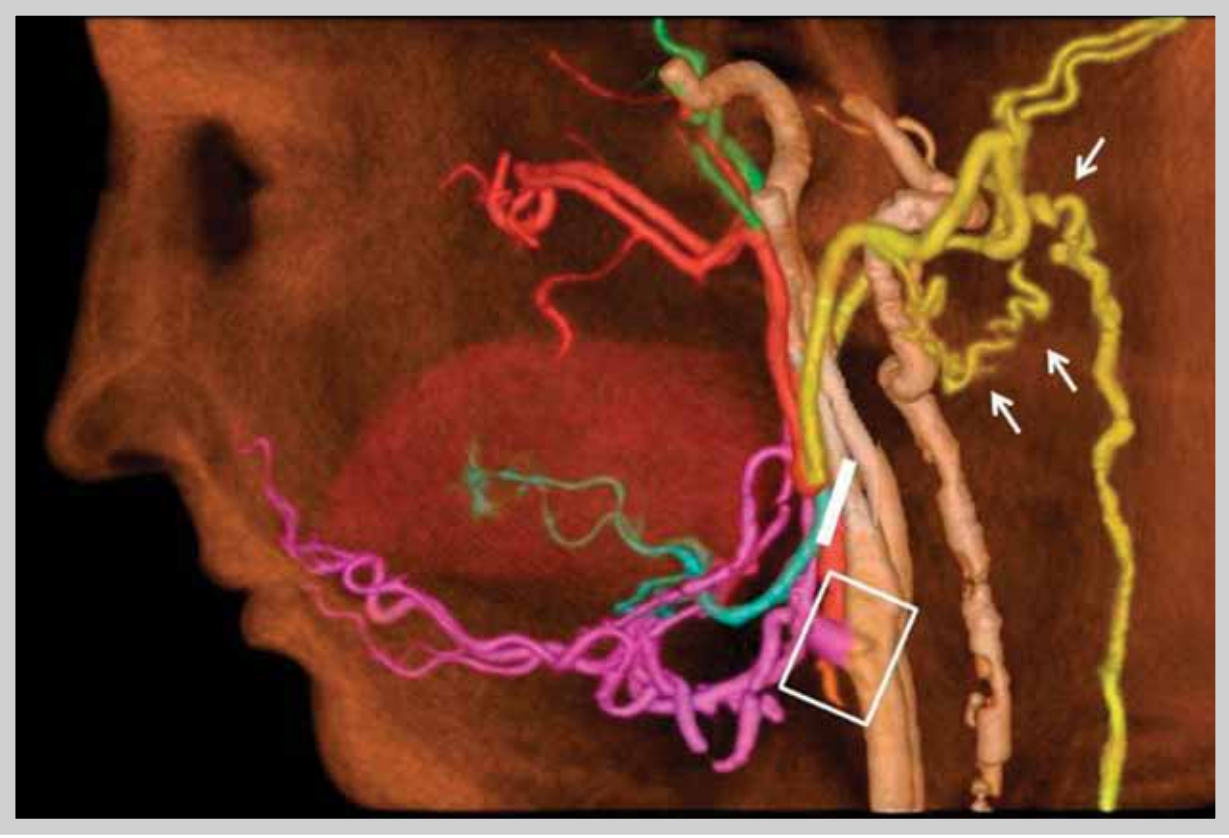
RSNA News™

April 2014 Volume 24, Number 4



Imaging Critical to Face Transplantation

ALSO INSIDE:

Advance Registration and Housing Opens May 1
See Page 23

RSNA®
Radiological Society of North America

William R. Eyler Editorial Fellowship

Experience radiologic journalism firsthand...

The Eyler Editorial Fellowship provides an opportunity for radiologists in mid-career to further their experience in radiologic journalism. Learn about manuscript preparation, peer review, manuscript editing, journal production, printing, and electronic publishing by working with the...

Editor of *Radiology*
Boston, Massachusetts,
for 2 weeks

Editor of *RadioGraphics*
Burlington, Vermont,
for 2 days

RSNA Publications Department
Oak Brook, Illinois,
for 2 days

The fellow will also assist the editors and attend editorial meetings during the RSNA annual meeting.

Award

One fellow will be selected each year and will be awarded a stipend of $10,000 to cover the cost of transportation, lodging, and meals during the fellowship.

Eligibility

Candidate must:

- ✓ Be an RSNA member
- ✓ Have accomplished at least 3 years of attending-level work at an academic institution
- ✓ Have served as a reviewer for a major imaging journal
- ✓ Be affiliated with a national radiologic society in his or her country

Applications

Learn more and download an application at ***RSNA.org/Eyler_Fellow*** or email ***editfellowships@rsna.org.***

Deadline for applications is May 1, 2014

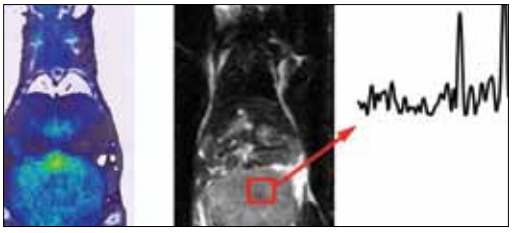
The Fellowship Experience

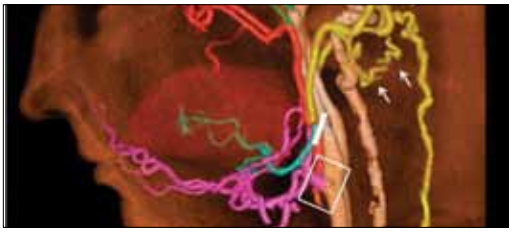
Fellows prepare evaluations and follow-up reports on their experiences during and as a result of the fellowship.

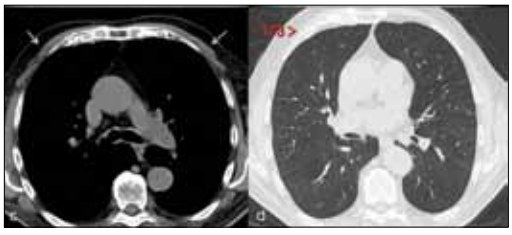
See firsthand accounts at ***RSNA.org/Eyler_Fellow***

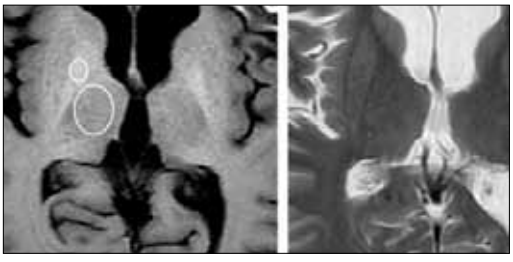
PUB278-R10/13

FEATURES









RSNA News

UP FRONT

RADIOLOGY'S FUTURE

NEWS YOU CAN USE

RSNA MISSION

The RSNA promotes excellence in patient care and healthcare delivery through education, research and technologic innovation.

Available on the App Store | ANDROID APP ON Google play

Access the *RSNA News* tablet edition on the App Store and Google play.

Follow us for exclusive news, annual meeting offers and more!

100 YEARS RSNA® CENTENNIAL SNAPSHOTS

During this year as RSNA celebrates its 100th Scientific Assembly and Annual Meeting, *RSNA News* will take a look back at milestones in the Society's history.

1919: First RSNA Gold Medal Bestowed

The first to receive RSNA's highest honor was Heber Robarts, M.D., credited by his peers with "catching the vision of the science of radiology while it was in its infancy." Among the 185 other individuals to have received the medal is **Marie Skłodowska-Curie**, in 1922.

1950: Paper Presentations First Grouped Into "Scientific Sessions"

At mid-century the RSNA meeting was growing so quickly that RSNA President **Warren W. Furey, M.D.**, sought ways to streamline the scientific program. Presentations were limited to 20 minutes, with an opening discussion of 10 minutes and succeeding discussions of 5 minutes—this format paved the way for how 2,000-plus scientific papers are now presented at the meeting each year.

1984: R&E Fund (now Foundation) Established

Since its inception, the Research & Education Foundation has awarded $40 million in grant funding for nearly 1,000 young investigators. Surveys show that for every $1 granted by the Foundation, recipients receive 40 additional grant dollars as principal investigator or co-investigator from other sources such as the National Institutes of Health.

1992: RSNA Annual Meeting Features First Public DICOM Demonstration

The standard for digital imaging and communications in medicine (DICOM) developed by the American College of Radiology and the National Electrical Manufacturers Association subsequently became the universal standard for medical imaging.

2006: Clinical Trials Methodology Workshop Debuts

The program offers clinical investigators a weeklong opportunity for one-on-one mentoring and instruction in clinical research design, regulatory issues, biostatistics, ethics and other topics, as well as specific guidance in crafting protocols for imaging clinical trials. More than 200 researchers have participated.

2010: Resident and Fellow Committee Formed

Charged with advising RSNA on the effectiveness of its resident and fellow programming and other resources, and encouraging free membership among radiologists in training, the committee continues RSNA's longstanding commitment to the next generation of physicians. RSNA 1969, led by President **John H. Gilmore, M.D.,** featured "radiologic roundtables" to facilitate trainees' relationships with experienced practitioners.

THORWARTH NAMED ACR CHIEF EXECUTIVE OFFICER

William T. Thorwarth Jr., M.D., a nationally recognized expert on radiology economics and reimbursement, has been named chief executive officer (CEO) of the American College of Radiology (ACR) effective April 2014.

Thorwarth

For nearly 30 years, Dr. Thorwarth has practiced as a radiologist with Catawba Radiological Associates in Hickory, N.C., where he also serves the Frye Regional Medical Center, Catawba Valley Medical Center and Caldwell Memorial Hospital.

Dr. Thorwarth has previously served as ACR President, chair of the ACR Economics Commission, a member of the ACR Board of Chancellors and was honored with the ACR Gold Medal in 2010. The William T. Thorwarth, Jr., M.D., Award, which honors ACR members and staff who demonstrate excellence in economics and health policy, is named after Dr. Thorwarth.

After serving as the RSNA Board of Directors Liaison-designate for Publications and Communications throughout 2010, Dr. Thorwarth served as the Board's Liaison for Publications and Communications from December 2010 through March 2014. "The opportunity to serve our specialty as a member of the RSNA Board of Directors has been a career highlight for me," Dr. Thorwarth said. "It has been a privilege to bring my private practice and past organization experience to the Board." His extensive RSNA involvement includes serving as chair of the RSNA Finance Committee, founding the Visionaries in Practice (VIP) program for the RSNA Research & Education (R&E) Foundation and serving as VIP committee chair from 2004 to 2009. He also has served on the R&E Fund Development and 25th Anniversary Campaign committees and the R&E Board of Trustees from 2006 to 2009.

As chair of the Publications Council, Dr. Thorwarth has overseen the development of an open-access option for journal manuscripts to satisfy the mandates of research funding agencies. In addition, he has been a prime mover in the efforts of RSNA to promote patient-centered radiology, particularly through the Radiology Cares™ campaign.

At Dr. Thorwarth's prompting, RSNA's Radiology Cares and ACR's Imaging 3.0 initiatives have united to help highlight the import of radiologists' involvement in the care of their patients. "The Radiology Cares Campaign emphasizes our critical role in the patient experience and merges seamlessly with the Imaging 3.0 program," Dr. Thorwarth said. "All radiologists need to become familiar with both programs and incorporate them into their daily practice."

Mahoney Joins RSNA Board of Directors

Mahoney

Mary C. Mahoney, M.D., an accomplished breast imager and staunch advocate of patient-centered radiology, became the newest member of the RSNA Board of Directors beginning in mid-March.

Dr. Mahoney was appointed as Board Liaison for Publications and Communications, replacing William T. Thorwarth Jr., M.D., who will become the executive director of the American College of Radiology (ACR) in April. Dr. Mahoney will serve in this capacity through the RSNA 2014 Annual Meeting and Scientific Assembly, at which time a member will be elected to the position for a five-year term.

"As we traverse a new landscape in patient-centered medicine, RSNA remains the leading organization promoting radiology research and education to improve patient care," Dr. Mahoney said. "I am honored to serve on the RSNA Board of Directors at this critical juncture in our specialty."

A professor of radiology, vice chair of research and the Eugene L. & Sue R. Saenger Chair of Radiological Sciences at the University of Cincinnati Medical Center, as well as director of Breast Imaging at Barrett Cancer Center in Cincinnati, Ohio, Dr. Mahoney is also a trustee of the American Board of Radiology and a fellow of ACR.

A long-time member of RSNA, Dr. Mahoney was chair of the Public Information Committee from 2010 to 2012 and has served on several committees, including the Research & Education (R&E) Foundation Public Relations Committee. She currently chairs the Patient-centered Radiology Steering Committee, the driving force behind RSNA's Radiology Cares™ campaign.

"Being patient-centered means you've considered the patient experience holistically—from the first time they have contact with any member of your staff until the time they are given their reports—and into your follow-up communications," she said. "The RSNA Radiology Cares campaign was devised to encourage and facilitate radiologists' meaningful engagement in the patient experience."

Dr. Mahoney received her bachelor's degree from Brown University in 1979 and her M.D. from the University of Cincinnati College of Medicine in 1983. She began her residency training in diagnostic radiology at Montefiore Hospital in New York, and went on to complete her residency at the University of Cincinnati Medical Center, becoming chief resident of the Department of Radiology in 1987.

Dr. Mahoney has authored or co-authored numerous publications and is a sought-after speaker, giving hundreds of invited lectures throughout the U.S.

Thrall Named to NIBIB Advisory Council

Thrall

James H. Thrall, M.D., has been appointed to the National Advisory Council for Biomedical Imaging and Bioengineering of the National Institute of Biomedical Imaging and Bioengineering (NIBIB). Dr. Thrall is chairman emeritus, Department of Radiology at Massachusetts General Hospital, and the Juan M. Taveras professor of radiology at Harvard Medical School in Boston.

Dr. Thrall has served as president of the American Roentgen Ray Society and as chair of the Board of Chancellors and president of the American College of Radiology. Dr. Thrall was awarded the RSNA Gold Medal in 2007 and served on the RSNA Research & Education (R&E) Foundation Board of Trustees from 2002 to 2008.

Also appointed was **Raphael Lee, M.D., Ph.D.**, professor in the Department of Plastic and Reconstructive Surgery, Plastic and Reconstructive Surgery Outpatient Service at the University of Chicago Medical Center.

Renew RSNA Membership Now

RSNA members who did not renew their membership by Dec. 31, 2013, ceased receiving their RSNA publications, including *RSNA News*. Know someone who hasn't renewed? Encourage them to retain all the benefits of RSNA membership by renewing today at *RSNA.org/renew*.

Members who are transitioning from training into practice pay reduced rates their first and second years. For more information, contact *membership@rsna.org*, 1-877-RSNA-MEM (776-2636) or 1-630-571-7873 (outside the U.S. or Canada).

Those interested in learning about RSNA retired status, which requires no membership dues and includes free admission to the annual meeting, can go to *RSNA.org/Retired_Member_Application.aspx*.

Applications Accepted Through April for Eyler Editorial Fellowship

Applications are still being accepted for the RSNA William R. Eyler Editorial Fellowship. The one-month fellowship offers the opportunity to work with *Radiology* Editor Herbert Y. Kressel, M.D., in Boston and *RadioGraphics* Editor Jeffrey S. Klein, M.D., in Burlington, Vt. The Eyler fellow will also visit the RSNA Publications and Communications Division at RSNA Headquarters in Oak Brook, Ill., and work with the *RadioGraphics* editorial team at RSNA 2014.

The application deadline for the Eyler fellowship is May 1. Learn more at *RSNA.org/RSNA_Editorial_Fellowships.aspx*.

IMAGING PHYSICS RESIDENCIES GRANT RECIPIENTS NAMED

RSNA and the American Association of Physicists in Medicine (AAPM) have announced the recipients of the 2014 AAPM/RSNA Imaging Physics Residency Grants:

- University of Chicago, Zhengfeng Lu, Ph.D., Program Director
- Duke University Medical Center, Ehsan Samei, Ph.D., Program Director
- Emory University, Jonathon A. Nye, Ph.D., Program Director
- Indiana University School of Medicine, Yun Liang, Ph.D., Program Director
- University of Oklahoma Health Science Center, Jagadeesh R. Sonnad, Ph.D., Program Director

RSNA and AAPM have partnered to support a total of eight new Commission on Accreditation of Medical Physics Educational Programs (CAMPEP)-accredited imaging physics residencies over the next six years. Each organization is providing $560,000 in funding for new imaging physics residencies in either diagnostic or nuclear medicine.

Under new requirements for accredited residency training from the American Board of Radiology, medical physicists must complete an accredited two-year residency program in order to take board exams and achieve the Qualified Medical Physicist (QMP) designation.

"The quality of imaging studies is significantly improved by the participation of qualified medical physicists," said N. Reed Dunnick, M.D., the Fred Jenner Hodges Professor and chair of the Department of Radiology at the University of Michigan Health System in Ann Arbor and president of the RSNA Board of Directors. "Currently, there are too few CAMPEP-approved training programs to satisfy the need for medical physicists. Both societies are delighted with the enthusiasm with which this offer has been accepted and the quality of the program applications."

"The AAPM is thrilled for this partnership with the RSNA to establish imaging physics residencies," said John E. Bayouth, Ph.D., the Bhudatt Paliwal Professor and chief of physics in the Department of Human Oncology at the University of Wisconsin in Madison and president of the AAPM. "Structured and documented training provided in clinical medical physics residency is essential to produce the highest quality medical physics services for patients. Clinical Medical Physics residency is required for board certification, certification is required to become a Qualified Medical Physicist, and QMPs are the only individuals recognized as qualified to perform a spectrum of clinical tasks. The AAPM believes this linkage is essential for patient safety and quality of care."

Each grant recipient institution will receive $35,000 per year for four years in 50 percent matching support of two residents. After completion of the grant, the programs are expected to pick up the full trainee funding. Three additional institutions were awarded funding beginning in 2013: Memorial Sloan-Kettering Cancer Center in New York, the University of Alabama at Birmingham and the University of Wisconsin in Madison.

Barrett Named Director of University of Cincinnati Cancer Institute

Barrett

William L. Barrett, M.D., has been named director of the University of Cincinnati (UC) Cancer Institute. Dr. Barrett also serves as chair of the Department of Radiation Oncology, as medical director for UC Health's Barrett Center and as associate director for education and community outreach with the UC Cancer Institute.

Dr. Barrett serves as an American Cancer Society Liaison and on the American Board of Radiation Oncology Board Examination Committee for Head and Neck Cancer. He is a peer reviewer for the *American Journal of Clinical Oncology*, the *International Journal of Radiation Oncology Biology Physics,* and *Cancer*.

Le Bihan Receives Louis-Jeantet Prize for Medicine

Le Bihan

Denis J. Le Bihan, M.D., Ph.D., was awarded the Louis-Jeantet Prize for Medicine for developing a new imaging method that has revolutionized the diagnosis and treatment of strokes. The innovative diffusion MRI technique of the brain has also been used for detecting cancer and mapping the fibres connecting different brain regions, opening the way for a better understanding of Alzheimer's disease, autism, schizophrenia and neurological disorders.

Dr. Le Bihan is a medical doctor, physicist and director of NeuroSpin, an institute at the French Nuclear and Renewable Energy Commission at Saclay near Paris. Dr. Le Bihan previously served as associate editor and consultant to the editor of *Radiology*.

The awards was also presented to Italian biochemist **Elena Conti, Ph.D.**, director of the Department of Structural Cell Biology at the Max-Planck Institute of Biochemistry in Munich, Germany, for her important contribution to understanding the mechanisms governing ribonucleic acid quality, transport and degradation.

The awards were to be presented in April by the Louis-Jeantet Foundation at a ceremony in Geneva, Switzerland. Established in 1986, the Louis-Jeantet Prize for Medicine distinguishes leading-edge researchers who are active in the European Council member countries.

My Turn

Leveraging Electronic Patient Portals

Information technology has changed the face of healthcare forever. Many patients already take advantage of the Internet to gather information and play an active role in and help advocate for their own healthcare. Electronic patient portals are provider-based applications managed by healthcare sites that allow patients access to their medical records including radiology images and reports. These types of portals are becoming more widely available and will be increasingly offered because patients will expect healthcare organizations to provide them access.

Electronic patient portals can be seen as a unique opportunity for radiologists. They offer a way to open two-way communication with patients that we have not had before. Patients can reach out to us using secure messaging services and ask questions about prior or upcoming imaging examinations. In response, we can provide personalized answers and guidance and, in the process, show the best possible face of radiology and make tangible the value of the input of radiologists to their diagnosis and treatment.

Electronic portals can greatly increase the integration of patients into their healthcare and increase their level of satisfaction with their radiology experience at the same time. From an operational perspective for imagers, better informed patients help reduce no-show rates, improve adherence to pre-procedural requirements and increase compliance with regular screening.

Judy Yee, M.D., is a professor and vice-chair of radiology and biomedical imaging, University of California, San Francisco, and chief of radiology, San Francisco VA Medical Center. Dr. Yee chairs the RSNA Public Information Committee and the RSNA Public Information Advisors Network (PIAN).

For more on this topic, see story on Page 11.

Electronic patient portals also offer an opportunity for radiologists to educate patients above and beyond simply answering questions. We can provide a broader exposure to a variety of subjects relevant to their health or illness.

Electronic patient portals help make clearer to patients the value of physicians with specialized training in radiology and educate them about what subspecialists like interventional radiologists actually do.

Radiologists should embrace electronic patient portals as a tool that has the potential to empower both patients and their physicians.

> "Electronic patient portals also offer an opportunity for radiologists to educate patients above and beyond simply answering questions."

THIS MONTH IN THE *RSNA NEWS* TABLET

Get more of this month's news with the *RSNA News* Tablet edition, available for download through the App Store and Google Play.

As part of this month's story on the role medical imaging plays in the entire spectrum of face transplantation, *RSNA News* features video interviews with researchers who presented the latest findings on the issue at RSNA 2013.

Access the *RSNA News* tablet edition on the App Store at *itunes.apple.com/us/app/rsna-news/id444083170?mt=8* and Google Play at *https://play.google.com/store/apps/details?id=air.org.rsna.rsnanews&hl=en.*

RSNA News

April 2014 • Volume 24, Number 4
Published monthly by the Radiological Society of North America, Inc.
820 Jorie Blvd., Oak Brook, IL 60523-2251. Printed in the USA.

Postmaster: Send address correction "changes" to: *RSNA News,* 820 Jorie Blvd., Oak Brook, IL 60523-2251

Non-member subscription rate is $20 per year; $10 of active members' dues is allocated to a subscription of *RSNA News.*

LETTERS TO THE EDITOR
rsnanews@rsna.org
1-630-571-7837 FAX

SUBSCRIPTIONS
subscribe@rsna.org
1-888-600-0064
1-630-590-7770

REPRINTS AND PERMISSIONS
permissions@rsna.org
1-630-571-7829
1-630-590-7724 FAX

ADVERTISING
advertise@rsna.org
Jim Drew, Director
1-630-571-7819

RSNA MEMBERSHIP
1-877-RSNA-MEM

RECYCLED PAPER
RECYCLABLE PAPER
PRINTED WITH SOY INK

Hyperpolarized Spectroscopy is a Promising Tool in Cancer Therapy

Although radiation therapy is a mainstay for treating many types of cancer, the therapy often doesn't achieve the success rate that patients and physicians are continually working toward.

In prostate cancer for example, even with modern conformal radiation therapy—a 3D technique in which beams of radiation are shaped to match the tumor—treatment fails in approximately 45 percent of patients with locally confined disease, according to a June 2013 study in *the Journal of Nuclear Medicine* (*JNM*).

A major challenge in cancer biology is monitoring and understanding cancer metabolism in vivo. Increasingly, redox (reduction and oxidation) mechanisms are considered critical to cancer progression, according to researcher David Wilson, M.D., Ph.D., a chemist by training and an assistant professor at the University of California, San Francisco (UCSF). "More studies suggest that reactive oxygen species (ROS), small-molecule antioxidants such as glutathione (GSH), and redox enzymes are highly relevant in cancer aggressiveness and resistance to conventional treatments (radiation and chemotherapy)," Dr. Wilson said.

To that end, Dr. Wilson is developing MR-compatible molecular imaging techniques that allow assessment of real-time metabolism in vivo, which could greatly enhance the specificity of cancer diagnosis and determine treatment response.

Dr. Wilson launched his research through a 2010 Toshiba America Medical Systems/RSNA Research Seed Grant for the project, "New ^{13}C Hexose Probes for the Metabolic Characterization of Tumors in Vivo Using Hyperpolarized ^{13}C Spectroscopy," and is continuing his research through other projects that grew from his RSNA study, including a project his group recently published in *JNM*. (See sidebar).

The broad goal of Dr. Wilson's RSNA project was to identify aggressive phenotypes, or "bad actors," and predict/monitor response to therapy. "The methods we have developed have the potential to address these processes noninvasively, allowing treatment to be tailored to individual patient phenotypes," Dr. Wilson said.

PET Complements Hyperpolarized ^{13}C Spectroscopy

Hyperpolarization, a relatively new method of dramatically increasing the MR signal for non-^{1}H nuclei, is used to study metabolism in real time using enriched endogenous ^{13}C molecules. Metabolic imaging using hyperpolarized ^{13}C spectroscopy is similar in many aspects to PET using ^{18}F fluorodeoxyglucose (FDG) and the two are potentially complementary, Dr. Wilson said.

"But ^{13}C offers significant advantages including lack of ionizing radiation, a shorter scan time and compatibility with proton MR with superior soft tissue contrast," Dr. Wilson said. "The ability to detect the metabolic products of injected ^{13}C substrates is expected to greatly enhance the specificity of cancer diagnosis and assessment of treatment response."

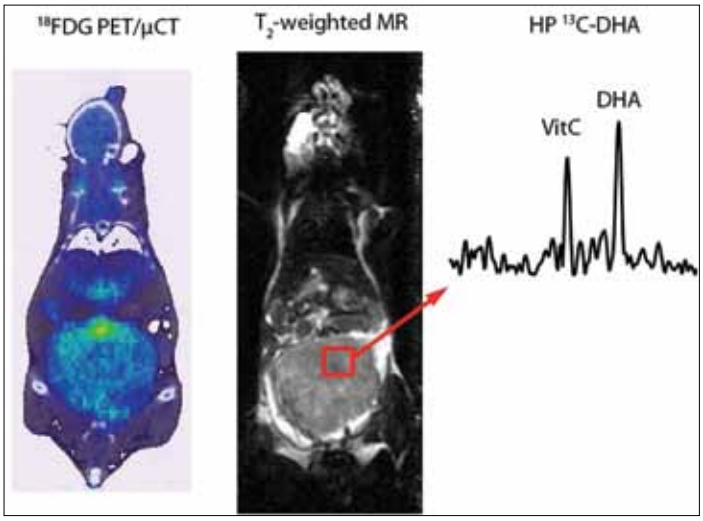
In his RSNA research, Dr. Wilson developed the labeled sugars [2-^{13}C] D-fructose and [1-^{13}C] dehydroascorbate as molecular probes for imaging using hyperpolarized ^{13}C spectroscopy and compared these agents to [2-^{18}F] D-deoxyglucose (FDG) currently used in clinical PET scanning.

"Simply stated, our general approach is to identify a biochemical problem of interest and design ^{13}C, ^{18}F and ^{11}C probes to address it," he said.

Wilson

Dr. Wilson's lab is looking at probes that are chemically and mechanistically similar, with hyperpolarized ^{13}C and PET methods reinforcing each other. "For example, we compared ^{13}C ascorbates (vitamin C and dehydroascorbate) and ^{18}F ascorbates as cancer-imaging agents," he said. "Results of hyperpolarized ^{13}C studies in animals have been very useful in the design of the related PET tracers. In many cases, PET tracers may reach the clinic faster than their hyperpolarized counterparts."

> "The ability to detect the metabolic products of injected ^{13}C substrates is expected to greatly enhance the specificity of cancer diagnosis and assessment of treatment response."
>
> **David Wilson, M.D., Ph.D.**



Researcher David Wilson, M.D., Ph.D., said his recent RSNA project represents significant progress toward the use of MR-compatible metabolic probes in diagnosing cancer patients. *Left*: Preliminary study comparing hyperpolarized [1-^{13}C] dehydroascorbate (DHA) MRI and FDG-PET in a large transgenic adenocarcinoma of the mouse prostate (TRAMP) tumor. Significant reduction of hyperpolarized [1-^{13}C] DHA to hyperpolarized [1-^{13}C] VitC was observed in tumor voxels, with corresponding accumulation of ^{18}F FDG.

The RSNA project represents significant progress toward the use of MR-compatible metabolic probes in diagnosing patients, Dr. Wilson said. "Like FDG, the proposed ^{13}C agents are expected to have enhanced uptake in cancer cells, allowing construction of metabolic maps of the human body," he said. "However, the principal advantage over FDG is the ability to detect real-time metabolism of injected hyperpolarized ^{13}C agents. This feature both potentially enhances the specificity of cancer diagnosis and allows assessment of subtle changes in metabolism that occur in response to treatment."

Technique Could Move to Clinical Practice

Dr. Wilson's project was completed under the supervision of John Kurhanewicz, Ph.D., a professor of radiology, urology and pharmaceutical chemistry at UCSF, which has a very large hyperpolarized ^{13}C spectroscopic imaging research program.

Along with expanding the arsenal of ^{13}C agents for hyperpolarized MR studies, the RSNA project also promoted collaborative research with the UCSF Department of Nuclear Medicine and contributed much-needed research comparing hyperpolarized ^{13}C spectroscopy as a complement to PET, Dr. Kurhanewicz said.

"The preliminary studies conducted by Dr. Wilson are some of the first comparisons of hyperpolarized ^{13}C MR probes to PET," Dr. Kurhanewicz said. "These studies are essential given the mechanistic similarities between the two approaches."

In the long term, Dr. Wilson would like to see the hyperpolarized ^{13}C MR technology move into routine clinical use, which he said is likely. "Given the recent successful clinical trial of the ^{13}C pyruvate imaging probe at UCSF, the potential for clinical translation is very high," Dr. Wilson said.

The importance of the RSNA grant to his career and future research can't be overstated, Dr. Wilson said. "This grant provided key preliminary data for two ROI submissions and was partially responsible for two publications, one in *PNAS* (*Proceedings of the National Academy of Sciences)* and one in *JNM*," Dr. Wilson said. "In the current NIH funding climate, grants like the R&E grant are exceedingly important for early-stage investigators." □

WEB EXTRAS

Spurred by his RSNA-funded grant, David Wilson, M.D., Ph.D., continued his research as a contributing author to the following studies:

- "Hyperpolarized [1-^{13}C] Dehydroascorbate MR Spectroscopy in a Murine Model of Prostate Cancer: Comparison with 18F-FDG PET," June 2013, *Journal of Nuclear Medicine*; access the study at *JNM.snmjournals.org/content/54/6/922.abstract.*
- "Hyperpolarized ^{13}C Dehydroascorbate as an Endogenous Redox Sensor for In Vivo Metabolic Imaging," November 2011, *PNAS*; access the abstract at *PNAS.org content/108/46/18606.abstract.*

GRANTS IN ACTION

Name:
David Wilson, M.D., Ph.D.

Grant Received:
2010 Toshiba America Medical Systems/RSNA Research Seed Grant

Study:
"New ^{13}C Hexose Probes for the Metabolic Characterization of Tumors in Vivo Using Hyperpolarized ^{13}C Spectroscopy."

Career Impact:
"The writing of the grant itself had a significant impact, as it forced us to make our ideas more coherent and develop a better grasp of the hyperpolarized ^{13}C and PET literature. This grant also funded key studies that allowed us to gather the preliminary data needed for our R01 application."

Clinical Implication:
"Prostate cancer appears to undergo redox adaptation, whereby they accumulate antioxidants that allow them to detoxify more ROS. This adaptation makes them more difficult to treat. Hyperpolarized MR and PET methods that target redox will help to identify 'bad actors' and determine the dosages and types of therapy needed."

Imaging Plays Increasingly Critical Role in Face Transplantation

The success of a medical transplantation procedure—whether it involves the kidney, liver, an extremity or some other organ—hinges on the ability of the vasculature to pump blood into the transplanted tissue.

In the case of the relatively new field of face transplantation, ensuring that blood circulates into the transplanted tissue is critical to the success of the procedure and follow-up studies related to blood vessel reorganization offer insights into the biology of transplanted tissues, according to Frank J. Rybicki, M.D., Ph.D., director of the Applied Imaging Science Laboratory at Boston's Brigham and Women's Hospital.

"We're dealing with people who have suffered catastrophic injuries and undergone as many as 30 operations, so we're looking at very abnormal preoperative vasculature and radiology is key to planning a successful procedure," Dr. Rybicki said.

Imaging not only plays a critical role before facial transplant surgery, but also is intricately involved in the process afterward. In research presented at RSNA 2013, Dr. Rybicki and colleagues demonstrated for the first time that blood vessels in face transplant recipients reorganize themselves. After RSNA 2013, this work was published in the February 2014 issue of the *American Journal of Transplantation*, the leading journal in the field.

Dr. Rybicki is part of the team at Brigham and Women's Hospital—led by Bohdan Pomahac, M.D., director of plastic surgery transplantation—that pioneered face transplantation, performing the first full face transplantation in the U.S. in 2011. Physicians have subsequently performed full face transplantations on three additional patients at Brigham and Women's Hospital.

When performing preoperative assessments of transplant candidates, CT is the modality of choice—specifically 320 detector row dynamic CT angiography (CTA)—said Dr. Pomahac, who presented "Facial Restoration by Transplantation and the Role of Novel Imaging Technology," during the RSNA 2012 Opening Session.

"CTA is the best overall vascular imaging strategy because it is the only CT strategy with no table motion and absolute registration for perfusion. In addition, it provides unparalleled precision in a high-definition final image," Dr. Pomahac said. "Radiologists are not only able to get incredibly precise cross-sections, but the 3D reconstructions can show us the vascular tree separately or related to bony structures, and can even superimposes the soft tissues. Imaging provides a complete 3D model of the anatomy and we are able to view it from various angles. This has been priceless."

Rybicki

Pomahac

Kumamaru

While imaging is critical preoperatively, it contributes significant information throughout the process. For example, if a patient is missing a significant amount of bone, imaging used for modeling enables the surgical team to estimate the amount of bone that needs to be transplanted to the upper and lower jaw.

After the procedure, imaging is used for monitoring, diagnosing and managing postoperative complications and for long-term follow-up to detect signs of rejection, changes in morphology and bone healing.

Blood Vessels Reorganize After Face Transplantation Surgery

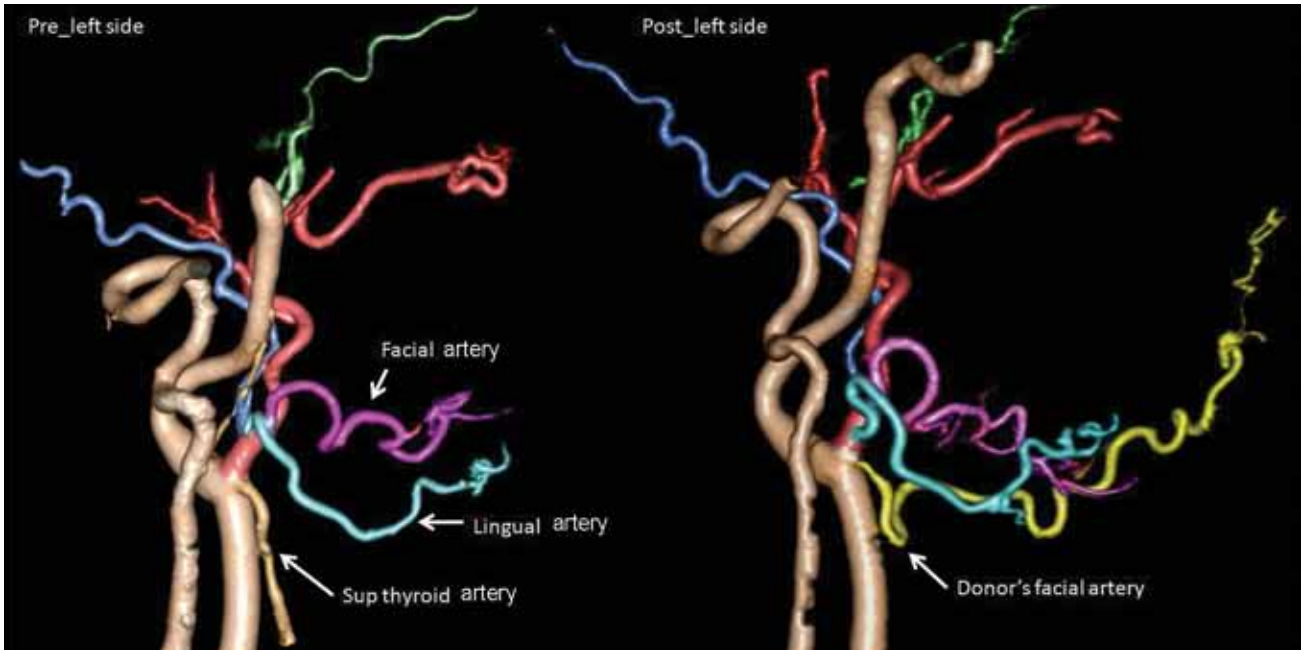
At RSNA 2013, Dr. Rybicki and Kanako K. Kumamaru, M.D., Ph.D., a research fellow at Brigham and Women's Applied Imaging Science Laboratory, and colleagues used 320 detector row dynamic CTA to study the facial allografts of the three patients one year after successful transplantation.

"Because the procedure has not been previously studied, no one has really figured out what happens to the vessels after the composite tissue graft is attached to the patient's body," Dr. Rybicki said. "It's a completely unknown biology.

"We demonstrated that we could use 320 detector row dynamic CTA to map out the vasculature and the perfusion of the face one year after the successful surgery and compare it to the pre-operative surgical planning," Dr. Rybicki said. "This vascular reorganization we noted is very interesting and significant."

Results showed that new blood vessel networks course posteriorly (toward the ears) and even farther behind the head, in addition to the large arteries and veins that course anteriorly in the face, or close to the jaw.

> "Imaging provides a complete 3D model of the anatomy and we are able to view it from various angles. This has been priceless."
>
> **Bohdan Pomahac, M.D.**



In research presented at RSNA 2013, pioneering physicians at Brigham and Women's Hospital demonstrated for the first time that blood vessels in face transplant recipients reorganize themselves. *Above:* CT angiography before and after face transplantation. The donor's facial artery (*yellow*) was successfully anastomosed to the recipient's vessel.

"The blood vessels in the back of the head that supply the spine and the back of the spine, actually wrap around and form an anastomosis with the tissue, and those are important, because if a transplant candidate doesn't have those vessels, the procedure can be considered to be at higher risk," Dr. Rybicki said.

Researchers who studied the lingual artery of the tongue in the transplant determined that even though the lingual arteries were not always preserved, these vessels grew back in transplant patients. "This suggests that human beings have strongly programmed wiring to maintain our blood supply to our tongue because of our evolution and need to use the tongue to eat and speak," Dr. Rybicki said.

Transplant Imaging Growing Quickly

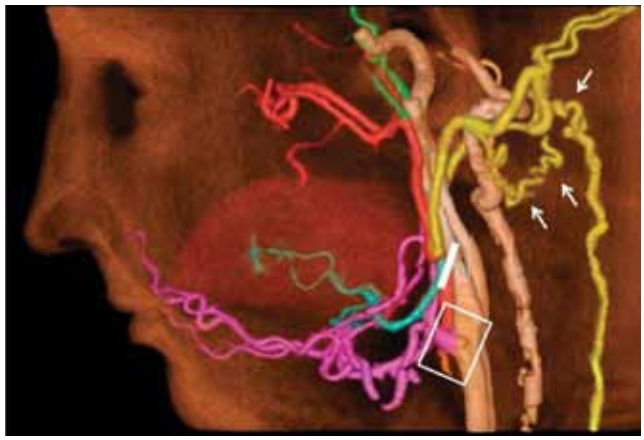
Moving forward, Dr. Rybicki pointed out that while the field of transplant imaging has been around for quite a while, "it is one of the fastest growing fields in imaging." "While CT in general may contract because of issues such as radiation and overutilization, surgeons nationwide perform more transplants, particularly since the need for tissue rejection medications have dramatically improved," he said.

In addition to face transplantation, Dr. Rybicki is involved in imaging of hand transplantation, abdominal wall transplants and the imaging of other novel tissue allograft procedures being pioneered at Brigham and Women's Hospital.

"Radiologists need to keep up with the surgical pace," Dr. Rybicki said. "And we need to be able to adapt our imaging so that we can provide the right surgical maps and follow-ups so that the transplants can be successful."□

WEB EXTRAS

View a video featuring Bohdan Pomahac, M.D., discussing the first full face transplant performed on Dallas Weins, and video animation of the procedure at Brigham and Women's Hospital, at *RSNA.org/News*.



ON THE COVER

CT angiography after face transplantation. The donor's external carotid artery *(pink)* was successfully anastomosed to the recipient's vessel (*rectangular area*). Branches distal to the ligation (*white line*) receive blood flow from collateral vessels *(arrow)*.

Dallas Weins, 26, pictured before and after undergoing the first full facial transplant in the U.S., in 2011. Weins participated in an RSNA 2013 press conference to express his gratitude to the team of physicians at Brigham and Women's Hospital who performed the transplant.

Images courtesy of Brigham and Women's Hospital.

Elderly Patients Present Unique Imaging Challenges

As life expectancy continues to increase globally, radiologists are faced with unique challenges when imaging geriatric patients. In fact, studies have shown it may be 10 times more difficult to obtain useful clinical imaging information in elderly patients than in younger ones.

In 2009, more than 700 million people in the world were age 60 and older—triple that of the 1950 population, according to a 2010 United Nations (UN) Department of Economic and Social Affairs report. The segment of people aged 60 and older has increased from 8 percent in 1950 to 11 percent in 2009, and the UN estimates that proportion will increase to 22 percent by 2050.

"With the increasing age of the population, the elder generation has become the predominant figure in our society," said Giuseppe Guglielmi, M.D., professor of radiology at the University of Foggia and the scientific institute Casa Sollievo della Sofferenza in San Giovanni Rotondo, Italy, who co-edited and contributed to the 2013 book, "*Geriatric Imaging*."

"This has resulted in a significant increase in demand for health services which, along with the development of new effective therapeutic protocols dedicated to geriatric patients, as well as non-invasive techniques and increasingly accurate diagnostic methods," Dr. Guglielmi said.

Because the elderly have a tendency to present with non-specific symptoms, radiologists are challenged to discern the boundary between normal findings of aging and pathological changes, said Dr. Guglielmi, who served as an RSNA William R. Eyler Editorial Fellow in 2003.

"To avoid overdiagnosis and overtreatment, it is important not to confuse the healthy elderly patient who complains of some 'pain' with the elderly patient who really needs medical intervention," he added. "This, unfortunately, still happens very frequently. Therefore it's necessary to know the 'normality specification' of the elderly; that is, what is the 'norm,' taking into account the para-physiological changes typical of older patients."

Radiologists must also pay particular attention when administering contrast media in the elderly to prevent contrast-induced nephrotoxicity (CIN). Although some studies have shown a protective effect against CIN using N-acetylcysteine, which is an antidote for acetaminophen poisoning, results are not yet definitive. "It is a low cost, potentially cyto-protective drug that is easy to administer and with few side effects," Dr. Guglielmi said. "It would seem an ideal product, but we have yet to determine whether it is really effective."

Another consideration is that geriatric patients sometimes have to be maintained in uncomfortable positions for significant lengths of time during their imaging studies. However, Dr. Guglielmi said, significant progress in all areas of diagnostic imaging helps assuage this concern.

Volumetric spiral CT in the study of cardiovascular disease and CT virtual endoscopy are examples of such improvements, while MR imaging has opened new perspectives in the study of the central nervous system, particularly in the identification of cerebrovascular disease. Also, MR spectroscopy results have significantly improved the identification of early stage prostate tumors.

Guglielmi

Mereu

CT Speed Critical in Chest Imaging the Elderly

The latest generation of CT scanners help address issues particular to imaging the chest, said Manuela Mereu, M.D., a radiologist in the Department of Neuroscience and Imaging at SS Annunziata Hospital in Chieti, Italy. Because elderly patients are unable to hold their breath for long periods, speed in administering CT scans is essential to avoid motion artifacts.

> "To avoid over-diagnosis and over-treatment, it is important not to confuse the healthy elderly patient who complains of some 'pain' with the elderly patient who really needs medical intervention."
>
> **Giuseppe Guglielmi, M.D.**

Radiologists are facing unique challenges in imaging the rapidly growing population of elderly patients. *Above*: The latest generation of CT scanners helps address issues particular to imaging of the chest cavity.

"In this scenario, chest imaging in these patients should be based on fast technical strategies such as chest radiography and CT that allow imagers to obtain information with few or no changes in positioning," said Dr. Mereu, who presented "Chest Imaging in the Elderly: What Every Radiologist Should Know About," at RSNA 2013.

Other considerations for chest imaging in elderly patients include frailty, immobility and the presence of comorbidities such as previous surgery, hypertension, renal insufficiency and poor peripheral venous access. Moreover, numerous anatomical and physiological changes occur during the aging process involving the chest wall, mediastinum and lung parenchyma.

An elderly patient's heart and aorta are characterized by several major involutions, including lengthening and dilation of the aorta—factors responsible for enlargement of the mediastinal contour in chest radiograph frontal projection. "Aortic atheromatic calcification is frequent but not always related to the gravity of the clinical situation," Dr. Mereu said.

In the lungs, physiologic aging of the lung parenchyma characterized by macroscopic, microscopic and vascular modifications translates into the "elderly lung." One manifestation is "barrel chest," a result of ribcage deformity with an increased bilateral hyperlucency and homogeneous reduction of vascularization often associated with bronchial wall thickening and air bubbles. The changes are marked by a reticular pattern on CT scans with a thickening of interlobular and intralobular septa, cysts, bronchial dilatation and bronchial wall thickening.

"In this context, the correlation of the extent of fibrotic changes with clinical history and other pulmonary and extrapulmonary findings is crucial to differentiate these moderate basal fibrosis related to the aging process with those of interstitial lung disease, such as usual interstitial pneumonia and non-specific interstitial pneumonia," Dr. Mereu said.

She cautions radiologists to be aware of the numerous changes in the chest that occur in the aging process and to implement a rigorous method for evaluating all of the subcomponents. By doing this, radiologists can more readily identify the signs of the onset of disease.

"Chest imaging findings should be always associated with the clinical context and previous examinations; whenever necessary a follow-up exam must be requested," Dr. Mereu said. □

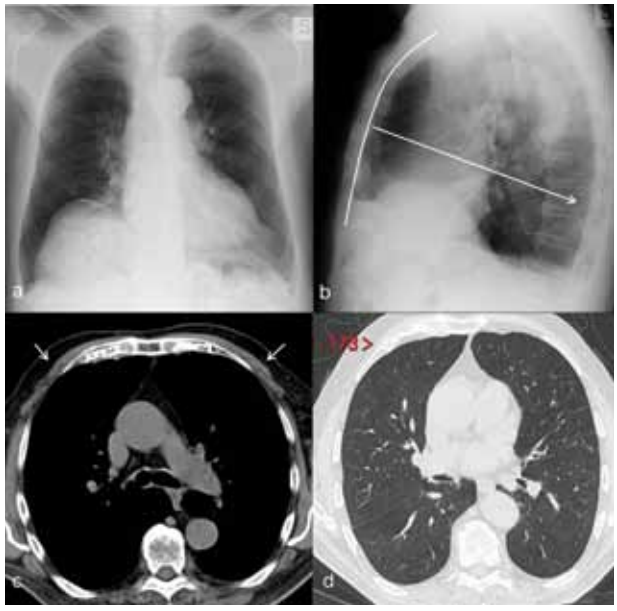


Image courtesy of Manuela Mereu, M.D.

Chest imaging in elderly patients presents special considerations for radiologists. *Above*: Frontal (*a*) and lateral chest X-ray (*b*) of a 78-year-old man show a "barrel chest" deformity with increase in the antero-posterior diameter (*white arrows in b*) with an apparent increase in lung transparency and hyperelevation of the right hemidiaphragm. Subsequent CT scans show atrophy of pectoral muscles (*white arrows in c*) partially responsible for the hyperluncency of lung parenchyma. Signs of pulmonary emphysema are not on CT (*d*). Hyperelevation of the right hemidiaphragm is due to muscle dyskinesia.

Radiology Adopts—and Adapts to—Online Patient Portals

Among healthcare reforms currently underway, there is one that most radiologists need to deal with immediately: Patients are increasingly likely to be reading the reports that were formerly written exclusively for referring physicians.

"It used to be that medicine was one-directional," said Elliot Fishman, M.D., professor of radiology, surgery and oncology at Johns Hopkins Hospital, Baltimore, and co-chair of the RSNA-American College of Radiology (ACR) Public Information Website Committee. "Everything was like Marcus Welby where your doctor told you what to do. Now you go to the doctor, you look online and you ask your 10,000 closest friends if you're doing the right thing."

That online component often includes access to the patient's own health records. One survey of 104 healthcare IT executives indicated that at least half of hospitals and clinics provide some kind of online portal where patients can e-mail their physicians, make appointments, view lab results and otherwise take charge of their own care. The 2012 poll was conducted by KLAS Research of Orem, Utah, which tracks the healthcare software market.

The number of online portals is set to rise dramatically as the federal Meaningful Use standards for promoting the use of electronic health records increasingly incorporate patient involvement as a requirement. Under the law, physicians and hospitals must not only provide patients electronic access to their health information, but also must demonstrate at least 5 percent of their patients are actually using that access.

Although offering radiology reports is the next logical step for patient portals that already include lab data, that step has some potentially treacherous implications, experts say. Unlike lab data, which can be contextualized by including the normal limits with the results, imaging studies often don't have such tidy norms. Moreover, radiologists are used to addressing the reports to referring physicians, who are experts in interpreting phraseology that may be confusing to the patient. Dr. Fishman said radiologists may have to modify their style to suit to their new lay readership and also pay closer attention to the precision of their wording.

"Patients read the reports with a fine tooth comb," Dr. Fishman said. "Simple typos that don't matter in the big picture do matter to the patient. If it looks sloppy or doesn't make sense, patients tend to lose confidence in the report."

Fishman

Chadalavada

Patients Embrace Online Pennsylvania Portal

At the Hospital of the University of Pennsylvania (HUP), Philadelphia, giving patients online access to their radiology reports has proven to be popular, according to Seetharam Chadalavada, M.D., a fourth-year radiology resident who presented results of the portal's effectiveness at RSNA 2013.

Since the portal's inception in May 2012, more than 150,000 patients have activated portal accounts. Results show that patients read about half of available reports, a rate comparable to review of lab results, Dr. Chadalavada said. Researchers found no change in the number of patient calls to clinics and radiologists during the study period, from May 2012 to March 2013, compared with call rates in the period before radiology reports were available online.

Dr. Chadalavada says referring physicians are often uncomfortable with the idea that a patient can access his or her radiology report before they have had a chance to review it. For that reason, release of the information is delayed for three days to give the referring physician a chance to review the report and call the patient if indicated.

> "It used to be that medicine was one-directional. Everything was like Marcus Welby where your doctor told you what to do. Now you go to the doctor, you look online and you ask your 10,000 closest friends if you're doing the right thing."
>
> **Elliot Fishman, M.D.**

The only exception is mammogram results, which are available as soon as the radiologist finalizes the report, allowing the patient to arrange for follow-up as soon as possible. "Patients getting mammograms are more likely to have an ongoing relationship with the referring physician," Dr. Chadalavada said.

Putting imaging reports in context will be increasingly important, Dr. Fishman said. "People may read these reports and not understand what the radiologist is saying." He cites one report where a radiologist noted the presence of a Bosniak Category 1 cyst in a kidney—a term that upset the patient when a notation of a "simple cyst" would have been adequate and less confusing. Dr. Fishman expects that routine patient access to reports will eventually lead to less medical jargon and a more standardized vocabulary.

Portal Links Patients to NIH Educational Site

Researchers at the University of California, Los Angeles (UCLA), addressed the context issue by designing an interface that provides patients educational material as part of their online medical report. In research presented at RSNA 2013, Mary McNamara, M.L.I.S., and colleagues presented results of a survey on patient portal preferences at UCLA.

After surveying 50 patients with non-small cell lung cancer about their patient portal preferences, researchers used their responses to develop a framework linking the patient's health issues, radiology reports and images to medical guideline content provided by the National Institutes of Health (NIH) MedlinePlus website for patients.

Since it was introduced in 2012 at the Hospital of University of Pennsylvania (HUP), more than 15,000 patients have activated portal accounts offering online access to their radiology reports. RSNA 2013 research on the HUP portal's effectiveness shows that patients read about half of available radiology reports, a rate comparable to review of lab results.

A natural language processing module identified concepts in pathology, oncology, radiology and laboratory documents and determined which MedlinePlus content would be most relevant to the patient. The portal automatically inserted links to the explanatory material. Concepts in the health issue list can also be linked to key slice radiological images featuring the ROI.

"This eliminates the need for patients to search consumer health websites to determine what content is applicable to their personal health situation," according to the researchers.

"Patients in our survey responded positively to the idea of accessing radiology content; and rated diagnosis problem lists, radiology report content and imaging as important in helping them to understand their medical record," according to researchers.

WEB EXTRAS

Visit the homepage of the patient portal at the Hospital of the University of Pennsylvania at *Secure.mypennmedicine.org*.

PATIENTS ACCESS RADIOLOGY IMAGES THROUGH RSNA IMAGE SHARE

For more than five years, RSNA has been part of the growing movement to give patients a more active role in their own healthcare.

Funded by the National Institute for Biomedical Imaging and Bioengineering (NIBIB) and administered by RSNA, RSNA Image Share Network enables radiologists to share medical images with patients using personal health record (PHR) accounts.

With RSNA Image Share, patients can access copies of their medical images—X-Rays, CTs, MR imaging scans and ultrasounds—and keep them in online Personal Health Record (PHR) accounts. The network allows patients to build a secure online personal medical history and securely share information with healthcare providers.

For providers, the network eliminates the need to give patients CD copies of medical images and reports, which can be cumbersome and frustrating.

RSNA Image Share

Sites interested in joining RSNA Image Share can contact *imageshare@rsna.org*. For more information about RSNA Image Share and to view an online demo, go to *RSNA.org/Image_Share.aspx*.

Contrast Agent Linked with Brain Abnormalities on MR Imaging

Japanese research linking brain MR imaging irregularities with one of two common contrast agents raises the possibility that a toxic component of the agent may remain in the body long after administration. However, leading U.S. experts on MR imaging contrast media say larger trials are necessary and that the research is not definitive in any sense.

The study published in the November 2013 issue of *Radiology* focused on patients who had received gadolinium-based contrast agents (GBCAs) for brain MR imaging studies. GBCAs have enabled significant improvements in diagnostic imaging since their arrival in the late 1980s, but the gadolinium ion itself is toxic and must be bound with non-metal ions for safe use.

Lead author Tomonori Kanda, M.D., Ph.D., of Teikyo University School of Medicine in Tokyo and the Hyogo Cancer Center in Akashi, Japan, and colleagues compared unenhanced T1-weighted MR brain images of 19 patients who had undergone six or more contrast-enhanced brain studies with 16 who had six or fewer unenhanced exams. Researchers found areas of hyperintensity on MR images in two brain regions: the dentate nucleus (DN) and globus pallidus (GP). The hyperintensity of both DN and GP correlated with the number of GBCA administrations.

"Our data suggest that MRI hyperintensity in regions of the brain was associated with gadolinium-based contrast agents," Dr. Kanda said. "Because gadolinium has a high signal intensity in the body, our data may suggest that toxic gadolinium remains in the body for a long time, even in patients with normal renal function."

Nevertheless, Dr. Kanda emphasized that there is currently no proof that gadolinium is responsible for hyperintensity on brain MR imaging. Further research based on autopsy specimens and animal experiments will be needed to clarify the relationship and determine if the patients with MR imaging hyperintensity in their brains have symptoms.

"Because patients who have multiple contrast material injections tend to have severe diseases, a slight symptom from the gadolinium ion may be obscured," Dr. Kanda said.

There are two types of GBCA—linear and macrocyclic—with distinct chemical compositions. Since the patients in the study received only the linear type, additional research is needed to see if the macrocyclic type can prevent MRI hyperintensity, according to Dr. Kanda.

Kanda

Weinreb

Kanal

> "Our data suggest that MR imaging hyperintensity in regions of the brain was associated with gadolinium-based contrast agents."
>
> **Tomonori Kanda, M.D., Ph.D.**

Researchers have confirmed an association between a common MR imaging contrast agent and abnormalities on brain MR imaging, according to a recent *Radiology* study which raises the possibility that a toxic component of the contrast agent may remain in the body long after administration. *Left:* MR images in 45-year-old woman with glioblastoma treated with surgery, chemotherapy and radiation therapy. (*a*) Unenhanced T1-weighted image shows high-signal-intensity globus pallidus. Standard ROIs were placed around globus pallidus and thalamus. (*b*) Fast spin-echo T2-weighted image at same level as *a*. (*c*) Unenhanced T1-weighted image shows high-signal-intensity dentate nucleus. Standard ROIs were placed around dentate nucleus and pons. (*d*) Fast spin-echo T2-weighted image at same level as *c*.

(*Radiology 2014;270;3:834–841*)

U.S. experts are paying close attention to the research but stress that the clinical significance of the study has yet to be determined. "These findings are nothing to panic or overreact about, but they merit attention and further investigation," said Jeffrey C. Weinreb, M.D., of Yale University School of Medicine in New Haven, Conn., and presenter of an RSNA 2013 session on MR contrast safety. "The clinical significance of this research will be a big question going forward."

Experts Say Further Research is Critical

Because of the enormous value of GBCAs to medicine, additional research is critical, said Emanuel Kanal, M.D., chairman of the American College of Radiology MR Safety Committee from 2002-2012 and a leading authority on MR contrast agents from the University of Pittsburgh Medical Center. Initially developed for detecting disease in the brain and spinal cord, GBCAs are now used for imaging throughout the body and are a key component of MR angiography.

"If the potential benefits of GBCA were small, people would say, 'forget it, it's not worth using it,'" Dr. Kanal said. "But society needs these agents. Patients need to know that the markedly increased sensitivity afforded by GBCA is available for them, but they also need to be assured that it's safe. A theoretical loss of GBCA would represent a major blow to diagnostic medicine."

Dr. Kanal suggested that pharmaceutical companies who manufacture GBCAs simultaneously spearhead retrospective and prospective studies on much larger populations to determine whether the effects reported by Dr. Kanda are associated with each of the GBCAs—and if they are associated with them equally.

"This is a perfect time to study these contrast agents and make sure that there are no unanticipated harmful effects down the road—especially any that may be related to inadvertent and previously unanticipated gadolinium accumulation dynamics," Dr. Kanal said.

Meanwhile, Dr. Kanda is expanding his research to study patients who received the macrocyclic type of GBCA. He also is looking to confirm the initial results of his *Radiology* research through post-mortem examination.

"I am now using inductively coupled plasma mass spectrometry to evaluate the dentate nucleus of autopsy specimens," Dr. Kanda said. "Because our studies were only on imaging data, this approach may prove gadolinium deposition in the brain." □

WEB EXTRAS

To access the *Radiology* study, "High Signal Intensity in the Dentate Nucleus and Globus Pallidus on Unenhanced T1-weighted MR Images: Relationship with Increasing Cumulative Dose of a Gadolinium-based Contrast Material," go to *dx.doi.org/10.1148/radiol.13131669*.

RESEARCH & EDUCATION FOUNDATION DONORS

The R&E Foundation thanks the following donors for gifts made January 14 – February 4, 2014.

Vanguard Program

Companies supporting endowments and term funding for named grants

Fujifilm Medical Systems
$15,000
A Vanguard company since 1989

Hitachi Medical Systems
$1,750
A Vanguard company since 1989

Visionary Donor Program

Individuals recognized for cumulative lifetime donations

BRONZE VISIONARY ($5,000)
Winston F. Clarke, M.D.
Eli Glatstein, M.D.
Mary W. & Stanton S. Kremsky, M.D.
Deborah & Donald G. Mitchell, M.D.
Richli
William W. Scott Jr., M.D.

Individual Donors

Donors who give $1,500 or more per year qualify for the RSNA Presidents Circle. Their names are shown in bold face.

$5,000 or more
Richli
In memory of Chusilp Charnsangavej, M.D.

$1,500 – $2,499
Lisa & Jonathan Breslau, M.D.
Jennifer R. Cranny, M.D. & Thomas L. Pope, M.D.
Ellen & Robert D. Zimmerman, M.D.

$500 – $1,499
Karen & Michael A. Sullivan, M.D.
Eli Glatstein, M.D.
Sharlene A. Teefey, M.D.

$251 - $499
Anonymous
Ahmad Aljefri, M.B.B.S.
Judith K. Amorosa, M.D. & Louis F. Amorosa, M.D.
Louise & Robert I. Appelman, M.D.
Donita & John E. Aruny, M.D.
Keri L. Azuar, M.D.
Henk J. Baarslag, M.D.
Elizabeth & Algis V. Babusis, M.D.
Tonya & Paul E. Bauer, D.O.
John D. Bennett, M.D.
Steven B. Birnbaum, M.D.
Edith Bleus, M.D.
Sharon & Daniel C. Bloomgarden, M.D., Ph.D.
Leonard R. Bok, M.D., M.B.A.
Tommie & Morton A. Bosniak, M.D.
Mara G. & Steven H. Brick, M.D.
Enza Carnevale, M.D.
Albert S. Chang, M.D., Ph.D.
Silvia D. Chang, M.D. & Zuheir Abrahams, M.D., Ph.D.
Paul S. Christy, M.D.
Winston F. Clarke, M.D.
Richard F. Cooper, M.D.
Samuel F. Cort Jr., M.D.
Jennifer M. Cutts, M.D. & Marc Hepp
John H. Doumanian, M.D.
Janet E. Durick, M.D.
Tamer H. El Refaiy, M.D.
Duard W. Enoch III, M.D.
David P. Fessell, M.D.
Lissa McKinley & Robert C. Gilkeson, M.D.
Jack A. Goode, M.D.
Larry A. Grissom, M.D.
Jonathan Grynspan, M.D.
Henry C. Howerton, M.D.
Howard Kahen, M.D.
Thomas E. Knight, M.D.
Judy & Mark J. Kransdorf, M.D.
Mary W. & Stanton S. Kremsky, M.D.
Shawn L. Laferriere, D.O.
Sammie I. Long-Pulliam, M.D.
Mindi & David LoPresti, M.D.
Kristen E. Lott, M.D.
Billy W. Mahaney, M.D.
Joshua D. Mamelak, M.D.
John O. Martin Jr., M.D.
William F. Muhr Jr., M.D.
Mary P. Naughton, M.D., M.P.H.
Julita Orozco Vazquez, M.D.
Sean D. Paulsen, M.D.
Maria T. Pettinger, M.D.
Thomas C. Puckette, M.D.
Pamela M. Reeser, M.D.
Steven A. Roat, M.D.
Noriko Salamon-Murayama, M.D. & Georges Salamon, M.D.
Najmus Saqib, M.D.
William W. Scott Jr., M.D.
Jean M. Seely, M.D.
Mark A. Shaman, M.D.
Scott D. Sidney, M.D.
Katherine & Alex L. Sleeker, M.D.
Letita & W. Sean Smith, M.D.
Stephen T. Sweriduk Jr., M.D.
Adriano Tachibana, M.D.
Carol & Thomas R. Thompson, M.D.
Bruce S. Turlington, M.D.
Denise M. Warner, M.B.B.S. & Bruce Allen
Winston S. Whitney, M.D.
Patricia M. Widjaja, M.D.
Corinne B. Winston, M.D.
Nina & Ramana V. Yedavalli, M.S., M.D.
Jeong Hee Yoon, M.D.
Roberta Morgado & Henrique B. Zuppani, M.D.

$250 or less
Annie & Mitchell D. Achee, M.D.
Shannon E. Ardoin, M.D. & Gregory Ardoin
Dalia Artal, M.D.
Hulya Aslan, M.D.
Nancy & John AufderHeide, M.D.
Robert J. Balotin, M.D.
Stephen A. Barrand, M.D.
Patricia A. Barry, M.D. & John Cosgrove, M.D.
Thomas F. Barsch, M.D., M.B.A.
Hend Belhiba, M.D.
Gerald R. Berg, M.D.
Urmila & Ramesh C. Bhatt, M.D.
Steven M. Boker, M.D.
Mitra B. Boodram, M.D.
Susi Bottger, M.B.Ch.B. & Terry Willis
Eric C. Bourekas, M.D.
Linda Bresolin, Ph.D., M.B.A., C.A.E. & Michael Bresolin, Ph.D.
Lynn A. Brody, M.D.
Marie F. Carette, M.D.
Alberto Cazzulani, M.D.
Wesley C. Chan, M.D
Wing Pong Chan, M.D.
Taylor Chung, M.D.
James C. Clarke, F.R.C.R., M.B.B.Ch.
Anne & Glen O. Clarke, M.B.B.Ch., R.R.A.
Liane & Marcel A. Clemente, M.D., M.B.A.
Howell A. Cone, M.D.
Carrie D. Cousar, M.D. & Michael Cousar
Joseph G. Craig, M.D.
John J. Culliney, M.D.
Bonnie C. Davis, M.D.
Joseph Dobtsis, M.D.
Jan Pieter Doeling, M.D.
Joshua D. Dowell, M.D., Ph.D.
Debra S. Dyer, M.D. & David Rosenberg
Christina & Bjorn I. Engstrom, M.D.
Elisa M. Foster, D.O.
Thiago F. Garcia, M.D.
Joanne D. Gerber, M.D.
Ronald J. Gerstle, M.D.
Amanjit S. Gill, M.D.
Sanjuanita I. Gonzalez-Coronado, M.D.
Clement J. Grassi, M.D.
Antje L. Greenfield, M.D. & Steven M. Greenfield, M.D.
W. Lawrence Greif, M.D.
Raynal R. Hamilton, M.D.

The RSNA R&E Foundation provides the research and development that keeps radiology in the forefront of medicine. Support your future—donate today at *RSNA.org/donate.*

Julia & Robert D. Harris, M.D., M.P.H.
Ryan K. Hegge, M.D.
David A. Hirschl, M.D.
Esther & Juerg Hodler, M.D.
Daniel V. Holbert, M.D.
Jill Holsinger, M.D. & Philip Holsinger
David E. Holznagel, M.D.
Abi Raymer & Brooks A. Horsley, M.D.
Andrea Diaz De Vivar & Juan J. Ibarra-Rovira, M.D.
Marcy B. Jagust, M.D.
Eric A. Jensen, M.D.
Thomas R. Jones, M.D.
Kishore V. Kamath, M.D.
Melanie & Mark W. Keenan, M.D.
Ian A. Kellman, M.D.
Hon Soul Kim, M.D., Ph.D.
Kimberly S. Kirschner, M.D. & Robert Kirschner
Melanie & Lukas Koeltringer, M.D.
Cynthia Reese & Keith Y. Kohatsu, M.D.

Your donations in action – Predicting Outcomes of Endovascular Therapies for Peripheral Arterial Disease

With a FUJIFILM Medical Systems U.S.A./RSNA Research Medical Student Grant, **Holly Nichols, B.S., of Duke University,** is working to develop a simple and clinically relevant calcium scoring system based on CT findings in order to assist decision-making for endovascular interventions in the lower extremity arteries.

"If our calcium scoring system correlates significantly with immediate and long-term outcomes, interventional radiologists will be able to preoperatively identify lesions that are likely to respond poorly to angioplasty and stenting, thereby optimizing patient outcomes," explains Nichols. "This CT-based scoring system may eventually become standard for treatment planning for patients with symptomatic peripheral arterial disease."

Holly Nichols, B.S.(*right*), with scientific advisor and RSNA Research Scholar Grant recipient Charles Y. Kim, M.D.

Nichols is performing this research under the scientific guidance of another R&E Foundation grant recipient—2013 GE Healthcare/RSNA Research Scholar Grant recipient, Charles Y. Kim, M.D.

Ronald B. Kolber, M.D.
Dawna J. Kramer, M.D. & Monte Kramer
Raymond H. Kuo, M.D.
Peter C. Lau, M.D.
Robert F. Leonardo, M.D.
Christopher K. Lin, M.D.
Iain D. Lyburn, M.B.Ch.B.
Theresa & Daniel E. Magill, M.D.
Ana Maliglig, M.D., M.P.H.
Laurene C. Mann, M.D. & John Loughlin
Matthew A. Marcus, M.D.
Wolfgang Marik, M.D.
Erlinda S. McCrea, M.D. & Jay T. McCrea
Jennelle & Alexander M. McKinney IV, M.D.
Uma C. Mehta, M.M.Ed. & Ashish Vaidya
David G. Meyer, M.D.
Deborah & Donald G. Mitchell, M.D.
Elizabeth A. Morris, M.D. & Giles Hunt
Alan R. Mortezaie, M.D.
Erich Mussak, M.D.
Dacia H. Napier, M.D. & Lanham Napier
Alexis V. Nees, M.D.
Xuan-Mai T. Nguyen, M.D.
Luciana M. Nobrega, M.D. & Gustavo Barreto
Robert B. Nordstrom, M.D.
Edgar P. Obando, M.D.
Daniel Ocazionez, M.D.
Allison L. Oldfield, M.D.
San San Oo, M.B.B.S., M.Med.Sc.
Michael D. Orsi, M.D.
Michelle & Richard R. Ozmun Jr., M.D.
Horacio M. Padua Jr., M.D.
Kathy F. & Charles E. Parke, M.D.
Melissa & Scott D. Perrin, M.D.
Anders Persson, M.D., Ph.D.
Elizabeth & Donald J. Ponec, M.D.
Liat Kishon-Rabin & Andrew M. Rabin, M.D.
Hemalatha & Jayanth V. Rao, M.B.B.S.
Nanda S. Rawat, M.B.B.S., M.D.
Sreenivas G. Reddy, M.D.
Margaret & Bradford J. Richmond, M.D.
Andrea J. Rothe, M.D. & Michael Shevach
Sarah E. Rowe, M.D.
Noah D. Sabin, M.D., J.D.
Rocky C. Saenz, D.O.
Abdul J. Salaam, B.M.B.S.
Rola Saouaf, M.D.
Moira F. Schieke, M.D.
Michael F. Schocke, M.D.
Elizabeth & David J. Sheehan, D.O.
Kapil R. Shroff, M.D.
Rajwinder Singh, M.D., M.B.B.S.
Akosua Sintim-Damoa, M.D.
Alison J. Smith, D.O. & Aaron Smith, D.O.
Aaron So, Ph.D.
Wilma E. Sostre, M.D.
Enid & Derek A. Suragh, M.B.A., Ph.D.
H. Denny Taylor, M.D.
Mariangela L. Tejerina, M.D.
Russell B. Tippins, M.D.
Rene Truter, M.B.Ch.B.
Timothy S. Tsai, M.D.
Justin Tse
Prabhu M. Velan, M.D.
Mary & Juan D. Vielma, M.D.
Siddharth S. Vijayakumar, M.B.B.S.
Steffen A. Vollenberg, M.D.
James W. Weaver, M.D
Jerold B. Weinberg, M.D.
Jane A. West, M.D.
Elspeth H. Whitby, M.B.Ch.B.
Laura & Geoffrey Wile, M.D.
Susan T. & James H. Wolfe, M.D.
Alvin J. Yamamoto, M.D.
Xiaoyong Zhang, Ph.D.

R&E GRANT APPLICATIONS CONTINUE TO RISE

Since opening the grant application process, the Research & Education Foundation (R&E) received a record-setting 264 applications.

R&E Foundation grant applications are submitted by aspiring investigators throughout North America and abroad. The Foundation accepted education grant applications through January 10 and research grant applications through January 15.

Grant projects cover the full range of anatomic areas and imaging/therapeutic modalities. Additionally, the rising cost of healthcare and increased pressure to improve the quality and quantity of imaging while reducing costs has led to the emergence of applications in imaging informatics and clinical efficiency/integration.

Without its generous donors, the RSNA R&E Foundation Grant program would not be possible. Those who donate to the Foundation are making a lasting contribution to the future of radiology. We hear "thank you" daily from grateful grant recipients. Your donations provide those promising young investigators the time and resources needed to make breakthrough discoveries for the benefit of the entire specialty.

RSNA thanks you for making the R&E Foundation a priority in your charitable giving. You are truly making a difference.

For more information on the R&E Foundation, go to *RSNA.org/Foundation.aspx*.

For more information on the grant application and review process, contact Scott Walter, Assistant Director, Grant Administration at *swalter@rsna.org*. For more information about the Foundation's donor programs, contact Shelley Taylor, Manager, Fund Development, at *sltaylor@rsna.org*.

Education and Funding Opportunities

RSNA/AUR/ARRS Introduction to Academic Radiology Program

Applications due July 15, 2014

Sponsored by RSNA, the American Roentgen Ray Society (ARRS) and Association of University Radiologists (AUR), the Introduction to Academic Radiology program:

- Exposes second-year residents to academic radiology
- Demonstrates the importance of research in diagnostic radiology
- Illustrates the excitement of research careers
- Introduces residents to successful clinical radiology researchers

Successful applicants will be assigned to either a seminar held during the RSNA Scientific Assembly in Chicago, November 30–December 4, 2013, or the ARRS Scientific Meeting in Toronto, Canada, April 19-24, 2015.

More information and the nomination form for this program are available at *RSNA.org/Introduction_to_Academic_Radiology_.aspx.*

More information and application/nomination forms for these programs are available at *rsna.org/research-courses.* Questions can be directed to Rachel Nelson at 1-630-368-3742 or *rnelson@rsna.org.*

RSNA Clinical Trials Methodology Workshop

January 10-16, 2015
Scottsdale/Ariz.
Applications due
June 15, 2014

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.

Medical Meetings

April-May 2014

APRIL 25-26
Asian Musculoskeletal Society (AMS), 16th Annual Meeting, Beijing International Convention
• *www.asianmsk.org*

MARCH 23–28
Australian and New Zealand Society of Nuclear Medicine (ANZSNM), 44th Annual Scientific Meeting, Adelaide Convention Centre, Australia
• *www.anzsnm2014.com.au*

APRIL 26-30
American Radium Society (ARS), 96th Annual Meeting, Marriott Frenchmans Reef, St. Thomas
• *www.americanradiumsociety.org*

APRIL 26-30
American College of Radiology (ACR), 91th Annual Meeting and Chapter Leadership Conference, Washington Hilton Hotel, Wash., D.C.
• *www.amclc.acr.org*

MAY 1-4
The Radiological and Diagnostic Imaging Society of São Paulo (SPR) developed with the Radiological Society of North America (RSNA), 44rd São Paulo Radiological Meeting (JPR 2014), Transamerica Expo Center, São Paulo
• *www.spr.org.br/en/jpr/2014*

MAY 4-7
Radiology Business Management Association (RBMA), 2014 Radiology Summit, The Westin Charlotte, Charlotte, North Carolina
• *www.rbma.org*

MAY 4-9
American Roentgen Ray Society (ARRS), 2014 Annual Meeting, San Diego
• *www.arrs.org*

MAY 10-16
International Society for Magnetic Resonance in Medicine (ISMRM), European Society for Magnetic Resonance in Medicine and Biology (ESMRMB), Joint Annual Meeting, Section for Magnetic Resonance Technologists (SMRT) 23rd Annual Meeting, Milan.
• *www.ismrm.org*

MAY 11-14
British Nuclear Medicine Society (BNMS), Annual Meeting, Harrogate International Centre, England
• *www.bnms.org.uk*

MAY 11-14
World Congress on Interventional Oncology (WCIO), Hilton New York
• *www.wcio2014.org*

FIND MORE EVENTS AT *RSNA.org/calendar.aspx.*

ARLM Certificate of Achievement Demonstrates Leadership Skills

Solidify your commitment to leadership excellence by earning an Academy of Radiology Leadership and Management (ARLM) Certificate of Achievement—perfect for inclusion on a CV or professional portfolio.

Earn the ARLM Certificate of Achievement by completing ARLM-approved courses in-person and online. Each ARLM-approved course meets one or more elements of the key learning domains that represent an integral part of a well-rounded leadership curriculum. Participants must earn at least 50 education credits—at least 30 credits in-person—within a three-year period. A minimum of three credits in each of the core learning domains in required.

Visit *Radleaders.org* to create your free account with ARLM. Visitors can access a full list of key domains and browse the extensive catalog of ARLM-approved courses in each. A search engine with a built in-filtering option helps you narrow content.

Once an account is created, users can claim ARLM credits for courses already taken, offering a jump-start on earning an ARLM Certificate. The handy "View Credits" section of the website provides a summary of earned credits in the core learning domains, making it easy to track completion progress and plan future courses.

Make leadership a priority in your career in 2014. Email us at *radleaders@rsna.org* with questions.

Informatics Experts Gather

At a recent planning meeting, the RSNA Radiology Informatics Committee talked about the latest developments in a number of the Society's informatics projects, including the MIRC Teaching File System, RadLex radiology lexicon, Integrating the Healthcare Enterprise initiative and structured reporting, as well as informatics offerings at the RSNA annual meeting. Learn more about RSNA Informatics products and services at *RSNA.org/Informatics.aspx*.

RSNA Derek Harwood-Nash International Fellowship

Applications Due **July 1, 2014** for 2015 Program

The Derek Harwood-Nash Fellowship program supports international scholars pursuing a career in academic radiology to study at North American institutions. Accepted participants will receive a stipend of up to $10,000 from RSNA to be used toward travel, living expenses and educational materials for the 6- to 12-week fellowship period.

RSNA Education

The application for this program is available at *RSNA.org/DHN*. For more information e-mail *CIRE@rsna.org*.

RSNA News Focuses on International Programs

In May, *RSNA News* will feature an article on how the RSNA Derek Harwood-Nash Fellowship, International Visiting Professors, Introduction to Research for International Young Academics and Education Material and Journal Awards program have impacted radiology education and practice in various countries and on participants' personal careers.

Journal Highlights

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

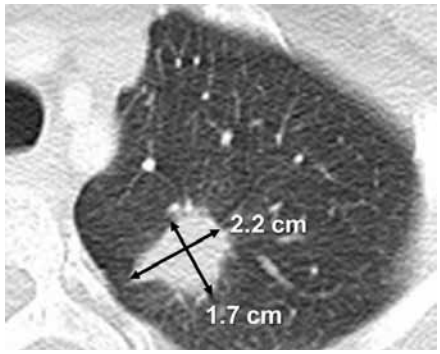
State of the Art: Response Assessment in Lung Cancer in the Era of Genomic Medicine

Effective targeted therapies for specific genomic abnormalities in lung cancer and their clinical application have brought revolutionary advances in therapy and transformed the oncologist's approach to the disease. Because imaging is a major method of response assessment in lung cancer in clinical trials and practice, radiologists must understand the genomic alterations in lung cancer and the rapidly evolving therapeutic approaches to effectively communicate with oncology colleagues and maintain a key role in lung cancer care.

In a State-of-the-Art article in the April issue of *Radiology* (*RSNA.org/Radiology*), Mizuki Nishino, M.D., of the Dana-Farber Cancer Institute, Boston, and colleagues present recent genomic discoveries in lung cancer and therapies directed against these genomic changes and describe how these discoveries affect radiology. The authors also summarize the conventional Response Evaluation Criteria in Solid Tumors and World Health Organization guidelines and describe their limitations, particularly in an era of genomic-based therapy.

Advanced imaging techniques using multidetector CT, MR imaging and PET are also discussed by the authors. "Imaging is the major tool in response assessment of lung cancer," the authors write. "Knowledge of the recent discoveries of genomic mechanisms of lung cancer and their clinical applications in molecular targeting therapy is essential for radiologists to interpret imaging studies and assess response in lung cancer patients receiving molecular targeting therapy."

This article meets the criteria for *AMA PRA Category 1 Credit™*. SA-CME is available online only.

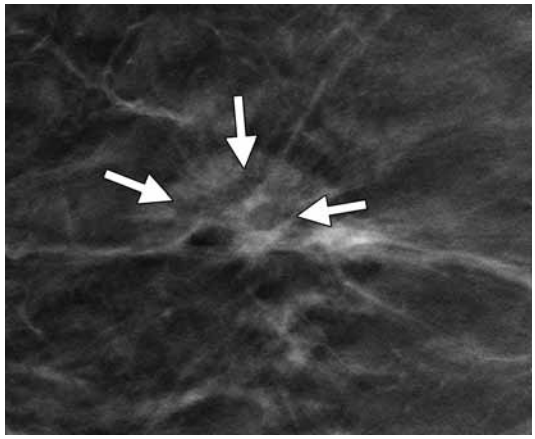


Unidimensional and bidimensional tumor measurements. CT scan of the chest in a 53-year-woman with stage IV adenocarcinoma of the lung depicts a lesion in the left upper lobe measuring 2.2 × 1.7 cm. With WHO criteria, the measurement of the lesion would be 3.7 cm2 (a product of 2.2 cm and 1.7 cm). The RECIST guideline use the longest diameter of the lesion, which is 2.2 cm for this lesion.
(*Radiology 2014;271:1:6–27*) ©RSNA, 2014. All rights reserved. Printed with permission.

Digital Breast Tomosynthesis in the Analysis of Fat-containing Lesions

While digital breast tomosynthesis (DBT) is rapidly emerging as an important screening and diagnostic tool in the clinical setting, the subtleties of interpretation with this modality are new to all radiologists.

Many masses, both benign and malignant, may contain fat, which manifests as radiolucencies that are visible at DBT. If fat seen in breast masses at DBT is not appropriately analyzed, malignant breast masses may be incorrectly classified as probably or even definitely benign, according to an article in the March-April issue of *RadioGraphics* (*RSNA.org/RadioGraphics*).



Invasive carcinoma in a 72-year-old woman. Screening DBT image shows a marked amount of apparent fat (arrows) infiltrating a mass. However, the presence of radiolucency or fat in an otherwise suspicious mass is not predictive of benignity and does not obviate biopsy, which was subsequently performed and revealed an invasive carcinoma with ductal and lobular features.
(*RadioGraphics* 2014;34;343–358) ©RSNA, 2014. All rights reserved. Printed with permission.

Phoebe E. Freer, M.D., of Massachusetts General Hospital, Boston, and colleagues discuss the use of DBT in the evaluation of various encapsulated fat-containing lesions (lipomas, hamartomas, galactoceles and lipid cysts) and nonencapsulated fat-containing lesions (nonencapsulated lobulated masses and especially spiculated fat-containing masses). Using radiologic-pathologic correlation, the authors illustrate cases in which the presence of fat can help correctly classify a mass as benign and pitfalls in which the presence or absence of fat within a mass is irrelevant and should not influence analysis.

Recognizing that existing fat within the breast can be engulfed by an evolving malignant process is critical, according to the authors. "Therefore, the radiologist should be judicious when referencing the presence or absence of fat on a DBT image and should remember that, whereas most encapsulated fat-containing masses may be confidently classified as benign, nonencapsulated fat-containing masses should be considered suspicious until proved otherwise," the authors write.

This article meets the criteria for *AMA PRA Category 1 Credit™*. SA-CME is available online only.

RadioGraphics CME Tests Now Online Only

RadioGraphics readers may notice the absence of CME tests and answer postcards from future print editions of the journal: All CME tests are now published in an interactive online format with immediate return of the test-taker's score and credit earned upon completion.

The tests can be accessed from the online journal pages by clicking "CME" or "SA-CME TEST"; from the article page in the *RadioGraphics* mobile app by tapping on the bulleted list symbol and choosing, "Take SA-CME" from the drop-down menu; or directly via the Internet by typing *RSNA.org/education/search/RG* into the browser window.

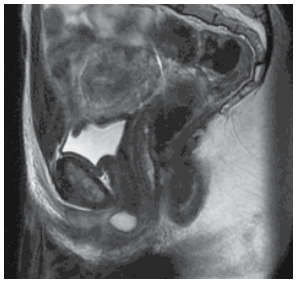
In the May-June issue, users of the online tests will be able to print a complete list of questions before taking a test. An after-test survey provides space for feedback and topic suggestions for future CME activities.

RadioGraphics Editor Jeffrey S. Klein discusses his decision to "Go Green with CME" in his editorial in the March-April issue at *RSNA.org/RadioGraphics*.

Online *RadioGraphics*' Tutorials Target Trainees

A new series of online presentations targeting radiology trainees will debut in *RadioGraphics* this spring in the journal's new Resident and Fellow Education section.

The March-April issue features a tutorial on cystic lesions of the female lower genitourinary tract by Marc Tubay, M.D., and colleagues, while the May-June issue will feature a tutorial on diagnostic imaging of various types of bladder injury by Jordan S. Gross, M.D. A similar presentation on imaging of the peritoneum is planned for the July-August issue.



Each of these online features offers a concise explanation of key concepts that correspond to well-defined learning objectives; is fully illustrated with radiologic images, anatomic drawings, diagrams and other learning aids; is viewable in 30 minutes or less; and includes a list of suggested readings for readers who want to delve further into the topic. A two-page abstract published in tandem with each presentation provides an overview of the contents, allowing readers to quickly judge its applicability for their learning needs.

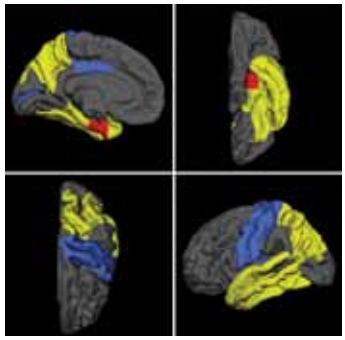
The presentations originated as RSNA Annual Meeting education exhibits and were selected specifically for radiology trainees by Resident and Fellow Education section chair Jennifer A. Harvey, M.D., and assistant chair Sanjeev Bhalla, M.D., with input from the *RadioGraphics* subspecialty reviewers and Editor Jeffrey S. Klein, M.D. The presentations undergo rigorous independent peer review, revision by the authors, copyediting by RSNA editorial staff and vetting by radiology educators for level of difficulty/appropriateness for residents and fellows; not all of those selected are accepted for publication in *RadioGraphics*.

To view a presentation, go to *pubs.RSNA.org/journal/radiographics* and click "All New for Residents & Fellows" on the left-hand column of the journal homepage.

Radiology EXTRA PODCASTS

Listen to *Radiology* Editor Herbert Y. Kressel, M.D., deputy editors and authors discuss the following articles in the March issue of *Radiology* at *pubs.rsna.org/page/radiology/podcasts*:

- "Background Parenchymal Signal Enhancement Ratio at Preoperative MR Imaging: Association with Subsequent Local Recurrence in Patients with Ductal Carcinoma in Situ after Breast Conservation Surgery," Sun-Ah Kim, M.D., and colleagues.
- "CT in Adults: Systematic Review and Meta-Analysis of Interpretation Discrepancy Rates," Mark Z. Wu, M.D., and colleagues.
- "Reviving the Dinosaur: Virtual Reconstruction and Three-dimensional Printing of a Dinosaur Vertebra," René Schilling, M.D., and colleagues.



CORRECTION

The March Radiology in Public Focus section ran an incorrect image with the *Radiology* study, "Mapping the Effect of the Apolipoprotein EGenotype on 4-Year Atrophy Rates in an Alzheimer Disease-related Brain Network." The correct image is pictured at left.

Radiology in Public Focus

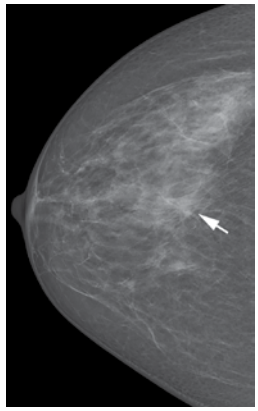
A press release was sent to the medical news media for the following article appearing in a recent issue of *Radiology*.

Digital Mammography Screening with Photon-counting Technique: Can a High Diagnostic Performance Be Realized at Low Mean Glandular Dose?

Digital mammography screening with dose-efficient photon counting enables desirable detection rates of small invasive cancers and ductal carcinoma in situ (DCIS), according to new research. Higher detection rates compared with statewide performance occurred with subsequent screening but at a higher recall rate.

In a retrospective study of prospectively acquired data from the North Rhine–Westphalian mammography screening program (2009–2010), Stefanie Weigel, M.D., of University Hospital Muenster, Germany, and colleagues compared the screening performance of a direct radiography (DR) photon-counting scan system with those of statewide operating screening units using different digital technologies.

Researchers examined 13,312 women with a DR photon-counting system and 993,822 women screened with either computed radiography (CR) or DR systems. The DR photon-counting scan system had a cancer detection rate of 0.76 percent for subsequent screening, compared with 0.59 percent for the other screening units, and a higher recall rate: 5.4 percent for the photon-counting method, 3.4 percent for the other methods. The DR photon-counting system demonstrated a higher detection rate of DCIS for subsequent screening compared to the statewide rate with CR and DR technology (0.23 percent vs. 0.12 percent), as well as for a subgroup of only DR technology (0.23 percent vs. 0.12 percent).



Two-view screening mammograms obtained with the DR photon-counting system show a spiculated mass in the right upper quadrants (*arrow*). The diagnosis was invasive ductal carcinoma, 8 mm in diameter, as seen on the right craniocaudal image

(*Radiology* 2014;271;3:InPress)

"….Our study showed that digital mammography screening by using the dose-efficient photon-counting technique enables detection of small invasive cancers and DCIS above the desirable level of the European guidelines," the authors write.

Media Coverage of RSNA

In January, 5,691 RSNA-related news stories were tracked in the media. These stories reached an estimated 1.6 billion people.

Coverage included *U.S. News & World Report, HealthDay, Health.com, Philly.com, Men's Health, Auntminnie.com, RedOrbit, MedicineNet.com, Medscape.com, Medical News Today* and *Science Daily*.

Total RSNA 2013 annual meeting media coverage tracked through February 7, 2014, has resulted in 14,839 tracked media placements, yielding an estimated potential audience/circulation of nearly 5 billion.

Notable placements for RSNA 2013 include: *The Huffington Post, The Washington Post, NYTimes.com, ChicagoTribune.com, New York Post, DenverPost.com, Newsday, SmithsonianMag.com,* Reuters, NPR, Good Morning America, CNN Headline News, CBS This Morning, Fox News Channel, Al Jazeera America, WABC-TV (New York), WCBS-TV (New York), WNBC-TV (New York), KNBC-TV (Los Angeles), KCBS-TV (Los Angeles), KTLA-TV (Los Angeles), WLS-TV (Chicago), WMAQ-TV (Chicago), WGN-TV (Chicago), WBBM-TV (Chicago), *Yahoo! News, Shape, Glamour, Self, MSNBC.com, WSJ.com, CNN.com, NPR.com, ABC.com, FoxNews.com, USNews.com, LATimes.com, CNBC.com, FoxNews.com, BBC.co.uk, Forbes.com* and *WebMD*.

New on *RadiologyInfo.org*

Visit *RadiologyInfo.org*, the RSNA and ACR's jointly-sponsored public information website, to read about the latest topics, including:

- Cardiac Screening
  Radiologyinfo.org/en/info.cfm?pg=screening-cardiac
- Brain Tumors
  Radiologyinfo.org/en/info.cfm?pg=braintumor

RadiologyInfo.org
The radiology information resource for patients

APRIL PUBLIC INFORMATION OUTREACH ACTIVITY FOCUS ON ADHD

In April, RSNA is distributing the "60-Second Checkup" audio program to nearly 100 radio stations across the U.S. The segments focus on the use of MR imaging to reveal low brain iron in attention deficit hyperactivity disorder (ADHD) patients.

The Value of Membership

Exclusive Member Benefits: Free Subscriptions to *Radiology* and *RadioGraphics*

Whether you prefer the print, online or mobile apps, free access to the finest journals in the field, *Radiology* and *RadioGraphics,* are premier benefits of RSNA membership.

Radiology, an authoritative reference for the most current, clinically relevant and highest quality research in the field of medical imaging, is continually among the top-cited journals in the field. Each month the journal publishes approximately 300 pages of peer-reviewed original research, authoritative reviews, well-balanced commentary on significant articles and expert opinion on new techniques and technologies. *Radiology* has the largest readership of any journal in the field and its current 6.339 impact factor is among the highest of all general diagnostic imaging journals. Members are also able to access free of charge the *Radiology* Legacy Collection, a searchable electronic archive of *Radiology* issues from 1923 to 1998.

RadioGraphics publishes the best peer-reviewed educational material in radiology and is a top source for earning CME credit toward maintaining professional certification. *RadioGraphics* offers readers a broad selection of image-based educational content in radiologic subspecialties. The journal is published bi-monthly online and in print with a special monographic issue featuring one imaging subspecialty published each October. The 2014 monograph focuses on chest imaging.

Visit the new RSNA Journal websites for *Radiology* and *RadioGraphics* to access the same high-quality content with new features and functionalities. New *Radiology* and *RadioGraphics* mobile apps are available for iPhone®, iPad® and Android® devices and include major improvements and additions. Readers can earn CME on-the-go by taking *RadioGraphics* and *Radiology* CME tests on mobile devices.

For more information about these member benefits, go to *RSNA.org/Journals*.

RSNA Staff Retirement

Earlier this year, RSNA said goodbye to an employee with more than 30 years' worth of service to the Society and particularly the annual meeting scientific and education program.

Betty Rohr, 36 years

In 1978, Betty Rohr was living in a small country town in Pennsylvania and working for a member of the RSNA Board of Directors, the late Theodore A. Tristan, M.D., who was retiring as chair of the Department of Radiology at Polyclinic Medical Center in Harrisburg. Rohr had gotten to know many radiologists and RSNA staff through Dr. Tristan, so when the Society decided to move from Syracuse, N.Y., to Oak Brook, Ill., then-RSNA Executive Director Adele Swenson recruited Rohr to come for six months and help hire staff and set up the new office.

Eager to experience city life, Rohr jumped at the offer. "I stayed 70 times longer than six months," Rohr noted at her retirement on Jan. 31, 2014.

During her tenure at RSNA, Rohr served as assistant to the executive director and in a variety of director roles overseeing program services, administration, membership, related societies and data management. She most recently served as director of program services, survey research and program evaluation, and academic management services.

Much of Rohr's influence has been felt in the annual meeting scientific and education program, which she helped Society volunteers create each year by managing the processes of abstract solicitation and review and coordinating meetings of various committees focused on scientific sessions, education exhibits, refresher courses and more.

"I can't express in a couple sentences what Betty Rohr has meant to the RSNA," said 2012 RSNA President George S. Bisset III, M.D., who worked closely with Rohr as chair of the RSNA Scientific Program Committee, and as RSNA Board Liaison for Education. "During the eight years I worked closely with Betty on the Scientific Program Committee she was the heart and soul of our group. She always had the answers. Betty is one of few employees I have known who is worthy of the term 'irreplaceable.'"

"Rohr's impact on Dr. Bisset is but one example of the indelible marks she left on her fellow staff members and the hundreds of volunteers with whom she worked," said Linda B. Bresolin, Ph.D., M.B.A., CAE, RSNA Assistant Executive Director for Science and Education.

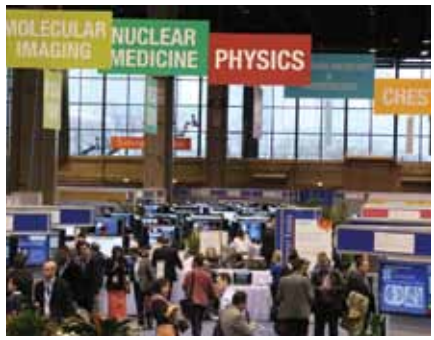
"By shaping the educational and scientific components of the RSNA Annual Meeting and Scientific Assembly, Betty has also influenced the way radiology is practiced around the world," Bresolin said.

Annual Meeting Watch

News about RSNA 2014

Advance Registration and Housing Opens May 1

RSNA 2014 advance registration and housing open May 1 for RSNA and AAPM members. Non-member registration and housing open June 4. Advance Registration and Housing information is available at *RSNA.org/Attendees.aspx*.



RSNA 2014 Registration

How to Register

There are four ways to register for RSNA 2014:

1 INTERNET—Fastest way to register!
Go to *RSNA.org/register*

2 FAX (24 hours)
1-888-772-1888
1-301-694-5124

3 TELEPHONE
(Mon.-Fri. 8 a.m. – 5 p.m. CT)
1-800-650-7018
1-847-996-5876

4 MAIL
Experient/RSNA 2014
P.O Box 4088
Frederick, MD 21705 USA

Registration Fees

BY NOV. 8	AFTER NOV. 8	
$ 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
180	280	Non-Member Resident/Trainee
180	280	Radiology Support Personnel
825	925	Non-Member Radiologist, Physicist or Physician
825	925	Hospital or Facility Executive, Commercial Research and Development Personnel, Healthcare Consultant and Industry Personnel
325	325	One-day registration to view only the Technical Exhibits

Important Dates for RSNA 2014

April 9	Call for Abstracts deadline
May 1	Member registration and housing opens
June 4:	Non-member registration and housing opens
July 9	Course enrollment opens
October 24	International deadline to have full conference badge mailed
November 7:	Final housing and discounted registration deadline
November 26	Deadline to guarantee a seat for all ticketed courses
Nov. 30–Dec. 5:	100th Scientific Assembly & Annual Meeting

Register by Nov. 7 to receive the discounted registration fee and full conference materials mailed to you in advance. International visitors must register by Oct. 24 to receive these materials in advance. Registrations received after Nov. 7 will be processed at the increased fee and conference materials must be obtained at the McCormick Place Convention Center.

For more information about registering for RSNA 2014, visit *RSNA.org/Attendees.aspx*, e-mail *reginfo@rsna.org*, or call 1-800-381-6660 x7862.

International Visitors

If you require a temporary non-immigrant visa to attend the RSNA Scientific Assembly and Annual Meeting, you are advised to apply as soon as travel to the U.S. is decided and no later than three to four months in advance of the travel date. RSNA offers an official, personalized letter of invitation for RSNA 2014 attendees. Information is available at *RSNA.org/Visas*.

RSNA.org

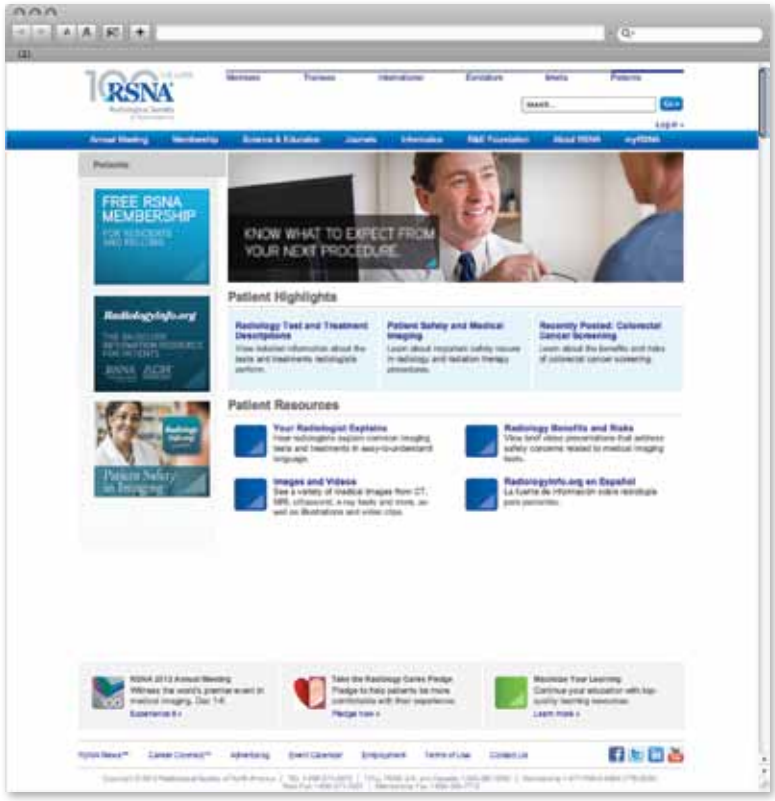
RSNA.org Offers Patients One-stop Radiology Information

As patients continue to take an increasingly active role in their own healthcare (See this month's story on patient portals, Page 11), more are seeking a one-stop website for easy access to healthcare information. To that end, *RSNA.org* offers a host of radiology-focused patient resources from one central location *(RSNA.org/Patients.aspx).*

The patient page links to *RadiologyInfo.org*, the RSNA-American College of Radiology public information website that provides simple, straightforward answers to patients' radiology questions.

RSNA's patient page also features a Patient Highlights section spotlighting descriptions of radiology tests and treatments and safety issues in medical imaging, while Patients Resources links users to valuable information including:

- **Your Radiologist Explains:** Hear radiologists explain common imaging tests and treatments in easy-to-understand language.
- **Images and Videos:** See a variety of medical images from CT, MR imaging, ultrasound, X-ray tests and more, as well as illustrations and video clips.
- **Radiology Benefits and Risks:** View brief video presentations that address safety concerns related to medical imaging tests.
- ***RadiologyInfo.org* en Español:** The popular Spanish language version of *RadiologyInfo.org*.



COMING NEXT MONTH

With the October deadline for compliance with ICD-10 regulations looming, *RSNA News* reports on the progress radiologists have made in reaching their goals and offers guidance for overcoming obstacles and challenges.

This is the year to celebrate with RSNA in São Paulo.

Whether you are in São Paulo or Chicago, RSNA is hard at work to bring you an outstanding program.

Visit us at JPR 2014 for an especially exciting meeting as RSNA celebrates its 100th year in radiologic science and education!

This is the best year to be a part of the RSNA community.

Visit RSNA
1 – 4 May
São Paulo, Brazil

JPR 2014
In partnership with RSNA®

Learn more about our partnership with the Radiological and Diagnostic Imaging Society of São Paulo (SPR) at ***RSNA.org/JPR2014***