

Image courtesy of Drs. Emily Stern, David Silbersweig and Hong Pan.

Peering Into Mental Illness

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Radiology Professors Visit Russia
Cosmetic Radiology Explored
Weighing CT Contrast Risks

**RSNA 2013 Course Enrollment
Now Under Way—See Page 23**

RSNA News™

RSNA MISSION

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

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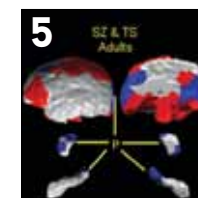
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13 Entire Paired Population
ADJ (Noncontrast Score)

	Yes	No
ADJ (Contrast Score)	22 0.5%	172 4.0%
	187 4.4%	3884 91.1%



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ACR Bestows Honors

Richard T. Hoppe, M.D., Lawrence R. Muroff, M.D., and Harvey L. Neiman, M.D., were awarded gold medals at the American College of Radiology's (ACR) recent annual meeting in Washington, D.C. **Moshe Graif, M.D., and Mukund S. Joshi, M.D.,** were named honorary fellows.

A professor of radiation oncology at Stanford University School of Medicine, Dr. Hoppe is RSNA's first vice-president and a member of RSNA's Public Information Advisors Network (PIAN). Dr. Muroff is CEO and president of Imaging Consultants, Inc., and a clinical professor of radiology at the University of Florida and the University of South Florida Colleges of Medicine. He has served on numerous RSNA committees over the years.

Dr. Neiman secured his current position as ACR's CEO following terms as chair of the ACR Board of Chancellors and ACR commissions on economics, education and ultrasound. Dr. Neiman recently announced plans to transition into retirement before stepping down as CEO in spring 2014.

Dr. Graif is chair of the Department of Medical Imaging at the Tel Aviv Sourasky Medical Center and professor of medical imaging at Tel Aviv University, both in Israel. Dr. Joshi is a consultant radiologist in the Department of Radiology at Jaslok Hospital and Research Centre and medical advisor in radiology at Kohinoor Hospital, both in Mumbai, India. He was named an RSNA Honorary Member in 2012 and is a current member of RSNA's International Advisory Committee.

ABR Executive Director Becker to Retire; Successor Sought

American Board of Radiology (ABR) Executive Director **Gary J. Becker, M.D.,** has announced he will retire from the position on June 30, 2014. ABR is accepting applications for his successor.

Dr. Becker, who served as RSNA president in 2009, became ABR executive director in January 2008.

The executive director supports the ABR Board of Trustees and oversees the operation of the ABR office and its staff of approximately 70 employees. The position reports to the president of the ABR, who also serves as the Chair of the Board of Trustees. The executive director represents the ABR to the public and medical community at large at the discretion of the president and the trustees. Candidates will be evaluated in terms of their experience as a diagnostic radiologist, radiation oncologist, interventional radiologist, or medical physicist; demonstrable experience working with the ABR; and experience and demonstrated accomplishment in leadership and management roles involving strategic planning, operations, human relations, and information technology management. Candidates should anticipate providing a mutually agreed-upon commitment for at least five years with renewable commitments to be determined thereafter.

For a detailed copy of the position posting, including how to apply, go to www.theabr.org/sites/all/themes/abr-media/pdf/ABR-executive-director.pdf.



Becker

Numbers in the News

1.3

Number in millions, of pageviews of the RSNA online journals in 2012. A redesign of the journals' online presence promises even more features and functionality. [See Page 7.](#)

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Population, in millions, of Russia. [Turn to Page 9 to read what a group of RSNA visiting professors learned during their recent trip to the country.](#)

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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.](#)

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Number, in millions, of people reached by RSNA-related stories in May. [Read more about coverage of RSNA in the media on Page 20.](#)

RSNA Editorial Fellows Announced

Mindy M. Horrow, M.D., a professor of radiology at Thomas Jefferson University and director of body imaging and co-director of the vascular laboratory at Einstein Medical Center, both in Philadelphia, has been named the 2013 RSNA Eyer Editorial Fellow. **Sina Tavakoli, M.D.,** a fourth-year resident in the research track radiology program at the University of Texas Health Science Center at San Antonio, is the 2013 Olmsted Trainee Editorial Fellow.

Dr. Horrow's work focuses on ultrasound, women's imaging and genitourinary radiology. Her editorial experience includes serving as associate editor of the women's imaging section of *RadioGraphics*, co-editor of the *RadioGraphics* monograph issue, "Gynecologic Imaging through the Life Span" and reviewer for the *American Journal of Roentgenology*, *Journal of Women's Imaging* and *Ultrasound Quarterly*.

Dr. Horrow said she aims to help publications engage more readers via digital media. "Our profession must continue to cultivate and nurture academic talent in our junior colleagues by using the technology that forms their media currency," she said. "I intend to utilize the Eyer Fellowship to assist the academic careers of other radiologists as well as improve my effectiveness in serving RSNA journals. These goals will further support RSNA publications to become part of the vanguard of 21st century scientific journalism."

In addition to her work with *RadioGraphics*, Dr. Horrow's work with RSNA has included reviewing abstracts in genitourinary radiology and moderating panel discussions for the annual meeting. She has served as examiner in ultrasound for the American Board of Radiology oral board examinations and on the Women's Imaging Panel considering American College of Radiology appropriateness criteria.

She is the recipient of many awards including the Mary Fisher Outstanding Educator Award from the Philadelphia Roentgen Ray Society and the Stanley J. Cohen Award for Research from the Albert Einstein Medical Center in Philadelphia.

Dr. Tavakoli received his medical degree from Tehran University of Medical Sciences. Prior to his residency, he worked as a post-doctoral fellow in the Institute for Genetic Medicine at the University of Southern California in Los Angeles and served as a post-doctoral fellow in the Cardiovascular Molecular Imaging Laboratory at Yale School of Medicine in New Haven, Conn.

Dr. Tavakoli's research focuses on molecular imaging of cardiovascular disease. He received a Research Resident Grant from the RSNA Research & Education Foundation in 2011 for his project on targeted non-invasive imaging of macrophage activation in vascular remodeling.

In addition to publishing in numerous major publications, Dr. Tavakoli has served as a reviewer for journals including *Molecular Imaging*, *Atherosclerosis*, and *Digestive Diseases and Science*. "I have experienced,



Horrow



Tavakoli

both as an author and a reviewer, the vital importance of the peer-review process to ensure the high quality of the publications through a fair, confidential and timely review process," Dr. Tavakoli said.

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 and Communications Departments at RSNA Headquarters in Oak Brook, Ill. Dr. Horrow will also work with the RSNA editorial team at RSNA 2013.

CIBR Shows Washington the Importance of Imaging

This year's Coalition for Imaging and Bioengineering Research (CIBR) Medical Technology Showcase drew policymakers and staff from 33 states. The annual Capitol Hill event highlights how imaging research is improving patient care and funding for the National Institutes of Health (NIH) is critical for future imaging innovations.

Christopher Austin, M.D., director of the National Center for Advancing Translational Sciences (NCATS) at the NIH, delivered the keynote address. Dr. Austin described how imaging will help move forward the agenda at NCATS through its potential to greatly shorten therapeutics clinical trials while possibly adding quantitative imaging to efficacy testing. Research program personnel from the NIH, U.S. Food & Drug Administration, Department of Veterans Affairs and Department of Defense also attended along with representatives of numerous radiology societies and academic radiology departments.

The showcase capped a day of meetings on Capitol Hill during which patients, academics and industry representatives met with more than 40 offices in support of NIBIB. To learn more about CIBR go to www.imagingcoalition.org.



AAPM SYMPOSIUM LECTURERS ANNOUNCED

The RSNA Board of Directors has named the lecturers who will present during the American Association of Physicists in Medicine (AAPM) Symposium at RSNA 2013. They are:

AAPM SYMPOSIUM LECTURERS

David A. Jaffray, Ph.D.
Toronto

James A. Deye, Ph.D.
Bethesda, Md.



Jaffray



Deye



PROGRAM DEDICATION

David H. Hussey, M.D.



Hussey

The Board of Directors have also announced that the RSNA 2013 Meeting Program will be dedicated to the memory of 2005 RSNA President

David H. Hussey, M.D., who died in April. The Meeting Program will also be dedicated to the memory of Philip E.S. Palmer, M.D., as announced previously.

For more information about RSNA 2013, go to RSNA.org/Annual_Meeting.aspx.

CAR Awards Gold Medals

The Canadian Association of Radiologists (CAR) presented Gold Medal Awards to **Richard Rankin, M.D.**, and **Shia Salem, M.D.**, during the society's recent annual scientific meeting in Montreal.

Dr. Rankin is professor emeritus at the University of Western Ontario where he served as the program director and department chair of medical imaging for more than 20 years. He was president of the Canadian Radiological Foundation from 2003 to 2011 and previously served as a member of the RSNA Public Information Advisors Network (PIAN) and Education Exhibits Awards Committee. Dr. Rankin did not attend the ceremony.

Dr. Salem is an associate professor of ultrasound at Mount Sinai Hospital in Toronto and has been a co-director and speaker at the University of Toronto conferences on obstetric ultrasound and women's imaging for the past 16 years. He received a Certificate of Appreciation from the Royal College of Physicians and Surgeons of Canada and was awarded the Ontario Association of Radiologists' Lifetime Achievement Award in 2004.



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

McKinney Named APDR President

J. Mark McKinney, M.D., was named president of the Association of Program Directors in Radiology (APDR) Board of Directors during the society's recent annual meeting in Los Angeles.

Dr. McKinney is the Interventional Radiology (IR) Fellowship Program Director and IR Section Chief at the Mayo Clinic in Jacksonville, Fla. He is a member the Society of Interventional Radiology and serves as Councilor to the American College of Radiology.



McKinney

My Turn

A New Look for RSNA's Journals

Over the past several decades, all of us have had our lives reshaped by a burgeoning array of online communications tools. We now receive information through a variety of media and communicate with one another in myriad web-assisted, video and asynchronous ways. We also have ready access to vast information stores, even on our hand-held devices.

Online communication tools have also shaped scholarly publications, including the RSNA's online journals, *Radiology* Online and *RadioGraphics* Online, since their inception in 1998. At the time, advances in search functions, email alerts, and availability of supplemental material were considered revolutionary. As the Web has evolved, so have the features of our journals to keep pace with the needs of RSNA's readers.

In 2009-2010, our online journals were redesigned to take advantage of newly developed Web 2.0 capabilities that improved reader interactivity and facilitated more customized content navigation. These enhancements were well received and the usage of the online journals has grown dramatically.

For instance, in 2012, 66 percent of *Radiology* subscribers and 61 percent of *RadioGraphics* subscribers received the journals online only. There was an astonishing total of 1,340,500 visits to the RSNA online journals' homepages and 1,775,000 views of their abstracts. Moreover, many readers also took advantage

of the RSNA mobile journal apps, with over 39,000 installations by the end of 2012. As we visit medical centers around the country for the RSNA's Visiting Editors Programs, we consistently hear that most readers have come to rely on being able to access journal content online. As a result, incorporating advances in online publication is a high priority for the RSNA.

This year, the online journals are poised to enter another new phase, as we shift production from Highwire Press to Atypon, a leading provider of specialty software to deliver online content. The enhanced semantic, bibliometric and social networking capabilities offered by Atypon should further enhance readers' experience. Readers will have increased capabilities to customize content by needs and interests. In time, they will be able to peruse only the content they want to see, where they want to see it, and in the way they want it presented.

The enhanced journal homepages will also offer simpler navigation. Social networking tools will improve interactive

communications about journal content among individuals, groups, and online forums. The new semantic features will further improve search capabilities, facilitate the assignment of expert reviewers to newly submitted articles under review, and provide a better format for creating and analyzing metadata. We also envision providing online tools to help readers more easily wade through the confusing array of abbreviations and acronyms that populate our journals.

We look forward to receiving your comments on the redesigned online journals and how the new features impact your experience.



RadioGraphics Editor Jeffrey S. Klein, M.D., and Radiology Editor Herbert Y. Kressel, M.D.

THIS MONTH IN THE RSNA NEWS TABLET

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

August features a Podcast discussion on recent *Radiology* studies focusing on CT contrast issues moderated by *Radiology* Editor Herbert Y. Kressel, M.D., and including researchers and other experts on the issue, along with a PowerPoint presentation illustrating recent research on the effectiveness of laser liposuction in interventional radiology.

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



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Seeking MR Imaging Biomarkers for Mental Illness

Despite significant advancements in diagnosing and treating psychiatric disorders in recent years, biological tests are still not part of the process. However, researchers using functional MR imaging (fMRI) to examine brain activity are investigating potential biologic markers for diagnosis and treatment of these complex illnesses.

CURRENTLY, diagnosing a psychiatric disorder involves several steps, including an evaluation by a physician if symptoms are present. The patient is then referred to a psychiatrist, who—depending on the symptoms and the patient's behavior—makes a diagnosis based on Diagnostic and Statistical Manual of Mental Disorder (DSM).

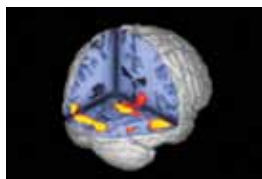
"It's a book of descriptive diagnoses—there's nothing biological about it," said Emily Stern, M.D., director of functional and molecular neuroimaging in the Department of Radiology at Brigham and Women's Hospital (BWH) in Boston. "It's remarkable that in the 21st Century someone can walk into a doctor's office and get diagnosed for a psychiatric disorder without one biological test."

So Dr. Stern, co-director of the Functional Neuroimaging Laboratory at BWH (along with David Silbersweig, M.D., chair of the Department of Psychiatry at BWH), has spent much of her career utilizing functional imaging—particularly fMRI—to examine the brain activity of patients with psychiatric disorders. "The goal is to look at the neurocircuitry that underlies symptom formation across a number of disorders," she said. "We then try to understand some of the similarities and differences among and between disorders so that we can get a better idea of the biology that causes symptom formation."

Dr. Stern and colleagues use fMRI to examine a variety of psychiatric illnesses including schizophrenia, affective disorders such as depression and bipolar disease, anxiety disorders, borderline personality disorder, panic disorder and post-traumatic stress disorder. Examining multiple disorders makes sense because many of the symptoms overlap, she said. For example, patients with schizophrenia may become depressed, while those with depression may become anxious and anxious patients often become depressed.

ON THE COVER

Abnormal brain activity in memory and visual regions in a patient with post-traumatic stress disorder.



Stern

Bansal (left), Peterson

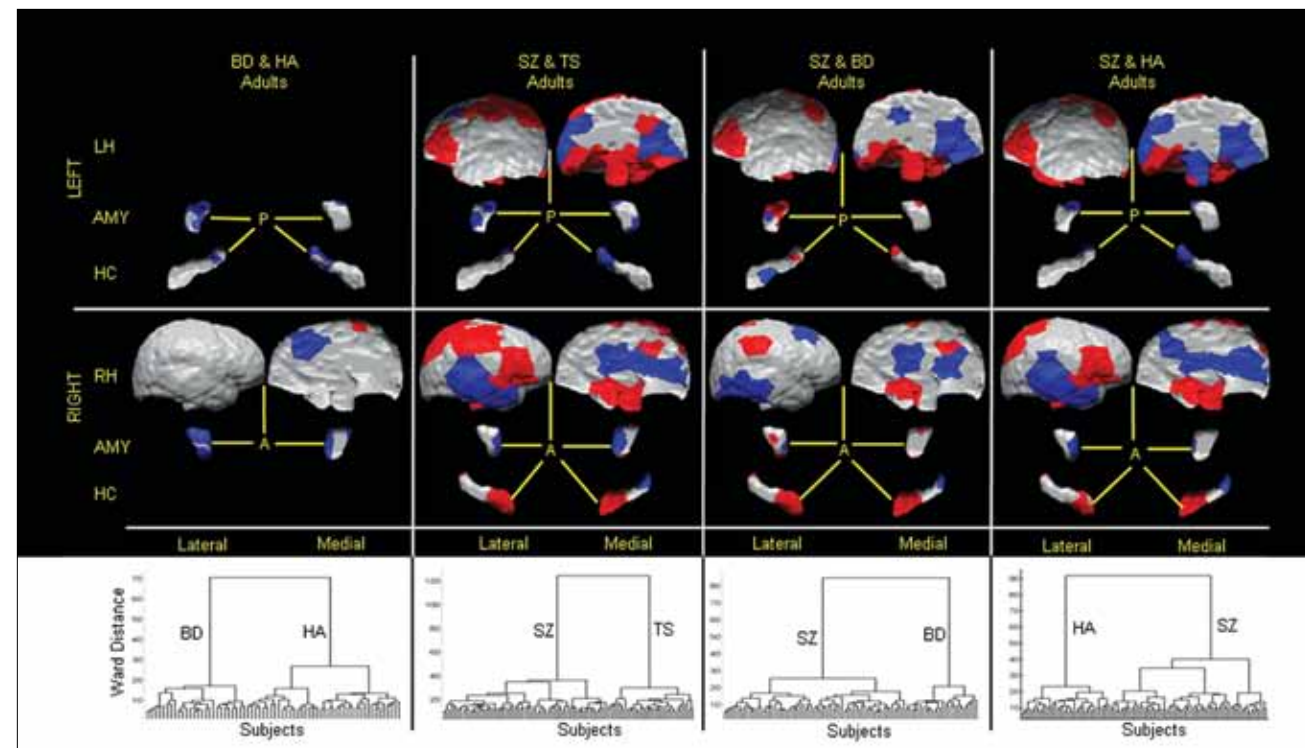
"The descriptive categories in the DSM aren't really hard and fast," Dr. Stern said. "Looking at the biological underpinnings of particular symptoms can help us to elucidate a biological framework for understanding all of these disorders."

In addition to using imaging tools as biomarkers to provide a foundation for possible future diagnosis of psychiatric disorders, one of Dr. Stern's major goals is to use imaging to guide treatment. For example, it would be extremely helpful to psychiatrists if scanning could help predict treatment response, and there is already some work in the field on this, she said.

"This is so important because some of the very standard forms of pharmacotherapy, such as serotonin reuptake inhibitors (SRIs) can take six to eight weeks to kick in and we wouldn't know until that point whether the

"It's remarkable that in the 21st Century someone can walk into a doctor's office and get diagnosed with a psychiatric disorder without one biological test."

Emily Stern, M.D.



Researchers are using anatomical MR imaging to diagnose conditions in brains based on patterns that emerge in the voxels that represent 3D images—a potential breakthrough for diagnosing and treating mental illness. Above: Classifying an adult as healthy or with a disorder, or between two neuropsychiatric illnesses.

Bansal R, Staib L.H., Laine A.F., Hao X., et al. (2012) "Anatomical Brain Images Alone Can Accurately Diagnose Chronic Neuropsychiatric Illnesses." PLoS ONE 7(12): e50698. doi:10.1371/journal.pone.0050698

treatment will be efficacious or not," she said. "That's a long time to wait for someone who's potentially suicidal. There is a great need to come up with an effective biological predictor of treatment response."

She points out that there are already examples of how such work can impact treatment. "One of the first studies we did was to identify certain areas of the brain that underlie hallucination formation in schizophrenia. Investigators at Yale then took this information and used transcranial magnetic stimulation in these regions to reduce hallucinations in schizophrenic patients," Dr. Stern said. "We're getting there in very small steps, but we haven't arrived at the point where we reliably have a biomarker that we know will work in individual patients. That's our goal."

Brain Imaging Algorithm Could Aid Diagnosis, Treatment

Other researchers are using anatomical MR imaging to investigate patterns that emerge from the voxels that represent 3D images—a potential breakthrough for diagnosing and treating mental illness.

At Columbia University, Bradley Peterson, M.D., director of the Center for Developmental Neuropsychiatry, New York, and Ravi Bansal, Ph.D., of the Brain Imaging Laboratory, New York State Psychiatric Institute, New York, have developed an automated method of diagnosing neuropsychiatric illnesses using anatomical MR imaging of the brain.

The spatial variation across voxels and brain subregions, rather than differences within voxels, are mostly likely to represent the abnormalities that produce and define a specific neuropsychiatric illness, according to Drs. Peterson and Bansal.

These patterns across the brain, said Dr. Peterson, are analogous to the dermatomal ridges on a fingertip—a fingerprint. "You don't identify a person by looking at a single point on that person's fingertips," he said. "Instead you look at the overall pattern of those ridges. Rather than analyze the data point by point at every millimeter of the brain, we wanted to capture spatial

variations or the spatial pattern of abnormalities, compared with healthy controls or people with other disorders."

Drs. Peterson and Bansal developed a new algorithm that can diagnose these illnesses based on those spatial variations or patterns. This approach, and the idea that imaging can be used in the diagnosis of psychiatric disorders, has profound implications for patients and their doctors.

Mental health professionals are very good diagnosticians, said Dr. Peterson, and they are usually able to narrow down the possibilities very quickly at the time of initial presentation. But, "only time will most likely tell you what the exact diagnosis turns out to be," he added.

Just as an internist can order a test to determine blood glucose levels to diagnose Type 2 diabetes, psychiatrists would like to have that same kind of diagnostic certainty to prescribe the best treatment as quickly as possible. Both doctors believe their algorithm can be the lab test that can aid in diagnosis, help treatment planning, put people on the right medications, and give them a more accurate prognosis.

Dr. Peterson also believes the algorithm offers a way of identifying subgroups within disorders, explaining that each should have a different response to specific treatments and different genetic and environmental causes. "We would like to know what those causes and specifically tailored treatments are. And so the prospect of identifying biological subtypes for both research and clinical use is incredibly compelling and exciting, and in my opinion, that's the greatest potential value of this kind of clinical aid." □

WEB EXTRAS

To access the study, "Anatomical Brain Images Alone Can Accurately Diagnose Chronic Neuropsychiatric Illnesses," by Ravi Bansal, Ph.D., and colleagues in the December 2012 issue of PLOS ONE, go to www.plosone.org/articleinfo%3Adoi%2F10.1371%2Fjournal.pone.0050698.

For more information on the Functional Neuroimaging Laboratory at Brigham and Women's Hospital, go to www.functionalneuroimaging.org.

RSNA Launches Image-rich Redesign of Radiology, RadioGraphics Websites

Colorful, prominently placed images that offer maximum functionality are among the eye-catching highlights of the redesigned Radiology and RadioGraphics websites set to debut in early September.

WHILE continuing to offer the same high-quality, educational content users have come to rely upon, the websites will feature in-depth search options, more interactive content, access to mobile CME and improved functionality, navigation and usability—all in an aesthetically engaging new package.

An image from each of RSNA's two peer-reviewed scientific journals will anchor each site along with smaller images from that research. Making full use of the images so critical to the journals, both sites will offer a new function allowing users to compare images from within a journal article—a feature unique to RSNA journals.

A new single sign-in process will allow users to move seamlessly between journal websites, *RSNA.org* and RSNA's New Learning Management System once they have logged onto any of those sites.

RSNA user feedback about most desired functions and features was the basis for the redesign that coincides with a transition to the online platform Atypion, a leading provider of content delivery solutions for some of the largest names in publishing, such as the *New England Journal of Medicine*. The changes will allow RSNA to deliver more relevant, targeted content efficiently and accurately, according to journal editors who are excited about the upcoming launch.

"The new site should be very user friendly and allow a more customized reader experience," said *Radiology* Editor Herbert Y. Kressel, M.D. "Also, the enhanced semantic capabilities should be helpful in searching content and gathering metadata."

The new site will offer an abundance of educational improvements, according to *RadioGraphics* Editor Jeffrey S. Klein, M.D. "The new *RadioGraphics* website will allow our readers to more readily access current and past educational content, and in particular will provide novel tools that allow customized delivery and archiving of material pertinent to each radiologist's practice and MOC efforts," Dr. Klein said. □

“The new site should be very user friendly and allow a more customized reader experience.”

Herbert Y. Kressel, M.D.

JOURNALS PAGE

Redesigned in a new, easy-access format, **RSNA Journals** is your one-stop connection to all of RSNA's prestigious publications. Along with links to *Radiology*, *RadioGraphics*, the *Radiology* Legacy Collection and *Radiology Select*, **RSNA News** joins the Journals Page under "Latest News" linking users to the most critical issues facing radiology.

Access an optimized search engine featuring in-depth functions as well as a host of resources on everything from the latest developments/announcements to mobile options for maximizing your journal experience. Interactive content—including a video tutorial on the new online platform—are a prominent part of the redesigned page.



An optimized search function maximizes your online experience

View colorful images from current issues

Access Podcast discussions of selected Radiology articles

View colorful images from current issues

Link to content geared toward Residents & Fellows

RADIOLOGY

The vibrant redesign matches the world-class content that has made *Radiology* the leading peer-reviewed scientific journal in its field. Innovative new features include colorful images from the current issue and a prominent link to current Podcast discussions of selected articles. Links to the current issue, CME and Published Ahead of Print Articles can be easily found along with a streamlined library of resources (most cited, mobile options, etc.) now located just above This Month in *Radiology*.



An optimized search function maximizes your online experience

Browse *RadioGraphics* by subspecialty

RADIOGRAPHICS

Vivid, prominently placed images play a critical role in the redesign of the journal of continuing medical education in radiology. Along with colorful images from key articles in the current issue, the *RadioGraphics* home page spotlights CME opportunities and quick access to browsing by subspecialty. The Illuminations section featuring the radiologic artwork of Dr. Kai-hung Fung is more prominently displayed while a new Residents & Fellows section links users to content specifically geared toward members in training.

Russian Radiologists Make the Most of Limited Medical Resources

Three U.S. radiologists who recently visited St. Petersburg, Russia, to assist with radiologic education came away with valuable lessons from Russian physicians adept at reaping the maximum benefits from an often limited pool of resources.

THE SECOND largest city in Russia, St. Petersburg is rich in art and culture, but often wanting for the funding, education and technology necessary to advance its healthcare system. Nevertheless, radiologists who visited the city through RSNA's International Visiting Professor (IVP) Program left with a true appreciation for the high-quality work Russian physicians are performing despite the lack of resources and other challenges.

"I was impressed by how little physicians are compensated and the dearth of resources they have to do their jobs," said Curtis E. Green, M.D., a professor of radiology and cardiology at the University of Vermont College of Medicine and an attending radiologist at Fletcher Allen Health Care, both in Burlington. "The Russian physicians could probably teach us a thing or two about making maximum use of our medical resources."

Dr. Green was joined by Nafi Aygün, M.D., and Johnny Monu, M.D., for the two-week April trip to Russia. The RSNA IVP program annually sends highly regarded professors to lecture at national radiology society meetings and visit radiology residency training programs at select host institutions in or serving developing nations.

All on their first IVP expeditions, the radiologists lectured at various medical institutions, taught intensive seminars to radiology residents, attended various conferences and meetings, and participated in the Nevsky Radiology Forum, which is the second largest national radiology meeting in Russia.

While roughly 2 percent of the country's budget is devoted to healthcare and many of St. Petersburg's healthcare facilities and institutions are in need of repair, the physicians and the work they are doing are of the highest quality, the professors said. "The scientific work presented in the meetings I participated in was very sophisticated," said Dr. Aygün, an associate professor of radiology at the Russell H. Morgan Department of Radiology and Radiological Sciences at Johns Hopkins University in Baltimore.

TB and AIDS are Major Health Concerns

The medical institutions and facilities on the itinerary offered the professors an up-close look at the day-to-day workings of the city's healthcare system. Dr. Green said the friendly, inquisitive staff and residents at Pavlov State Medical University and the

Saint Petersburg Research Institute of Phthisiopulmonology, showed him some interesting—even surprising—cases.

"I was impressed by the number and severity of cases of tuberculosis (TB) they treat," Dr. Green said. "Many of the patients come from central Asia and have multi-drug resistant TB. There is a 250-bed hospital devoted entirely to children with TB. It's truly a devastating disease for these individuals."

At the Mariinskaya Hospital, a well-received presentation on the diagnosis and management of TB of the spine led professors to the realization that the disease is still a major health issue in Russia, said Dr. Monu, a staff radiologist at the University of Rochester Medical Center and a professor at the University of Rochester, N.Y.

AIDS is another major healthcare issue in the country and public awareness is not as high as it should be, said Dr. Aygün, who lectured at the Nevsky forum, the Bechtereva Institute of the Human Brain of the Russian Academy of Sciences and the Center for AIDS and Infectious Diseases.

"Infections secondary to AIDS are much more common than in the U.S. and appear to overwhelm the capacity of healthcare delivery," Dr. Aygün said. "On the other hand, at the research level, they are tackling the same problems we have, such as HIV-related cognitive impairment. In short, there is a dichotomy: high-quality work is being done in certain places, but overall standards aren't as high and there seems to be a huge need for postgraduate CME."

Medical Equipment in Short Supply

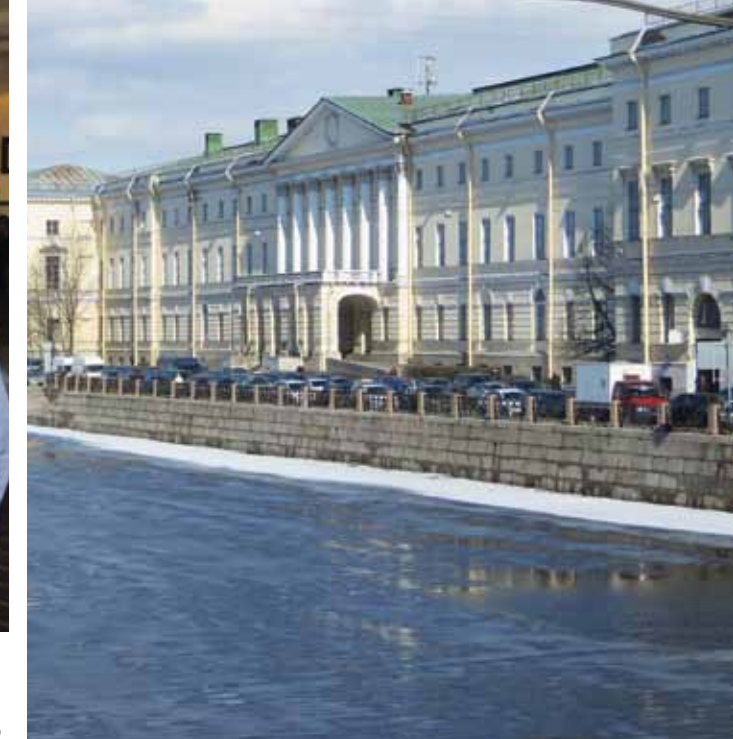
In terms of technology, the professors describe the radiology equipment as advanced but in relatively short supply. "The quality of equipment was good, but there were far fewer machines than we have here," Dr. Green said. "For example, the thoracic hospital I visited—with more than 600 beds—had only two CT scanners. I think that much less use is made of each scanner and they seem to rely more on clinical evaluation rather than technology. This is not necessarily a bad thing, however."

"I was impressed by how little physicians are compensated and the dearth of resources they have to do their jobs."

Curtis E. Green, M.D.



The three radiologists who traveled to St. Petersburg, Russia, through the RSNA International Visiting Professor (IVP) Program were impressed with the work performed by Russian physicians despite a lack of resources. The trip was hosted by Nevsky Radiology Society and Philips Medical Systems. Above, front row (left to right): Rosemary Monu and husband and IVP member Johnny Monu, M.D., Elena Dizendorf, M.D., medical director of Philips, and IVP member Curtis E. Green, M.D.; back row (left to right): IVP member Nafi Aygün, M.D., Filipp Taratynov, education manager at Philips, and Dimitry Kupriyanov, Ph.D., a physicist with Philips.



When not touring medical facilities, the RSNA International Visiting Professors found time to explore the beauty of St. Petersburg, including the breathtaking St. Petersburg Canal (above).

For example, one of the hospitals made extensive use of nuclear medicine perfusion scans of the chest to guide surgical resection of TB lung, Dr. Green said. "I have not encountered that here in the U.S., as surgery is rarely necessary due to our different patient population," he said.

In fact, nuclear medicine is an area where Russia is excelling, according to the professors. Dr. Aygün said nuclear medicine techniques in neuroradiology are more sophisticated in Russian than in the U.S. "We saw very interesting applications of C11-Methionin-PET in central nervous system tumors as well as cryoablation of brain tumors," Dr. Aygün said.

Education, Salaries Often Lacking

Salaries and educational opportunities for Russian radiologists vary dramatically from what U.S. radiologists experience, the professors said.

Residency training is just two years and the country doesn't offer a formal fellowship program. Because education is sorely needed in all areas of radiology, specialty training could benefit greatly from exchanges with U.S. institutions, they concurred. "Two young fellows wanted to know how to continue their residencies in the U.S.," Dr. Monu said.

Those who do earn medical degrees often find the salaries for available positions lacking. Although most doctors are employed at government institutions, many also work at private practices or even in other professions, Dr. Monu said. "Many medical doctors appear disenchanted with the system and some claim they may make a better living at other professions than being a doctor," Dr. Monu said.

"One of our interpreters trained in OB but could quadruple his salary as an interpreter and so never practiced medicine after his residency," Dr. Green said. "I have no idea what residents' salaries are, but I am sure they must be quite low."

Continued on Page 12

PRESENTED IN RUSSIAN, "NAVIGATING RSNA 2013"

RSNA will offer a new series of informal discussions at its 2013 Annual Meeting, "Navigating RSNA 2013." Suggested for first- and second-time meeting attendees, these discussions will be presented in various languages, including Russian. The Russian discussion is scheduled for 7:30-8 a.m., Monday, December 2, at the Global Connection booth, part of the RSNA Services Area and located



in the Lakeside Center Ballroom (Level 3) at the McCormick Place Convention Center.

First-time attendees may find their experience at the RSNA Annual Meeting to be overwhelming given the large number of education and networking opportunities, and exciting activities Chicago has to offer. The leaders of "Navigating RSNA 2013" are experienced RSNA meeting attendees and will provide advice about cultural insights, the RSNA Annual Meeting and the city of Chicago in an effort to make attendee's experience the best possible.

For more information about "Navigating RSNA 2013" and the Global Connection Booth, visit Rsna.org/Global_Connection.

Cosmetic Interventional Radiology: Another New Face of the Specialty?

Several years ago, interventional radiologist Ziv Haskal, M.D., observed that cosmetic procedures such as injections of botulinum toxin (Botox), dermal fillers and treatment for hyperhidrosis (excess sweating) were being performed “by every specialty of medicine on the planet.”

ALONG with obstetricians, ophthalmologists, vascular surgeons and internists who offered such treatments, “there was a diagnostic radiologist who had a longstanding cosmetic clinic in midtown Manhattan,” said Dr. Haskal, a professor of radiology at the University of Maryland Medical Center, Baltimore and editor-in-chief of the *Journal of Interventional Radiology*.

Given that such cosmetic procedures involve many of the tools and procedures interventional radiologists already know well, Dr. Haskal began looking for a way to spark further interest in cosmetic procedures within the interventional radiology (IR) specialty.

“We were already doing procedures such as injecting medications, treatments for pain and nerve blocks,” Dr. Haskal said. “These skills make us as capable—if not more capable—than other specialties that aren't necessarily wielding needles as part of their daily practice.”

In 2007, Dr. Haskal, the meeting chair of the Society of Interventional Radiology (SIR), organized an all-day symposium to explore what he coined “Cosmetic IR.” He was stunned when more than 600 interventional radiologists showed up. Since then, workshops and sessions on cosmetic IR have become a staple of the SIR annual meeting.

At this year's SIR meeting, the session “Laser Liposuction in Interventional Radiology,” presented by Abbas Chamsuddin, M.D., drew considerable media attention for its findings suggesting that minimally invasive lasers melt fat more effectively than a “tummy tuck.”

Dr. Chamsuddin, an interventional radiologist at the Center for Laser and Interventional Surgery in Atlanta, and colleagues presented results of a study examining skin tightening in about 2,200 patients who underwent laser liposuction on various parts of the body (75 percent of the patients were women). He has been practicing laser liposuction since it was approved by the U.S. Food and Drug Administration (FDA) in 2008.

According to Dr. Chamsuddin, many people are afraid to try liposuction because they fear it will cause skin to sag after the fat is removed. In his research, Dr. Chamsuddin found that laser lipolysis enables the removal of more fat than standard liposuction. When used in combination with standard

liposuction, the fat-melting action of laser lipolysis has the added benefit of producing new collagen. Additionally, the laser causes the collagen to contract, which tightens the skin.

“Combining traditional liposuction with laser lipolysis has now been shown to produce well-sculpted bodies with tight skin,” Dr. Chamsuddin said. “We are able to give people benefits such as a tighter abdomen without the need for surgery.”

Vein Interventions Open Door to Laser Liposuction

Dr. Chamsuddin said that his interest in laser liposuction—and more broadly, cosmetic radiology—was spawned by the development and approval of fiber optic endovenous laser technology for the treatment of varicose veins back in 2001.

Once he decided to pursue laser liposuction, he went through a training period that involved performing 25 different liposuction cases in five different areas of the body under the guidance of physicians who regularly performed the procedure. “I learned the basic techniques of liposuction and purchased my first generator,” he said. “My experience with fiber optic laser helped me feel comfortable doing laser liposuction.”

“That's the beauty of interventional radiology—it can house patient care all the way from birth to an advanced age, and everything in between.”

Ziv Haskal, M.D.



Haskal



Combining traditional liposuction with laser lipolysis produces well-sculpted bodies with tight skin, according to researcher Abbas Chamsuddin, M.D., who presented, “Laser Liposuction in Interventional Radiology” at the 2013 Society of Interventional Radiology annual meeting. Above: Before (left) and after images of a patient who underwent laser liposuction which enables the removal of more fat than standard liposuction and has the added benefit of production new collagen, Dr. Chamsuddin said.

Images courtesy of the Society of Interventional Radiology

The fact that many interventional radiologists like Dr. Chamsuddin have offered vein interventions as part of their practice may have sparked these practices into providing other cosmetic interventions, said Dr. Haskal, who added that “it's a very tiny step to move into these cosmetic interventions for many of the patients you've already seen for varicose vein interventions.”

That's exactly how Dr. Chamsuddin's practice evolved. Many of his patients were originally treated for conditions like varicose veins or fibroids and began asking him about cosmetic procedures. He estimates that about 50 percent of his practice now involves cosmetic IR. Nevertheless, “I still have my workstation so that every morning at 7 a.m. I'm sitting down and reading studies,” Dr. Chamsuddin said.

Cosmetic Radiology a Burgeoning Trend

While there are relatively few interventional radiologists who have freestanding practices devoted solely to cosmetic IR, “it certainly plays an adjunct or additional role in many practices,” Dr. Haskal said.

“I view this as a natural extension of an outpatient practice, particularly a vein practice,” Dr. Haskal said. “Cosmetic IR fits well into the broad and heterogeneous landscape of interventional radiology. That's the beauty of interventional radiology—it can house patient care all the way from birth to an advanced age, and everything in between.”

Dr. Chamsuddin expects the trend towards cosmetic radiology to mushroom, particularly as radiologists continue to feel the reimbursement squeeze. Unlike many interventional procedures, Dr. Chamsuddin acknowledges that he expects to be fully reimbursed for laser liposuction since it's not covered by insurance and the patient is responsible for payment.

“I know at the end of the procedure I'm going to have a satisfied patient and I know I'm going to be paid right away,” he said. “It provides satisfaction in two ways—my patients are happy and I'm able to support my staff and practice.” □

Russian Radiologists Make the Most of Limited Medical Resources

Continued from Page 10

Better access to educational materials is critical, according to the professors who say Russian physicians could greatly benefit from the resources available in the U.S., including those offered by RSNA. “Internet is very available in Russia, so access to learning materials from the RSNA would be helpful,” Dr. Monu said.

To meet the needs of radiologists from around the world including a growing number of members from Russia, RSNA is expanding its education resources to include over 600 online courses. For those unable to travel to RSNA 2013, the virtual meeting offers select sessions on-demand throughout the week of the meeting and the following week.

“I would love to see the U.S. sponsor some radiology residents or young faculty to spend a few weeks here,” Dr. Green said.

Russians 'Proud of Their Country'

When not touring medical facilities, the professors found time to explore the beauty of St. Petersburg, which Dr. Green describes as a “very interesting city with stunning architecture, museums, statues and churches. It is amazingly European in ambiance.”

In terms of the Russian citizens, the professors left with a very favorable impression. “All the people were very warm and friendly and generally wanted to help,” Dr. Monu said. “My impression is that the average Russian is very proud of his or her country.”

The Russian IVP trip was hosted by the Nevsky Radiological Society and Philips Medical Systems. In 2014, IVP teams are scheduled to travel to Argentina, Brazil, Mexico, South Africa and Tunisia. □

WEB EXTRAS

For more information on the RSNA International Visiting Professor Program, go to RSNA.org/International_Visiting_Professor_Program. Applications for the 2015 IVP program will be posted in late summer 2013.

The IVP program is made possible by the support of Agfa HealthCare and Fujifilm Medical Systems.

Radiology Studies Shed New Light on CT Contrast Risks

Although intravenous iodinated contrast media used in some CT exams has long been regarded as potentially harmful to kidneys, two April 2013 *Radiology* studies found no evidence that patients undergoing CT exams with contrast face an increased risk of kidney injury.

DEMONSTRATING the complexity of the issue, however, a third study appearing in the same issue of *Radiology* showed that intravenous, low-osmolality iodinated contrast material is a nephrotoxic risk factor, but only in patients with preexisting renal insufficiency. The authors of the first two studies, Robert J. McDonald, M.D., Ph.D., and Jennifer S. McDonald, Ph.D., join the third author, Matthew S. Davenport, M.D., and other experts in a *Radiology* Podcast discussion of their research and contrast agents in general. (See sidebar).

For many years, the association between intravenous iodinated contrast media and kidney injury was so entrenched that the terms acute kidney injury (AKI) and contrast material-induced nephropathy (CIN), or an increase in serum creatinine (SCr) after a CT exam, were used interchangeably. “Medical dogma currently suggests that intravenous contrast is an extremely common cause of renal injury,” said Dr. Robert McDonald, a radiologist at the Mayo Clinic in Rochester, Minn.

Despite their ability to improve visualization of tissue, contrast agents are often withheld from CT exams due to this concern, and patients with compromised kidney function are frequently discouraged from having these tests. This practice has come under the scrutiny of Dr. Robert McDonald, Dr. Davenport and colleagues who believe that improperly designed studies have led to an overstated risk of renal injury from intravenous iodinated contrast material. Clinical trials in which patients are randomly assigned to receive or not receive contrast could provide answers, but ethical dilemmas over such trials have forced clinicians to instead predominantly rely on studies with no control groups.

“Over the past several decades, well over 1,000 studies have been published on contrast-induced nephropathy that did not include control groups of patients who did not receive contrast,” said Dr. Jennifer McDonald, an assistant professor in the Department of Radiology at the Mayo Clinic. “These uncontrolled studies cannot differentiate cases of true contrast-induced nephropathy from contrast-independent causes of renal injury and are thus of little value in the realm of evidence-based medicine.”

To that end, Dr. Robert McDonald and his Mayo Clinic colleagues recently conducted an extensive review of AKI in patients who underwent contrast-



R. McDonald



J. McDonald



Davenport

enhanced and unenhanced abdominal, pelvic and thoracic CT. In a study published in the April issue of *Radiology*, researchers applied analytical tools including propensity score adjustments to simulate a randomized controlled trial on retrospective data and a counterfactual analysis, an experiment designed to test causality.

The Mayo team studied AKI incidence in 53,439 patients who underwent CT scanning between 2001 and 2010. After analyzing 157,140 scans, researchers found no significant difference in AKI risk between patients who had received contrast and those who had not. Analysis of patients who received both an enhanced and unenhanced CT scanning during the study timeframe also showed no significant difference in AKI incidence between the two scan types, suggesting a weak or absent causal association between contrast exposure and kidney injury.

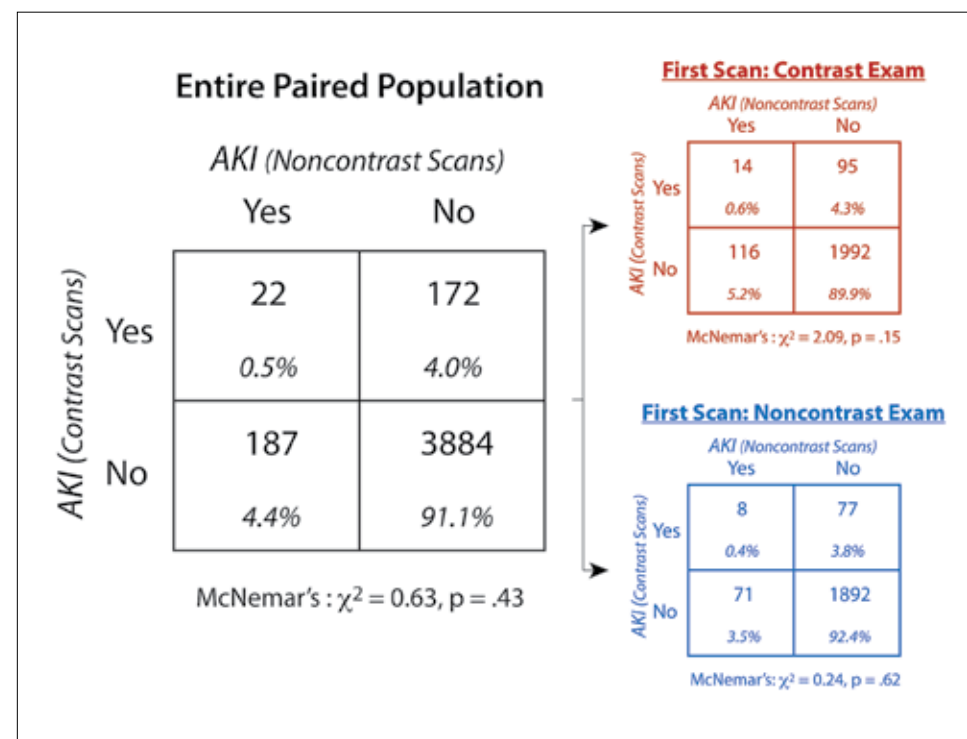
Research Analyzes Controlled Studies on Contrast Media

Findings from the first study inspired Mayo researchers to identify and analyze all prior controlled studies of the nephrotoxic effects of IV contrast media. These separate efforts were also published in the April issue of *Radiology*.

Researchers identified 13 non-randomized studies comprising 25,950 patients. The risk of AKI, death and dialysis was similar between the group that received contrast medium and the control group that did not receive contrast medium. This pattern was observed regardless of IV contrast medium type, diagnostic criteria for AKI or whether patients had diabetes mellitus or renal insufficiency.

“The results of this meta-analysis mirror the findings from our own controlled study,” Dr. Jennifer McDonald said. “These studies comprehensively could not detect an increased incidence of AKI in those patients that received contrast media.”

The Mayo studies and other research suggest that other sources for kidney injury exist in this patient group. Dr. Robert McDonald pointed out that people undergoing CT with contrast are less healthy, on average, than people in the general population.



“There are dozens of other causes of kidney injury that lead to a rise in serum creatinine and, based upon our findings, these contrast-independent causes seem to occur at a similar rate between patients who were exposed to intravenous contrast and those who were not,” he said.

Numerous Factors Contribute to CIN

While the *Radiology* research led by Dr. Davenport determined that intravenously administered low-osmolality iodinated contrast material is an important independent risk factor for post-CT AKI in patients with preexisting renal insufficiency, researchers also determined that many factors other than contrast material can affect post-CT AKI rates.

In their retrospective study, researchers performed CT exams over a 10-year period in 20,242 patients identified with sufficient SCr data. Half of the exams included intravenous contrast material and half did not.

Researchers performed a one-to-one propensity-matched cohort analysis with multivariate analysis of effects. Propensity matching was performed with respect to likelihood of patients receiving intravenous contrast material (36 tested covariates). The primary endpoint was post-CT AKI by using Acute Kidney Injury Network SCr criteria; the secondary endpoint was post-CT AKI by using traditional SCr criteria for contrast material-induced nephrotoxicity. Multivariate subgroup threshold analysis was performed and adjusted for assigned propensity scores.

Intravenous low-osmolality iodinated contrast material had a significant effect on the development of post-CT AKI for patients with pre-CT SCr levels of 1.6 mg/dL or greater, results showed. Patients with stable SCr less than 1.5 mg/dL were not at risk for developing CIN.

“Our data demonstrate that intravenously administered iodinated contrast is indeed nephrotoxic, although only in a small population of patients,” said Dr. Davenport, an assistant professor at the University of Michigan Health System in Ann Arbor. “Only patients with severe renal dysfunction appear to be at significant risk. Each of our studies has shown rather convincingly that the risk is much less common than previously believed.”

Although all three studies share common ground, there is one critical difference, Dr. Davenport said. “Our research shows that there is a risk in patients with severe renal impairment, while Dr. McDonald and colleagues were unable to find such a risk. Resolving this difference has profound clinical implications.”

Research Could Reverse Thinking on Contrast

The Mayo and Michigan findings and other research could help speed a change in thinking among physicians and expand access to potentially life-saving exams for patients.

Paradoxically, patients for whom contrast is withheld are often those who would benefit the most from a contrast-enhanced CT exam. “Without contrast, we are more limited in the information we can provide to the patient and the primary care provider which unfortunately can lead to unnecessary additional CT examinations and delays in diagnosis and/or treatment,” Dr. Robert McDonald said.

There are signs that the Mayo and Michigan studies and other research are helping physicians make more informed decisions, according to David F. Kallmes, M.D., a professor of radiology at the Mayo Clinic and a co-author of both studies who also participates in the Podcast discussion.

“The research has made an impact, and we’re already seeing liberalization in the use of contrast media,” he said.

That could be the lasting impact of all three studies, according to another expert who co-authored an editorial on contrast media in the same *Radiology* issue and participates in the Podcast. “Wherever the real truth lies, these studies show it is far from what we’ve been thinking in terms of contrast being particularly dangerous,” said Jeffrey H. Newhouse, M.D., of the Department of Radiology, Columbia-Presbyterian Medical Center, N.Y. “It’s only a little dangerous for a small group of people.” □

Mayo Clinic researchers investigated the causal association and effect of intravenous iodinated contrast material exposure on the incidence of acute kidney injury (AKI), also known as contrast material-induced nephropathy (CIN). **Left:** Incidence of AKI within the paired counterfactual data set. Contingency tables compare the incidence of AKI after contrast-enhanced scans with the incidence of AKI after unenhanced CT scans for the entire counterfactual data set (black), the subset of patients within the counterfactual data set where the contrast-enhanced examination was performed first (red), and the subset of patients within the counterfactual data set where the unenhanced examination was performed first (blue). (*Radiology* 2013;267;1:106-118) ©RSNA, 2013. All Rights Reserved. Printed with permission.

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YOUR DONATIONS IN ACTION

A grant **Jonathan R. Dillman, M.D.**, received from the RSNA Research & Education Foundation was the stepping stone to a recent National Institutes of Health (NIH) grant that will build on his RSNA project, "Comparative Effectiveness of MR Enterography, Enteric Ultrasound, and Ultrasound Elastography Imaging in the Evaluation of Pediatric Small Bowel Crohn Disease."



After receiving the 2011–2013 AGFA HealthCare/RSNA Research Scholar Grant, Dr. Dillman was awarded the University of Michigan Institute for Clinical & Health Research (MICHR)/NIH K12 Mentored Career Development Grant. This two-year grant will provide 75 percent protected time for patient-oriented research and career development.

"My proposed research is an extension of my RSNA Research Scholar Grant project and will further investigate ultrasound elasticity imaging and contrast enhanced ultrasound as potential quantitative biomarkers evaluation of inflammation and fibrosis in Crohn's disease animal model and humans," Dr. Dillman said. "The career development plan will focus on acquiring an M.S. degree in Clinical Research Design and Statistical Analysis through the University of Michigan School of Public Health"

Dr. Dillman will work with a multidisciplinary research/mentoring team including Peter Higgins, M.D., Ph.D., M.S., assistant professor of internal medicine specializing in gastroenterology; Jonathan Rubin, M.D., Ph.D., director of ultrasound, and Ruth Carlos, M.D., M.S., assistant chair of clinical research and faculty affairs for the Department of Radiology, all at the University of Michigan.

"This is my first NIH grant; such an achievement would not have been possible without the protected research time provided by the Research Scholar Grant," Dr. Dillman said. "In addition, the RSNA Advanced Course in Grant Writing was critical to the success of my K12 Application."

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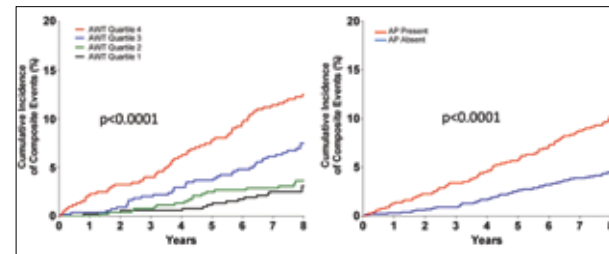
Abdominal Aortic Atherosclerosis at MR Imaging Is Associated with Cardiovascular Events: The Dallas Heart Study

MR IMAGING measures of aortic atherosclerosis are predictive of future adverse cardiovascular events, new research shows.

In a study of 2,122 participants from the multiethnic, population-based Dallas Heart Study who underwent abdominal aortic MR imaging at 1.5 T, Christopher D. Maroules, M.D., of the University of Texas Southwestern Medical Center, Dallas, and colleagues measured aortic atherosclerosis by quantifying mean aortic wall thickness (MAWT) and aortic plaque burden. Participants were monitored for cardiovascular death, nonfatal cardiac events, and nonfatal extracardiac vascular events over a mean period of 7.8 years.

Increasing MAWT was positively associated with men (odds ratio, 3.66; $P < .0001$), current smoking (odds ratio, 2.53; $P < .0001$), 10-year increase in age (odds ratio, 2.24; $P < .0001$) and hypertension (odds ratio, 1.66; $P = .0001$). A total of 143 participants (6.7 percent) experienced a cardiovascular event.

“MR imaging measures of aortic atherosclerosis are predictive of future adverse cardiovascular events,” according to researchers. “Both aortic plaque burden and mean aortic wall thickness are significant predictors of nonfatal, extracardiac vascular events.”



Graphs show cumulative incidence curves for incident composite cardiovascular events based on (left) MAWT quartiles and (right) aortic plaque burden (present vs. absent). AP = aortic plaque, AWT = aortic wall thickness.

(*Radiology* 2013;269:1:InPress) ©RSNA, 2013. All rights reserved. Printed with permission.

White Matter Hyperintensities: Use of Aortic Arch Pulse Wave Velocity to Predict Volume Independent of Other Cardiovascular Risk Factors

AORTIC ARCH PULSE WAVE VELOCITY (PWV) is an independent predictor of subsequent white matter hyperintensity (WMH) volume, with a greater standardized effect and level of significance than all other cardiovascular risk factors assessed except for age, new research shows.

In a study of 1,270 participants in the multiethnic, population-based Dallas Heart Study, Kevin S. King, M.D., of the University of Texas Southwestern Medical Center, Dallas, and colleagues measured

aortic arch PWV with phase-contrast MR imaging. Seven years later, the volume of WMH was determined using brain MR imaging. Researchers also analyzed 15 other cardiovascular risk factors, as well as age, gender and ethnicity, as predictors of WMH.

Results showed that aortic arch PWV helped predict WMH volume independent of the other demographic and cardiovascular risk factors. Researchers estimated that a 1 percent increase in aortic arch PWV

(in meters per second) is related to a 0.3 percent increase in subsequent WHM volume (in milliliters) when all other variables are constant.

“In an optimal predictive model, aortic arch PWV provides a distinct contribution to WMH burden along with systolic blood pressure, hypertension treatment, history of congestive heart failure, and age,” the researchers write.

Soccer Heading Is Associated with White Matter Microstructural and Cognitive Abnormalities

HIGH FREQUENCY of soccer ‘heading’—in which players field the ball with their head—in otherwise healthy adult amateur players is associated with lower white matter fractional anisotropy and worse memory performance than in players who performed less heading, new research shows.

Michael L. Lipton, M.D., Ph.D., of Albert Einstein College of Medicine of Yeshiva University, N.Y., and colleagues conducted diffusion-tensor MR imaging on 37 amateur adult soccer players (median age 31 years); 29 were men. Par-

ticipants played soccer for an average of 22 years and an average of 10 months during the past year. Cognitive function was measured using a computerized battery of tests. Voxelwise linear regression (heading vs. fractional anisotropy [FA]) was applied to identify significant regional associations. Researchers tested FA at each location and cognition for a nonlinear relationship to heading by using an inverse logit model that incorporated demographic covariates and history of concussion.

Results showed that participants headed 32-5,400 times over the previous year.

High frequency of soccer heading (885–1,800 headings per year) in otherwise healthy adult amateur players is associated with lower white matter fractional anisotropy (FA) ($P < .00001$) and worse memory performance ($P < .00001$) than in players who performed less heading.

“Repetitive subconcussive head trauma in the setting of heading during soccer may be associated with white matter microstructural and neurocognitive changes similar to those seen in patients with traumatic brain injury,” the authors write.

Continued on Page 20

Education and Funding Opportunities



2013 CORE Workshop

Registration deadline
September 26

THE 2013 Creating and Optimizing the Research Enterprise (CORE) workshop will be held Friday and Saturday, Oct. 25 and 26, 2013, in Oak Brook, Ill. The workshop will focus on strategies for developing and/or expanding research programs in radiology, radiation oncology and nuclear medicine departments. The CORE Program features a combination of presentations, case studies and group discussions. More information and registration is available at RSNA.org/CORE.

RSNA Faculty Development Workshop

Registration
Now Open

REGISTRATION for the RSNA Faculty Development Workshop, a day-long course on the best techniques for designing and delivering radiology education, is now open. The workshop is led by RSNA Board Liaison for Education Valerie P. Jackson, M.D., Eugene C. Klatte Professor and Chair of the Department of Radiology and Imaging Sciences 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. Attendees will explore how adults—especially physicians—learn best and how faculty can use test questions to improve their teaching.

The workshop will be held September 18, 2013, at the Westin O’Hare Hotel, providing convenient access for attendees flying into Chicago. Most participants can fly in and out of Chicago on the same day. RSNA staff and faculty will be on hand to discuss specific questions with participants.

The workshop fee is \$150. Registration, housing and workshop information is available at RSNA.org/Faculty_Development_Workshop.aspx. For more information, contact Jennifer Comerford at jcomerford@rsna.org or 1-630-590-7772.



Jackson



DiSantis

Medical Meetings

August-September 2013

AUGUST 16-18

Latin America Society of Pediatric Radiology (SLARP), 16th Congress, Julio Cesar Turbay Ayala Convention Centre, Cartagena, Colombia
• www.slarp.net

SEPTEMBER 4-7

Sociedad Mexicana de Radiología e Imagen/ Mexican Society of Radiology and Imaging (SMRI), XII Curso Annual de Ultrasonido (12th Annual Ultrasound Course), World Trade Center, Mexico City
• www.smri.org.mx

SEPTEMBER 8-11

Radiology Business Management Association (RBMA), Fall Educational Conference, Seaport Boston Hotel
• www.rbma.org

SEPTEMBER 14-18

Cardiovascular and Interventional Radiological Society of Europe (CIRSE), 28th Annual Congress and Postgraduate Course, Barcelona, Spain
• www.cirse.org

SEPTEMBER 18-21

Canadian Association of Radiation Oncology (CARO), Canadian Organization of Medical Physicists (COMP), 2013 CARO-COMP Annual Scientific Meeting, Hilton Montréal Bonaventure
• www.caro-acro.ca

SEPTEMBER 18-21

World Molecular Imaging Society (WMIS), European Society for Molecular Imaging (ESMI) and the Federation of Asian Societies for Molecular Imaging (FASMI), 2013 World Molecular Imaging Congress (WMIC), Savannah, Georgia
• www.wmicmeeting.org

SEPTEMBER 19-22

European Society of Urogenital Radiology (ESUR), 20th European Symposium of Urogenital Radiology, Harbiye Museum and Cultural Centre, Istanbul, Turkey
• www.esur2013.org

SEPTEMBER 22-25

American Society for Radiation Oncology (ASTRO), 55th Annual Meeting, Georgia World Congress Center, Atlanta
• www.astro.org

SEPTEMBER 25 - 29

American Society of Head and Neck Radiology (ASHNR), 47th Annual Meeting, Pfister Hotel, Milwaukee
• www.ashnr.org

SEPTEMBER 26-29

American Society of Nuclear Cardiology (ASNC), 18th Annual Meeting, Hyatt Regency Chicago
• www.asnc.org/asnc2013

FIND MORE EVENTS AT
RSNA.org/calendar.aspx

Journal Highlights

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

Hybrid PET/MR Imaging of the Heart: Feasibility and Initial Results

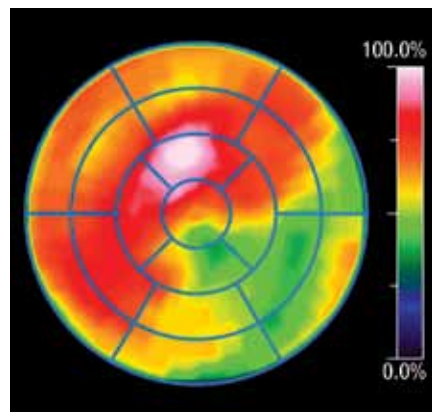
Cardiac PET/MR imaging with fluorine 18 fluorodeoxyglucose (FDG) is feasible and may add complementary information in patients with ischemic heart disease.

In the August issue of *Radiology* (RSNA.org/Radiology), Felix Nensa, M.D., of University Hospital Essen, University of Duisburg-Essen, Germany, and colleagues studied 20 consecutive patients with myocardial infarction who underwent cardiac PET/MR imaging. Ten patients underwent additional cardiac PET/CT before PET/MR. Researchers performed 2D half-Fourier acquisition single-shot turbo spin-echo sequences, balanced steady-state free precession cine sequences, 2D turbo inversion-recovery magnitude T2-weighted sequences, and late gadolinium-enhanced (LGE) segmented 2D inversion-recovery turbo fast low-angle shot sequences. Categorical intermethod agreement between PET and cine imaging or LGE imaging, respectively, was calculated using the Cohen κ .

Cardiac PET/MR imaging was successfully performed in 19 of 20 patients. In 306 segments, 32 percent were rated as infarcted on PET images compared with 30 percent rated as infarcted on LGE images and 29 percent rated as infarcted on cine images. In the subgroup of patients with an additional PET/CT scan, no significant difference in myocardial tracer uptake between PET/CT and PET/MR images was found.

"Our results demonstrated the feasibility of hybrid cardiac PET/MR imaging with FDG in myocardial infarction on an integrated wholebody PET/MR imaging system with 3-T field strength," the authors write. "Yet, it must be proved that this new hybrid imaging modality yields added value of clinical relevance."

Radiology



Acute occlusion of the left circumflex artery and a corresponding subendocardial infarction of the lateral and inferior myocardial wall in a 59-year-old male patient. PET data mapped onto a polar plot and overlaid with the 17-segment model of the left ventricle. Despite the subendocardial extent of the infarction, agreement between LGE and PET images was high in this patient.

(*Radiology* 2013;268:2:366-373) ©RSNA, 2013. All rights reserved. Printed with permission.

Interactive Case Review of Radiologic and Pathologic Findings from Breast Biopsy: Are They Concordant? How Do I Manage the Results?

As percutaneous breast biopsy becomes more common and supplants excisional biopsy as the preferred diagnostic tool, the radiologist's role in caring for patients must extend beyond imaging to include identifying lesions for biopsy and performing the procedure.

To successfully perform a minimally invasive breast biopsy, radiologists must not only be familiar with the technique, but know how to determine radiologic-pathologic concordance as well as the appropriate treatments for patients after the procedure.

In an online-only article in the July-August issue of *RadioGraphics* (RSNA.org/RadioGraphics), Christopher P. Ho, M.D., of the University of Virginia Health System, Charlottesville, Va., and colleagues use a case-based system to review the radiologic-pathologic correlation of breast lesions and appropriate BI-RADS lexicon and classification and discuss concordance and case management.

An accompanying online tutorial presents typical diagnostic cases and allows users to participate in all stages of case management.

"The decision to recommend surgical excision or short-term follow-up relies heavily on whether the histologic diagnosis correlates with the imaging findings, a determination that is part of the radiologist's responsibilities if he or she performs the biopsy," according to the authors.

RadioGraphics



Ultrasound image shows a complex mass in the left breast of a 37-year-old woman with a bloody nipple discharge and palpable left breast mass.

(*RadioGraphics* 2013;33:E149-E152) ©RSNA, 2013. All rights reserved. Printed with permission.

Residents & Fellows Corner

Don't Miss a Thing: Keep Your RSNA Profile Up-to-Date

Residents and fellows are encouraged to update their contact information with RSNA as they move to new positions. Log in at myRSNA.org and click Edit Profile to update your personal information. Having current street and personal e-mail addresses on file with RSNA means you won't miss out on:

- Subscriptions to *Radiology*, *RadioGraphics* and *RSNA News*
- Special membership rates for members transitioning from residency or fellowship to practice
- E-mail news bulletins, including RSNA Insider and RSNA Weekly
- Annual meeting announcements

RSNA members transitioning to practice after residency or fellowship pay just \$100 their first year and \$200 their second year. Full dues are not required until the third year. If you have questions or wish to renew by phone, call 1-877-RSNA-MEM (776-2636) or 1-630-571-7873 (outside the U.S. or Canada).



Radiology in Public Focus

Continued from Page 17

Symptomatic White Matter Changes in Mild Traumatic Brain Injury Resemble Pathologic Features of Early Alzheimer Dementia

DISTRIBUTION of white matter abnormalities in patients with symptomatic mild traumatic brain injury (TBI) is strikingly similar to the distribution of pathologic abnormalities in patients with early Alzheimer dementia, new research shows.

In the study, Saeed Fakhraan, M.D., of the University of Pittsburgh School of Medicine, and colleagues evaluated diffusion-tensor images from 64 consecutive patients with mild TBI obtained with conventional MR imaging. Fractional anisot-

ropy (FA) maps were generated as a measure of white matter integrity. All patients underwent a neurocognitive evaluation.

Results showed a significant correlation between elevated total concussion symptom score and reduced FA at the gray matter-white matter junction ($P < .05$), most prominently in the auditory cortex ($P < .05$). FA values in the parahippocampal gyri were significantly decreased in patients with sleep and wake disturbances relative to those in patients without sleep

and wake disturbances (0.26 and 0.37 respectively, $P < .05$).

"Additional research in this area may help further elucidate a potential link between these seemingly disparate disease processes because the symptoms of mild TBI may not be from direct damage already done but rather from damage from a neurodegenerative cascade that may be prevented," the authors write.

Media Coverage of RSNA

In May, 513 RSNA-related news stories were tracked in the media. These stories reached an estimated 227 million people.

Coverage included *The Wall Street Journal*, *Chicago Tribune*, *Toronto Star*, Yahoo! News, *The Globe and Mail*, KTVD-TV (Denver), *The Vancouver Sun*, *Toronto Star* and *Medical News Today*.

August Outreach Public Information Activities

In August, RSNA is distributing the "60-Second Checkup" radio segments to nearly 100 radio stations across the U.S. The segments focus on the use of MR imaging to show brain abnormalities in patients who suffer from migraines.

New on RadiologyInfo.org

Visit RadiologyInfo.org, RSNA and ACR's jointly-sponsored public information website, to read the latest additions to the Diseases and Conditions section:

- Cholecystitis
- Diffuse Interstitial Lung Disease
- Croup
- Cervical Cancer

Annual Meeting Watch

Enroll Now for Courses

Course enrollment for RSNA 2013 is underway. Online enrollment occurs instantly, while faxed or mailed registration forms are processed in the order they are received. The RSNA 2013 Advance Registration, Housing and Course Enrollment brochure is available at RSNA.org/register. Use this brochure to make the most of your RSNA 2013 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 2013 in order to enroll for courses.

Guarantee Your Seat!

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

All ticketed courses must be confirmed prior to November 27 to guarantee a seat. RSNA ticketed courses fill up fast, so ensure you get the courses you need by enrolling at 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.



5K Fun Run

Tuesday, December 3, 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 your patients. During online registration or onsite at McCormick Place, you can sign up as a runner or walker for the 5K Fun Run. The signup donation of \$40 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 RSNA2013.RSNA.org (click childcare).

International Visitors

If you must apply for a temporary non-immigrant visa to attend RSNA 2013, 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. RSNA offers an official letter of invitation for RSNA 2013 attendees. For more information go to RSNA.org/International_Visitors.aspx.

Spouse/Family Member Badge

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 (16 or over) 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.

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 8 (October 25 for International registrants). Technical exhibits-only registrants must pick up badges on the day of the exhibit attendance at McCormick Place.

RSNA Gears up for 2013 Technical Exhibition

The world's largest exhibition of radiology-related products, the 2013 RSNA Technical Exhibition features nearly 700 exhibitors from across the globe showcasing products of all kinds in every specialty. Shop and compare equipment supplies, devices and software exhibited by leading manufacturers, suppliers, and developers of medical information and technology—all under one roof.

Highlights of the 2013 Technical Exhibit:

- Exhibitor Product Theater: Discover new products, services and software systems from exhibitors
- Vendor Workshops: Get hands-on tutorials of vendor software systems
- Publishers Row: Shop for educational publications covering all areas of medical imaging
- IHE Image Sharing Demonstration: See how software systems can communicate seamlessly across locations

Access the full list of RSNA 2013 exhibitors and the Exhibitor Product Theater and Vendor Workshop schedules at RSNA.org/exhibits.



Virtual Meeting Now Extended an Extra Week

The RSNA 2013 Virtual Meeting allows users to experience the world's premiere medical imaging event from anywhere in the world. Participants can tune in to live and on-demand sessions during RSNA 2013 and on-demand sessions through December 13. Participants can explore education exhibits and scientific posters, see demonstrations of new technology, submit diagnoses for Cases of the Day and earn CME for live activities.

The fee is \$100 for RSNA members and \$300 for non-members. RSNA members-in-training, medical student members and retired members can access the Virtual Meeting for free. For more information or to register for the Virtual Meeting, go to RSNA.org/virtual.

RSNA 2013 Registration

How to Register

There are four ways to register for RSNA 2013:

1 INTERNET (fastest way)

Go to RSNA.org/register

2 FAX (24 hours)

1-888-772-1888

1-301-694-5124

3 TELEPHONE

(Mon.-Fri. 8 a.m. - 5 p.m. CT)

1-800-650-7018

1-847-996-5876

4 MAIL

Experient/RSNA 2013

P.O. Box 4088

Frederick, MD 21705 USA

Registration Fees

BY NOV. 8 AFTER NOV. 8

BY NOV. 8	AFTER NOV. 8	Category
\$ 0	\$100	RSNA/AAPM Member
0	0	RSNA/AAPM Member Presenter
0	0	RSNA Member-in-Training, RSNA Student Member and Non-Member Student
0	0	Non-Member Presenter
180	280	Non-Member Resident/Trainee
180	280	Radiology Support Personnel
825	925	Non-Member Radiologist, Physicist or Physician
825	925	Hospital or Facility Executive, Commercial Research and Development Personnel, Healthcare Consultant and Industry Personnel
325	325	One-day registration to view only the Technical Exhibits

Important Dates for RSNA 2013

October 25	International deadline to have full conference badge mailed
November 8	Final housing and discounted registration deadline
November 27	Deadline to guarantee a seat for all ticketed courses
December 1-6	RSNA 99th Scientific Assembly & Annual Meeting

Virtual Meeting

\$ 0	RSNA Member-in-Training, RSNA Medical Student Member and Retired RSNA Member
\$100	RSNA/AAPM Member
\$300	Non-Member



Register by November 8 to receive the discounted registration fee and full conference materials mailed to you in advance. International visitors must register by October 25 to receive these materials in advance. Registrations received after November 8 will be processed at the increased fee and conference materials must be obtained at the McCormick Place Convention Center.

For more information about registering for RSNA 2013, visit RSNA.org/Attendees.aspx, e-mail reginfo@rsna.org, or call 1-800-381-6660 x7862.

The Value of Membership

RSNA/AAPM Physics Modules Redesigned for Mobile Age

Supporting the on-the-go lifestyle of the digital age, RSNA/AAPM Physics Modules have been redesigned for mobile tablet viewing, offering a fresh new look and feel designed to foster an exciting and dynamic learning experience.

All 45 RSNA/AAPM Physics modules have been redesigned and will include user-driven, module-specific interactive learning features for a richer user experience. Moving away from the traditional e-textbook format, each module will offer a more colorful, exciting interface, with modules color-coded by topic area. The new interface allows users to navigate to key module topic areas with a tap of the screen rather than navigating via a static course outline.

Module post-tests are included with each module, providing users with instantaneous feedback on correct or incorrect answers. The mobile RSNA/AAPM Physics Modules will be available this fall. Contact physics@RSNA.org for more information.



A brand new interface accompanies each module for an engaging user experience.

RSNA's Online Education is Going Mobile

Coming in fall 2013, RSNA is revolutionizing the way members can access the Society's vast online library of CME courses. The new mobile format allows users to view RSNA's online education content on-the-go.

Each of the following CME offerings is being redesigned for mobile tablet viewing,

offering a fresh new look and feel designed to foster an exciting and dynamic learning experience.

- Refresher Courses
- *RadioGraphics* and *Radiology*
- Cases of the Day
- SAMs

All of the above CME features include:

Mobile accessibility, a sleek new interface, interactive touch-screen learning and instantaneous user feedback.

This is just one more example of how RSNA's educational content continues to meet the highest standards for our members.

RSNA Staff Retirement

In spring 2013, RSNA said goodbye to an employee with nearly 30 years' worth of service to the Society's publications.

Carol Douglas, 28 years

From the moment she began her employment as a production assistant with RSNA in November 1984, Carol played a significant role in the evolution of *RadioGraphics* and *Radiology*. Carol took on increasing leadership responsibilities as the journals expanded to new media and much of the production work was shifted from vendors to an in-house staff at RSNA. Carol served as production and graphics manager, assistant director of production and managing director of publications.

At *RadioGraphics*, she worked with former editor William W. Olmsted, M.D., current editor Jeffrey S. Klein, M.D., and the first *RadioGraphics* editor,

William J. Tuddenham, M.D. At *Radiology*, she worked with former editors William R. Eyler, M.D., Stanley S. Siegelman, M.D., and Anthony V. Proto, M.D., and current editor Herbert Y. Kressel, M.D.

"Carol has brought experience and a mastery of production to the RSNA journals," Dr. Kressel said. "She is a 'can do' person who has developed a wonderful, highly skilled team committed to RSNA and its journals. I am delighted to be among the beneficiaries of her work."

"We hired Carol to bring professional production work to the RSNA journal



Radiology before computers were involved in print production," added Roberta E. Arnold, M.H.P.E., RSNA assistant executive director for publications and communications. "Carol also has brought her creativity to bear on covers and interior designs of both journals, created

in-house ads, guided development of a consistent journal workflow, initiated 'desktop publishing' and spearheaded special projects. In all of this, she has maintained a 'never give up' attitude whenever the effort was challenging."

RSNA.org

Catch the Fever: Log onto the RSNA 2013 Annual Meeting Page

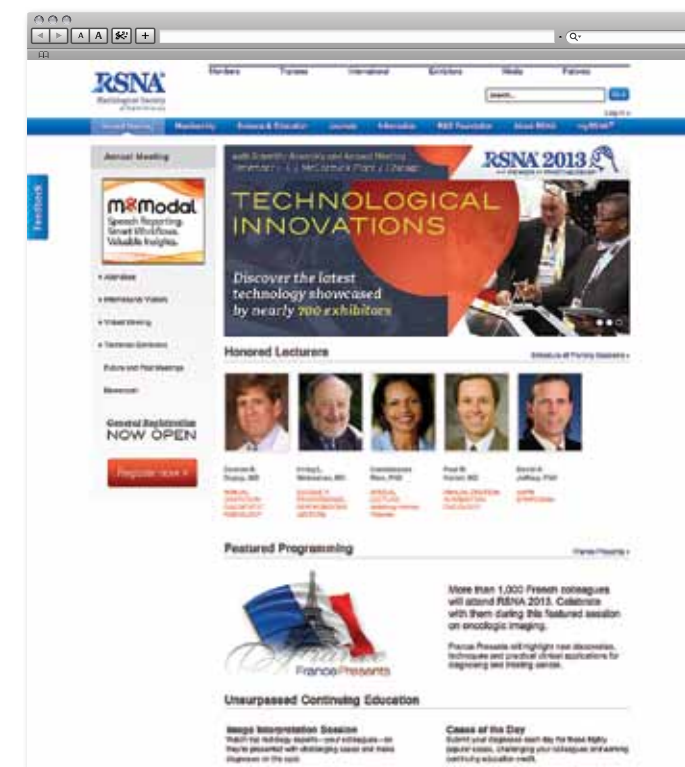
It's still a few months away, but we guarantee you'll start to catch RSNA 2013 fever after logging onto the Annual Meeting webpage on *RSNA.org*.

Along with registration, housing, technical exhibits, programming information and much more, the colorful, interactive site features don't-miss highlights including:

- ▶ A video of RSNA 2013 President Sarah Donaldson, M.D., speaking on "Empowering Your Colleagues" as a tie-in to the RSNA 2013 theme, "The Power of Partnership."
- ▶ A preview of France Presents, a celebration of France's contributions to radiologic discovery and RSNA's partnership with its French colleagues.
- ▶ RSNA 2013 Virtual Meeting information on registration, live sessions during the annual meeting and on-demand sessions through December 13. View videos of educational highlights of the RSNA 2012 Virtual Meeting.
- ▶ A roster of RSNA 2013 Honored Lecturers including Condoleezza Rice, Ph.D., who will present the Special Lecture: "Mobilizing Human Potential."

RSNA also makes it easy to plan your trip to Chicago by linking users to www.choosechicago.com/plan-your-trip. RSNA has teamed up with the City of Chicago and Bloomingdale's to offer exciting ways to experience Chicago including multiple city tours, culinary experiences, shopping excursions and museum exhibits.

Stay plugged into *RSNA.org* for the latest news and up-to-the minute information leading up to the meeting Dec. 1-6 at McCormick Place, Chicago.



COMING NEXT MONTH

Along with our guide to helping you experience the best of Chicago during RSNA 2013, we preview the RSNA 2013 France Presents session highlighting new discoveries, techniques and practical clinical applications for diagnosing and treating cancer.



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Two refresher courses from past annual meetings.

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Each collection includes visual presentation, accompanying audio, and transcripts.

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CME expires 10/31/13.

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