGH UNIVERSITY OFFICIALS say no one has been charged in the hacking—which was not discovered until 2009—and the university does not believe any information was ultimately removed, the incident nearly cost the primary investigator her job. In lieu of termination, however, university officials opted instead to demote her to associate professor and cut her pay in half. She is appealing the decision before the UNC Board of Trustees, said Karen McCall, UNC spokeswoman.

“Ultimately, the lead researcher is responsible for ensuring that university information security standards are followed,” McCall explained. “Researchers are trained on university and HIPAA [Health Insurance Portability and Accountability Act] standards. The primary investigator is responsible for making sure all standards are followed.”

## Time is Ripe for Data Breach Awareness

As news of the UNC incident spread, it served as a wake-up call of sorts for the radiologic community.

“Heightening awareness is becoming critical as researchers grapple with healthcare privacy and security requirements and data breaches become commonplace,” said Paul Chang, M.D., a professor and vice-chair of radiology informatics and medical director of pathology informatics at the University of Chicago Medical Center (UCMC). “This is happening at institutions every day,” said Dr. Chang, who is also a consultant to RSNA’s RadSCOPE® and myRSNA® initiatives. “Every researcher is vulnerable.”

The problem is rooted in a lack of education and a general misunderstanding of the requirements mandated by HIPAA and the Institutional Review Board (IRB), Dr. Chang said. With few exceptions, institutions lack adequate IT infrastructure and policies to successfully implement a secure research environment. Compounding the problem, researchers and IT staff don’t understand each other’s roles, he said.

Because they bear the burden of responsibility, researchers are at the center of what Dr. Chang calls “a perfect storm.” While researchers need to get prepared in the interim, ultimately the institutions must provide the tools to support HIPAA-compliant research, he stressed.

“No investigator should be put in the position of securing his or her own research data,” said Dr. Chang, a representative on UCMC’s HIPAA Steering Committee. “Institutions should provide IT solutions that make it virtually impossible for a researcher to violate HIPAA security regulations. There are ‘success’ stories out there and the radiology research community should leverage these experiences.”

## HIPAA, IRB Requirements are Different

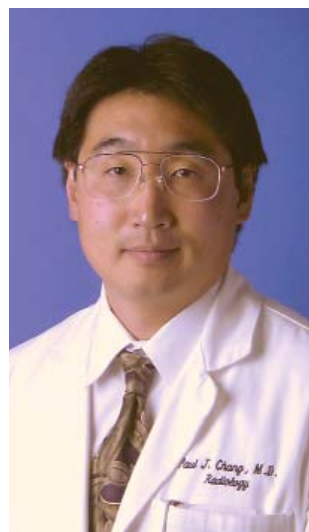
The most important step researchers can take is to get educated, Dr. Chang said. Researchers tend to focus on IRB requirements, often overlooking HIPAA and the Health Information Technology for Economic and Clinical Health Act (HITECH Act) that ramped up HIPAA compliance requirements, especially with respect to security.

While HIPAA and IRB both address patient privacy in a roughly similar way, HIPAA encompasses security as well. “Many investigators are under the common misconception that getting approval from IRB is sufficient,” Dr. Chang said. “They don’t understand that IRB approval does not give you cover from HIPAA security requirements.”

Along with hacking, security violations could also include the loss of data through fire, theft or even failure to back up information. “What if the system crashes and you lose data? Security is a bigger issue

“Heightening awareness is becoming critical as researchers grapple with healthcare privacy and security requirements and data breaches become commonplace.”

**Paul Chang, M.D.**



Chang



than just defending against ‘bad guys,’” Dr. Chang stressed. “You also have to sweat the day-to-day IT issues.”

Although institutions require annual HIPAA training, that is often inadequate and may not keep up with the law’s rate of change, Dr. Chang said.

Another critical step is involving IT staff early and keeping the department involved throughout the process. “Researchers realize they need to contact a statistician when designing a research project, for example, but many never talk to an IT person about HIPAA security,” Dr. Chang said.

The bottom line is that researchers who store patient information on any server “always run the risk of having it compromised,” Dr. Chang said.

“Most institutions lack appropriate IT infrastructure to support modern-day, HIPAA-compliant research,” Dr. Chang said. “Researchers are not IT experts. We need to get away from saddling them with the burden for data security.”

## Virtual Database Offers Protection

An obvious way to thwart a security risk is to eliminate personal information from patient data. In 2009, UCMC created its Human Imaging Research Office (HIRO), to acquire, analyze, collect, distribute and anonymize image data for UCMC investigators and research staff. This includes access to and support for the University’s Electronic Honest Broker Systems, which allow investigators to obtain

HIPAA- and IRB-compliant clinical research data automatically and electronically.

Researchers essentially make data requests to HIRO, which strips out personal information such as names and Social Security numbers, replacing them with an IRB identifying code number. “We give researchers back the list of research subject identifier numbers and say, ‘Here are your research subjects...anytime you want the data you can access it through the website,’” Dr. Chang said.

“All of the information is protected and individual investigators never have to build their own databases,” Dr. Chang said. “No data is stored locally and the burden is no longer on researchers. They are free to concentrate on their jobs.”

Currently available only through UCMC’s Imaging Institute, Dr. Chang is working with others at the university to expand the program throughout the enterprise. He also encourages other institutions to invest in the IT systems that are beneficial not only for patients and researchers but also the institutions that have a lot to lose in the event of a security breach.

In the wake of the UNC incident, the university paid \$250,000 to notify roughly 180,000 patients and set up a call center to field questions about the breach, McCall, UNC’s spokeswoman said.

“Institutions that invest that kind of money up front to build the appropriate system won’t get in those problems to begin with,” Dr. Chang said. □

## LEARN MORE

For more information on the University of Chicago Imaging Research Institute’s Human Imaging Research Office (HIRO), go to [hiro.bsd.uchicago.edu](http://hiro.bsd.uchicago.edu).



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 Nina A. Mayr, M.D. &  
 William T. Yuh, M.D., M.S.E.E.  
 Muhammad A. Zaheer, M.D.  
 Karel J. Zuiderveld, Ph.D.

**YOUR DONATIONS IN ACTION**



With an RSNA R&E Foundation grant, **Michael S. Gee, M.D., Ph.D.**, is evaluating a novel point-of-care method of diagnostic MR technology for molecular characterization of cancer cells. This technology could be used to reduce patients' exposure to the toxicities of ineffective therapies and allow alternate treatment strategies to be implemented sooner.

Sophia B. Peterman, M.D., M.P.H.  
 Jane & Brian D. Petersen, M.D.  
 Cheryl A. Petersilge, M.D.  
 Robin & Roderic I. Pettigrew, Ph.D., M.D.  
 Nuala & Douglas E. Pfeiffer, M.S.  
 C. Douglas Phillips, M.D.  
*In memory of Theodore E. Keats, M.D.*  
 Philip C. Pieters, M.D.  
 James R. Pillars Jr., M.D.  
 Thelma & Daniel J. Pisano, M.D.  
 Cynthia A. & Richard S. Plank, M.D.  
 Donna M. Plecha, M.D.  
 Michelle Dombrowski &  
 Stephen D. Plichta Jr., M.D.  
 Mary E. & Donald A. Podoloff, M.D.  
 Steven R. Pollei, M.D.  
 Deborah & David J. Porter, M.D.  
 Sandy & Barry D. Pressman, M.D.  
 Thomas C. Puckette, M.D.  
 Thomas F. Pugh Jr., M.D.  
 Christine A. Quinn, M.D.  
 Philip W. Ralls, M.D.  
 Hector Ramirez Jr., M.D.  
 Sabiha Raouf, M.D. & Suhail Raouf  
 Michele C. & James G. Ravenel, M.D.  
 Caroline A. Reich, M.D., Ph.D.  
 Stanley B. Reich, M.D.  
 Murray A. Reicher, M.D.  
 Erica & Erick M. Remer, M.D.  
 Lori A. Deitte, M.D. & Mark Rice, M.D.  
 John S. Richmond, M.D.  
 Marilyn T. Riederer, Ph.D. &  
 Stephen J. Riederer, Ph.D.  
 Steve N. Rindsberg, M.D.  
 Ronald P. Robinson, M.D.  
 Roxie & Joseph J. Roco, D.O.

## Journal Highlights

The following are highlights from the current issues of RSNA's two peer-reviewed journals.

### Radiologic Imaging and Intervention for Gastrointestinal and Hepatic Complications of Hematopoietic Stem Cell Transplantation

ABDOMINAL IMAGING and intervention play an important role in early, minimally invasive diagnosis and treatment of graft-versus-host disease (GVHD) and veno-occlusive disease—unique and deadly complications that may limit the success and applicability of hematopoietic stem cell transplantation. Urgent and accurate diagnosis of these diseases may be life-saving, especially in the acute phase or in clinically ambiguous cases.

Abdominal plain radiography, ultrasound and CT imaging generally reveal nonspecific signs of disease, but understanding frequencies and radiologic subtleties of findings within the clinical setting may guide management, according to a State-of-the-Art article in the March issue of *Radiology* ([RSNA.org/Radiology](http://RSNA.org/Radiology)), by Shmuel Y. Mahgerefteh, M.D., Hebrew

University Medical Center, Jerusalem, Israel, and colleagues.

In cases where the diagnosis is unclear and liver biopsy is required, image-guided transvenous liver biopsy may be a safer and more practical option than the transcutaneous approach, according to researchers.

“Image-guided interventions, including intraarterial steroid-injection therapy in severe, systemic steroid-refractory GVHD and transjugular intrahepatic portosystemic shunt placement in veno-occlusive disease with portal hypertension, have shown some promise in small, uncontrolled series,” researchers concluded. Larger, controlled studies are needed to define the role of these invasive procedures in this patient population, they said.



**Plain abdominal anteroposterior radiograph in a 34-year-old woman with acute gastrointestinal graft-versus-host disease shows multiple dilated bowel loops and bowel wall thickening.** (*Radiology* 2011;258;3:660-671) ©RSNA, 2011. All rights reserved. Printed with permission.

### MR Imaging Mapping of Skeletal Muscle Denervation in Entrapment and Compressive Neuropathies

ALTHOUGH USING MR imaging to diagnose entrapment or compressive neuropathies is increasing, localizing nerve entrapment or demonstrating nerve compression lesions with MR imaging is sometimes difficult. Nevertheless, even in these cases, MR imaging may show denervation-associated changes in specific muscles innervated by the affected nerves.

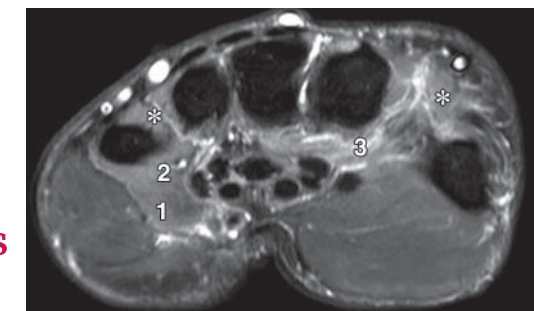
In the March-April issue of *RadioGraphics* ([RSNA.org/RadioGraphics](http://RSNA.org/RadioGraphics)), Su-Jin Kim, M.D., of Seoul National University College of Medicine, Seoul, Korea, and colleagues describe MR imaging patterns of denervated muscles caused by specific entrapment or compressive neuropathies in upper and lower extremities and demonstrate the potential utility of MR imaging for diagnosing those neuropathies by mapping muscle denervation. Specifically, the authors detail:

- Typical MR imaging findings of muscle denervation in different stages
- Peripheral nerve anatomy and maps of motor innervation
- Advantages of MR imaging mapping of muscle denervation in managing patients with entrapment and compressive neuropathies.

Knowledge of the relevant anatomy of the peripheral nerves is crucial to understanding the MR imaging patterns of muscle denervation caused by specific neuropathies, the authors write.

“Muscle denervation may be the only MR imaging sign of an entrapment or compressive neuropathy and thus can be useful for the diagnosis and localization of neuropathies,” the authors conclude. “MR imaging mapping of muscle denervation may also help determine the level of an affected nerve and assist in surgical planning and management of patients.”

This article meets the criteria for 1.0 AMA PRA Category 1 Credit™ and is available for print and online CME.



**Distal ulnar nerve denervation pattern in a 49-year-old man with Guyon canal syndrome. Axial short inversion time inversion-recovery (STIR) MR image (4528/30) of the left hand shows abnormal hyperintensity of the muscles innervated by the distal ulnar nerve. 1 = flexor digiti minimi, 2 = opponens digiti minimi, 3 = adductor pollicis, \* = interosseous muscles.** (*RadioGraphics* 2011;31;319-332) ©RSNA, 2011. All rights reserved. Printed with permission.



## Radiology in Public Focus

A press release was sent to the medical news media for the following article appearing in the latest issue of *Radiology*.

### CT-based Ballistic Wound Path Identification and Trajectory Analysis in Anatomic Ballistic Phantoms

Radiologists with varying training and experience can identify ballistic wound paths in phantoms and measure trajectory angles on multidetector CT (MDCT) images with good agreement with the actual angles at which the phantoms were shot.

In an in vitro study, Les R. Folio, D.O., M.P.H., of the Uniformed Services University of the Health Sciences in Bethesda, Md., and colleagues evaluated the accuracy of CT-based ballistic wound path identification in phantoms by determining the agreement between actual shooting angles and trajectory angles determined by using MDCT with either a PACS measurement tool or x, y, z coordinates of the entrance and exit points.

Results demonstrated the feasibility of consistent wound path identification and the accuracy of trajectory angle determination in models with use of MDCT.

“Based on our findings, we can be 95 percent confident that future angle determinations made by using a PACS angle tool will differ from the actual shooting angles by no more than 4.5°,” the researchers concluded.



A leg phantom is attached to wooden board placed on a pivot, enabling legs to be tilted at fixed angles. Length of phantom extends from a few centimeters above tibial plateau to a few centimeters below lateral malleolus. Gunshots to regions that included bone resulted in larger wound paths and exit wounds due to increased transfer of energy and creation of additional missiles (bone fragments), similar to human tissue ballistic properties. Angles were recorded between shots to provide various predetermined bullet trajectories in the phantoms. This apparatus was placed in a shooting range, 50 yards from trained marksman.

(*Radiology* 2011;258:3:923-929) ©RSNA, 2011. All rights reserved. Printed with permission. Photograph courtesy of Dominik Usling.

“Based on our findings, we can be 95 percent confident that future angle determinations made by using a PACS angle tool will differ from the actual shooting angles by no more than 4.5°.”

## Media Coverage of RSNA

In January 2011, media outlets carried 4,175 RSNA-related news stories. These stories reached an estimated 2.6 billion people.

January print coverage included *The New York Times*, *TIME*, *Los Angeles Times*, *Chicago Tribune*, *USA Today*, *Washington Post*, *Boston Globe*, *Seattle Times*, *New York Daily News*, *San Francisco Chronicle*, *Philadelphia Daily News*, *Houston Chronicle*, *Miami Herald* and *Atlanta Journal-Constitution*.

Broadcast coverage included CNN, CNN Headline News, *WGN America*, FOX News Channel, CBS Radio Network, WNYW-TV (New York), WLS-TV (Chicago), WBBM-AM (Chicago), WJBK-TV (Detroit), KMSP-TV (Minnesota), WAGA-TV (Atlanta), WFAA-TV (Dallas) and WPVI-TV (Philadelphia).

Online coverage included Yahoo! News, FOX News-Online, *CNN.com*, *LATimes.com*, CBS News Online, *Newsday.com*, *ChicagoTribune.com*, *MSNBC.com*, ABC News Online, *Businessweek.com*, *Forbes.com*, *Reuters.com*, *USA Today* – Online Edition, *Baltimore Sun* – Online Edition, *UPI.com*, *USNews.com* and WebMD.



### March Public Information Activities Focus on Colorectal Cancer

To highlight National Colorectal Cancer Awareness Month in March, RSNA distributed radio public service announcements (PSAs) encouraging listeners to be screened for colorectal cancer.

In addition, RSNA distributed the “60-Second Checkup” audio program to nearly 100 radio stations across the U.S. The segments focused on colorectal cancer topics, including early detection of colorectal cancer and the use of CT colonography.

## For Your Benefit

# Cases of the Day Now Online

One of the most popular programs at RSNA annual meetings, Cases of the Day from RSNA 2010 are now available online—an option that offers a unique set of benefits for participants.

“CASES OF THE DAY generate a lot of conversation and excitement at annual meetings, but in some ways, they are better online,” said Claire E. Bender, M.D., chair of the RSNA Education Exhibits Committee. “When you view them online you can still test your skills, but you don’t have to wait to get the answer.”

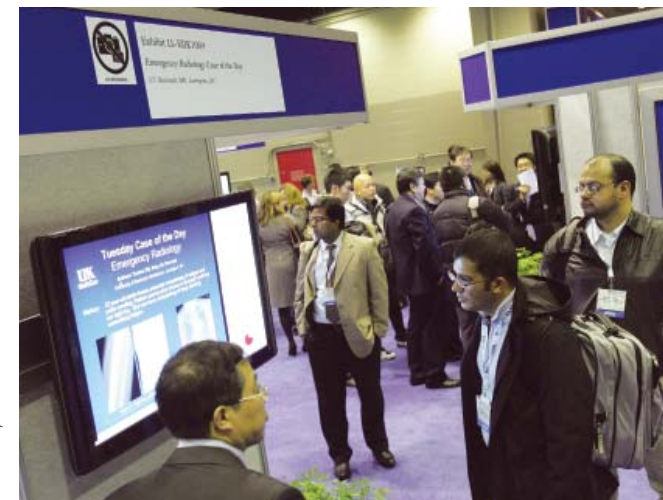
In the Cases of the Day area at the annual meeting, image-based case scenar-

ios in 14 different radiology subspecialties are presented to participants who submit their diagnoses for cases for five consecutive days and check for the correct answer the following morning.

In the online format, participants who view the RSNA 2010 cases and submit diagnoses can immediately see the correct answer and view the discussion for each case.

“Cases are selected for the ways they test the radiologist’s skill and for their rich images,” Dr. Bender explained. “Cases of the Day are a wonderful resource for the practitioner and loads of people appreciate the immediacy of working online.”

Free to RSNA members, Cases of the Day are now available at [RSNA.org/Education](http://RSNA.org/Education).



## Residents & Fellows Corner

Residents & Fellows

### Nominations Being Accepted for Roentgen Resident/Fellow Research Award

**Deadline—April 1** The RSNA Research & Education Foundation is accepting nominations for the Roentgen Resident/Fellow Research award, designed to recognize and encourage outstanding residents and fellows in radiologic research. Each participating North American residency program will receive an award plaque with space to display a brass nameplate for each year’s recipient. The Foundation will also provide a personalized award for the department to present to the selected resident or fellow.

The residency program director or the department chair should identify one individual annually based on the following:

- Presentations of scientific papers at regional or national meetings
- Publication of scientific papers in peer-reviewed journals
- Receipt of a research grant or contributions to the success of a research program within the department
- Other research activities

Every resident/fellow in an Accreditation Council for Graduate Medical Education-approved program of radiology, radiation oncology or nuclear medicine is eligible. Nominations are limited to one resident or fellow per department per year. For more information, including the nomination form and a listing of past recipients, go to [RSNA.org/Foundation/Roentgen.cfm](http://RSNA.org/Foundation/Roentgen.cfm).

### Residents Want Help Finding Fellowships, Transitioning to Practice

With available radiology fellowships currently posted on a variety of websites, pulling all the information together in a central location would help applicants find the opportunities that best match their experience and interest, said many participants in a recent RSNA survey.

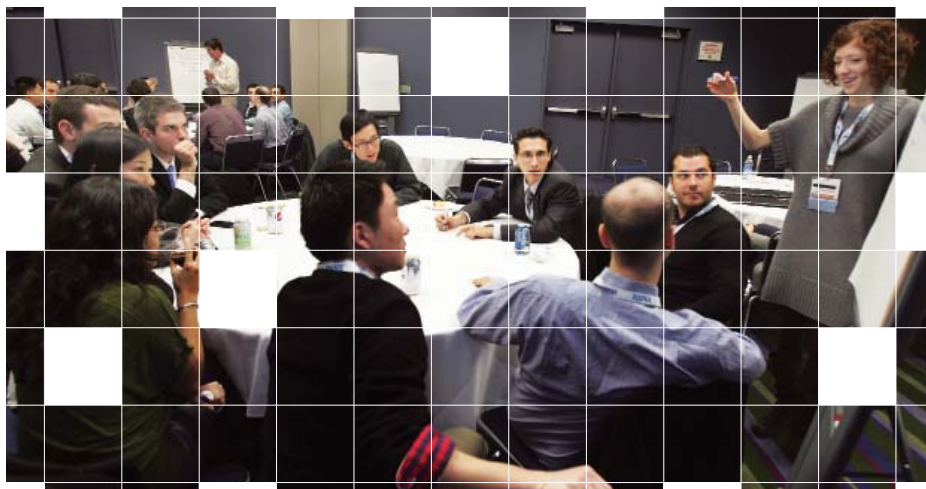
Fifty residents and fellows responded to the survey conducted in the Residents Lounge at RSNA 2010. They noted that having to search multiple websites for fellowship postings can be frustrating, such as when they discover a fellowship after the application deadline has passed or are unable to identify opportunities in their subspecialty.

Residents and fellows also expressed a desire to be better prepared to go into practice, with its complicated process of signing contracts, credentialing and other issues.

Also addressed in the survey were the Graduated Dues Program, Research & Education Foundation grants, Resident Learning Portfolio and medical student membership. RSNA is currently working with its Resident and Fellow Committee to use the survey results to develop and enhance programs that best meet the needs of members in training.



## Education and Funding Opportunities



### RSNA Introduction to Research for International Young Academics

The RSNA Committee on International Relations and Education (CIRE) seeks nominations for this program that encourages young radiologists from countries outside North America to pursue careers in academic radiology by:

- Introducing residents and fellows to research early in their training
- Demonstrating the importance of research to the practice and future of radiology
- Sharing the excitement and satisfaction of research careers in radiology
- Introducing residents to successful radiology researchers, future colleagues and potential mentors

The program consists of a special four-day seminar held during the RSNA Scientific Assembly and Annual Meeting. CIRE recommends 15 international young academics for consideration by the RSNA Board of Directors each year. Complimentary registration, shared hotel accommodation for the duration of the program and a stipend to help defray travel expenses are awarded to successful candidates.

Eligible candidates are residents and fellows currently in radiology training programs or radiologists not more than two years out of training who are beginning or considering an academic career. Nominations must be made by the candidate's department chairperson or training director. Fluency in English is required.

Nomination forms are available at [RSNA.org/IRIYA](http://RSNA.org/IRIYA).

### RSNA Eyer Editorial Fellowship

Candidates are sought for the RSNA Eyer Editorial Fellowship, sponsored by the RSNA Publications Council and the Committee on International Relations and Education (CIRE).

Named after William R. Eyer, M.D., a former editor of *Radiology*, the fellowship is designed to provide an opportunity for a mid-career radiologist to further his/her experience in radiologic journalism. Working with *Radiology* and *RadioGraphics* editors and RSNA publications staff, the fellow will learn about manuscript preparation, peer review, manuscript editing, journal production, printing and electronic publishing.

For more information on eligibility requirements and to apply, go to [RSNA.org/Publications/editorial\\_fellowships.cfm](http://RSNA.org/Publications/editorial_fellowships.cfm).

### Medical Meetings

March – May 2011

**MARCH 26–31**

**VISIT THE RSNA BOOTH**

Society of Interventional Radiology (SIR), 36th Annual Scientific Meeting, Chicago • [www.sirmeeting.org](http://www.sirmeeting.org)

**APRIL 3–8**

IDKD's 43rd International Diagnostic Course, Davos, Switzerland. Main Course Topics: Diseases of the heart and chest, including breast satellite courses • [www.idkd.org](http://www.idkd.org)

**APRIL 7–10**

Japan Radiological Society (JRS), 70th Annual Meeting, Yokohama, Japan • [www.secretariat.ne.jp/jrs70/eng/index.html](http://www.secretariat.ne.jp/jrs70/eng/index.html)

**APRIL 12–15**

**VISIT THE RSNA BOOTH**

Association of University Radiologists (AUR), 59th Annual Meeting, Westin Boston Waterfront Hotel • [www.aur.org](http://www.aur.org)

**APRIL 14–16**

American Brachytherapy Society (ABS) Annual Conference, Manchester Grand Hyatt, San Diego • [www.americanbrachytherapy.org](http://www.americanbrachytherapy.org)

**APRIL 14–17**

American Institute of Ultrasound in Medicine (AIUM), Annual Meeting, New York Marriott Marquis Hotel • [www.aium.org](http://www.aium.org)

**APRIL 28–MAY 1**

Canadian Association of Radiologists (CAR), 74th Annual Scientific Meeting, Hyatt Regency Hotel, Montréal • [www.car.ca](http://www.car.ca)

**APRIL 29–30**

RSNA, ASTRO, Cancer Imaging and Radiation Therapy Symposium: A Multidisciplinary Approach, Atlanta Marriott Marquis • [www.cancerimagingandrt-symposium.org](http://www.cancerimagingandrt-symposium.org)

**MAY 6–7**

RSNA in conjunction with SNM and the Society for Molecular Imaging (SMI): Molecular Neuroimaging Symposium, National Institutes of Health, Bethesda, Md. • [www.snm.org/brain2010](http://www.snm.org/brain2010)

**MAY 17–20**

27th Iranian Congress of Radiology (ICR), Olympic Hotel, Tehran • [www.icr2011.ir](http://www.icr2011.ir)

**MAY 21–24**

European Society of Gastrointestinal and Abdominal Radiology (ESGAR) 2011 annual meeting, Venice Convention Center, Italy • [www.esgar.org](http://www.esgar.org)

**MAY 24–26**

The Russian National Congress of Radiologists, Radiology 2011, Crocus Expo International Exhibition Centre, Moscow • [www.radiology-congress.ru](http://www.radiology-congress.ru)

## For Your Benefit

### Web Tool Assists French Residents

EARLY IN HIS CAREER as a French radiology resident, Julien Savatovsky, M.D., parlayed his membership in the Association Parisienne des Internes en Radiologie (APIR) into a Web tool that connects French radiology residents with another resource critical for radiologists: RSNA membership.

In 2003, the APIR president asked Dr. Savatovsky to find out whether RSNA journals *Radiology* and *RadioGraphics* were accessible to French radiology residents. "After a quick look at the RSNA website, I found the membership-training section and contacted RSNA to see whether it was applicable to overseas residents," Dr. Savatovsky said. "It was."

Because of the language barrier and differences in medical degrees, Dr. Savatovsky had some difficulty understanding portions of the online membership appli-

cation. "We felt that more French residents would benefit from RSNA membership if we promoted it and found an easier way for them to apply," he said.

Soon after, Dr. Savatovsky created a tool on the APIR website ([www.apir-radio.com](http://www.apir-radio.com)) that answers frequently asked questions about completing RSNA's online membership application and explains parts of the process that could be misunderstood by non-American residents. Dr. Savatovsky also assisted RSNA in translating the application into French.

Now on staff at the Fondation Adolphe



Savatovsky

de Rothschild Ophthalmology in Paris, Dr. Savatovsky has attended four RSNA annual meetings and continues to tout the benefits of membership.

"Although France has the Société Française de Radiologie and subspecialty societies that offer high-quality publications and annual meetings, residents are especially lucky to have access to the amazing additional educational free resources from RSNA."

For more information about RSNA membership, go to [RSNA.org](http://RSNA.org) or contact the Membership Department at 1-877-RSNA-MEM (1-877-776-2636) or [membership@rsna.org](mailto:membership@rsna.org).

## Education and Funding Opportunities

### RSNA Clinical Trials Methodology Workshop

January 14–20, 2012  
Scottsdale/Phoenix, Ariz.  
Applications due **June 6**

Over the course of this 6½-day workshop, each trainee will be expected to develop a protocol for a clinical study, ready to include in an application for external funding. Participants will learn how to develop protocols for the clinical evaluation of imaging modalities. A dynamic and experienced faculty will cover topics including:

- Principles of clinical study design
- Statistical methods for imaging studies
- Design and conduct of multi-institutional studies
- Sponsorship and economics of imaging trials
- Regulatory processes

Applicants will undergo a competitive selection process for course entrance. Once admitted, trainees will participate in advance preparation, didactic sessions, one-on-one mentoring, small group discussions, self-study and individual protocol development. Familiarity with basic concepts and techniques of statistics and study design is required of all applicants.

For more information, contact Fiona Miller at 1-630-590-7741 or [fmiller@rsna.org](mailto:fmiller@rsna.org). Learn more about projects conducted by alumni of the Clinical Trials Methodology Workshop in the April issue of *RSNA News*.



### LAUNCH OF RADIOLOGY CME SUCCESSFUL

Within the first three weeks of CME being available through *Radiology*, more than 100 readers completed an online test and claimed credit. The journal's new online feature launched in January with the review article, "CT Findings of Chemotherapy-induced Toxicity."

Up to one article per month in *Radiology* ([RSNA.org/Radiology](http://RSNA.org/Radiology)) will be designated for CME activity. Readers who successfully complete a CME test associated with a review-style ("Review," "State of the Art") article in *Radiology* will be awarded 1.0 AMA PRA Category 1 Credit™.

The test is accessible through the Education Center portal at [RSNA.org](http://RSNA.org). CME is a free benefit of membership; nonmembers will be charged a \$15 fee.



## Annual Meeting Watch

### Submit Abstracts by March 31

The online system to submit abstracts for RSNA 2011 is now active. **New this year, the submission deadline is 12:00 p.m. Central Time on March 31.** Abstracts are required for scientific presentations, education exhibits, applied science and quality storyboards.

To submit an abstract online, go to [RSNA.org/abstracts](http://RSNA.org/abstracts).

The easy-to-use online system helps the Scientific Program Committee and Education Exhibits Committee evaluate submissions more efficiently. For more information about the abstract submission process, contact the RSNA Program Services Department at 1-877-776-2227 within the U.S. or 1-630-590-7774 outside the U.S.



### WINNER OF RSNA 2011 AIRFARE ANNOUNCED

Seema Salehi-Bird, M.B.C.H.B., M.R.C.S., of the Department of Radiology at University Hospital North Staffordshire in Stoke-on-Trent, Staffordshire, United Kingdom, is the winner of the \$500 voucher good toward the purchase of airfare to attend RSNA 2011.

RSNA 2010 attendees who booked air travel through Gant Travel by Oct. 1, 2010, were entered into a drawing to receive the travel credit.

### Wayfinders Post Impressive Numbers

Finding their destination was easier than ever for RSNA 2010 attendees thanks to the new "wayfinding" units located throughout public areas and exhibit floors at McCormick Place. Introduced at RSNA 2010, the technology scored big with attendees who occasionally formed lines to use the navigational machines. "I prefer it to the big book, it's less cumbersome," said Amy Chambers, a lawyer from Grand Rapids, Mich., a general counsel for a large radiology service who was searching for a room location. More than a dozen of the interactive digital units featured touch screens that helped guide attendees with interactive maps, search engines for exhibitors, sessions and posters, and facility information and schedules. Wayfinders were used 582,268 times, including 12,709 exhibitor searches, 134 requests for information, 3,198 session searches and 548 poster locator searches. A total of 1,367 maps were printed at RSNA 2010.



### RSNA 2011 Registration

#### Registration Fees

BY NOV. 4	ONSITE	
\$ 0	\$100	RSNA/AAPM Member
0	0	RSNA/AAPM Member Presenter
0	0	RSNA Member-in-Training, RSNA Student Member and Non-Member Student
0	0	Non-Member Presenter
165	265	Non-Member Resident/Trainee
165	265	Radiology Support Personnel
750	850	Non-Member Radiologist, Physician or Physician
750	850	Hospital or Facility Executive, Commercial Research and Development Personnel, Healthcare Consultant and Industry Personnel
300	300	One-day registration to view only the Technical Exhibits

#### Important Dates

<b>March 31</b>	Deadline for abstract submission
<b>May 4</b>	RSNA/AAPM member registration and housing open
<b>June 1</b>	General registration and housing open
<b>July 6</b>	Course enrollment opens
<b>October 21</b>	Deadline for international mailing
<b>November 4</b>	Deadline for housing and discounted registration
<b>Nov. 27 - Dec. 2</b>	RSNA 97th Scientific Assembly & Annual Meeting

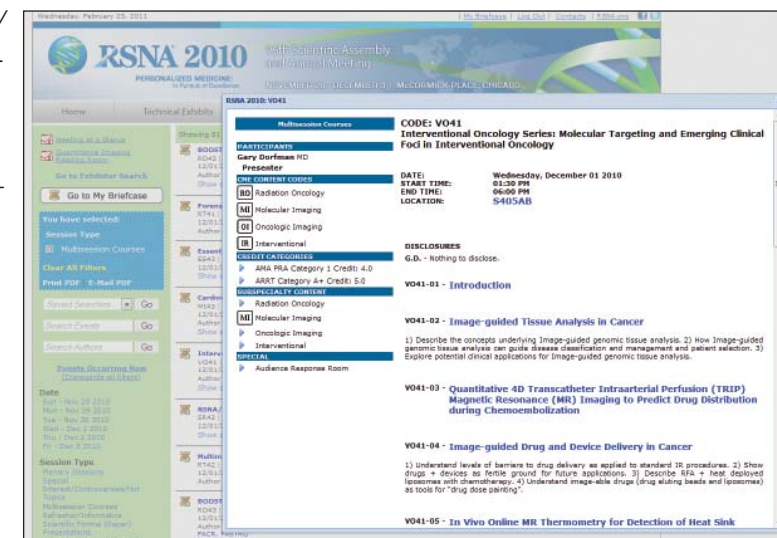
For more information about registering for RSNA 2011, visit [RSNA2011.RSNA.org](http://RSNA2011.RSNA.org), e-mail [reginfo@rsna.org](mailto:reginfo@rsna.org) or call 1-800-381-6660 x7862.

## RSNA.org

### Virtual RSNA 2010 Available at *RSNA.org*

The virtual annual meeting at *RSNA.org/virtual2010.cfm* allows visitors to experience, or revisit, portions of RSNA 2010:

- More than 1,200 education exhibits and scientific posters in numerous subspecialties (access limited to RSNA 2010 attendees and RSNA members)
  - Handouts for select RSNA 2010 refresher courses
  - Award-winning education exhibits
- A searchable meeting program is also available through the virtual meeting site. The site will be updated with new content throughout the year.



### ISR Virtual Congress Opens in April

The third International Society of Radiology (ISR) virtual congress will be launched on the society's website ([www.isradiology.org](http://www.isradiology.org)) in April.

Patterned after the first two virtual congresses in 2007 and 2009, the third congress also offers special features from national radiology societies in Korea, France, Russia and Brazil and contains scientific lectures, case studies and electronic posters. The virtual congresses in English have been the best received educational presentations on the ISR website and will remain on the site indefinitely. Radiologists who wish to participate can fill out an electronic application on the ISR website. Enrollees will be added to an ISR electronic list and sent notices of new website features.



### COMING IN APRIL

Mentors can produce more successful practicing radiologists, guide them into academic practice and research and cultivate future leaders. Next month, *RSNA News* examines the key role mentors play in guiding residents through all phases of their careers and compares the success of self-selecting versus being assigned a mentor.



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understand the policies and  
procedures of MIPPA/CMS  
accreditation

**Breast MRI | March 23 | 1–2 p.m. (ET)**

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