

## Mobile Apps Gain New Ground in Radiology

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## RSNA News™

For more than 20 years, *RSNA News* has provided high-quality, timely coverage of radiology research and education and critical issues facing the specialty, along with comprehensive information about RSNA programs, products and other member benefits.

### UP FRONT

- 1 First Impression
- 4 My Turn
- 4 MOC NEWS

### FEATURES

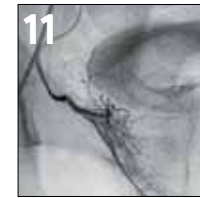
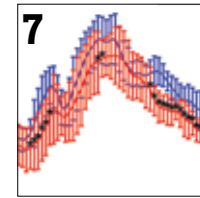
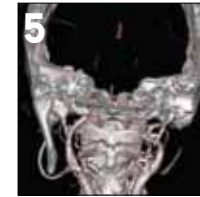
- 5 Mobile Apps Gain New Ground in Radiology
- 7 PET/MR Leads to Potential Biomarkers for Autism Spectrum Disorders
- 9 **RESIDENTS & FELLOWS CORNER:** Post-residency Success Means Leaving the Reading Room
- 14 Experience the Best of Chicago during RSNA 2012

### RADIOLOGY'S FUTURE

- 11 Prostatic Artery Embolization Promising for Treating Enlarged Prostate
- 19 R&E Foundation Donors

### NEWS YOU CAN USE

- 21 Journal Highlights
- 22 Radiology in Public Focus
- 23 Education and Funding Opportunities
- 24 Technology Forum
- 25 Annual Meeting Watch
- 27 The Value of Membership
- 28 *RSNA.org*



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ACR Officers, back row, left to right: Howard B. Fleishon, M.D., M.M.M., Anne C. Roberts, M.D., Kimberly E. Applegate, M.D., M.S., Paul A. Larson, M.D. Front row, left to right: John A. Patti, M.D., Paul H. Ellenbogen, M.D., Bibb Allen, Jr., M.D.

## ACR Names New Officers

**Paul H. Ellenbogen, M.D.**, was recently elected chair of the American College of Radiology (ACR) Board of Chancellors, and **Bibb Allen, Jr., M.D.**, was elected to serve as vice-chair. Dr. Ellenbogen is a senior attending radiologist at Texas Health Presbyterian Hospital Dallas, a partner in Radiology Associates of North Texas, and a clinical professor of radiology at the University of Texas Southwestern Medical School in Dallas. Dr. Allen is a diagnostic radiologist in the Birmingham Radiological Group in Alabama.

**John A. Patti, M.D.**, was elected as president and **Paul A. Larson, M.D.**, as vice-president. Immediate past-chair of the ACR Board of Chancellors, Dr. Patti is a thoracic radiologist at Massachusetts General Hospital in Boston and serves on the faculty at Harvard Medical School. Dr. Larson is in private practice as a general radiologist in Oshkosh, Wis.

## QIBA Meeting Focuses on Clinical Value of Quantitative Imaging

The fifth annual Quantitative Imaging Biomarkers Alliance (QIBA) meeting drew more than 75 stakeholders from the clinical community, imaging equipment manufacturers, the pharmaceutical industry, government agencies and medical informatics companies. Held in May in Rosemont, Ill., highlights of the meeting included:

- QIBA's Modality Committee leaders provided updates concerning ongoing projects funded from a contract awarded to RSNA by the National Institute of Biomedical Imaging and Bioengineering.
- Invited panelists from pharmaceutical, equipment and informatics companies and academia provided their perspective on the clinical value of quantitative imaging and engaged attendees in a question-and-answer session afterwards.
- Co-chairs of the newly formed Ultrasound Technical Committee met to discuss the organization of subcommittees and their short-term project goals.
- Modality and Technical Committees worked in breakout sessions to further develop QIBA Profiles and plan for groundwork studies to provide the data needed to establish or reinforce Profile claims.

For more information on QIBA and to access the *QIBA Newsletter* and presentations from the 2012 QIBA Annual Meeting, go to [RSNA.org/QIBA\\_.aspx](http://RSNA.org/QIBA_.aspx)

## Numbers in the News

# 10

Percent of their workday radiologists should devote to activities that don't involve image interpretation, according to some experts. See Page 9 to learn how undertaking activities such as utilization management and quality initiatives can help both residents and senior radiologists increase their value in a tight job market.

# 78

Increase in estimates of autism spectrum disorder (ASD) prevalence in the overall population between 2002 and 2008, according to a recent report by the Centers for Disease Control and Prevention. Turn to Page 7 to learn how researchers using MR and PET have discovered potential biomarkers that may lead to earlier ASD diagnosis and improved treatments.

# 165

RSNA Research & Education Foundation Roentgen Resident/Fellow Research Awards presented this year. Roentgen Awards recognize and encourage residents and fellows, nominated by their program directors or department chairs, who have played active and outstanding roles in radiologic research. See [RSNA.org/Roentgen\\_Research\\_Award.aspx](http://RSNA.org/Roentgen_Research_Award.aspx) for a list of awardees.

# 260

Number, in thousands, of pieces in the Art Institute of Chicago collection. The Institute is just one of dozens of Chicago museums, theatrical performances and other attractions featured in RSNA News' annual guide to the Windy City. See Page 13.

## RSNA Editorial Fellows Announced

**Birgit Ertl-Wagner, M.D.**, a professor of radiology and section chief for MR imaging at the University of Munich, has been named the 2012 RSNA Eyer Editorial Fellow. **Mai-Lan Ho, M.D.**, a fourth-year resident and clinical fellow in the Department of Radiology at Beth Israel Deaconess Medical Center, is the 2012 Trainee Editorial Fellow.

Professor Ertl-Wagner, whose work focuses on neuroradiology and head and neck radiology, has published more than 60 original articles, including 28 as first or senior author. She has written 21 review articles and book chapters and is the main author of five textbooks. She serves as associate international editor for the *Journal of the American College of Radiology* and has served as a reviewer for other journals including *Investigative Radiology* and *European Radiology*.

Current chair of the education committee of the European Society of Radiology, Professor Ertl-Wagner chaired the European Training Assessment Program (ETAP) from 2009 to 2012. She received a grant from the RSNA Research & Education (R&E) Foundation in 2001.

"Due to my activities in radiologic publishing and in radiologic societies both on a national and on a European and international level, I believe I would be in an excellent position to transfer and translate the knowledge and skills gained from the fellowship into the advancement of radiologic scholarship and deepen mutual ties between the countries," Professor Ertl-Wagner said in her application.

Dr. Ho's work focuses on neuroradiology and MR imaging. She has served on the editorial board of the *International Journal of Stroke Research*, as a section editor for *Radiopaedia.org* and as a reviewer for the *Journal of Pediatric Neuro-radiology*. Among the 11 funded projects on which Dr. Ho serves as principal investigator is "Sodium-23 MRI for Seizure Focus Localization in Epileptic Patients," funded by a 2011 Bracco Diagnostics Research Resident Grant from the RSNA R&E Foundation.

Transforming patient care through research and educational innovation is her ultimate goal, Dr. Ho said. "During residency and medical school, I have published several original and review articles and pursued initiatives in medical education and leadership," she said in her application. "The RSNA Trainee fellowship will be an amazing opportunity for me to broaden my experiences in medical journalism, thus enhancing my contributions



Ertl-Wagner



Ho

to radiology research and practice."

Both fellows will work with *Radiology* Editor Herbert Y. Kressel, M.D., in Boston and *RadioGraphics* Editor Jeffrey S. Klein, M.D., in Burlington, Vt. The Eyer fellowship lasts one month and the trainee fellowship lasts one week. Each fellow will also visit the RSNA Publications Department at RSNA Headquarters in Oak Brook, Ill. Professor Ertl-Wagner will also work with the *Radiographics* editorial board at RSNA 2012.

## SAMSON RECEIVES CAR GOLD MEDAL AWARD

The Canadian Association of Radiologists (CAR) presented its Gold Medal Award to Louise M. Samson, M.D., head of the Department of Radiology at the University of Montreal. A revered educator, Dr. Samson is the first radiologist to serve as president of the Royal College of Physicians and Surgeons of Canada. She is a former RSNA second vice-president and was a member of both the Education and the Maintenance of Certification/Education Councils.



Canadian Association of Radiologists (CAR) President James Fraser, M.D. (left) and Louise M. Samson, M.D. (right)

## Omary Named Chair at Vanderbilt University

**Reed Omary, M.D., M.S.**, has been appointed a professor and chair of the Department of Radiology and Radiological Sciences at Vanderbilt University Medical Center in Nashville, Tenn. Dr. Omary previously served as a professor of radiology and biomedical engineering and vice-chair of research for the Department of Radiology at the Northwestern University Feinberg School of Medicine in Chicago. Dr. Omary is a past recipient of two RSNA R&E Foundation grants and remains active in Foundation activities. He has served as a manuscript editor for *Radiology*.





**RSNA Assists at AMA Medical Student Showcase**

RSNA was represented at the American Medical Association Medical Student Showcase (AMA-MSS) held in June in Chicago, where hundreds of medical students learned about various medical disciplines. RSNA personnel answered questions and offered free membership to students pursuing radiology. RSNA employees were joined by Andrew Moriarty, M.D., (above, left) a radiology resident at Henry Ford Hospital in Detroit, who offered professional insight and touted the benefits of RSNA membership. Right: RSNA membership assistant Betsy Albelo assists an attendee completing an application.

## AAPM Award Recipients

The American Association of Physicists in Medicine (AAPM) awarded **Stephen Thomas, Ph.D.**, the William D. Coolidge Award at the Society's recent annual meeting in Charlotte, N.C. A past-AAPM president, Dr. Thomas is a professor emeritus of radiology at the University of Cincinnati Medical Center. Dr. Thomas has served as an RSNA third vice-president and as a reviewer for *RadioGraphics*. He will receive the RSNA Gold Medal at RSNA 2012.

**Charles Mistretta, Ph.D., Edward Sternick, Ph.D., and Kenneth Vanek, Ph.D.**, received the Edith H. Quimby Lifetime Achievement Award. Dr. Mistretta is a medical physics and radiology professor at the University of Wisconsin School of Medicine in Madison. He was named the RSNA Outstanding Researcher in 2010. Dr.

Sternick is a medical physicist-in-chief, professor and vice-chair of radiation oncology at Rhode Island Hospital/Brown University Medical School in Providence. Dr. Vanek is a professor of radiation oncology at the Medical University of South Carolina in Charleston.



Thomas

Mistretta



Sternick

Vanek

## Guiberteau and Ibbott Elected to ABR Board of Trustees

The American Board of Radiology (ABR) Board of Trustees has elected **Milton J. Guiberteau, M.D.**, as president-elect and **Geoffrey S. Ibbott, Ph.D.**, as secretary-treasurer in terms that started July 2012.

Dr. Guiberteau is chief of nuclear medicine and academic chief in the Department of Medical Imaging at St. Joseph Medical Center and a clinical professor of radiology and nuclear medicine at the University of Texas medical school, both in Houston. A past-American College of Radiology president, Dr. Guiberteau is a member of the RSNA Public Information Advisors Network (PIAN). Dr. Guiberteau replaces James P. Borgstede, M.D., who became president of the Board of Trustees on July 1.

Dr. Ibbott is a professor and chair in the Department of Radiation Physics, Division of Radiation Oncology, at the University of Texas MD Anderson Cancer Center in Houston. Dr. Ibbott is a past-president of the American Association of Physicists in Medicine. He will replace Richard L. Morin, Ph.D., who has served as secretary-treasurer since 2008.



Guiberteau

Ibbott

## My Turn

# Getting Started with Your First Job Search

In today's changing healthcare system, the process of finding a job has become a challenging task. The perfect position you envisioned at the start of your residency may no longer exist. With the country in a sluggish economic recovery, fewer positions are open to finishing residents and fellows and the competition is intense for a smaller number of quality positions. However, the situation may not seem as bleak if you approach your job search with a reasonable strategy.

While it would be ideal to find a job that matches your specific interests, what drives most of us to choose one position over another is often location. You may need to be in the same city as a spouse or stay in a large urban environment, as opposed to a rural community. If this is a factor, then focus your search in job banks to a few select areas.

Don't be disheartened if you don't see a multitude of postings since many jobs are unadvertised. Talk to everyone you

know about tracking down a position. Your current residency and/or fellowship program can be great starting point. Radiology meetings and conferences are also fantastic places to meet potential employers.

Still not enough leads? Call the practices in your target area and ask them if they are in need of a physician with your unique skills. Remember that being able to perform the core duties of your position is just the start. Sometimes it is your additional non-patient care abilities that can benefit the prospective employer and get you hired. For some, specialization in informatics or a business background may be the skills that are critical to a specific practice. For others, it may be serving as a liaison for the community to improve patient care.

Most importantly, be patient but persistent. The process may take longer than it has in prior years, but you will eventually find the right position. All resi-

dents and fellows feel the pressure to find the perfect job, but factors like practice profile and salary projection can be artificial measures of success. Find the job you like, with people you trust, and give it your best shot. If it doesn't work out, you will have other opportunities. Your first job is not necessarily your last job. For more insight on career development, join us at the Resident and Fellow Symposium at RSNA 2012.

Aparna Annam, D.O., is a fellow in pediatric interventional radiology at Texas Children's Hospital in Houston. Dr. Annam chairs the RSNA Resident and Fellow Committee.



Read "Post-residency Success Means Leaving the Reading Room" on Page 9. To access RSNA Career Connect™, the comprehensive job search site for the radiology profession, go to [careers.rsna.org](http://careers.rsna.org).

## MOC News

# ABMS Launches Public Reporting of Physicians' MOC Status

The American Board of Medical Specialties (ABMS) on Aug. 31 will begin reporting on its public website whether physicians certified by its member boards—including the American Board of Radiology (ABR)—are meeting MOC requirements.

ABR-certified diagnostic radiologists, radiation oncologists and medical physicists will be reported as "meeting requirements of MOC," "not meeting requirements of MOC" or "not required to participate in MOC." The ABMS website ([www.certificationmatters.org](http://www.certificationmatters.org)) will provide a link to the ABR website ([www.theabr.org](http://www.theabr.org)) where further clarification of

each diplomate's status will be provided.

ABR diplomates enrolled in MOC and meeting MOC requirements will be able to direct individuals and organizations to the ABMS website or the ABR website as proof of their MOC status. ABR leaders stress that physicians with lifetime certification status need not "meet the requirements" of MOC to retain their valid ABR certification.

ABR Executive Director Gary Becker, M.D., stressed the need for each diplomate to visit his or her personal database to make sure their information is up to date. "This is a huge data operation and we want to make sure that information

is accurate for each member," said Dr. Becker, who served as RSNA president in 2009.

The initiative coincides with ABR's new method of MOC status verification known as "Continuous Certification." All new and maintained certificates will move to the new model this year. Certificates will not display an end date but will instead state that ongoing certification is contingent on meeting MOC requirements. MOC requirements will not change.

A full report on the ABMS-ABR initiatives will appear in the September issue of *RSNA News*.

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# Mobile Apps Gain New Ground in Radiology

From helping to demonstrate the meaningful use of electronic healthcare records (EHRs) to improving workflow in the MR imaging suite, ever-evolving mobile devices are well on their way to becoming embedded in the daily routine of many radiologists.

ALONG with tapping into mobile apps for their convenience and potential for collaboration, consultation and teaching, radiologists are using them to strengthen relationships with referring physicians who are adopting the technology in greater numbers and to improve relationships with patients who appreciate the accessibility mobile apps afford.

"Now I can do my job better because I am always available to answer questions on a CT study," said Elliot K. Fishman, M.D., director of diagnostic imaging and body CT at Johns Hopkins University Medical Center in Baltimore. Dr. Fishman was named RSNA Outstanding Educator in 2009 and is vice co-chair of the RSNA-American College of Radiology (ACR) Public Information Website Committee and serves on RSNA's Public Information Committee and Public Information Advisors Network. "Because you are always available, it really improves patient care."

As tablets continue to offer greater image clarity, resolution and functionality, mobile devices will move beyond a consultative role to a diagnostic one, experts say.

## Apps Move Toward Diagnosis

Introduced this spring, Apple's iPad 3 makes it easier for radiologists to review images, potentially moving medical imaging closer to using mobile devices for diagnostic purposes. Mobile MIM Software was one of the first apps for diagnostic radiology approved by the U.S. Food and Drug Administration (FDA), opening the way for other companies.

"Due to recent innovations in computer hardware and software, the iPad and other tablet devices have emerged as the newest forms of mobile computing with a role in image interpretation," Dr. Fishman said.

With a retina display of 2,048 by 1,536 pixels, iPad 3 features more than four times the number of pixels offered by iPad 2 and a million more than a high-definition television, said Mark Cain, chief technology officer at MIM Software.

## ON THE COVER

3D volume rendered images showing a right aortic sided aortic arch with aberrant left subclavian artery as displayed on Webviewer on the iPad. Image courtesy of Elliot K. Fishman, M.D.



Fishman

Halabi

"If you have an X-ray that is 4,000 by 4,000 pixels, you might not be able to see the whole image at once, but you can see large portions of it at a time and you don't have to pan over it as much," Cain said.

Full-volume rendering is also possible on the iPad 3 using the syngo®.via WebViewer application created by Siemens Medical Solutions and used at Johns Hopkins. By loading a data set at full resolution, the application allows the user to interact in real time, essentially turning the iPad 3 into a mobile workstation, Dr. Fishman said.

"All the typical things you associate with the workstation we are able to do in real time on the iPad 3 without sacrificing quality," Dr. Fishman said. "In fact, the iPad 3 is faster."

"All the typical things you associate with the workstation we are able to do in real time on the iPad 3 without sacrificing quality."

Elliot K. Fishman, M.D.



Advancements in the iPad make it easier for radiologists to review images, potentially moving medical imaging closer to using mobile devices for diagnostic purposes. Above, from left: a 3D volume rendered image (left) of carotid circulation in coronal plane and 3D MIP image (right) of same dataset with bone removal with dual energy CT presented in oblique projection on WebViewer on the iPad; right: A 3D volume rendered image (left) and MIP image (right) of the intracranial circulation from dual energy dataset with bone removal as displayed using WebViewer on the iPad.

## PACS Plug-in Tracks Patient Follow-up

Introduced at RSNA 2011, another app allows radiologists to track patient follow-up through their EHRs, potentially creating closer relationships with referring physicians.

Utilizing Softek's Illuminate PACS plug-in application with their Philips Healthcare software, users can tag the studies they want to follow and select a time window for the follow-up. The system automatically sends an alert when the follow-up study is performed and when the time window for follow-up expires. Alerts can also be created so radiologists know if a particular patient has returned for the recommended follow-up test.

"This is a whole new area," said app developer Safwan Halabi, M.D., of the Department of Radiology at the Henry Ford Health

System in Detroit. "If I schedule a follow-up, this plug-in will alert me if that patient has or has not been seen at our healthcare system. This not only helps the primary care physician but also the continuity of patient care."

The app also makes it easier for radiologists to learn whether their initial interpretations were correct. For example, a radiologist who interprets a lesion on a chest X-ray as abnormal could ultimately learn it was benign. "If I do that 20 times and continue to get that negative feedback, it may help me avoid making that recommendation in the future, or vice-versa," Dr. Halabi said.

The app also helps guard against frivolous recommendations and add to the value of the radiology service, Dr. Halabi said.

Continued on page 13

## RSNA OFFERS ACCESS AND APPS FOR YOUR MOBILE DEVICE

Along with the ultra-readable RSNA News tablet edition, RSNA offers other member-exclusive "must-have" apps free to iPhone, iPod touch and iPad users, including:

- **Radiology and RadioGraphics:**

Access full-text content of current and recent issues, jump to sections within articles, perform full-text searches, store and share articles and more.

- **Radiology Select:** Access this continuing series of selected *Radiology* articles highlighting developments in imaging science, techniques and clinical practice.

- **RSNA Suite:** One app offers instant access to current information on the RSNA Annual Meeting, *Radiology*, *RadioGraphics* and *RadiologyInfo.org*. Find and connect to interrelated apps at the App Center.

Access *m.rsna.org* from your smartphone or other mobile device to find select content in a mobile-optimized format:

- **RadiologyInfo.org:** Check out the latest patient education materials, including images and video.

- **Annual Meeting:** Check in throughout the year for updates on new content to be featured at RSNA 2012, as well as information about esteemed lecturers and honorees and other announcements.

- **Radiology and RadioGraphics:** Browse Tables of Contents for RSNA's peer-reviewed science and education journals and read articles.

- **myRSNA™:** Instantly access the files and bookmarks you've saved.

Coming soon, RSNA's newest app will offer patient safety content from *RadiologyInfo.org* for tablets and smartphones.

For more information on RSNA mobile features, go to [RSNA.org/Mobile\\_Options.aspx](http://RSNA.org/Mobile_Options.aspx).



# PET/MR Leads to Potential Biomarkers for Autism Spectrum Disorders

*Researchers using MR and PET to study autism spectrum disorders (ASD) in children have discovered potential biomarkers that may lead to earlier diagnosis and improved treatments.*

ASD—sometimes also referred to as pervasive developmental disorder (PDD)—is characterized by deficits in social interaction, verbal and nonverbal communication and engagement in repetitive behaviors or interests. The Centers for Disease Control and Prevention (CDC) estimates that one in approximately 88 children has been identified as having some form of ASD, with autism being the most common and debilitating type. There is no cure for ASD but behavior and communication therapies and medication can help control symptoms.

Diffusion-weighted MR imaging (DW-MRI) is giving researchers insight into the connection between autism and irregularities involving signal pathways in the white matter. Jeong-Won Jeong, Ph.D., an assistant professor in the departments of Pediatrics and Neurology at Wayne State University School of Medicine in Detroit, and colleagues used DW-MRI to study differences among children with ASD in research first presented at RSNA 2011 and later published in the April 2012 issue of *The Cerebellum*.

Focusing on the brain's dentatorubrothalamic tract—which has been implicated in the deficits in communication and motor skills found in autism patients—researchers examined children with high-functioning autism (HFA), who have typical cognitive function, and with low-functioning autism (LFA), who have impaired cognitive function.

Researchers imaged 13 HFA children, 11 LFA children and 14 typically developing children. Results showed decreased white matter integrity in HFA and LFA children, Dr. Jeong said. “We found that the reduction of axonal integrity measured by DW-MRI correlates highly with the reduction of communication and living skills in children with high- and low-functioning autism,” he said.

DW-MRI has the potential to highlight imaging biomarkers that can help diagnose children with HFA and LFA, Dr. Jeong said. “A child with high-functioning autism receives an entirely different treatment than a child with low-functioning autism,” he said. “A low-functioning child could not tolerate the sensory input that a high-functioning child could. Thus, early distinction between the two is critical to curing or managing the disorders.”



Jeong



Shandal

In current research, Dr. Jeong and colleagues are studying how the reduced white matter integrity of the dentatorubrothalamic pathway affects serotonin synthesis in the cerebellum of children with LFA and HFA.

## Carbon-11 PET Identifies Abnormal Protein Synthesis

In a first-of-its-kind study, Varun Shandal, M.B.B.S., a research assistant at Children's Hospital of Michigan, Wayne State University of Medicine in Detroit, and colleagues have used Carbon-11

“We discovered that the reduction of axonal integrity measured by DW-MRI correlates highly with the reduction of communication and living skills in children with high- and low-functioning autism.”

Jeong-Won Jeong, Ph.D.

PET to identify protein synthesis abnormalities in disorders related to autism.

Previously, researchers have detected unusual increases in the synthesis of dendritic proteins, which make up the branched projections of neurons that conduct electrochemical stimulation from other nerves in conditions like Fragile X syndrome and tuberous sclerosis.

In research originally presented at RSNA 2011 and published in the November 2011 issue of the *Journal of Child Neurology*, Dr. Shandal and colleagues used PET with the radiotracer Carbon-11 leucine—an amino-acid-tagged radioisotope—to measure protein synthesis in 16 children with developmental delays. Eight of the children had PDD.

Researchers generated time activity curves for leucine concentration in the blood and leucine uptake in the brain and found higher rates of cerebral protein synthesis in developmentally delayed children with PDD. Higher rates of protein synthesis correlated with more severe and pervasive autistic features, Dr. Shandal said.

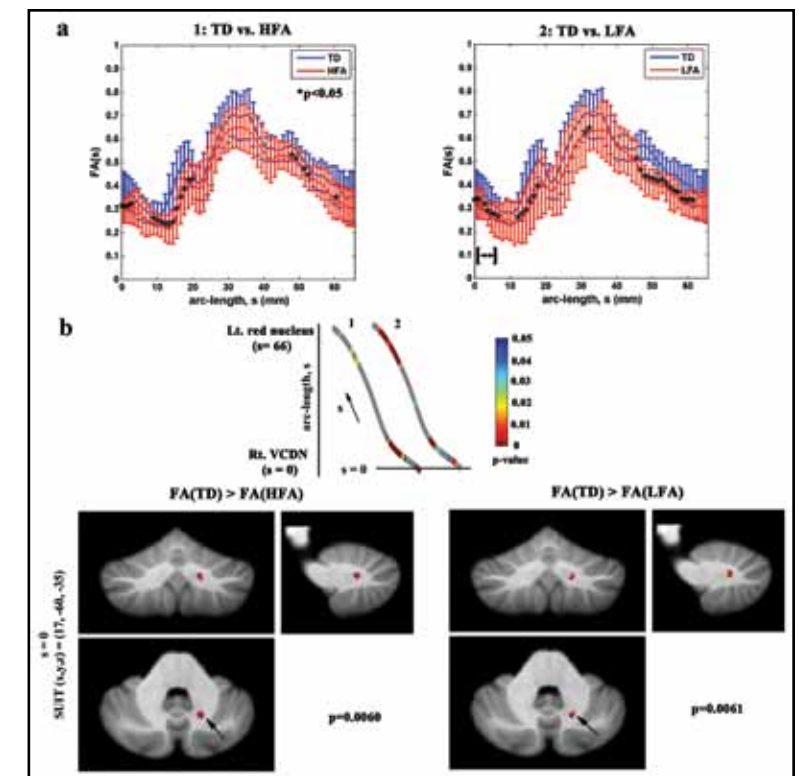
“This increase in dendritic protein synthesis causes defects in synaptic connections and alters the normal development of brain functions such as language and cognition,” Dr. Shandal said.

Abnormal protein synthesis in the language centers of the brain may offer an imaging biomarker in assessing the severity of autism, according to study co-author Senthil K. Sundaram, M.D., an assistant professor of pediatrics and neurology at Wayne State University. “Right now, leucine helps us see differences in the two groups of children,” Dr. Sundaram said. “We need more studies to see if it's clinically useful.”

ASD research has taken on increased urgency in the face of a rapid rise in prevalence. According to a CDC report released in March 2012, ASD prevalence estimates in the overall population increased 23 percent between 2006 and 2008 and 78 percent between 2002 and 2008. Hybrid imaging with PET and MR is likely to play an important role in the research because it offers major advantages for brain imaging of pediatric patients, Dr. Shandal said.

“Brain PET alone is not that useful when you have to look for subtle details, but the finer anatomical resolution provided by MR imaging perfectly complements the functional imaging of PET,” Dr. Shandal said.

“PET and MR should be performed at the same time, and ideally on the same scanner, to avoid the potential problem of co-registering brain images of unequal sizes, which is possible if the scans are performed weeks or months apart,” Dr. Shandal continued. Another advantage would be that the child would only undergo sedation once for both exams, he added. □



Recent research by Jeong-Won Jeong, Ph.D., assessed whether the dentatorubrothalamic tract is altered in Autism Spectrum Disorders (ASD) using diffusion-weighted MRI. Q-ball imaging tractography was performed in 13 children with high-functioning ASD (HFA), 11 children with low-functioning ASD (LFA), and 14 typically developing children (TD). Fiber-tract fractional anisotropy (FA) was estimated from tract-based morphometry (TBM) analysis for right ventro-caudal dentate (VCDN) pathway. (a) The group mean and standard deviation of FA at each common arc-length coordinate are plotted at the respective common coordinates, (left) TD vs. HFA and (right) TD vs. LFA. Block asterisks and brackets indicate the coordinates and their clusters showing significant difference,  $p < 0.05$ . (b) For the comparison of the TD group FA is greater than in the HFA group (1: left) and the LFA group (2: right), the p-value for the group difference at each common arc-length coordinate is overlaid on a prototype fiber. Researchers define the first common arc-length coordinate ( $s = 0$  mm) at right VCDN. 3D cross-sectional images show exact locations of  $s = 0$  coordinate showing the highest significance (marked by black arrows) in SUIT space whose FA is significantly reduced in HFA (left) and LFA (right) compared to TD. The FA values reduced in TBM segments of right VC pathways were significantly correlated with the reduced communication skills in HFA/LFA group ( $p$  value = 0.005).

## WEB EXTRAS

□ To view a video discussion by Jeong-Won Jeong, Ph.D., and Varun Shandal, M.B.B.S., of their RSNA 2011 research, go to [rsnanews.RSNA.org](http://rsnanews.RSNA.org).

☑ To view an abstract of the study “Altered White Matter Structure of the Dentatorubrothalamic Pathway in Children with Autistic Spectrum Disorders,” by Dr. Jeong, in the April 2012 issue of *The Cerebellum*, go to [www.ncbi.nlm.nih.gov/pubmed/22477362](http://www.ncbi.nlm.nih.gov/pubmed/22477362).

☑ To view an abstract of the study, “Abnormal Brain Protein Synthesis in Language Areas of Children With Pervasive Developmental Disorder A L-[1-11C]-Leucine PET Study,” in the October 2011 edition of *Journal of Child Neurology* by Dr. Shandal, go to [jcn.sagepub.com/content/26/11/1347](http://jcn.sagepub.com/content/26/11/1347).

# Post-residency Success Means Leaving the Reading Room

While radiology residents and fellows seeking their first position in today's tight job market find themselves having to be flexible on issues like salary, vacation and geographic location, they're also likely to discover they need to bring more skills to the table, according to experts.

CANDIDATES can increase their marketability by offering more than interpretive skills, said William T. Thorwarth Jr., M.D., a nationally recognized expert on radiology economics and reimbursement who serves as the RSNA Board Liaison for Publications and Communications.

"New residents need to show employers that they have done more than just pass the boards," said Dr. Thorwarth. "Getting involved beyond clinical care will have an impact both on an individual's career and on the future of the profession." Dr. Thorwarth is 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.

Calling it a "cultural shift in radiology," the American College of Radiology (ACR) is working on a number of initiatives to promote the value of radiologists in various capacities throughout health-care. ACR President John A. Patti, M.D., suggests that radiologists devote 10 percent of their workday to non-interpretive activities such as utilization management and quality initiatives.

"Willingness to be involved is a requirement," said Bibb Allen Jr., M.D., vice-chair of the ACR Board of Chancellors and a presenter at the RSNA 2011 session, "Critical Issues Facing the Profession of Radiology: An ACR Leadership Perspective." "We have to be able to prove that our value is more than just productivity," Dr. Allen said.

The American Board of Radiology (ABR) also stresses the importance of non-interpretive skills. To ensure new radiologists are knowledgeable on a wide range of issues, ABR has devoted an entire module in the newly revised Certifying Exam to topics including radiation safety, error prevention and privacy issues (See sidebar). By incorporating these topics on the board examination, the hope is that these topics will play a greater role in the residency curriculum.

The need for radiologist involvement in patient safety and community awareness is already on the radar for many residents and fellows planning careers. When he becomes a practicing radiologist, second-year resident Mike Hazenfield, M.D., also expects to be involved in initiatives such as radiation dose reduction and test appropriateness.



Thorwarth



Annam



Allen

"I think the days of reading out a batch of exams and being finished for the workday is over," said Dr. Hazenfield, who is completing his residency at the University of Cincinnati.

## More than Reading: Serving and Leading

A radiology leader for the entirety of his career, Dr. Thorwarth stressed that committee work and leadership positions provide radiologists with the opportunity to be seen and heard—as

“The economy has made it tough, but focusing exclusively on income generation is a short-term gain in productivity at the risk of long-term sustainability.”

William T. Thorwarth Jr., M.D.



New radiologists are urged to spend 10 percent of their workday on non-interpretive activities such as utilization management and quality initiatives and to become involved in committees, take on leadership roles and work with local medical societies. Getting involved beyond clinical care will have an impact both on the individual's career and on the future of the profession, experts say.

well as to influence. "Serving in leadership positions within your healthcare institution heightens the profile of radiology and gains respect and credibility for the profession," he said.

While speaking across the country, Dr. Thorwarth stresses the importance of radiologists participating on medical staff credentialing committees, in professional radiology and medical societies and within local community organizations.

"It's important to be around the people whose decisions impact our practice," Dr. Thorwarth said. Serving on the Medicare Contractor Advisory Committee and working alongside local business leaders responsible for evaluating healthcare contracts are two simple examples of ways to become involved, he said.

It is important for practicing radiologists to work and partner with every physician group they can, Dr. Allen added. "We need to make ourselves indispensable to our institutions and the communities we serve, not be a faceless name on a report," he said.

Newly trained radiologists with an energy and enthusiasm for such initiatives have an opportunity to help mold the future of the profession, according to Dr. Thorwarth. But he advises graduates to be discriminating when it comes to choosing where they practice.

"Residents and fellows should assess what a workplace values," Dr. Thorwarth said. "Is it just reading and generating revenue, or does the practice reward and promote people who participate? The economy has made it tough, but to focus exclusively on income generation is a short-term gain in productivity at the risk of long-term sustainability."

## Standing Out From the Crowd

Aparna Annam, D.O., a fourth-year radiology resident at Baylor College of Medicine in Houston, is fully cognizant of the value of non-interpretive skills.

"I'm a strong believer in the idea of participating," said Dr. Annam, who also has great perspective on assessing job opportunities: after completing a pediatric residency in 2005, she worked for three years as a neonatal hospitalist in New York City.

"It's not the same market that it was then," Dr. Annam said. "It's definitely a buyer's market now."

In her next position as a fellow in pediatric interventional radiology at Texas Children's Hospital, Dr. Annam expects to be actively involved in various aspects of healthcare. "We don't want to be an invisible partner who doesn't have a say in the issues we face," she said. "Unless we put in face time with our colleagues, we will become isolated from other physicians. They won't know or rely on us."

"Ultimately, academic institutions and radiology practices will hire based on their individual needs. If you demonstrate that you are willing to contribute beyond your clinical skills, there will be a place for you," Dr. Annam said. □

## WEB EXTRAS

### Resident/Fellow Symposium Offered at RSNA 2012

Designed to provide useful information to residents and fellows as they begin their career paths, the RSNA 2012 Resident/Fellow Symposium will focus on topics including employment options, the job-searching process and legal aspects of radiology.

For more information on this and other RSNA 2012 sessions, go to [RSNA.org/AnnualMeeting.aspx](http://RSNA.org/AnnualMeeting.aspx). Enrollment for RSNA 2012 courses is under way at [RSNA.org/register](http://RSNA.org/register).

For more information on the American Board of Radiology's newly revised Certifying Exam, go to [www.theabr.org](http://www.theabr.org).

The Academy of Radiology Leadership and Management (ARLM), sponsored by five radiology education societies including RSNA, offers the opportunity to gain knowledge and skills essential to serve as a leader in your practice or institution. For more information, go to [www.radleaders.org](http://www.radleaders.org).

# Prostatic Artery Embolization Promising for Treating Enlarged Prostate

*Prostatic artery embolization (PAE) offers a potential breakthrough for treating prostatic hypertrophy while potentially avoiding some of the debilitating side effects that often accompany transurethral resection of the prostate (TURP).*

IN FINDINGS presented at the recent Society of Interventional Radiology (SIR) 2012 annual meeting, Francisco Cesar Carnevale, M.D., Ph.D., a professor and chief of interventional radiology at the University of São Paulo Medical School in Brazil, said that results of a four-year study suggest that PAE is “safe, effective, and has a low rate of complications.”

Men over 50 are more susceptible to benign prostatic hyperplasia (BPH), which can seriously impact quality of life. With PAE, clinicians use a catheter to inject small microspheres into the arteries that nourish the prostate, blocking the arteries and starving the prostate of its blood supply, eventually shrinking it.

One advantage of PAE is that it can treat even very large prostates, which may limit those who are good candidates for TURP, the current gold standard for BPH treatment. And potential side effects associated with TURP have not been seen with PAE, Dr. Carnevale said.

“We haven’t seen impotence, ejaculatory disorders or urinary incontinence in our patients after prostatic artery embolization,” said Dr. Carnevale, who heads a group of physicians performing the procedure in Brazil.

## PAE Yields Clinical Success, Improves Quality of Life

Dr. Carnevale’s study included 11 men with acute urinary retention due to BPH who had been managed with medical treatment and indwelling urethral catheters and were waiting to undergo surgery.

Using a micro-catheter threaded into the prostatic arteries, interventional radiologists performed 12 PAE procedures under local anesthesia in 11 patients using resin microspheres as embolizing agents. The men ranged from 59 to 78 years of age, with a mean age of 68.5 years. Researchers used MR imaging and ultrasound to study the exact anatomy of the prostate arteries.

Patient follow-up ranged from 16 months to almost four years. Results showed a 30 percent reduction in prostate size in these men at final follow-up, a result “supported by urodynamic findings and symptom relief,” Dr. Carnevale said. Patients reported having “mild” symptoms and an improved quality of life, he said.



Carnevale



Pisco



Spies

“If we can demonstrate that it’s safe, we can expand PAE to a larger number of patients and begin to look at preliminary data to determine the actual therapeutic impact.”

**James B. Spies, M.D., M.P.H.**



**Figure 1:** Pre-embolization MR imaging. Enlarged prostate due to central gland nodules. Note the presence of the urethral catheter (white arrow) due to acute urinary retention.

**Figure 2:** One-month post-PAE MR imaging. Bilateral avascular areas (black areas mainly on the left side) in the central part of the prostate (white arrows) and reduction of the prostate size by 40 percent. Black areas mean no blood supply to the prostate due to infarction of the prostate after embolization (occlusion of the prostate arteries). The catheter was removed after reduction of the prostate size and patient is voiding normally.

**Figure 3:** Microcatheter into the prostatic arteries. Prostate arteriogram (injection of contrast media into the prostate gland) after selective catheterization of the prostatic arteries with a microcatheter 1 mm in diameter (black arrows point to the urethral arteries; white arrows point to capsular arteries). The hemi-prostate (one side of the prostate) is shown in the middle of the arrows. Microspheres are injected into these vessels until their occlusion.

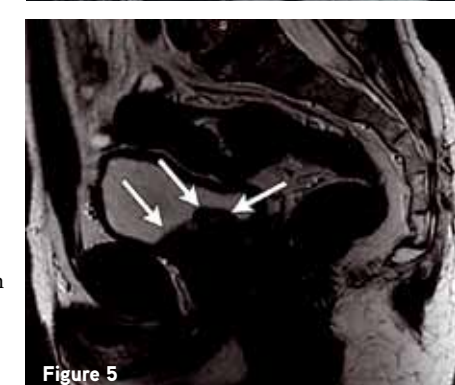
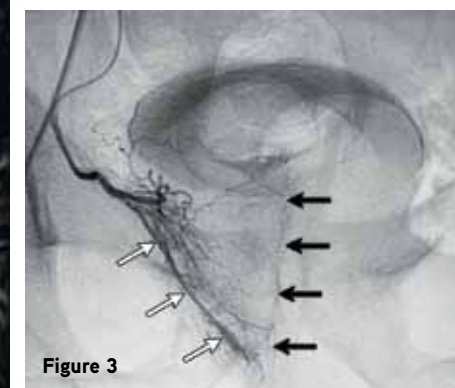
**Figure 4:** MR imaging before PAE. An enlarged prostate protruding (white arrows) into the bladder. Note the presence of the urethral catheter (red arrows) before treatment due to acute urinary retention.

**Figure 5:** MR imaging 30 days after PAE. Reduction of the prostate size with minimal protrusion into the bladder (white arrows). Note the urethral catheter was removed after treatment and the patient is voiding normally.

“After treatment, we assessed quality of life and evaluated how well the urinary system was working,” Dr. Carnevale said. “Technical success (bilateral prostatic artery embolization) was 75 percent and clinical success (Foley catheter removal and symptoms improvement) was 91 percent.”

In research also presented at the 2012 SIR annual meeting, a group of researchers from the New University of Lisbon in Portugal, led by Joao Martins Pisco, M.D., reported similar results in performing PAE.

Dr. Pisco reported that 84 men treated with PAE after an average follow-up of nine months showed “significant” clinical improvement. Treatment was technically successfully in 98.5 percent of the cases, with 77 men showing “excellent” improvement, he said.



Images courtesy of Francisco Cesar Carnevale, M.D., Ph.D.

Continued on next page



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**Safety Trials of PAE Necessary**

As a radiologist who has traveled to Portugal and Brazil to observe the procedure, Dr. James B. Spies, M.D., M.P.H., said the potential for PAE will be significant if the procedure is deemed safe for clinical use.

"If we can demonstrate that it's safe, we can expand PAE to a larger number of patients and begin looking at preliminary data to determine its actual therapeutic impact," said Dr. Spies, a professor and chair of the Department of Radiology at Georgetown University Hospital in Washington, D.C.

Dr. Spies said he plans to perform a safety trial on the procedure and has submitted an investigational device exemption application to the U.S. Food and Drug Administration (FDA).

"Because PAE takes an embolic approved for another purpose and applies it to a new organ system, there are some associated risks such as potential injury to the bladder or rectum," Dr. Spies said. His research team plans to perform both office

cystoscopy and anoscopy to evaluate whether those organs have suffered any damage after PAE, he said.

In terms of using the treatment in clinical practice, Drs. Carnevale and Spies both stressed that PAE requires advanced expertise and stressed that training will be necessary if the technique is to be adopted on a wider scale.

"Only experienced physicians trained in interventional radiology techniques as well as someone who has a strong understanding of pelvic vascular anatomy should perform the procedure," Dr. Carnevale said.

Dr. Spies hopes to begin treating patients in coming months and said it's likely that comparative trials will be under way by next year. In the meantime, prospective patients have called him after reading about the procedure and its promising results.

"Potentially, this has a great future in this country and around the world," Dr. Spies said. "There certainly is the skill set out there for people to do this, but it's not quite ready for primetime yet." □

**WEB EXTRAS**

☑ To view a video by Francisco Cesar Carnevale, M.D., Ph.D., discussing his research on prostatic artery embolization at SIR 2012, go to [rsnanews.RSNA.org](http://rsnanews.RSNA.org).

☑ To access Dr. Carnevale's study, "Quality of Life and Symptoms Relief Support Prostatic Artery Embolization for Patients with Acute urinary Retention Due to Benign Prostatic Hyperplasia," in the March 2012 issue of the *Journal of Vascular and Interventional Radiology*, go to [JVIR.org/article/S1051-0443\(11\)01656-3/fulltext](http://JVIR.org/article/S1051-0443(11)01656-3/fulltext).

**Mobile Apps Gain New Ground in Radiology**

Continued from Page 6

**MR Imaging App Improves Workflow**

While its use is so far confined to his institution, a Stanford University researcher has developed an app that improves workflow in the MR imaging suite.

Andrew Holbrook, Ph.D., developed the app using webOS software to operate on a modified mobile phone and a Hewlett-Packard (HP) TouchPad tablet, allowing users to control an MR imaging scanner. Dr. Holbrook removed most of the metal components so the user can operate the devices more safely in the MR imaging room.

"The big advantage is that the physician performing an intervention can also be the 'driver' of the imaging," said Dr. Holbrook, a research associate in the Department of Radiology at Stanford. "For example, every issue does not need to be communicated back to someone in the control room. With intuitive multi-touch gestures, radiologists can make changes themselves."



Holbrook

Although HP is no longer involved in the manufacturing of tablet PCs with webOS, the project has moved beyond the dependence on this operating system. Dr. Holbrook is now developing applications using modern, cross-platform web technologies that can run on a myriad of devices including PCs and tablets, regardless of vendor.

**Mobile Devices Offer "Best of Both Worlds"**

Challenges remain and radiologists aren't likely to abandon traditional workstations overnight, but experts say the industry is definitely moving in that direction.

In fact, in a study published in the March 2012 issue of *Emergency Radiology*, Dr. Fishman and other Johns Hopkins researchers found no difference between the use of an iPad and a PACS workstation in terms of diagnostic accuracy for detecting pulmonary embolism.

The device "has the potential to expand radiologists' availability for consultation and expedite emergency patient management," according to the authors.

"It's the best of both worlds—the application provides everything you need," Dr. Fishman added. □

**WEB EXTRAS**

☑ To access an abstract of the study, "The iPad as a Mobile Device for CT Display and Interpretation: Diagnostic Accuracy for Identification of Pulmonary Embolism," by Elliot K. Fishman, M.D., in the March 2012 edition of *Emergency Radiology*, go to [www.springerlink.com](http://www.springerlink.com).

☑ To access an abstract of Dr. Fishman's study, "How to Develop, Submit, and Get an iPad Application Accepted to the Apple Store," in the June 2012 issue of the *Journal of the American College of Radiology*, [www.ncbi.nlm.nih.gov/pubmed/22632674](http://www.ncbi.nlm.nih.gov/pubmed/22632674).

# Experience the Best of Chicago during RSNA 2012

No matter what your passion or interest, Chicago has something for everyone attending RSNA 2012. Peruse our annual roster of Chicago events for everything from world-class museums and restaurants to dazzling architecture and artwork and much more. We also include Our Insider's Guide to Chicago's Best Deals, featuring the many free activities available in the Windy City.

## Museums

**ART INSTITUTE OF CHICAGO**

Renowned for its Impressionist and Post-Impressionist collection as well as its Depression-era American paintings, the Art Institute boasts a 260,000 piece-collection representing 5,000 years of art from around the globe. Don't miss the Modern Wing, which exhibits early 20th Century European Art.

Artist and director Steve McQueen's film and moving image installations are among the highlights of the special winter exhibits which also include *Allen Ruppersberg: The Birth and Death of Rock 'n' Roll*.

- 111 S. Michigan Ave.  
1-877-307-4242  
[www.artic.edu](http://www.artic.edu)  
[www.ticketmaster.com](http://www.ticketmaster.com)

**FIELD MUSEUM OF NATURAL HISTORY**

Upon entering, visitors will encounter Sue, the world's largest and most complete Tyrannosaurus Rex fossil. The natural history museum has something for everyone from taxidermal animals and dioramas to Egyptian mummies and a memorable dinosaur exhibit. Stop by this year's special exhibits Extreme Mammals and Images of the Afterlife, featuring sculpted portraits of mummies imaged with CT.

- 1400 S. Lake Shore Dr.  
1-312-922-9410  
[www.fieldmuseum.org](http://www.fieldmuseum.org)

**SMITH MUSEUM OF STAINED GLASS WINDOWS**

When visiting Navy Pier, enjoy the largest collection of Tiffany stained glass windows,



The Beluga whale show is one of the many popular attractions offered at the Shedd Aquarium.

Image courtesy of ©Shedd Aquarium/Brenna Hernandez.

which are displayed along the interior public walkway at the east end of the pier building. The collection contains more than 150 stained glass works by artists such as Louis Comfort Tiffany and Frank Lloyd Wright.

- 600 E. Grand Ave. (Navy Pier)  
1-312-595-7437  
[www.navypier.com](http://www.navypier.com)

**MUSEUM OF CONTEMPORARY ART**

The largest museum of contemporary art in the world, the MCA displays a variety of Post-World War II art including paintings, sculptures, photographs and video installations. In its history, the museum has hosted noteworthy and controversial exhibits including Christo's first U.S. building wrap; Andres Serrano's work with statuettes submerged in urine, milk or blood; and Robert Mapplethorpe's *The Perfect Moment*.

This winter, MCA will feature two special exhibits—MCA DNA: John Cage and Martin Creed Plays Chicago.

- 220 E. Chicago Ave.  
1-312-280-2660  
[www.mcachicago.org](http://www.mcachicago.org)

**SHEDD AQUARIUM**

The world's largest indoor marine animal facility offers an array of exhibits from adorable sea otters to vicious piranhas and allows visitors the chance to pet a sea star. The popular dolphin and Beluga whale show takes place in the Oceanarium amphitheater and sharks can be found in the Wild Reef. Enjoy the new, high-tech 4D Experience in the Phelps Auditorium. A temporary exhibit, *Jellies*, demonstrates how sea jellies hunt and grow exponentially.

- 1200 S. Lake Shore Dr.  
1-312-939-2438  
[www.sheddaquarium.org](http://www.sheddaquarium.org)

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Part of the Science Storms exhibit at the Museum of Science and Industry, the Tesla Coil discharges lightning strikes using more than 1.2 million volts of electricity.

Image by J.B. Spector, Museum of Science and Industry, Chicago.

Continued from previous page

### ADLER PLANETARIUM

A National Historic Landmark, the Adler opened in 1930 and is the world's oldest planetarium. A variety of astronomical adventures await guests, from visiting the restored Gemini 12 spacecraft to landing the Lunar Module simulator on the face of the moon. Planetarium shows play continuously throughout the day in three theaters.

- 1300 S. Lake Shore Dr.  
1-312-922-7827  
[www.adlerplanetarium.org](http://www.adlerplanetarium.org)

### PEGGY NOTEBAERT NATURE MUSEUM

The Notebaert welcomes children of all ages to explore nature in unusual and innovative ways. Permanent exhibits include The Birds of Chicago, Extreme Green House, Istock Family Look-in Animal Lab, Judy Istock Butterfly Haven, Mysteries of the Marsh, Nature's LunchBox, RiverWorks, Water Lab and the Wilderness Walk. Visitors seven years of age and younger are invited to enjoy the Hands-on Habitat.

- 2430 N. Cannon Dr.  
1-773-755-5100  
[www.chias.org](http://www.chias.org)

### MUSEUM OF SCIENCE AND INDUSTRY

The only remaining building from the 1893 World's Columbian Exposition, the museum is packed with one-of-a-kind exhibits: one of two U-505 German submarines captured during World War II; a realistic coal mine; the multilevel Science of Storms exhibit, complete with a vapor tornado and tsunami tank; and the Henry Crown Space Center featuring Apollo 8. A temporary exhibit, Smart Home: Green + Wired, demonstrates

a sustainable "green" home. Annual seasonal exhibits include the Christmas Around the World and Holidays of Light.

- 57th St. and Lake Shore Dr.  
1-773-684-1414  
[www.msichicago.org](http://www.msichicago.org)

### CHICAGO HISTORY MUSEUM

This collection dates from 1856, approximately 25 years after the founding of Chicago, and was started with the intent to help to research and interpret the city's history. The museum helps bring to life many aspects of Chicago's past, including the Great Chicago Fire of 1871, the rise of Chicago's Chinatown and the life and times of Abraham Lincoln. Details on neighborhood tours, lectures, performances and events are available on the website.

- 1601 N. Clark St.  
1-312-642-4600  
[www.chicagohs.org](http://www.chicagohs.org)

### DUSABLE MUSEUM OF AFRICAN AMERICAN HISTORY

A special museum dedicated to collecting and preserving the history of African Americans, this nearly 50-year-old institution is the first of its kind in the U.S. It features exhibits on salient historical topics such as civil rights as well as work by African-American artists.

- 740 East 56th Pl.  
1-773-947-0600  
[www.dusablemuseum.org](http://www.dusablemuseum.org)

### LINCOLN PARK CONSERVATORY

Built in the late 1800s, the conservatory originally provided visitors a chance to view exotic plants while growing most of the specialized horticulture for Chicago's parks. Today, visitors can stroll among the four

display houses: Fern Room, Orchid House, Palm House and Show House, where the Christmas show is hosted.

- 2391 N. Stockton Dr.  
1-312-742-7736  
[www.chicagoparkdistrict.com/index.cfm](http://www.chicagoparkdistrict.com/index.cfm)

### GARFIELD PARK CONSERVATORY

Enjoy the holiday flower show in one of the world's largest gardens under glass, built at the turn of the last century. The conservatory is famous for its prairie waterfall set among stone and water landscapes.

- 300 N. Central Park Ave.  
1-312-746-5100  
[www.garfield-conservatory.org](http://www.garfield-conservatory.org)

### MILLENNIUM PARK ICE RINK

The McCormick Tribune Plaza & Ice Rink is located just off Michigan Avenue in the shadow of the Cloud Gate sculpture, affectionately called "The Bean." The windows of the Park Grill restaurant look out on the rink. Skating is free and skate rental is available.

- East side of Michigan Avenue between Washington and Madison streets  
1-312-742-1168  
[www.millenniumpark.org](http://www.millenniumpark.org)

### DALEY BICENTENNIAL PLAZA ICE RINK

Located across Millennium Park's snake-like BP Pedestrian Bridge is a secluded ice rink with far fewer skaters than the well-known Millennium Park rink. The facility offers free skating, skate rental and a warming building.

- South side of East Randolph Street between Columbus Drive and Lake Shore Drive  
1-312-742-7650  
[www.chicagoparkdistrict.com](http://www.chicagoparkdistrict.com)

## RSNA Tours & Events

RSNA is sponsoring a series of tours and events during RSNA 2012. The RSNA Tours & Events brochure is available at [RSNA2012.RSNA.org/attendees/tours\\_and\\_events.cfm](http://RSNA2012.RSNA.org/attendees/tours_and_events.cfm).



**RSNA TOUR**

Look for the RSNA Tour icon next to event listings in this article, signifying that a pre-arranged RSNA package is available. Enroll for tours and events online when registering for the annual meeting or while adding courses.

## Theater

### FAILURE: A LOVE STORY

A tale of love and loss following three Chicago sisters through the 1920s.

- Victory Gardens Biograph Theater  
2433 N. Lincoln Ave.  
1-773-871-3000  
[www.victorygardens.org](http://www.victorygardens.org)

### JAMES JOYCE'S "THE DEAD"

Classic Irish tale told through a family gathering in Dublin on the Feast of the Epiphany.

- Court Theatre  
5535 S. Ellis Ave.  
1-773-753-4472  
[www.courttheatre.org](http://www.courttheatre.org)

### LATE NITE CATECHISM

This witty performance examining the Baby Boomer parochial school experience is a longtime favorite among those taught by nuns and also serves as a wry introduction to Catholicism.

- Royal George Theatre  
1641 N. Halsted St.  
1-312-988-9000  
[www.ticketmaster.com](http://www.ticketmaster.com)

### LES MISERABLES **RSNA TOUR**

The 25th anniversary production of this much-loved musical features sets inspired by author Victor Hugo's paintings.

- Cadillac Palace Theatre  
151 W. Randolph St.  
1-312-902-1400  
[www.ticketmaster.com](http://www.ticketmaster.com)

### THE SANTALAND DIARIES

David Sedaris' witty account of his experience as a Macy's Christmas Elf.

- Theater Wit  
1229 W. Belmont Ave.  
1-773-975-8150  
[www.theaterwit.org](http://www.theaterwit.org)

### THE SCHOOL FOR LIES

Enjoy this raunchy adventure based on Molière's *The Misanthrope*.

- Chicago Shakespeare Theater  
800 E. Grand Ave.  
1-312-595-5600  
[www.chicagoshakes.com](http://www.chicagoshakes.com)

### THE SECOND CITY **RSNA TOUR**

Second City is the comedic training ground for many of today's favorite comedians. Shows are scheduled on both the Main Stage and the smaller ETC stage, combining short comedy sketches and improvisation.

Cocktails and food are served during performances.

- Main Stage and ETC stage  
1616 N. Wells St.  
1-312-337-3992  
[www.secondcity.com](http://www.secondcity.com)

### SISTER ACT **RSNA TOUR**

Deloris Van Cartier, a diva in witness protection, turns the convent that is sheltering her upside down.

- The Auditorium Theater of Roosevelt University  
50 E. Congress Pkwy.  
1-312-902-1400  
[www.ticketmaster.com](http://www.ticketmaster.com)

### TOMMY GUN'S GARAGE

This interactive dinner theatre set in the Roaring Twenties features Prohibition-era gangsters and flappers in a musical comedy show.

- Tommy Gun's Garage  
2114 S. Wabash St.  
1-312-225-0273  
[www.tommygunsgarage.com](http://www.tommygunsgarage.com)

### UP COMEDY CLUB

Catch the best of stand-up comedy or see an improv show created by Second City producers at the new Up Comedy Club. Cocktails and food are served during the performance.

- Piper's Alley  
230 W. North Ave., Third Floor  
1-312-662-4562  
[www.upcomedyclub.com](http://www.upcomedyclub.com)

### WASTELAND

Two Vietnam POWs from distinctly different backgrounds forge a friendship of hope while spending two years in adjacent underground cells.

- TimeLine Theatre  
615 W. Wellington Ave.  
1-773-281-8463  
[www.timelinetheatre.com](http://www.timelinetheatre.com)

### ZANIES COMEDY NIGHT CLUB

Chicago's favorite for stand-up comedy. Enjoy comedians from Comedy Central, HBO and the Tonight Show in Zanies' intimate atmosphere.

- Zanies  
1548 N. Wells St.  
1-312-337-4027  
[www.chicago.zanies.com](http://www.chicago.zanies.com)

## Family Performances

### A CHRISTMAS CAROL

For more than 30 years, the Goodman Theatre has presented this timeless Dickens classic during the holiday season.

- Goodman Theatre  
170 N. Dearborn St.  
1-312-443-3800  
[www.goodman-theatre.org](http://www.goodman-theatre.org)

### THE BLUE MAN GROUP

A vibrant event blending flashing lights, comedy, loud music—and yes, blue men—for one unique experience. Shows are unique to each city. Children under five not admitted.

- Briar Street Theatre  
3133 N. Halsted St.  
1-773-348-4000  
[www.blue.com](http://www.blue.com)  
[www.ticketmaster.com](http://www.ticketmaster.com)

### KNUFFLE BUNNY: A CAUTIONARY MUSICAL

Dad saves the day when Trixie loses her lovey in this classic Mo Willems tale.

- The Apollo Theater  
2540 N. Lincoln Ave.  
1-773-935-6100  
[www.emeraldcitytheatre.com](http://www.emeraldcitytheatre.com)

Continued on next page



Ildebrando D'Arcangelo will sing the title role of Don Pasquale at the Lyric Opera of Chicago.

Image by Axel Zeininger/Wiener Staatsoper

Continued from previous page

## Symphony and Opera

### LYRIC OPERA OF CHICAGO

The historic and renovated art-deco Civic Opera House is the perfect setting to see the renowned Lyric Opera of Chicago. Free lectures are offered one hour before every performance. Tickets go on sale Aug. 1. Productions include:

#### Don Pasquale **RSNA TOUR**

Nov. 25 & 28

The younger woman turns out to be more than Don Pasquale can handle in this operatic comedy. *By Gaetano Donizetti; Conductor: Stephen Lord with René Barbera, Ildebrando D'Arcangelo and Marlis Petersen.*

#### Werther **RSNA TOUR**

Nov. 26

A memorable story of ill-fated love and heartbreak based on the much loved Goethe novel, *The Sorrows of Young Werther*. *By Jules Massenet; Conductor: Sir Andrew Davis with Kiri Deonarine, Sophie Koch, Matthew Polenzani and Craig Verm.*

• 20 N. Wacker Dr.  
1-312-332-2244 x5600  
[www.lyricopera.org](http://www.lyricopera.org)

## Family Activities

### CHICAGO SYMPHONY ORCHESTRA

Nov. 25

#### Special Event: Disney Fantasia

##### **RSNA TOUR**

Conductor: Ludwig Wicki  
Program: Dukas: The Sorcerer's Apprentice; Beethoven: Symphony No. 5; Tchaikovsky: The Nutcracker Suite.

Nov. 28

#### Afterwork Masterworks **RSNA TOUR**

Dvorak and Shostakovich  
Conductor: Sir Mark Elder

Nov. 29 & 30 and Dec. 1

Conductor: Sir Mark Elder  
Program: Dvorák: The Golden Spinning Wheel; Berlioz: Les nuits d'été; Shostakovich: Symphony No. 1

• 220 S. Michigan Ave.  
1-312-294-3000  
[www.cso.org](http://www.cso.org)

### AMERICAN GIRL PLACE

Beyond the shopping frenzy the American Girl experience can include dining, book signings, cooking classes and the popular doll hair salon.

• Water Tower Place  
835 N. Michigan Ave.  
1-877-247-5223  
[www.americangirl.com](http://www.americangirl.com)

### CHICAGO CHILDREN'S MUSEUM

Children of every age experience interactive learning through 15 permanent hands-on exhibits that range from dinosaurs to art, water play to fire safety, climbing to commerce. Daily activities offer even more focused learning opportunities.

• 700 E. Grand Ave. (Navy Pier)  
1-312-464-7732  
[www.chicildrensmuseum.org](http://www.chicildrensmuseum.org)

### JOHN HANCOCK OBSERVATORY

This observatory experience on the 94th floor begins with a ride on the fastest elevator in North America and includes an open-air skywalk, free multimedia sky tour and the first interactive telescopes in the U.S.

• 875 N. Michigan Avenue  
1-888-875-VIEW

### NAVY PIER IMAX THEATRE

The Navy Pier IMAX theatre will announce its complete holiday film schedule in late autumn.

• 700 E. Grand Ave.  
1-312-595-5MAX  
[www.imax.com/chicago](http://www.imax.com/chicago)

### LINCOLN PARK ZOO

One of the nation's last free zoos, and one of its oldest, the Lincoln Park Zoo is conveniently located in nearby Lincoln Park. Walk through the zoo at night with the holiday-themed ZooLights festival on Friday through Sunday evenings.

• 2200 N. Cannon Dr.  
1-312-742-2000  
[www.lpzoo.com](http://www.lpzoo.com)

### SKYDECK CHICAGO AT WILLIS TOWER

At 1,353 feet above the ground, Skydeck Chicago in Willis Tower, the tallest building in the Western Hemisphere, offers views up to 60 miles. If you dare, venture out onto The Ledge, four glass-enclosed—and glass-bottomed—boxes outside the building.

• 233 S. Wacker Dr.  
Enter Skydeck on Jackson Boulevard  
312-875-9447



A dazzling display of ornaments is one feature of the Christkindlmarket Chicago, a traditional German open air market.

Image by Timmy Samuel

## The Insider's Guide to Chicago's Best Deals

Many Chicago museums offer free admission on select days. With some smart scheduling, you can visit many of the city's top attractions for little to no money. Here is a rundown of some of the best deals in town:

#### FREE AS INDICATED:

- **Museum of Contemporary Art**, 220 E. Chicago (Tuesday for Illinois residents)
- **Charnley-Persky House Museum**, 1365 N. Astor St. (Wednesday)
- **Clarke House Museum**, 1827 S. Indiana Ave. (Free tours on Wednesday)
- **DuSable Museum of African American History** (Sunday)
- **Glessner House Museum**, 1800 S. Prairie Ave. (Free tours on Wednesday)
- **Art Institute of Chicago**, 11 S. Michigan Ave. (First and second Wednesdays of the month for Illinois residents)
- **Chicago Children's Museum at Navy Pier**, 700 E. Grand Ave. (Thursday, 5–8 p.m. for all and first Sunday of each month for ages 15 and younger)
- **Notebaert Nature Museum**, 2430 N. Cannon Dr. (Thursday for Illinois residents)

#### ALWAYS FREE:

- **Chicago ArchiCenter**, 224 S. Michigan Ave.
- **Chicago Cultural Center**, 78 E. Washington St.
- **City Gallery at the Historic Water Tower**, 806 N. Michigan Ave.
- **Lincoln Park Conservatory**, 2391 N. Stockton Dr.
- **Lincoln Park Zoo**, 2200 N. Cannon Dr.
- **Millennium Park Welcome Center**, 201 E. Randolph St.
- **Museum of Contemporary Photography**, 600 S. Michigan Ave.
- **National Museum of Mexican Art**, 1852 W. 19th St.
- **Navy Pier**, 600 E. Grand Ave.
- **Smart Museum of Art**, 5550 S. Greenwood Ave.

#### MACY'S HOLIDAY WINDOWS

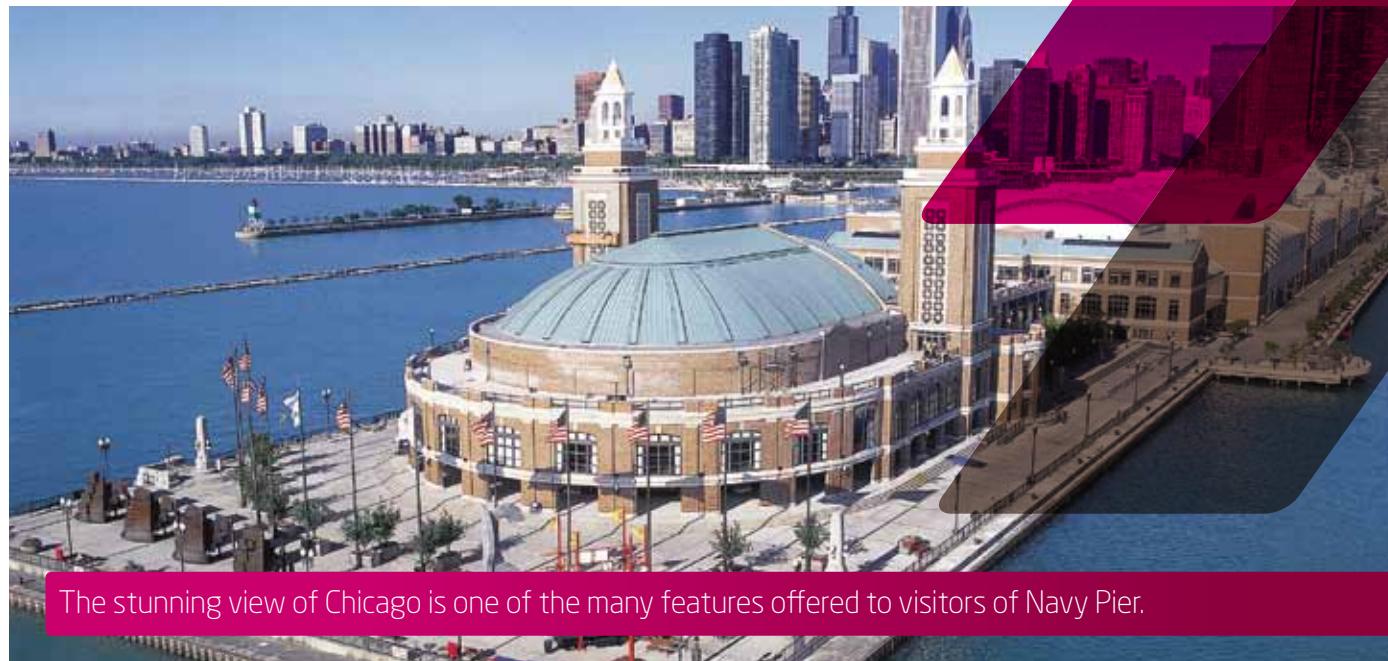
Walk outside alongside the Macy's store at 111 N. State St. to view animated holiday scenes.

#### MCDONALD'S THANKSGIVING PARADE

Spend Thanksgiving morning with marching bands, enormous inflatables, floats, and Santa Claus and Ronald McDonald. This annual parade travels down State Street from 8 to 11 a.m.

#### CHRISTKINDLMARKET CHICAGO AND THE SANTA HOUSE

One of Chicago's most popular holiday events is Christkindlmarket Chicago, a traditional German open air market offering authentic German food, drink and wares. Christkindlmarket is free and is located on Daley Plaza between Washington and Dearborn Streets.



The stunning view of Chicago is one of the many features offered to visitors of Navy Pier.

# RESEARCH & EDUCATION FOUNDATION DONORS

The R&E Foundation thanks the following donors for gifts made April 14 – May 11, 2012.



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Companies who give annual unrestricted gifts at four levels from \$1,500 to \$10,000

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Medical Insight



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Parascript

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A giving program for private practices and academic departments

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## RSNA BOARD CHAIRMAN SUPPORTS R&E FOUNDATION WITH CHARITABLE GIFT ANNUITY

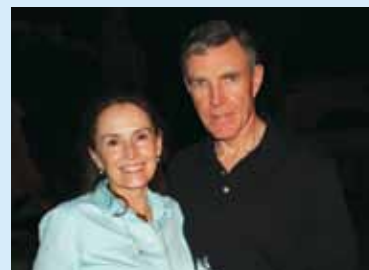
Among the RSNA Research & Education Foundation donors who have established a charitable gift annuity are RSNA Board Chairman **N. Reed Dunnick, M.D.**, and his wife, **Marilyn A. Roubidoux, M.D.**

"A charitable gift annuity is a wonderful way to continue to receive income, yet provide a lasting contribution to the R&E Foundation," Dr. Dunnick said. "We feel we are receiving more than we are giving."

A charitable gift annuity works like this: through a simple contract, the donor gives cash or stocks to the R&E Foundation, and then RSNA pays the donor—or someone else, if the donor chooses—a fixed amount each year for the rest of that person's life. The fixed rates are based on age and do not fluctuate with the stock market or interest rates. The gift itself is partially income tax-deductible, as are the payments the donor receives. In the case of a gift of appreciated stock, the donor's capital gains taxes may be reduced.

"The charitable gift annuity is a true win/win—a revenue stream for us and a contribution to the Foundation," Dr. Dunnick said.

For more information, including fixed annuity rates, go to [RSNA.org/PlannedGiving](http://RSNA.org/PlannedGiving).



## Individual Donors

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

### \$2,500 – \$5,000

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Robert J. Schmall, M.D.

### \$1,500 – \$2,499

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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](http://RSNA.org/donate).

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## YOUR DONATIONS IN ACTION



With an RSNA Research & Education (R&E) Foundation Research Medical Student Grant, **Lova Sun, B.S.**, will investigate the use of biologically safe gold nanoparticles as a theranostic agent to enhance imaging and radiation therapy of brain tumors.

## R&E FOUNDATION'S WEB PAGE GETS A NEW LOOK

Visitors to the R&E Foundation Web page will notice a fresh new look as part of the newly redesigned [RSNA.org](http://RSNA.org). Along with the familiar roster of resources, the R&E page offers need-to-know information, a link for donating and access to R&E's quarterly newsletter, *Foundation Focus*. Check out the new look at [RSNA.org/Foundation.aspx](http://RSNA.org/Foundation.aspx).



## Journal Highlights

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

### Radiation Risks of Medical Imaging: Separating Fact from Fantasy

Predictions of cancers and cancer deaths caused by medical imaging procedures that use ionizing radiation are often computed by multiplying small and highly speculative risk factors by large populations of patients to yield a substantial impressive number of "cancer victims."

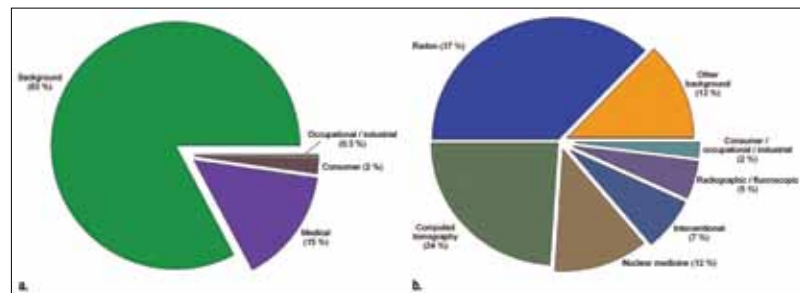
Not infrequently, patients are anxious about a scheduled imaging procedure because of articles they have read in the public media, according to the Annual Oration/

Review and Commentary in the August issue of *Radiology* (RSNA.org/Radiology), authored by William R. Hendee, Ph.D., and Michael K. O'Connor, Ph.D., of the Mayo Clinic in Rochester, Minn. Along with discussing the basis for these predictions, including the data that led to these numbers, the reliability of the data, and how much attention should be given to this information, the authors discuss:

- The Linear No-Threshold Hypothesis
- Dose descriptors
- Risk models/estimates

Publications that estimate cancers and cancer deaths caused by medical imaging are frequently sensationalized by electronic and print public media, resulting in considerable public anxiety and fear about medical imaging, the authors write.

**Radiology**



**Average effective dose per capita to the U.S. population from major sources of exposure. (a) Effective dose (percentage of total) in early 1980s. (b) Effective dose (percentage of total) in 2006. (Reprinted, with permission, from reference 1.)**

(*Radiology* 2012;264:2:312-321) ©RSNA, 2012. All rights reserved. Printed with permission.

"On some occasions, the fear and anxiety results in reluctance to accept imaging procedures, even though the risk of a deferred examination creates a much greater risk than that related to radiation from the procedures, if any risk exists at all," they write.

### Imaging of the Female Perineum in Adults

Although a wide array of diseases can affect the female perineum in adults, there are limited articles in the literature describing the intricate imaging anatomy of the female perineum. Understanding of the anatomy and diseases of the female perineum allows appropriate utilization of imaging modalities for accurate diagnosis and for guiding treatment.

In a July-August article in *RadioGraphics* (RSNA.org/RadioGraphics) Keyanoosh Hosseinzadeh, M.D., of the University of Pittsburgh Medical Center, and colleagues use illustrations detailing the structures of the perineum and discuss various disorders and diseases with characteristic imaging findings encountered in the female perineum in adults for each organ or region. Specifically, the authors discuss:

- The anatomy of the female perineum relevant structures
- The disease processes unique to the female perineum
- The strengths and weaknesses of the various imaging modalities for appropriate diagnostic imaging and planning of therapy

The female perineum is an important anatomic region that traditionally has been described in the literature in relation to its physiologic contribution to continence, the authors write.

"However, a wide spectrum of diseases arises within the female perineum in adults, and knowledge of the diseases and spatial anatomy allows the radiologist to confidently identify the site of origin and extent of disease with the appropriate selection of imaging modality. For many diseases, MR imaging is the preferred modality for diagnosis and definition of disease extent."

Continued on page 24



**Endometrial metastasis to the urethra in a 70-year-old woman who presented with urinary retention and a history of treated endometrial carcinoma. Fused FDG PET/CT image shows intense FDG avidity of the mass (arrow). Note the Foley catheter traversing the displaced urethral lumen (arrowhead). Transvaginal biopsy findings confirmed metastatic endometrial carcinoma.**

(*RadioGraphics* 2012;32:1065-1066) (Expanded abstract for online-only article) ©RSNA, 2012. All rights reserved. Printed with permission.

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

## Radiology in Public Focus

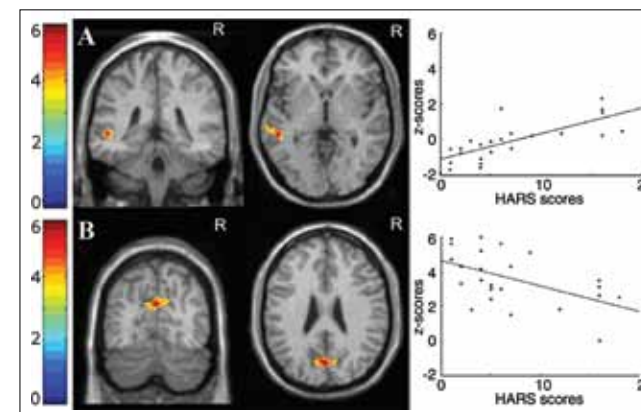
Press releases were sent to the medical news media for the following articles appearing in recent issues of *Radiology*.

### Subacute Default Mode Network Dysfunction in the Prediction of Post-Stroke Depression Severity

IMPAIRMENT of default mode network (DMN) functional connectivity involved in emotional control is associated with the severity of post-stroke depression, new research shows.

In the study, Saïoa Lassalle-Lagadee, a doctoral student at the Université Bordeaux2, France, and colleagues, examined 24 patients who underwent resting-state functional MR imaging (fMRI) 10 days after having mild to moderate ischemic stroke. Patients were also clinically evaluated 10 days and three months post-stroke to determine the presence and severity of depression and anxiety.

At three months post-stroke, 10 patients had minor to moderate depression and 14 patients exhibited no depression. The fMRI exams revealed an association between modifications of connectivity in the DMN 10 days after stroke and the



**Axial and coronal MR images show correlation between DMN FC and severity of late anxiety symptoms. Anxiety symptom severity measured at 3-month follow-up, A, correlates positively with FC index to DMN in left middle temporal cortex ( $R = 0.81$ ; 95% confidence interval: 0.58, 0.92;  $P, .001$ ) and, B, correlates negatively with posterior cingulate cortex ( $R = -0.80$ ; 95% confidence interval: 20.91, 20.56;  $P, .001$ ).**

(*Radiology* 2012;264:1:218-224) ©RSNA, 2012. All rights reserved. Printed with permission.

severity of depression three months post-stroke.

Findings suggest that post-stroke depression involves impairment in resting-state networks and their interconnections, according to the researchers. "Resting-state fMRI is easier than standard activation task-related functional MR imaging,

requiring neither patient collaboration nor sophisticated technical equipment," they write. "This method could have a potentially broad translation into clinical practice, providing an opportunity to investigate the effects of pharmacologic treatments."

### Positive Predictive Value of BI-RADS MR Imaging

STANDARDIZED terminology of the Breast Imaging and Reporting Data Systems (BI-RADS) lexicon enables quantification of the likelihood of malignancy for MR imaging-detected lesions through careful evaluation of lesion features, according to new research.

Mary C. Mahoney, M.D., of the University of Cincinnati Medical Center, and colleagues evaluated the positive predictive values (PPVs) of BI-RADS assessment categories for breast MR imaging and identified the BI-RADS MR imaging lesion

features most predictive of cancer. Study participants included 969 women who had recently received a breast cancer diagnosis in one breast and underwent breast MR imaging on the other breast.

Based on initial MR images, 71.3 percent had a BI-RADS category 1 or 2 assessment; 10.9 percent a category 3 assessment; 10 percent a category 4 or 5 assessment; and 7.7 percent a category 0 assessment. Thirty-one cancers were detected with MR imaging.

Mass lesion features most predictive of

malignancy were irregular shape (PPV, 0.306), spiculated margins (PPV, 0.333) and marked internal enhancement (PPV, 0.231); the type of non-masslike enhancement (NMLE) most likely to represent cancer was ductal enhancement (PPV, 0.500).

"Careful evaluation of morphologic and kinetic features of breast MR imaging lesions with the BI-RADS lexicon enables differentiation of most benign and malignant lesions," the authors write.

### Media Coverage of RSNA

In May, media outlets carried 219 RSNA-related news stories. These stories reached an estimated 223 million people.

Coverage included Yahoo! News, *CNN.com*, *Buffalo News*, *The Ledger* (Tacoma, Wash.), *Chapel Hill News*, *WOR-AM* (New York, NY), *FOXNews.com*, *USNews.com*, *Medical News Today*, *Redorbit.com*, *Auntminnie.com* and *Medscape*.

### August Outreach Activities Focus on Heart Attack Risks

In August, RSNA's 60-Second Checkup radio program focuses on how CT angiography can show the differences in heart attack risks between men and women.

### RadiologyInfo.org Posts "Your Radiologist Explains" Videos

Videos on MR Cholangiopancreatography, Children and Radiation Safety, Carotid Ultrasound, CT of the Kidneys and 13 other topics are now available on *RadiologyInfo.org* as part of the "Your Radiologist Explains" series. The video presentations feature PowerPoint slides with images and narration and are intended to help explain various radiology tests and treatments to patients.

To access the videos, go to [RadiologyInfo.org/vids](http://RadiologyInfo.org/vids).

## Education and Funding Opportunities

### Submit Abstracts for the RSNA-ASTRO Co-sponsored Cancer Imaging and Radiation Therapy Symposium

**February 8-9, 2013**  
The Hilton Walt Disney World Resort, Orlando, Fla.  
Deadline for abstract submission  
**August 13**

Abstract submission for the second Cancer Imaging and Radiation Therapy Symposium, co-sponsored by ASTRO and RSNA, is now open. Submit an abstract by August 13, 2012, 11:59 p.m. Eastern Time, in one of the following categories: anatomic imaging and normal tissue definition; molecular and biological imaging (including PET); diagnosis, staging and recurrence; therapeutic target definition; and image-guided therapeutic techniques.

The symposium will continue to focus on the collaboration between radiation oncologists and clinical radiologists—treating head and neck, breast, gastrointestinal and lung cancers—in determining the extent of a patient's cancer, developing the best radiation plan and following up for response and recurrence. Taking a multidisciplinary

look at cancer staging and treatment, the symposium will seek the many points of contact between imaging and radiation oncology from diagnosis through the entire course of the patient's disease. The future of biological imaging and adaptive therapy will also be addressed from the perspective of both specialties.



Kevin Camphausen, M.D., and Suresh Mukherji, M.D., are co-chairs of the committee planning the symposium. Dr. Camphausen is a radiation oncologist at the National Cancer Institute in Bethesda, Md. Dr. Mukherji is a professor of radiology at the University of Michigan in Ann Arbor.

Registration will open in September. To submit abstracts and for more information, go to [www.cancerimagingandradiationtherapy.org](http://www.cancerimagingandradiationtherapy.org).

### RSNA Faculty Development Workshop

**September 12, 2012**  
Chicago

REGISTRATION for the RSNA Faculty Development Workshop, a day-long course on the best techniques for designing and delivering radiology education, is now open to all members. The workshop, led by RSNA Refresher Course Committee Chair Valerie Jackson, M.D., John A. Campbell Professor of Radiology and chair of the Department of Radiology at the Indiana University School of Medicine in Indianapolis, and David J. DiSantis, M.D., associate residency program director, professor and quality, safety and compliance medical director in the Department of Radiology at the University of Kentucky, Lexington, will focus on how adults—especially physicians—best learn and how faculty can use test questions to improve their teaching.

The workshop will be held September 12, 2012 at the Westin O'Hare hotel, providing convenient access for attendees flying into Chicago. Most participants can fly in and out on the same day. RSNA staff and faculty will be on hand to discuss specific questions with participants.

The workshop fee is \$150. Registration is available at [RSNA.org/Faculty\\_Development\\_Workshop.aspx](http://RSNA.org/Faculty_Development_Workshop.aspx). For more information, contact Jennifer Comerford at [jcomerford@rsna.org](mailto:jcomerford@rsna.org) or 1-630-590-7772.



Jackson



DiSantis

## Medical Meetings

August-September 2012

### AUGUST 12-15

The Association for Medical Imaging Management (AHRA), 40th Annual Meeting and Exposition, Gaylord Palms, Orlando, Fla.  
• [www.ahraonline.org](http://www.ahraonline.org)

### AUGUST 30 - SEPTEMBER 2

Asian Oceanian Society of Radiology (AOCR), 14th Congress and 63rd Royal Australian and New Zealand College of Radiologists (RANZCR) Annual Scientific Meeting, Sydney Convention and Exhibition Centre  
• [www.aocr2012.com](http://www.aocr2012.com)

### SEPTEMBER 5-8

2012 World Molecular Imaging Congress (WMIC), The Convention Centre Dublin  
• [www.wmicmeeting.org](http://www.wmicmeeting.org)

### SEPTEMBER 6-9

American Society of Nuclear Cardiology (ASNC), 17th Annual Meeting, Baltimore Convention Center  
• [www.asnc.org](http://www.asnc.org)

### SEPTEMBER 12-15

American Society of Emergency Radiology (ASER), Annual Scientific Meeting, New Orleans Marriott  
• [www.erad.org](http://www.erad.org)

### SEPTEMBER 12-15

International Skeletal Society (ISS), Annual Meeting, Rome, Italy  
• [www.internationalskeletalsociety.com](http://www.internationalskeletalsociety.com)

### SEPTEMBER 13-16

European Society of Urogenital Radiology, joint meeting of European Symposium on Urogenital Radiology (ESUR) and British Society of Urogenital Radiology (BSUR) Annual Scientific Meeting, Royal College of Surgeons in Edinburgh, Scotland  
• [www.esur2012.org](http://www.esur2012.org)

### SEPTEMBER 15-19

Cardiovascular and Interventional Radiological Society of Europe (CIRSE), Annual Congress and Postgraduate Course, Centro de Congressos de Lisboa, Lisbon, Portugal  
• [www.cirse.org](http://www.cirse.org)

### SEPTEMBER 19-23

European Society of Neuroradiology (ESNR), Congress and Advanced Course, Edinburgh, Scotland  
• [www.esnr.org](http://www.esnr.org)

### SEPTEMBER 22-25

Canadian Association of Radiation Oncology (CARO), 24th Annual Scientific Meeting, Hyatt Regency, Vancouver, BC  
• [www.caro-acro.ca](http://www.caro-acro.ca)

FIND MORE EVENTS AT  
[RSNA.org/calendar.aspx](http://RSNA.org/calendar.aspx)

## Technology Forum

### Open-source Toolkits Create Radiation Exposure Data Repositories

Researchers have developed and validated open-source informatics toolkits capable of creating radiation exposure data repositories from existing CT dose information and nuclear medicine report archives.

Results of two studies conducted by a research team at Brigham and Women's Hospital in Boston were published in the May issue of *Radiology*.

Led by Aaron Sodickson, M.D., Ph.D., the first study demonstrated that large-scale anatomy-specific radiation exposure data repositories can be created with high fidelity from existing digital image archives by using open-source informatics tools.

Researchers created the generalized radiation observation kit, or GROK, capable of locating and retrieving volume CT dose index and dose-length product information from a DICOM image archive and converting dose screens to text for analysis.

Software was validated by using 150 randomly selected encounters for each major CT scanner manufacturer. After

validation, GROK was used to populate an exposure repository from a cohort of 54,549 CT encounters—29,948 which had available dose screens.

Results showed that dose screen retrieval occurred at a rate of 99 percent and an anatomic assignment precision of 94 percent.

"Open-source informatics tools can be used to create accurate large-scale repositories of anatomy-specific CT radiation exposure data from existing image archives, which may be useful in patient safety initiatives, including radiation exposure monitoring and technique optimization programs," the authors write.

In a second study, Ichiro Ikuta, M.D., and colleagues randomly selected 5,000 nuclear medicine reports from Sept. 17, 1985, to Feb. 28, 2011, of which 1,500 were used for an iterative code training

process that tailored the search patterns of the toolkit. Manual validation was then performed on 2,359 reports to assess effectiveness.

Results showed that the toolkit was able to extract data with a recall rate of 97.6 percent and precision of 98.7 percent. Researchers say the toolkit could potentially enhance patient safety efforts in nuclear medicine quality assurance and radiation dose monitoring.

"In particular, radiopharmaceutical administrations can be readily mapped to organ doses, opening new avenues in longitudinal patient-specific dose monitoring and risk assessment and potentially enhancing physician-patient communication and informed decision making," they write.

To access the full *Radiology* studies, go to [RSNA.org/Radiology](http://RSNA.org/Radiology).

## Journal Highlights

Continued from page 21

### Stroke is Focus of *Radiology Select*, Volume 2

The newest volume of *Radiology Select*, Volume 2: Stroke, is now available to members and non-members for purchase.

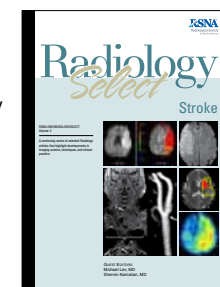
The second in the continuing series of selected *Radiology* articles focusing on a specific subspecialty topic, *Radiology Select*, Volume 2, contains 30 *Radiology* articles totaling nearly 300 pages of content dedicated to stroke and associated imaging. Volume 1 focused on pulmonary nodules.

Volume 2 covers topics including:

- Dual-energy imaging, perfusion imaging and thrombus detection

- Techniques for risk stratification, diagnosis and therapeutic monitoring in the internal carotid artery
- MR applications for predicting infarct growth, ischemic lesions and hyperperfusion
- "Mismatch" MR imaging techniques
- Observations on neonatal intracranial hemorrhage and cerebral artery flow in pediatric sickle cell disease.

The edition is available in print, online



and tablet formats. The online self-assessment module (SAM) edition features four SAM tests with the opportunity to earn up to 8 SAM credits and 12 CME credits. Interactive videos and podcasts are featured with the tablet and online SAM editions.

*Radiology Select* will be published bi-annually. To purchase and for information on *Radiology Select*, visit [RSNA.org/RadiologySelect](http://RSNA.org/RadiologySelect).

## Annual Meeting Watch

### Enroll Now for Courses

Course enrollment for RSNA 2012 is under way. Online enrollment occurs instantly, while faxed or mailed registration forms are processed in the order they are received. The RSNA 2012 Advance Registration, Housing & Course Enrollment brochure is available at [RSNA.org/register](http://RSNA.org/register). Use this brochure to make the most of your RSNA 2012 experience. RSNA has organized the information in the course brochure to help you complete your enrollment in just a few steps. Find the courses you need, build your schedule and enroll quickly and easily online or via the print form. You must be registered for RSNA 2012 in order to enroll for courses.



### NEW! "Patients First" 5K Fun Run

Tuesday, November 27, 6:30 a.m.

Arvey Field, South Grant Park, Chicago

Enjoy a 5k event with your colleagues along Chicago's beautiful Lake Michigan shore and help fuel critical research to enable the



best care for our patients. During online registration or onsite at McCormick Place, sign up as a runner or walker for the "Patients First" 5k Fun Run. The sign-up donation of \$30 will benefit the RSNA R&E Foundation and is fully tax deductible. Participants receive a commemorative T-shirt.

### Arrange Childcare

To uphold the professional and educational standards of the RSNA annual meeting, children under 16 years of age are not permitted in the exhibit halls or sessions or issued a badge. Onsite childcare will be available for children six months to 12 years through ACCENT on Children's Arrangements, Inc. Online registration and application forms are available at [RSNA2012.RSNA.org](http://RSNA2012.RSNA.org) (click childcare).

### International Visitors

If you must apply for a temporary non-immigrant visa to attend RSNA 2012, you are advised to apply as soon as U.S. travel is decided and no later than three to four months in advance of the travel date. The RSNA offers an official letter of invitation for RSNA 2012 attendees. For more information go to [RSNA2012.RSNA.org/attendees/international.cfm](http://RSNA2012.RSNA.org/attendees/international.cfm).

### Reserve Your Room Now

RSNA has many hotel rooms available at discounted rates. Register for the meeting today and reserve yours.

### Spouse/Family Member Badge: News for 2012

Full-conference professional registrants are entitled to one complimentary spouse/family member badge; each additional badge is \$50. This badge is intended for use by a spouse or family member (over the age of 16) accompanying a full-conference professional registrant to the meeting. It allows access to technical exhibit halls, Lakeside Learning Center and classrooms—space permitting—after all professional registrants have been seated. CME credit is not tracked or awarded. A co-worker or industry associate is not eligible for this badge and must register as a professional and pay the applicable registration fee.

### Guarantee Your Seat!

Tickets are required for various meeting components, including refresher and multisession courses, informatics workshops and RSNA tours and events.

All ticketed courses must be confirmed by November 21 to guarantee a seat. RSNA ticketed courses fill up fast, so ensure you get the courses you need by enrolling at [RSNA.org/register](http://RSNA.org/register). There is no onsite course ticketing. Registrants without tickets will be allowed entrance into a course after all ticketed registrants have been seated.



### Receive Registration Materials Prior to the Meeting

RSNA will mail registration materials in late October / early November to all full-conference registrants enrolled by November 2 (October 19 for International registrants). Technical exhibit-only registrants must pick up badges on the day of the exhibit attendance at McCormick Place.



### Book with Gant Travel for a Chance to Win!

RSNA attendees who book air travel through Gant Travel by September 28 will be entered into a drawing to receive a \$500 (USD) travel credit good toward future airfare on United Airlines.

Benefits of using Gant Travel for RSNA 2012 include:

- Fare-checker technology (checking for lower fares until your return flight home)
- Seat-checker technology (checking for the best available seats per your preference)
- Emergency assistance available by phone
- Flight monitoring alerts

For more information, contact Gant Travel at 1-877-613-1192, international +1 011 630-227-3873 or [RSNA@ganttravel.com](mailto:RSNA@ganttravel.com).

### RSNA 2012 Registration

#### How to Register

There are four ways to register for RSNA 2012:

**1 INTERNET—Fastest way to register!**

Go to [RSNA.org/register](http://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 2012

P.O. Box 4088

Frederick, MD 21705 USA

#### Registration Fees

BY NOV. 2 AFTER NOV. 2

BY NOV. 2	AFTER NOV. 2	Registration Fee
\$ 0	\$100	RSNA/AAPM Member
0	0	RSNA/AAPM Member Presenter
0	0	RSNA Member-in-Training, RSNA Student Member and Non-Member Student
0	0	Non-Member Presenter
165	265	Non-Member Resident/Trainee
165	265	Radiology Support Personnel
750	850	Non-Member Radiologist, Physicist or Physician
750	850	Hospital or Facility Executive, Commercial Research and Development Personnel, Healthcare Consultant and Industry Personnel
300	300	One-day registration to view only the Technical Exhibits

#### Important Dates for RSNA 2012

Oct 19	Deadline for international badge mailing
Nov 2	Deadline for housing and discounted registration
Nov 21	Deadline for guaranteed seating to all ticketed courses
Nov. 25 - 30	RSNA 98th Scientific Assembly & Annual Meeting



For more information about registering for RSNA 2012, visit [RSNA.org](http://RSNA.org), e-mail [reginfo@rsna.org](mailto:reginfo@rsna.org) or call 1-800-381-6660 x7862.

## The Value of Membership

# RSNA Offers One-Stop-Shopping for MOC Needs

Meet Maintenance of Certification (MOC) needs with the newest RSNA online self-assessment modules (SAMs) produced in conjunction with several refresher courses recorded at RSNA 2011.

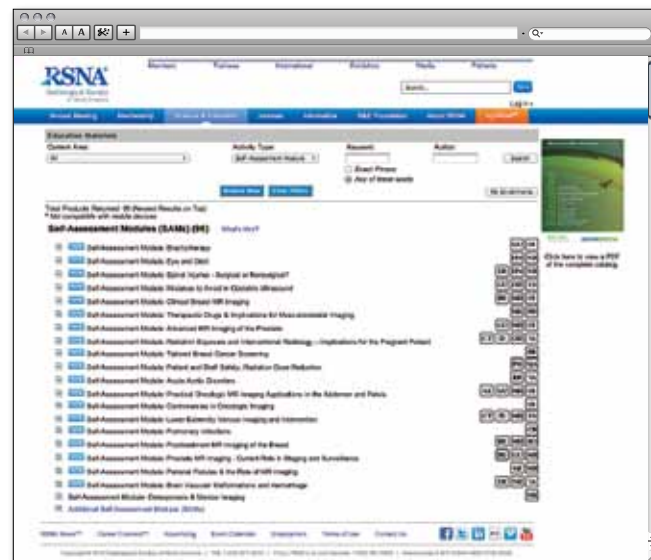
Each SAM course has been approved for *AMA PRA Category 1 Credit™* and qualifies for SAM credit by the American Board of Radiology (ABR). Online SAM refresher courses are available free to all members; nonmembers pay \$50 to access each course.

RSNA currently offers more than 80 online SAMs in nearly every radiology subspecialty area. Check out the newest titles added to the online SAMs library:

### Maintenance of Certification

- Acute Aortic Disorders
- Brachytherapy
- Controversies in Oncologic Imaging
- Eye and Orbit
- Lower Extremity Venous Imaging and Intervention
- Patient and Staff Safety with Focus on Radiation Dose Reduction
- Practical Oncologic MR Imaging Applications in the Abdomen and Pelvis
- Pulmonary Infections
- Spinal Injuries: Surgical or Nonsurgical? A Fresh Look at Injury Assessment
- Tailored Breast Cancer Screening

To view the available courses, visit [RSNA.org/education/search/sam](http://RSNA.org/education/search/sam) or call 1-800-272-2920, extension 3733 for more information.



## Explore RSNA's New Online Education Search Page

RSNA members can enhance their professional knowledge and earn CME/Self assessment modules (SAMs) credit online with RSNA's new education search page. With this free benefit, RSNA members can easily browse hundreds of online education opportunities custom-built for radiology.

Tailor searches through pre-defined content areas specific to radiologists' areas of interest or narrow searches further by browsing a pre-populated list of activity types.

Enter an author's name or keyword to further define search results. View cur-

rent course enrollments by using the "My Enrollments" button at any time.

RSNA members will find vetted and customized search results automatically populated based

on their subspecialty designation in myRSNA. Additionally, activities that

have already been completed will automatically appear with a green checkmark. Look for the blue "NEW" tag next to activities that have just been added to the growing collection of RSNA educational activities.

Visit [RSNA.org/education/search](http://RSNA.org/education/search).



## THE NEW RSNA.org

# Members Across the Globe Stay Current through International Portal

Ever-committed to serving members around the globe, RSNA now offers a Web portal devoted exclusively to the news, events and resources most critical to its international members.

With one click, visitors to the international portal on the redesigned *RSNA.org* can access everything from RSNA 2012 visa information and a library of international resources to RSNA education initiatives like the Introduction to Research for International Young Academics program. Accessible on the top menu above the search field, the international portal is your all-access pass to the news and information you want most.

Highlights include:

► **International News:** International news: Visitors can access RSNA 2012 travel and visa information, peruse a calendar of international events and stay plugged into regularly updated news and information.

► **International Resources:**

**Programs, Fellowships and Grants:** Find information on international programs, fellowships and grants for young investigators across the world.

**Membership:** Join RSNA's global community and enjoy exclusive benefits, including free registration to the RSNA Annual Meeting.

**Education Offerings:** Keep your skills sharp throughout your career with the finest online education resources.

**Journals:** Access the two top peer-reviewed journals in the field—*Radiology* and *RadioGraphics*.

**Annual Meeting:** As an RSNA member, you can receive free advance registration to the world's premier annual event in medical imaging.

**Radiology Organizations:** Explore a comprehensive list of national and international organizations in the radiologic sciences.

Additional icons at the bottom of the page direct you to essential tools and interactive content relevant to your online experience.



## COMING NEXT MONTH

In next month's *RSNA News*, experts will provide an update on the second phase of the federal Meaningful Use incentives set to take effect in 2014, and discuss radiology's progress in complying with the laws and what they can expect when the new rule takes hold.



# MAKE AN IMPACT



## YOUR GIFT CAN LEAD TO BIG RESULTS

For every \$1 the R&E Foundation provides in grants, recipients go on to receive over \$30 in additional funding for projects that advance the field of radiology.



To make a gift, visit [RSNA.org/donate](https://www.rsna.org/donate) or call 1-630-590-7760.