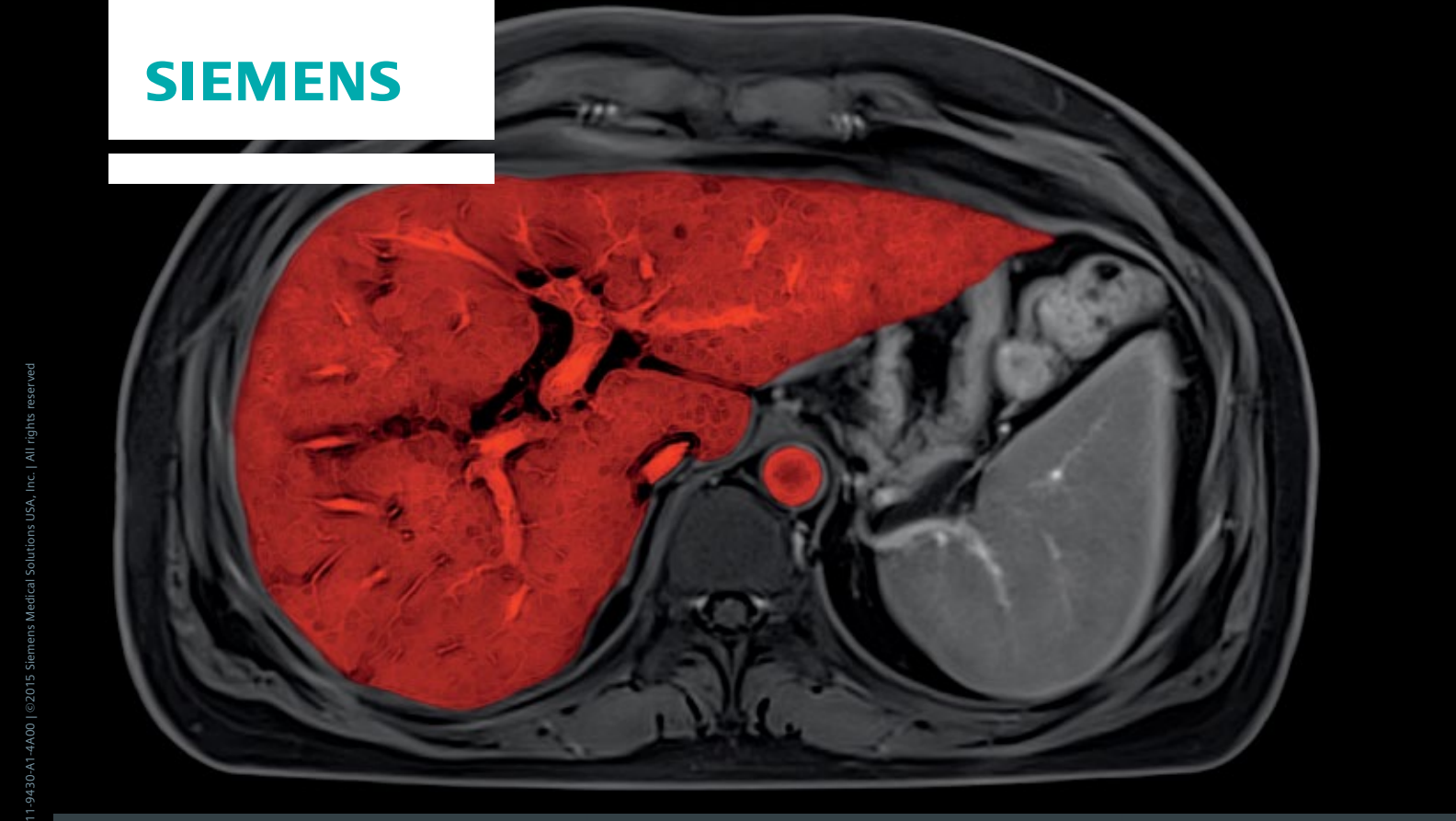
RSNA News™
September 2015 Volume 25, Issue 9

MRI Shows Babies Feel Pain Like Adults

ALSO INSIDE:

New RSNA Online Refresher Courses Available
See Page 22

SIEMENS



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With image quality like this, you and your patients can both Breathe Easy.

Capture body MR images the first time by freezing motion.

MRI is "the best test for characterizing liver lesions" according to the ACR's appropriateness criteria[1]. While body MR imaging has grown 28% since 2013[2], abdominal MRI exams are still challenging and results can vary due to patient motion and breathing artifacts. At Siemens, we're helping make body MR imaging easier with FREEZEit—the exclusive technology named by Frost and Sullivan as the industry's most effective solution in abdominal MRI.

FREEZEit delivers robust, free-breathing abdominal exams by intelligently resisting motion artifacts. Patients who have difficulty holding their breath can now Breathe Easy and be imaged with consistent, high-quality results. This same technology enables motion-free imaging in other areas of the body including the head and neck[3].

[1]American College of Radiology Appropriateness Criteria 2014
[2]IMV 2014 MR Market Outlook Report
[3]This option is Pending 510(k) clearance, and is not yet commercially available in the United States.

Expand your service coverage in MRI and become a preferred provider for pediatric[4], geriatric, and very ill patients who have been excluded from "the best test" because of breath-hold challenges or difficulty laying still. Improve treatment with more accurate results that come from clear, sharp, motion-free MR images. And enhance efficiency by obtaining the best image the first time—no need for rescans. It's time for consistently high-quality abdominal MRI for all patients. It's time to Breathe Easy.

Another example of Sustainable Healthcare Technology from Siemens.

[4]MR scanning has not been established as safe for imaging fetuses and infants less than two years of age. The responsible physician must evaluate the benefits of the MR examination compared to those of other imaging procedures.

Answers for life.

FEATURES

RSNA News

UP FRONT

RADIOLOGY'S FUTURE

NEWS YOU CAN USE

RSNA MISSION

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

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

ABR Names Roberts Associate Executive Director for Interventional Radiology


Roberts

Anne C. Roberts, M.D., was recently named associate executive director for interventional radiology by the American Board of Radiology (ABR).

During her tenure on the ABR Board of Trustees, Dr. Roberts was the lead trustee in charge of vascular and interventional (VIR) components for the Maintenance of Certification (MOC) exam. She also served on both the VIR Subspecialty Committee (oral exams) and the Diagnostic Radiology Written Committee (VIR category) from 2001 to 2005. For the past 20 years, she has been an ABR oral examiner for diagnostic radiology and/or VIR almost every year.

Dr. Roberts has served as president of the Society of Interventional Radiology and has been an international visiting professor for RSNA. She is a member of RSNA's Public Information Advisors Network.

Celebrate the Fourth Annual International Day of Radiology

INTERNATIONAL DAY OF RADIOLOGY
AN INITIATIVE OF RSNA, THE ESR AND ACR

Join 128 medical societies from 68 countries in celebrating the advances radiologic innovations have brought to patients worldwide on the fourth annual International Day of Radiology (IDoR) on November 8.

This year, IDoR focuses on pediatric radiology, highlighting the important role that radiology plays in the detection, diagnosis and management of a wide variety of diseases affecting children, and the special treatment younger patients need.

The Society for Pediatric Radiology, World Federation of Pediatric Imaging, European Society of Pediatric Radiology and the Image Gently® campaign join the IDoR sponsors in recognizing the valuable contributions radiology has made to pediatric care.

IDoR is sponsored by RSNA, the European Society of Radiology and the American College of Radiology, with a dedicated website (*IDoR2015.com*) and social media activities.

Visit *RSNA.org/IDoR2015* for promotional materials customizable for your practice or organization.

ZYLAK RECEIVES HONORARY DOCTORATE FROM UNIVERSITY OF SASKATCHEWAN

1991 RSNA president **Carl J. Zylak, M.D.**, was presented with an Honorary Doctor of Science award by the University of Saskatchewan during its recent convocation ceremony in Saskatoon, Saskatchewan, Canada.


Zylak

Dr. Zylak earned his bachelor's and medical degrees from the University of Saskatchewan. Following 10 years practicing radiology in Winnipeg, he accepted the position of professor and chairman of the Department of Radiology at McMaster University in Hamilton, Ontario. He was the founding director of the Ontario Breast Screening Program and worked in Ohio, Michigan and Arizona. He has over 200 published articles, book chapters, scientific presentations and lectures to his credit.

Dr. Zylak received the RSNA Gold Medal in 1998.

Numbers in the News

1

The number—in millions—of visits in May 2015 to *RadiologyInfo.org*, the RSNA/American College of Radiology public information website that continues to experience record growth. Read about the ever-evolving website's recent redesign on Page 9.

11

The average number of painful procedures undergone each day by infants in neonatal intensive care units. Read about new MRI research showing that babies experience pain much like adults but with a potentially lower pain threshold on Page 13.

300,000

Number of pieces of artwork and artifacts housed at the Art Institute of Chicago, one of the many destinations featured in our annual roundup of must-see Chicago attractions during RSNA 2015. Explore the full list on Page 11.

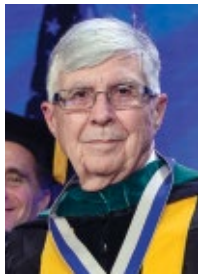
60

The number of courses offered live or on-demand through the RSNA 2015 Virtual Meeting. Read more about the many offerings of this year's Virtual Meeting on Page 24.

Luminaries Honored at ACR Annual Meeting

Carl R. Bogardus, Jr., M.D., clinical director and vice chairman of the Department of Radiation Oncology at Oklahoma University Medical Center, Oklahoma City, was awarded the American College of Radiology (ACR) Gold Medal at ACR 2015, held recently in Washington, D.C. Along with his nearly 50 years of ACR service, Dr. Bogardus has devoted most of his career to developing the Radiation Oncology Coding and Nomenclature System.

In addition, ACR named **Luis Donoso-Bach, M.D., Ph.D.**, and **Valentin Sinitsyn, M.D., Ph.D.**, as honorary fellows. **Donald F. Lavanty, J.D.**, ACR's principal legislative consultant for 42 years, earned the Distinguished Achievement Award.


Bogardus


Bach


Sinitsyn

Dr. Donoso-Bach is chair of the Diagnostic Imaging Department at the Hospital Clínic of Barcelona, Spain, and a professor of radiology at the University of Barcelona.

Dr. Sinitsyn is head of the Radiology Department at the Federal Center of Medicine and Rehabilitation and Lomonosov Moscow State University.

ASRT Debuts Museum and Archives

The American Society of Radiologic Technologists (ASRT) unveiled the ASRT Museum and Archives during its recent annual meeting in Albuquerque, New Mexico. The permanent museum is housed within the ASRT office in Albuquerque.

The museum traces the progress of medical imaging and radiation therapy professionals from the discovery of X-ray until today. Its mission is to deepen the appreciation and understanding of the radiologic technology profession and to inspire further learning.

Along with interactive displays, the museum features educational exhibits showing the role technologists have played in patient care and healing. An advocacy exhibit in the museum includes information about the Image Gently® and Image Wisely® campaigns. For more information, go to *ASRT.org/main/about-asrt/museum-and-archives*.

RSNA *Around the World*

RSNA continues to expand its reach around the globe in numerous radiology conferences and through the RSNA International Visiting Professors Program. Upcoming dates include:

October 3-17
Santiago, Chile
International Visiting Professor Program
Chilean Society of Radiology

October 16-19
Paris, France
RSNA Booth and Presidential Visit
Journées Françaises de Radiologie

October 29-November 1
Adelaide, Australia
Presidential Visit and RSNA Diagnosis Live ™ courses
Royal Australian and New Zealand College of Radiologists (RANZCR) Annual Scientific Meeting

December 9-19
Dhaka, Bangladesh
International Visiting Professor Program
Bangladesh Society of Radiology and Imaging

RSNA Travels to SPR Meeting in Brazil

RSNA leaders attended the recent 2015 Jornada Paulista de Radiologia (JPR) meeting in São Paulo, Brazil, organized by the Sociedade Paulista de Radiologia Diagnóstico por Imagem (SPR). *Left to right:* Jaime Ribeiro Barbosa, M.D., SPR Director of Professional Defense, Tufik Bauab Jr., M.D., SPR Past-President, Antônio Soares Souza, M.D., SPR President, James P. Borgstede, M.D., RSNA Board of Directors Liaison for International Affairs, Antônio José da Rocha, M.D., Chairman, SPR Advisory Council, George S. Bisset III, M.D., 2012 RSNA President, and Renato Adam Mendonça, M.D., SPR Scientific Director. Organized by SPR, JPR is the largest diagnostic imaging meeting in Latin America. RSNA began its partnership with SPR to co-sponsor the event in 2014 and will continue as a co-sponsor in 2016 and 2018.

RSNA Board of Directors Report

At its June meeting, the RSNA Board of Directors approved the Society's 2015-2016 budget, continued planning for the annual meeting and outlined plans for RSNA participation in upcoming international events.

Richard L. Ehman, M.D.
Chairman, 2015 RSNA Board of Directors

Travel Award Program Moves Forward

The Board approved establishing a new RSNA Travel Award Program designed to encourage young investigators to submit new research to the RSNA Scientific Program. Students, clinical trainees, and postdoctoral trainees will be eligible to receive $500 travel awards for top-rated abstracts accepted for presentation at RSNA 2016. Full eligibility requirements will be available with the 2016 Call for Abstracts.

Neuroradiology Research Award Established

Funded with a donation from Kuo York Chynn, M.D., the Board established the Kuo York Chynn Neuroradiology Research Award—an annual award for the top neuroradiology research paper presented at the RSNA annual meeting.

A longtime RSNA member, Dr. Chynn is an internationally known neuroradiology expert who has authored more than 30 papers and two textbooks and holds one patent. The first award of $3,000 will be presented at RSNA 2016. Stay tuned to *RSNA News* for more information on the award.

RSNA/ESR Symposia Continue

Continuing the popular RSNA/European Society of Radiology (ESR) collaboration, the Board approved hybrid imaging as the topic of the next RSNA/ESR Symposia to be presented at RSNA 2016 and at ESR's European Congress of Radiology in 2017. Alexander Drzezga, M.D., a professor and chair of the Department of Nuclear Medicine at the University Hospital Cologne, Germany, was appointed to serve as the RSNA planner for the symposia. Dr. Drzezga serves as chair of the Molecular Imaging Subcommittees of both the RSNA Scientific Program Committee and the RSNA Education Exhibits Committee.

New Position Statements Available on Gadolinium and Traumatic Brain Injury

The Board approved RSNA position statements on gadolinium and traumatic brain injury. The statements are designed to aid RSNA members who need to respond to the media or the public about radiology-related topics that frequently receive prominent coverage in the news. Access these and other position statements on myRSNA® by clicking Member Benefits under myDashboard and scrolling to Position Statements.

RSNA Resident Representative

The Board approved appointing an RSNA Resident Representative from each radiology residency program in the U.S. Those representatives will be charged with disseminating trainee-related RSNA information.

RSNA Spotlight Course in Cancun

The Board approved emergency radiology as the topic for a new RSNA course to be held June, 2016, in Cancun, Mexico. The course, "RSNA Spotlight: Advances in Emergency Radiology," is designed to provide high-quality education to radiologists in Latin America, and will be presented in Spanish. Jorge A. Soto, M.D., Boston, and Guillermo Elizondo-Riojas, M.D., of Monterrey, Mexico, will serve as course directors.

New in Education Exhibits 2015 and 2016

Beginning with RSNA 2015, education exhibit authors will be required to submit PDF files of backboard exhibits by the same deadline as electronic exhibits if they wish to be considered for an award. The Board authorized a pilot program at RSNA 2016 to grant CME for select backboard education exhibits using on-line quizzing capabilities embedded in the exhibits.

RSNA to Co-sponsor DIA Conference

RSNA has agreed to co-sponsor with the Drug Information Association (DIA) its 2015 Medical Imaging Conference: The Implementation of Audit Methods in Oncology Clinical Trials. The DIA is well-recognized by the communities involved in drug development and this will provide a new and unique opportunity for RSNA to explore synergies with individuals and subjects of interest to the Quantitative Imaging and Biomarkers Initiative.

As the Board continues planning for RSNA 2015, I look forward to seeing all of you in Chicago as we celebrate the Society's 100 years at the forefront of radiology.

Richard L. Ehman, M.D.
Chair, 2015 RSNA Board of Directors

THIS MONTH IN THE *RSNA NEWS* ONLINE VERSION

Get more of this month's news online at *RSNA.org/News*. Enjoy interactive features including video, audio, slide presentations and more. Go online to leave us a comment and easily share stories via social media as well.

As part of this month's story on new MRI research shedding light on how babies experience pain, we feature a video of a parent involved in the study, explaining her motivation to participate in the research. In addition, we invite readers to explore the recently redesigned *RadiologyInfo.org*, the RSNA/ACR public information website, featured in this month's issue.

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

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

REPRINTS AND PERMISSIONS
permissions@rsna.org
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1-630-590-7724 fax

ADVERTISING
jkapicak@rsna.org
Judy Kapicak, Assistant Director
1-630-571-7818

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LOOK AHEAD

The Future of Oncologic Imaging

BY HEDVIG HRICAK, M.D., PH.D., DR. H.C.

In the last 40 years, radiology has received a tremendous boost from technological innovation and advances in computer science and engineering. As a result, imaging has emerged as an essential diagnostic tool in cancer care. The role and importance of imaging continue to grow as it evolves from depicting anatomy and morphology to concurrently interrogating tumor biology. For us as radiologists all of this should be cause for great optimism and excitement, yet the future of oncologic imaging is somewhat uncertain.

Hricak

There are two possible paths: one—though strewn with challenges—which involves continuous learning and development and can lead to a bright future for radiology; and another—the path of least resistance—in which radiology never fully embraces the new era of molecular medicine and thereby accepts a reduced standing in the arena of clinical practice. At this time it is still unclear which path our specialty will choose.

Seizing Opportunities for Change

Instead of eagerly embracing the new capabilities of imaging and the new paradigm of molecular-based medicine, our specialty has been slow to adapt. Today our training programs neither mandate nor incentivize the acquisition of knowledge regarding molecular biology, genomics or epigenetics. And while advances in these areas have made a significant impact on all fields of medicine, they are especially important in oncology.

If we only apply our technical skills to read routine, primarily morphologic imaging scans, at some point in the future our skills may become obsolete due to the increasingly sophisticated software for computer-assisted diagnosis that is already diffusing through the medical environment. In the same way as other obsolete medical practices are thought of today, radiology may come to be regarded as a relic of the past, its phenomenal capabilities and opportunities absorbed into other medical disciplines. In short, if we do not embrace change, we risk the future of our whole specialty.

However, if we seize the many exciting opportunities that modern medicine already offers and work to incorporate molecular diagnostics into all subspecialties of radiology, then radiology will grow and flourish as a respected, pioneering branch of medicine in the decades to come.

Participating in "Tumor Boards" is Essential

In this age of rapid innovation and accumulation of knowledge, many nuances that radiologists learned about MR or CT technology, molecular imaging or molecular biology five or ten years ago are already out of date. Our success depends on our willingness to continuously learn and integrate new knowledge into our clinical practice.

Today, for many cancers, genomic and proteinomic tests are already used routinely, and their use will only grow in the

HEDVIG HRICAK, M.D., PH.D., DR. H.C., is Chair of the Department of Radiology, Caroll and Milton Petrie Chair, Memorial Sloan-Kettering Cancer Center, New York. She also holds a senior position within the Molecular Pharmacology and Chemistry Program at the Sloan-Kettering Institute and is a professor of radiology at the Weill Medical College of Cornell University, New York. Dr. Hricak served as 2010 RSNA President and will receive the RSNA Gold Medal at RSNA 2015.

years to come. We must be able to factor in the results of "omic" tests when we provide summaries of our interpretations. As the complexity of medicine grows, we will only be able to provide context-specific, clinically relevant interpretations if we increase the depth and specificity of our knowledge.

There is substantial evidence to show that subspecialty training and subsequent continuous subspecialty practice greatly improve the quality of image interpretation. In an optimal cancer care setting, radiologists are integral members of multidisciplinary teams, in which specialists with expertise in a particular type of cancer regularly meet to discuss cases and determine the best management approach for each patient.

Radiologists who participate in multidisciplinary team meetings (MTMs, also known colloquially as "tumor boards") learn very quickly that their added value comes from being consultants and true partners in patient care. They realize they have to be more than just "film readers" who produce reports that are technically accurate but clinically irrelevant or unhelpful. Furthermore, by listening to case discussions and the feedback from other members of MTMs, they deepen their understanding of specific tumors and stay abreast of the latest developments in clinical care. As a result, their reports are increasingly tailored to individual patients and specific clinical scenarios.

While time spent in MTMs may not currently be financially reimbursable in the U.S., our participation in them should be considered an essential investment in our own continuous professional development. In the long term, regular participation in such "tumor boards" will pay dividends in the form of more accurate, clinically relevant image interpretations that lead to more effective and efficient patient care. In turn, it will also bring greater recognition of the importance of our profession.

Embracing the Precision of Quantitative Data

Oncologic imaging needs to be formally recognized as a subspecialty of radiology, and subspecialty training opportunities need to be expanded. Furthermore, in addition to participating in MTMs, we need to find better ways to share our knowledge and help each other with complex cases or rare cancers. One possible solution is to create centers of excellence, which could provide detailed subspecialty interpretation and advice.

Modern molecular imaging offers tremendous potential for advancing our understanding of tumor biology. 18F-FDHT PET/CT imaging of free androgen receptors in a patient with metastatic prostate cancer. Imaging before (a) and after (b) treatment with a novel anti-androgen drug demonstrates that the drug reaches the target and blocks the interaction of androgens with androgen receptors in metastases. (Images reprinted from: Hricak H. Oncologic imaging: a guiding hand of personalized cancer care. *Radiology*. 2011;259(3):633-40. doi: 10.1148/radiol.11110252. Epub 2011 Apr 14.)

Radiologists who participate in multidisciplinary team meetings (MTMs, or "tumor boards") learn very quickly that their added value comes from being consultants and true partners in patient care.

Many exciting opportunities exist to incorporate molecular diagnostics into all subspecialties of radiology.

Implementing radiology reporting templates and lexicons that offer greater diagnostic precision is another important step toward using quantitative, rather than qualitative assessments, whenever possible.

"...if we seize the many exciting opportunities already available in modern medicine and work to incorporate molecular diagnostics into all subspecialties of radiology, then our specialty will grow and flourish."

HEDVIG HRICAK, M.D., PH.D., DR. H.C.

Another important step that would enhance radiology's value is the implementation of standardized reporting templates and lexicons with greater diagnostic precision. Quantitative, rather than qualitative assessments, should be used wherever possible, thereby allowing robust comparison of results both from an individual patient and between patient groups. To take just one example: a urologist would never accept a report that described a patient's PSA as "a little elevated." As radiologists, how can we expect needlessly ambiguous language to be accepted by our clinical partners?

A Specialty of Innovation

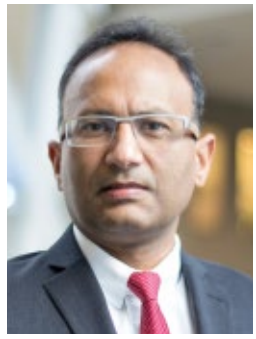
Finally, teamwork between physicians and patients is critical for achieving the best possible outcomes. Clear and open lines of communication with patients are key for radiologists to become more relevant and engaged as partners in patient care. Patients are seeking a clear understanding of their diagnostic test results in order to help them make appropriate, informed decisions. Patient portals, although viewed by some as disruptive to the paternalistic medical framework, are one of the best technological developments in recent years for improving radiologists' accessibility—and their visibility. Radiologists need to embrace such new communication tools and the responsibilities that come with them.

If we build on all these wonderful opportunities, radiology will continue to grow and will be recognized as a specialty of innovation. It will become even more central to patient care by advancing diagnostics as well as therapy. Therefore we must make every effort to emerge from our reading rooms, integrate ourselves into the ever-changing flow of daily clinical practice and advance into the bright future that lies ahead. □

Multiphase CT Shows Promise for Stroke Patients

BY ED BANNON

A new brain imaging technique—multiphase CT angiography—allows physicians treating acute ischemic stroke (AIS) patients to make faster decisions at a time when every second is critical, new *Radiology* research shows.



Goyal

Menon

"Multiphase CT angiography has a number of qualities that make us believe the tool will improve patient care in stroke significantly."

MAYANK GOYAL, M.D.

The imaging tool quickly produces crucial data on collaterals, reducing uncertainty in clinical decision-making and allowing for slightly better prediction of clinical outcome than current imaging techniques, researchers say. The study appears in the May 2015 issue of *Radiology*.

"Multiphase CT angiography allows for consistency across different machines and different locations and leads to a quick diagnosis in terms answering the question, 'Is this patient a suitable candidate to take to the next level and try for early recanalization?'" said author Mayank Goyal, M.D., director of research in the Department of Diagnostic Imaging at the University of Calgary in Canada.

While current techniques have allowed for significant progress in stroke treatment, they also possess disadvantages: conventional angiography is invasive and time-intensive, single-phase CT angiography lacks temporal resolution, perfusion CT and MRI are susceptible to patient motion and require trained personnel to process data, and dynamic CT angiography requires post-processing and whole-brain perfusion CT.

Multiphase CT angiography provides information on degree and extent of pial arterial filling in the whole brain more quickly than other methods—critical considering that every 30-minute delay in treatment could increase the risk of poor clinical outcome by approximately 14 percent, researchers said.

"This tool is easy to use and very fast to interpret," said lead author Bijoy K. Menon, M.D., an assistant professor of neurology at the University of Calgary. "It can save critical time that can mean the difference between walking and not walking, talking or not talking, or even living or not living."

Quick to Perform, Easy to Interpret

Researchers studied 147 acute ischemic stroke patients—all of whom underwent baseline unenhanced CT, single-phase CT angiography of the head and neck, perfusion CT and multiphase angiography CT, and compared techniques with respect to their interrater reliability and predictive ability. The mean patient age was 72 years and the patient cohort was about 50 percent male.

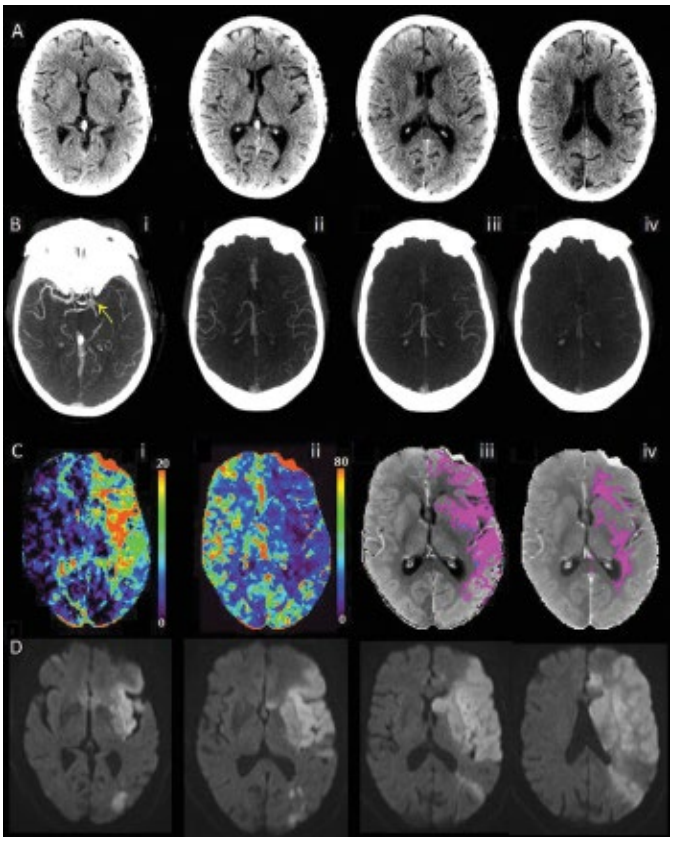
The authors independently assessed multiphase CT angiography in 30 randomly chosen subjects by using a six-point ordinal scale that was then reclassified into three clinically relevant categories ("good," "intermediate" and "poor" pial arterial filling). Researchers made treatment recommendations based on images using all scanning techniques.

Results showed that for intravenous tissue plasminogen activator decision making, there was agreement 92.5 percent (k = 0.68) of the time between single-phase vs. multiphase CT angiography—the highest rate of agreement. The next highest agreement rate was between unenhanced CT and multiphase CT angiography at 89.1 percent (k = 0.4). Similarly for intra-arterial treatment decisions, maximal agreement (89.8 percent, k = 0.8) was seen between single- and multiphase CT angiography.

Additionally, multiphase CT models decreased National Institutes of Health Stroke Scores by 50 percent over a 24-hour period.

Results showed that multiphase CT angiography has the ability to predict stroke outcomes slightly better than models using single-phase CT angiography and perfusion CT. In addition, the technique was quick to perform and produced images that were easy to acquire and interpret.

"It's those in-between situations where we need to have the fine-tuning of decision-making



Above: **Multimodal CT images obtained 2 hours 18 minutes after symptom onset in an 87-year-old woman with an NIH Stroke Scale of 15 and left hemisphere symptoms. A, Unenhanced CT ASPECTS score was 6. B, A proximal left M1 MCA occlusion (i). Multiphase CT angiography (three phases) maximum intensity projection images (ii, iii, iv) are indicative of one phase delay at worst, with similar extent and prominence when compared with the contralateral side. These indicate of a score of 4 and suggest the patient should undergo treatment. C, CT perfusion Tmax and CBF maps (i, ii). A CBF-defined infarct core is 1 mL (iii, no blue regions). A mismatch ratio of 106 and a small infarct core suggests the patient should undergo treatment. Multiphase CT angiography and perfusion CT imaging are congruent for treatment decision. D, MR diffusion images at 26 hours after admission show the final infarct as hyperintense. This patient did not attain recanalization with endovascular therapy.** (*Radiology* 2015:257;2;510-520)

that multiphase CT angiography provides," Dr. Goyal said.

"The major point of this research is that this is a very simple, quick tool," Dr. Menon said. "This tool can be used by a wide range of caregivers and can help physicians make the right decision."

WEB EXTRAS

Access the study, "Multiphase CT Angiography: A New Tool for the Imaging Triage of Patients with Acute Ischemic Stroke," at *RSNA.org/Radiology*.

No Extra Contrast Required

In developing the multiphase CT angiography technique, researchers started with conventional arch-to-vertex CT angiography. The next two phases were sequential skull-base-to-vertex acquisitions performed in the mid- and late-venous phases. The result is three time-resolved images of pial arterial filling in the whole brain.

The multiphase technique takes about 16 seconds longer than a single-phase CT angiography but the multiphase scan is easier to interpret and more reliable, Dr. Menon said.

Neuroimaging experts say multiphase CT angiography offers considerable promise for treating stroke patients, including those who show contraindications for treatment.

"With just a single phase, the physician may over- or underestimate the core infarction," said Michael Lev, M.D., director of emergency radiology and emergency neuroradiology at Massachusetts General Hospital, Boston. "Multiphase CT angiography is a way to more accurately detect that element. The key advantage is that the three sets of images provide a much better assessment of the collaterals."

In addition, the technique requires minimal radiation, does not require additional contrast material, offers whole-brain coverage, does not need post-processing and costs less than other modalities such as MRI and CT perfusion.

"An important feature of our imaging protocol was that the two additional phases of multiphase CT angiography used no additional contrast material; the total radiation dose with our imaging protocol was less than that in many established stroke centers," Dr. Menon said.

While larger studies are needed to conclusively demonstrate the utility of multiphase CT angiography in triage and clinical decision making, researchers say the new imaging method has the potential to substantially impact the care of stroke patients. □

ED BANNON is a Chicago-based freelance writer.

RSNA 2015 Courses Focus on Stroke

RSNA 2015 offers a number of courses related to stroke, including:

- International Stroke Treatment: Practical Techniques (an Interactive Session)—Monday, Nov. 30
- Neuroradiology Series: Stroke—Tuesday, Dec. 1
- Controversy Session: CT Perfusion (CTP) and Stroke: RIP?—Wednesday, Dec. 2

Visit RSNA 2015 Meeting Central to register and add courses to your agenda at *Meeting.RSNA.org*.

RadiologyInfo.org Redesign Makes Site More User-Friendly

BY PAUL LaTOUR

RadiologyInfo.org, ***the 15-year-old collaborative public information effort between RSNA and the American College of Radiology (ACR), recently underwent a major redesign with two goals in mind: to make the website more user-friendly by offering seamless access on a variety of devices, and to present the information in an easier way for patients and the lay public to digest.***

Conceived in 1997 and operating since 2000, *RadiologyInfo.org* offers information on more than 200 radiologic procedures with easy-to-understand descriptions about what to expect during imaging exams, how to prepare and more. It also includes information about diseases and conditions, as well as articles about screening wellness.

"Our research showed that in the past the site has been a little bit daunting for the public," said Geoffrey D. Rubin, M.D., co-chair of the RSNA-ACR Public Information Website Committee that oversees *RadiologyInfo.org*. "With this redesign we have not sought to 'dumb down' or reduce the quality of content in any way—we have simply made the more advanced content available for secondary reading after users have indicated that they would like to know more."

Keeping up with changing technology was central to the redesign, said Elliot K. Fishman, M.D., co-chair of the *RadiologyInfo.org* committee. The site now adapts to any screen size regardless of whether a person is using a desktop computer, mobile device or tablet. The website previously offered separate mobile and desktop versions.

The motivation for the changes was simple—while the information is still valuable for radiology patients, the website no longer reflected today's digital world in look or feel.

"Everything about the way people access information has changed in the intervening years since we began *RadiologyInfo.org*," Dr. Fishman said. "We wondered if we were keeping up with where things were going with technology. We wanted to be certain we were ahead of the curve, not behind it."

That meant not only the redesign, but a thorough vetting of the site in order to make it as user-friendly as possible. The process began in 2013 with several rounds of focus groups and usability testing. The research sessions involved medical personnel and members of the general public interacting with the site and discussing how they research medical information.

A strategic planning session, the first of its kind for the committee, took place in February 2014. While patient-centeredness had always been key to the website's mission, the committee developed a simple, yet meaningful mission statement: *RadiologyInfo.org* is dedicated to being the trusted source of information for the public about radiology and to helping patients understand the vital role radiologists play in their healthcare.

With the usability research in hand, the committee set out to provide the information patients wanted in the ways they were used to accessing it.

Videos to Feature Doctors Describing Procedures

One major undertaking involved the many videos on the site. Before the redesign, the videos were PowerPoint presentations with an audio overlay. The committee is now developing new videos with radiologists describing radiology procedure directly to viewers.

Fishman

Rubin

"We looked at what users said they wanted and took that to heart," said Dr. Fishman, a radiology professor at Johns Hopkins School of Medicine. "With videos they told us they wanted to see a real doctor explaining the information rather than a PowerPoint presentation. It was a very simple, but effective, change to make."

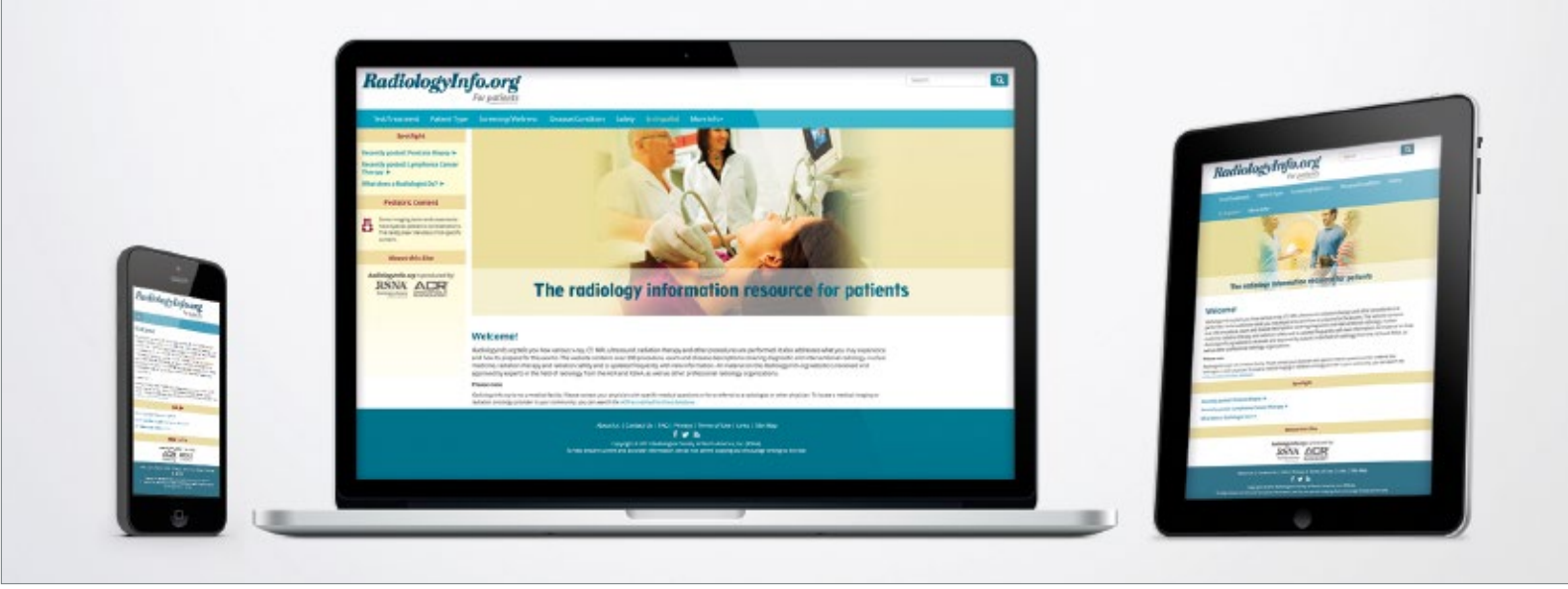
Another change involved segmenting the content into two tiers. The first tier contains basic information about a particular test the patient is undergoing. Focus group members indicated that sometimes they prefer easily digestible snippets of information to get a general idea about a particular exam.

"Even the names of some imaging tests can be scary or disorienting," said Dr. Rubin, a professor of radiology and bioengineering at Duke University. "Our goal is to demystify the tests so that patients and those who support those patients are as reasonably informed as possible to allay anxiety and concern."

Users who want information beyond the basics can access the second tier for more in-depth procedure descriptions along with technical aspects of an exam. Most of those materials already existed on the site.

The committee believes that the redesign will lead to increased traffic, which impacts the site's ranking on Google searches and will help differentiate *RadiologyInfo.org* from its competitors.

"It's a Google world where people expect to find what they're looking for within one click," Dr. Fishman said. "The redesign brings the site up to where it should be. Diseases haven't changed, but we've learned how to present the information better."



Keeping pace with changing technology, *RadiologyInfo.org* now adapts to any screen size regardless of whether a visitor is using a desktop computer, mobile device or tablet.

RadiologyInfo.org is Important Patient Resource

The redesign comes as *RadiologyInfo.org* is experiencing record growth. Each of the first six months of 2015 set a record for the number of visits within that calendar month. For instance, in March, the website set a record of more than 1 million (1,011,730) visits in a single month. That was topped two months later with 1,026,641 visits. And of the nearly 5.7 million total visits to the website during the first six months of 2015, 1,797,128 were to the Spanish-language version of the site.

"This is an exciting milestone for *RadiologyInfo.org*," Dr. Fishman said. "Thanks to the combined efforts of many radiology professionals, RSNA and ACR have created an important information resource that positively impacts thousands of lives each day."

Dr. Rubin added that in an effort to maximize the value of the site, the committee wants radiology practices and other medical professionals to emphasize the resource to their patients. Referring physicians can help their patients prepare for an exam by pointing them to the site so they arrive ready for their examination.

"It's a way to get in front of the appointment and get the information to the patient," Dr. Rubin said. "It's all about direct communication with patients and their families."

Dr. Fishman also said the committee will continue to look at ways to improve the site in the future.

"The site is really alive and evolving," he said. "We don't want it to become static. It will always be a work in progress." □

PAUL LaTOUR is an *RSNA News* staff writer.

User feedback was central to the redesign of *RadiologyInfo.org*. "We looked at what users said they wanted and took that to heart," said Elliot Fishman, M.D., co-chair of the RSNA-ACR Public Information Website Committee. *Right*: Users who want information beyond the basics can now access a second tier for more in-depth procedure descriptions along with technical aspects of an exam.

Explore *RadiologyInfo.org* at RSNA 2015

RadiologyInfo.org is featured as an important patient communication tool in patient-centered radiology courses presented to radiologists at RSNA 2015. The Special Interest Session, "A New Model of Patient Care: Value Over Volume," Monday, Nov. 30, and "Tweet This: How to Make Radiology More Patient Centered," Thursday, Dec. 3, will highlight *RadiologyInfo.org* and its benefits to patients. Attendees are also invited to stop by RSNA Services to get a demonstration of the website from RSNA staff members.

Visit the RSNA 2015 Meeting Central site at *Meeting.RSNA.org* to register and add courses to your agenda.

EXPLORE CHICAGO DURING RSNA 2015

BY MARY ANN McCLAIN

Take advantage of your time in Chicago to experience some of what this amazing city has to offer. From dazzling architecture and world-class museums to an eclectic mix of music and entertainment, the Windy City has a vibrancy all its own.

This year, we have compiled our annual roster of some of the "musts" — must see, do, enjoy — from Choose Chicago, the city's official tourist destination resource. For a full list of attractions, visit *ChooseChicago.com*.

MUSEUMS AND CONSERVATORIES

ADLER PLANETARIUM

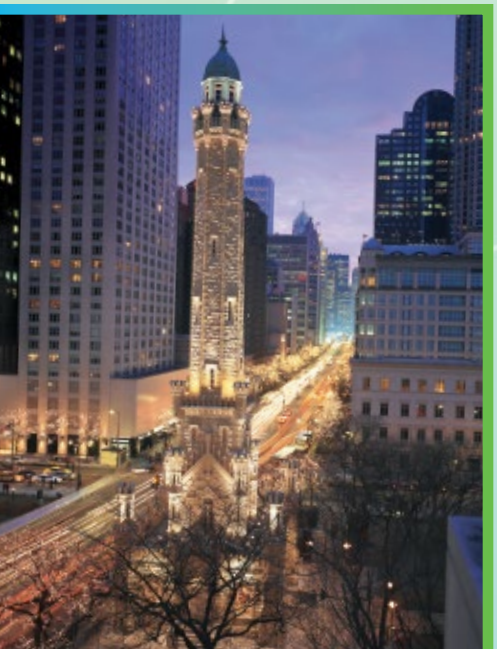
The Adler fuels imaginations about the skies above us, offering daily planetarium shows and exhibits using leading-edge technology. Don't miss "The Universe: A Walk through Space and Time" or the 30-minute live "Destination Solar System."

- 300 S. Lake Shore Dr.
  1-312-922-7827
  adlerplanetarium.org

ART INSTITUTE OF CHICAGO

With two bronze lions flanking its Michigan Avenue entrance, the Art Institute houses more than 300,000 artworks and artifacts from around the globe. The new "A Voyage to South America" exhibit shows the influence cultural convergence had in early South America as European conventions merged with indigenous traditions.

- 111 S. Michigan Ave.
  1-877-307-4242
  artic.edu



CHICAGO HISTORY MUSEUM

Telling the proud story of Chicago's past, the museum's artifacts and collections date back to 1856. For "The Secret Lives of Objects," the museum opened its vaults to shine a light on objects that have played a part in this city's intriguing past, including Charlie Chaplin's bamboo cane and the glasses worn by Nathan Leopold Jr., in the infamous 1924 Leopold and Loeb murder case.

- 1601 N. Clark St.
  1-312-642-4600
  chicagohistory.org

DRIEHAUS MUSEUM

Take a self-guided tour through the Driehaus, one of the few remaining palatial homes erected during America's Gilded Age. The "Makers & Muse" exhibit showcases over 250 pieces of exquisite jewelry made by female designers between the Victorian Era and the First World War.

- 40 E. Erie St.
  1-312-482-8933
  driehausmuseum.org

DUSABLE MUSEUM OF AFRICAN AMERICAN HISTORY

As the nation's first independent museum dedicated to collecting and preserving the history, culture and works of people of African descent, the DuSable offers exhibits, concerts, films, children's events and literary discussions.

- 740 E. 56th Place
  1-773-947-0600
  dusablemuseum.org

FIELD MUSEUM OF NATURAL HISTORY

The Field inspires curiosity about life on Earth while exploring how the world came to be. The newest exhibit, "Cyrus Tang Hall of China," takes visitors across thousands of years of Chinese history to discover one of the world's most influential civilizations.

- 1400 S. Lake Shore Dr.
  1-312-922-9410
  fieldmuseum.org

GARFIELD PARK CONSERVATORY

Often referred to as "landscape art under glass," this glass and metal structure is breathtaking with lush greenery, demonstration gardens and prairie waterfalls set among stone and water landscapes.

- 300 N. Central Park Ave.
  1-312-746-5100
  garfield-conservatory.org

LINCOLN PARK CONSERVATORY

Built in the late 1800s, the Conservatory was designed to showcase exotic plants and grow the thousands of plants needed for use in area parks.

- 2391 N. Stockton Dr.
  1-312-742-7736
  chicagoparkdistrict.com/parks/lincoln-park-conservatory

MUSEUM OF CONTEMPORARY ART

The MCA offers exhibitions of the most thought-provoking art created since 1945.

- 220 E. Chicago Ave.
  1-312-280-2660
  mcachicago.org

MUSEUM OF SCIENCE AND INDUSTRY

Packed with all kinds of interactive bells and whistles, the museum offers hands-on experiences designed to spark scientific inquiry and creativity. Catch the "Journey to Space" film and the newest interactive collection – "Robot Revolution," illustrating how robots help and improve our lives.

- 5700 S. Lake Shore Dr.
  1-773-684-1414
  msichicago.org

NATIONAL MUSEUM OF MEXICAN ART

Experience the richness of Mexico through its color, art and culture. The museum offers performing arts initiatives in film, literature, theater, culinary arts and more.

- 1852 W. 19th St.
  1-312-738-1503
  nationalmuseumofmexicanart.org

PEGGY NOTEBAERT NATURE MUSEUM

With its focus on green living and sustainability, the Notebaert invites you to explore nature in unusual and innovative ways.

- 2430 N. Cannon Dr.
  1-773-755-5100
  naturemuseum.org

PRITZKER MILITARY MUSEUM & LIBRARY

A must-see for military buffs, the Pritzker offers a nonpartisan look at military history and at the sacrifices made by the men and women who served.

- 104 S. Michigan Ave.
  1-312-374-9333
  pritzkermilitary.org

RSNA TOURS & EVENTS

To add to your Chicago adventure, RSNA offers variety of tours and events. Look for the RSNA Tours and Events icons in this article signaling RSNA pre-arranged packaged deals. Enroll for tours and events online at *RSNA.org/Tours-and-Events*.

SHEDD AQUARIUM

As the largest indoor marine animal facility and home to over 32,500 animals, Shedd explores the world's oceans, rivers and reefs, and offers an enthralling array of exhibits and shows. The newest exhibit dives into the fascinating world of amphibians.

- 1200 S. Lake Shore Dr.
  1-312-939-2438
  sheddaquarium.org

Nov. 29—Behind the Scenes at the Shedd Aquarium.

- *RSNA.org/All-Tours-and-Events/*

THEATRE

"BEAUTIFUL: THE CAROLE KING MUSICAL"

Starts Dec. 1

Endorsed by the Grammy winner herself, this Tony award-winning play traces Carole King's early life, her reluctant rise to fame, and features some of the songs she made famous.

- Oriental Theatre
  24 W. Randolph St.
  1-312-977-1700
  Tickets: 1-800-775-2000
  broadwayinchicago.com/show/beautiful-the-carole-king-musical
- *RSNA.org/All-Tours-and-Events/*

"DOMESTICATED"

Starts Dec. 3

Politician Bill Pulver stumbles through a carefully crafted apology as his wife stands stoically behind him in this wickedly funny play about a marriage burst apart by a sex scandal. Yet... what is she really thinking?

- Steppenwolf Theatre Company
  1650 N. Halsted St.
  1-312-335-1650
  steppenwolf.org

"THE HEIR APPARENT"

Eraste has it all – good looks, a beautiful fiancée and the prospect of a sizable inheritance from an elderly uncle. However, his uncle has bequeathed his entire fortune to someone else.

- Chicago Shakespeare Theater's Courtyard Theater
  800 E. Grand Avenue on Navy Pier
  1-312-595-5600
  chicagoshakes.com

"THE LION KING"

Disney presents this Tony-winning musical that brings the much-loved 1994 animated film to life.

- Cadillac Palace Theatre
  151 W. Randolph St.
  1-800-775-2000
  broadwayinchicago.com/show/disneys-lion-king
- *RSNA.org/All-Tours-and-Events/*

"TREASURE ISLAND"

Adapted from the beloved Stevenson novel, set sail with young Jim Hawkins, Long John Silver and a crew of swashbuckling rogues as this epic tale unfolds on the stage.

- Lookingglass Theater
  821 N. Michigan Ave.
  1-312-337-0665
  lookingglasstheatre.org/event_page/treasure-island

ENTERTAINMENT

BEST OF SECOND CITY AND CHICAGO PIZZA

Nov. 30

Chicago is known for deep dish pizza and for the side-splitting improv of Second City, where Dan Aykroyd and John Belushi got their start. Enjoy an evening at one of the area's best pizzerias then head over to The Second City Theater for some laughs.

- *RSNA.org/All-Tours-and-Events/*

BLUE MAN GROUP

Find out for yourself why the Blue Man Group continues to impress and entertain audiences worldwide. Children under five not admitted.

- Briar Street Theatre
  3133 N. Halsted St.
  1-773-348-4000
  blueman.com
- *RSNA.org/All-Tours-and-Events/*

BLUES REVUE AT REGGIE'S MUSIC JOINT

Dec. 2

Enjoy a night of hot wings and cool Chicago blues at this unique Chicago venue. Hosted by RSNA's own Ari "Doc o' Rock" Mintz, your evening will be filled with memorable music, some of the best wings in town – and if you are up for it – dancing!

- *RSNA.org/All-Tours-and-Events/*

SYMPHONY AND OPERA

GERSHWIN'S "RHAPSODY IN BLUE"

Nov. 27, 29

This musical composition by George Gershwin beautifully combines elements of classical music with jazz-influenced effects. Marin Alsop conducts a program of masterworks that also includes Clyne's "Masquerade," Barber's Second Essay for Orchestra and Dvorak's Symphony No. 7.

- Chicago Symphony Orchestra
  20 S. Michigan Ave.
  1-312-294-3000
  cso.org

"THE MERRY WIDOW"

This captivating comedy tells the story of wealthy widow Hanna and her countrymen's attempts to keep her money in the principality by finding her the right husband.

- Lyric Opera of Chicago
  20 N. Wacker Dr.
  1-312-332-2244
  lyricopera.org

VIENNA BOYS CHOIR

Nov. 28

Ring in the holidays with the enchanting sounds of the world-renowned Vienna Boys Choir

- Chicago Symphony Orchestra
  20 S. Michigan Ave.
  1-312-294-3000
  cso.org
- *RSNA.org/All-Tours-and-Events/*

Continued on Page 16

Do Babies Feel Pain Like Adults? MRI Research Offers New Insights

BY RICHARD S. DARGAN

Novel MRI research has determined that infants have patterns of pain-related brain activity similar to adults but with a much lower pain threshold. The study findings highlight the importance of developing effective pain management strategies for infants, researchers said.

"Our study suggests that not only may babies experience pain, but they may be more sensitive to it than adults."

REBECCAH SLATER, PH.D.

Infants—particularly those born prematurely—are sometimes subjected to painful procedures, like line and tube placement and repetitive blood draws. A 2014 *Neonatology* study from the Netherlands found that each infant in the neonatal intensive care unit averaged more than 11 painful procedures per day. Compared with adults, less is known about how infants experience pain, which has led to a lack of recognition in clinical practice. MRI has been used to study pain-related brain activity in adults, but is difficult to perform on infants because it requires the subject to remain still during imaging.

For the new study, researchers from the Department of Paediatrics at the University of Oxford, U.K., were able to address this issue by enlisting the help of the babies' parents. A report on the research appears in the April 21 online edition of the journal eLife.

"Until recently, researchers didn't think it was possible to study pain in babies using MRI because, unlike adults, they don't keep still in the scanner," said study lead author Rebeccah Slater, Ph.D., associate professor of paediatric imaging at the University of Oxford. "However, as babies less than a week old are more docile than older babies, we found that their parents were able to get them to fall asleep inside a scanner so that we could study pain in the infant brain using MRI."

The study compared 10 healthy infants between one and six days old and 10 healthy adults aged 23 to 36 years. In most cases one or both parents stayed with the babies and a trained medical professional was always present. Babies were cuddled and nursed to get them to fall asleep inside the MRI scanner. Researchers used a special bean bag to help keep the babies' heads still and earphones to reduce the scanner sound.

The Oxford researchers used Blood Oxygenation Level Dependent (BOLD)-based MRI, a technique in which the signal changes in intensity depending on the oxygen level in the blood.

"Brain activity causes a local increase in blood flow, bringing with it oxygenated blood that causes the images to get a little brighter," said Stuart Clare, Ph.D., university research lecturer at the University of Oxford. "This non-invasive method doesn't require any extra equipment—just a researcher with a stopwatch to provide the stimulus at the right time."

Slater

Clare

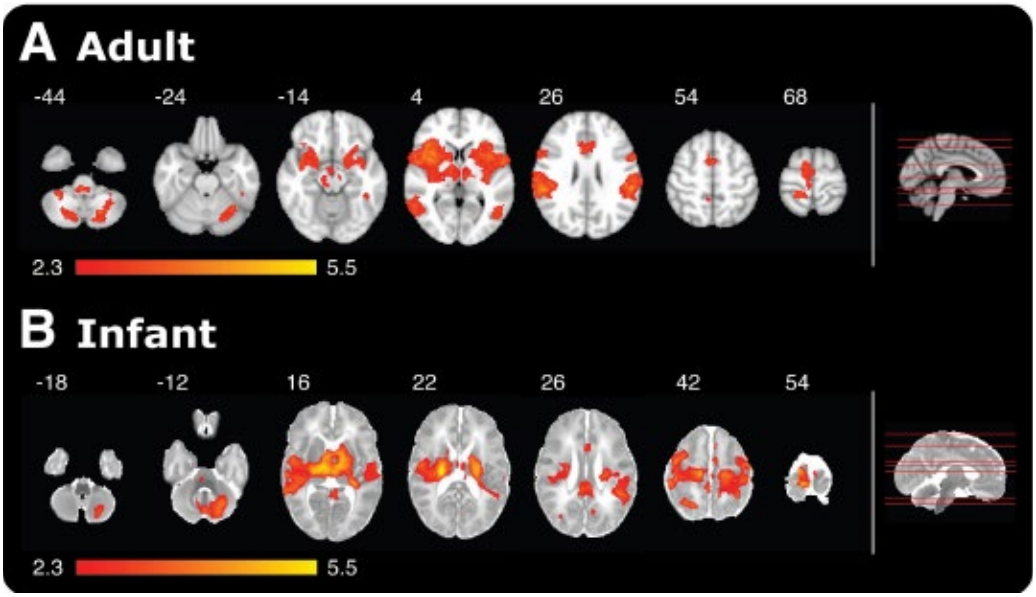
To monitor head motion, researchers also used Prospective Acquisition CorrEction (PACE), a vendor-supplied technology that tracks the subject's movement from scan to scan making minor adjustments to the imaging prescription to ensure that the region of interest is always in view.

"At first we thought that this technology would make a big difference in the study—but, provided the babies are settled in the scanner, which happened most of the time—it would be possible to do a study like this without it," Dr. Clare said.

During scanning, subjects were poked on the bottom of their left foot with special retracting rods that can be applied at several different force settings. Each stimulus was administered 10 times for about one second each.

When researchers compared MRI scans from the babies with those of adults exposed to the same intensity stimulation, they found that 18 of the 20 brain regions active in adults experiencing pain were active in babies. Scans also showed that babies' brains had the same response to a weak poke as the adults did to a stimulus four times as strong, suggesting that they may have a much lower pain threshold than adults.

"This is particularly important when it comes to pain: obviously babies can't tell us about their experience of pain and it is difficult to infer pain from visual observations," Dr. Slater said. "Histor-



Left: **An MRI scan comparing brain activity in adults and infants when poked with the special retracting rod simulating a sensation of pain. Red-yellow colored areas represent active brain regions. The side-on view on the far right shows the level at which each scan was taken.**

Images courtesy of the University of Oxford.

ically it was thought that babies' brains may not be developed enough for them to really 'feel' pain—that any reaction is just a reflex. Our study provides evidence that this is not the case."

Reexamining Pain Prevention Strategies

The findings highlight the importance of pain prevention strategies in infants, researchers said. As recently as the 1980s it was common practice for babies to be given neuromuscular blocks without pain relief medication during surgery.

"Thousands of babies across the U.K. undergo painful procedures every day, but there are often no local pain management guidelines to help clinicians," Dr. Slater said. "Our study suggests that not only may babies experience pain but they may be more sensitive to it than adults. If we provide pain relief for an older child undergoing a procedure, then we should look at giving pain relief to an infant undergoing a similar procedure."

Rachel Edwards, one of the parents involved in the study, was motivated to participate after her first son Rhys was born four weeks early and had to go to a special unit where he received more than 10 heel lances a day without any pain medication. Wanting to know more about how babies feel pain, she gave permission for her newborn son Alex to take part in the study.

"Before Alex went in I got to feel all the things he would feel as part of the study including the pencil-like retracting rod," she recalled. "It wasn't particularly painful; it was more of a precise feeling of touch."

There are numerous pain management strategies for infants, and not all carry the risks associated with powerful drugs. For instance, studies have shown that a small amount of a sweet, sucrose-based solution placed in the infant's mouth is a safe and effective strategy for management of short-term pain. Pain or stress-reducing strategies like those outlined in the Newborn Individualized Developmental Care and Assessment Program are also helping to raise awareness.

In the future, the Oxford researchers hope to identify a neurological pattern of pain-related brain activity in babies' brains similar to that shown in adults in recent MRI studies.

"This could enable us to test different pain relief treatments and see what would be most effective for this vulnerable population who can't speak for themselves," Dr. Slater said.

The infants in the study were poked on the bottom of the foot by a special retracting rod simulating a sensation of pain that could then be studied using MRI. Rachel Edwards, *above*, who gave permission for her son Alex to take part in the study, demonstrates how the retracting rod works on herself. She said: "It wasn't particularly painful, it was more of a precise feeling of touch."

"This intriguing study brings together developmental neuroscience and cutting-edge neuroimaging to advance our understanding of pain," added Raliza Stoyanova, Ph.D., science portfolio advisor for Wellcome Trust, the London-based biomedical research charity that funded the research. "The finding that brain networks similar to those found in adults are activated in babies exposed to pain stimuli suggests that babies may feel pain in a similar way. We may need to re-think clinical guidelines for infants undergoing potentially painful procedures." □

WEB EXTRAS

Access the study, "Development: How Do Babies Feel Pain"? at *elifesciences.org/content/4/e07552.full*

View a video of Rebeccah Slater, Ph.D., of Oxford University, discussing pain in infants and the potential role of MRI at *RSNA.org/News*.

RICHARD S. DARGAN is a writer based in Albuquerque, N.M., specializing in healthcare issues.

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Feng Zhang, M.D.

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YOUR DONATIONS IN ACTION

Research Explores Non-invasive Monitoring of Liver Inflammation and Fibrosis

Liver fibrosis—an important worldwide health problem if left unchecked = can progress to cirrhosis and corresponding portal hypertension and liver failure. Cirrhosis is also a major risk factor for development of hepatocellular carcinoma. Biopsy is the gold standard for diagnosing fibrosis, but is invasive and subject to sampling errors.

With a 2014-2016 Mallinckrodt/RSNA Research Scholar Grant, Michael A. Ohliger, M.D., Ph.D., seeks to develop new hyperpolarized carbon-13 MRI methods to monitor the progression of inflammation and fibrosis using clinical MRI scanners.

"The techniques developed in this study can be directly translated into human studies; a 13C-labeled compound ([1-13C] pyruvate) has already been tested in humans," Dr. Ohliger said.

"Data will be used to gain further funding and regulatory approval to bring hyperpolarized 13C techniques in the clinic, providing new tools to help patients with chronic liver disease."

EXPLORE CHICAGO DURING RSNA 2015 *Continued from Page 12*

FAMILY PERFORMANCES

"A CHRISTMAS CAROL"

Nov. 28

Ring in the holidays with this timeless Dickens classic, a holiday staple at the Goodman for over 30 years!

- Goodman Theatre
  170 N. Dearborn St.
  1-312-443-3800
  goodmantheatre.org
- *RSNA.org/All-Tours-and-Events/*

FAMILY ACTIVITIES'

360 CHICAGO (FORMERLY JOHN HANCOCK OBSERVATORY)

If you are into thrills, 360 Chicago atop the John Hancock building now offers a heart-thumping experience allowing you to hold on as a bank of windows tilts outwardly at a staggering 36-degree angle. Aptly named Tilt, this experience offers a whole new perspective on the already amazing views.

- 875 N. Michigan Ave.
  1- 888-875-8439
  360chicago.com

CHICAGO CITY HIGHLIGHTS WITH WILLIS TOWER SKYDECK

Dec. 1

Take a guided tour of some of the best Chicago has to offer – museums, notable architecture, the iconic 103-story Willis Tower (formerly Sears Tower) and more.

- *RSNA.org/All-Tours-and-Events/*

FRANK LLOYD WRIGHT EXPERIENCE

Dec. 1

Frank Lloyd Wright fans will want to take this guided tour to see the legendary architect's Oak Park home and studio where inspirations like his renowned "Prairie style" originated. The tour continues with lunch and a tour at Wright's Robie House – considered one of the most important buildings in American architecture.

- *RSNA.org/All-Tours-and-Events/*

LINCOLN PARK ZOO

Lincoln Park Zoo – home to over 1,200 animals – now offers $3 Lionel Train Adventure rides. During its annual ZooLights festival, over two million twinkling lights, ice carvings and music transform the zoo into a magical winter wonderland. Call ahead for ZooLights dates.

- 2200 N. Cannon Dr.
  1-312-742-2000
  lpzoo.org

NAVY PIER

Newly reimagined - the historic Navy Pier - a Chicago landmark since 1916, is now bolder, greener and offers elevated food experiences.

- 700 E. Grand Ave.
  1-800-595-7437
  navypier.com

HOLIDAY FAVORITES

CHRISTKINDLMARKET CHICAGO AND SANTA HOUSE

Reminiscent of old Germany, this open air market celebrates the holidays with authentic German food, drinks and wares.

- Daley Plaza
  50 W. Washington St.
  1-312-494-2175
  christkindlmarket.com

CAROLING AT CLOUD GATE, MILLENNIUM PARK

Nov. 27 & Dec. 4; 6 p.m.

201 E. Randolph St., Michigan Avenue between Randolph and Monroe.

A CHANTICLEER CHRISTMAS

Dec. 1

The Grammy-award winning ensemble Chanticleer is the perfect way to spark your holiday spirit. Set in Chicago's beautiful Fourth Presbyterian Church, this intimate concert will showcase Chanticleer's "orchestra of voices," performing traditional Christmas music ranging from Baroque classics to 21st-century favorites. Produced by the Chicago Symphony Orchestra, this enchanting holiday experience is not one to be missed.

- Chicago's Fourth Presbyterian Church
  126 E Chestnut St.
- *RSNA.org/All-Tours-and-Events/*

MARY ANN McCLAIN is an RSNA Public Information & Communications manager.

Radiology in Public Focus

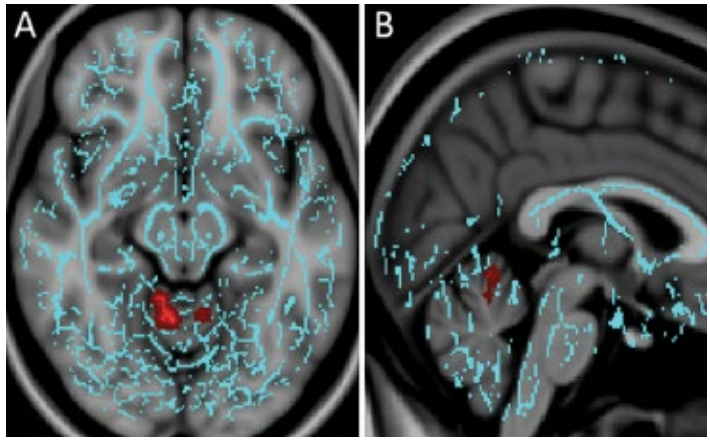
Press releases were sent to the medical news media for the following articles appearing in recent issues of *Radiology*.

Brain Injury Patterns Linked to Post-concussion Depression and Anxiety

Detection of a similar injury in patients with mild traumatic brain injury (mTBI) and depression and patients with major depressive disorder, with similar prognostic importance regarding abnormalities in the nucleus accumbens, may suggest a common pathophysiology in both traumatic and nontraumatic depression that may help guide treatment, new research shows.

Lea M. Alhilali, M.D., of the University of Pittsburgh Medical Center, and colleagues used diffusion-tensor imaging and serial neurocognitive testing with the Immediate Post-Concussion Assessment and Cognitive Testing evaluation on 45 patients with mTBI (38 with irritability, 32 with depression and 18 with anxiety). Control subjects consisted of 29 patients with mTBI without neuropsychiatric symptoms.

Compared with control subjects, patients with mTBI and depression had decreased fractional anisotropy in the superior longitudinal fasciculus (P = .006), white matter around the nucleus accumbens (P = .03), and anterior limb of the internal capsule (P = .02). Patients with anxiety had diminished fractional anisotropy in the vermis (P = .04). No regions of significantly decreased fractional anisotropy were seen in patients with irritability relative to control subjects.



A, Axial and B, sagittal images derived from TBSS results and rendered on T1-weighted MR images from the Montreal Neurological Institute (MNI) atlas indicate that significant white matter differences in patients with mTBI and anxiety involve the cerebellar vermis, the region responsible for fear conditioning. Voxels with significant differences detected with tract-based spatial statistic (TBSS) (P < .05 corrected for multiple comparisons) were thickened by using the TBSS fill function into local tracts (red) and overlaid on the white matter skeleton (blue).
(Radiology, 2015;277;3:InPress) ©RSNA, 2015. All rights reserved Printed with permission.

"Detection of the central white matter injuries that underlie depression and anxiety but not irritability indicates that not all neuropsychiatric symptoms after mTBI are the result of discrete white matter injuries, but in those with corresponding injuries, the injured regions provide insight into the underlying pathophysiology and prognosis," the authors write.

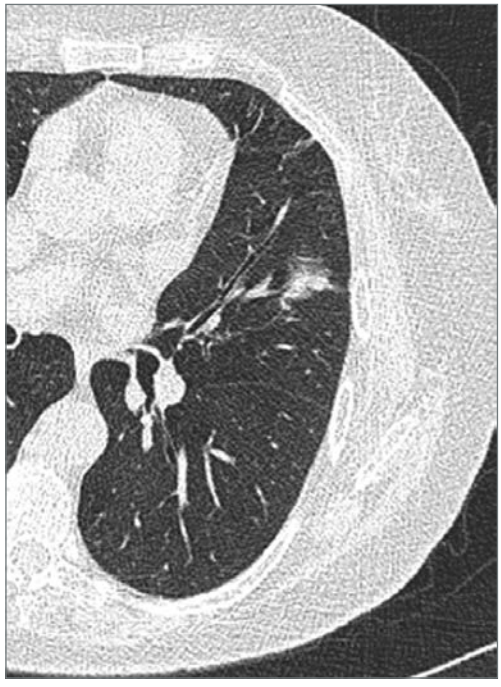
CT Allows Nonsurgical Management of Some Lung Nodules

Nonsolid nodules of any size can be safely followed with CT at 12-month intervals to assess transition to part-solid, new research shows.

In research by David F. Yankelevitz, M.D., of the Icahn School of Medicine at Mount Sinai, New York, and colleagues, 57,496 participants underwent baseline and subsequent annual repeat CT screenings. The frequency of participants with non-solid nodules, the course of the nodule at follow-up, and the resulting diagnoses of lung cancer, treatment and outcome were given separately for baseline and annual repeat rounds of screening.

Newly seen non-solid nodules at annual repeat screening resolve or decrease more frequently than those seen at baseline screening (66 percent [322 of 485] vs. 26 percent [628 of 2,392], P <. 0001), according to results. In 64,677 annual repeat screenings, no lung cancer was diagnosed among the 31 participants with a newly seen nonsolid nodule that was 15 mm or larger. All lung cancers manifesting in non-solid nodules were stage I adenocarcinomas, and the long-term lung cancer–specific survival was 100 percent, regardless of the time from initial identification to treatment (median, 19 months; interquartile range, 6–41 months).

Nonsolid nodules of any size can be followed for growth yearly, rather than more frequently, as lung cancers diagnosed among them are slow growing.



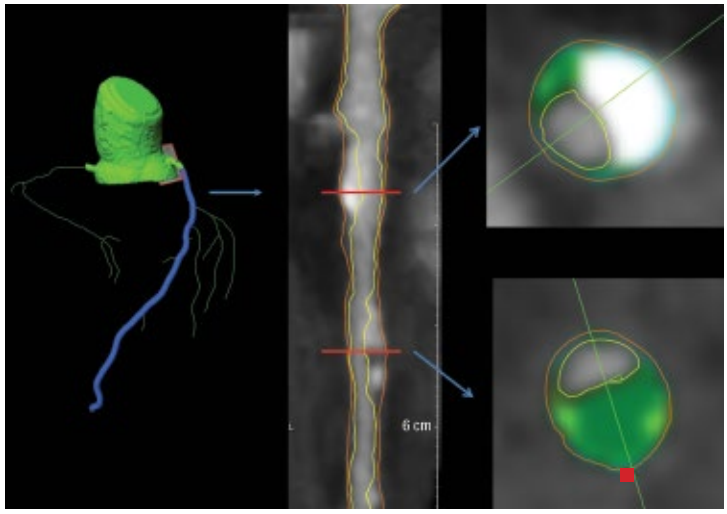
CT images in a 68-year-old smoker show a solid component emerged at follow-up 9 years later. At that time, it was resected, and the final diagnosis was 2.1-cm invasive adenocarcinoma. *(Radiology,* 2015;277;2:InPress) ©RSNA, 2015. All rights reserved. Printed with permission.

CT Angiography Links Arterial Plaque with Diabetes, Blood Pressure, Cholesterol

Low-density lipoprotein cholesterol level, systolic blood pressure and diabetes were associated with noncalcified plaque burden at coronary CT angiography in asymptomatic individuals with low-to-moderate risk, new research shows.

Karen Rodriguez, B.A., of the National Institutes of Health Clinical Center, and colleagues recruited 202 patients for an ongoing prospective study designed to evaluate the effect of HMG-CoA reductase inhibitors on atherosclerosis. Subjects were asymptomatic, older than 55 years and eligible for statin therapy. Coronary CT angiography was performed by using a 320–detector row scanner. Coronary wall thickness and plaque were evaluated in all epicardial coronary arteries greater than 2 mm in diameter. Images were analyzed by using dedicated software involving an adaptive lumen attenuation algorithm.

In asymptomatic individuals, noncalcified plaque index was positively correlated with systolic blood pressure (b = 0.80 mm2/10 mm Hg; P = .03), diabetes (b = 4.47 mm2; P = .03), and low-density lipoprotein cholesterol level (b = 0.04 mm2/mg/dL; P = .02), results showed.



Images in 62-year-old man. *Left:* Coronary segmentation model of the coronary tree. Middle: A curved multiplanar reconstruction of the left anterior descending artery, with the lumen and external vessel walls marked. *Right*: Representative cross-sectional images, with green shading = noncalcified plaque. (*Radiology,*** 2015;277;1:InPress) ©RSNA, 2015. All rights reserved. Printed with permission.**

Coronary CT angiography shows promise as a tool for quantifying total and noncalcified coronary artery plaque, according to the authors.

"Our results involving noninvasive intravascular US–like analysis of coronary plaque point to the importance of LDL cholesterol level as a significant biologic predictor of noncalcified plaque," the authors write.

Aneurysms May Recur Years after Endovascular Treatment

Endovascular treatment (EVT) of intracranial aneurysm is effective for prevention of long-term bleeding, but recurrences occur in a clinically relevant percentage of patients, a finding that may justify follow-up of selected patients—such as those with aneurysms larger than 10 mm or classified as Raymond grade 2 at midterm MR angiography—for 10 years or more.

In a prospective study, Augustin Lecler, M.D., of the Centre Hospitalier Sainte-Anne in Paris, and colleagues performed clinical examinations and 3-T MR angiography 10 years after EVT of intracranial aneurysms in a single institution. Authors also reviewed results from the medical literature to identify studies reporting bleeding and/or aneurysm recurrence rate in patients followed beyond 10 years after EVT.

Results showed that a clinically relevant percentage (12.4 percent) of aneurysms that were completely occluded (Grade 1) at MR angiography performed 3–5 years after endovascular treatment subsequently recurred at MR angiography performed more than 10 years after treatment. Incomplete aneurysm occlusion (Grade 2) at 3–5-year follow-up MR angiography (relative risk [RR], 4.16; 99 percent confidence interval [CI]: 2.12, 8.14) and retreatment within 5 years (RR, 4.67; 99 percent CI: 1.55, 14.03) were risk factors for recurrence (Grade 3) at MR angiography more than 10 years after treatment.

"Long-term (>10 years) MR angiographic follow-up may be needed in patients with aneurysms larger than 10 mm or in patients with grade 2 aneurysms at the end of standard midterm follow-up; de novo aneurysms may occur 5–10 years after treatment in one of 25 patients," the authors write.

SEPTEMBER PUBLIC INFORMATION OUTREACH ACTIVITIES FOCUS ON OVARIAN, PROSTATE CANCERS

In recognition of Ovarian Cancer and Prostate Cancer Awareness Month in September, RSNA is distributing public service announcements (PSAs) focusing on risk factors, screening methods and possible treatment options for ovarian and prostate cancers. The RSNA "60-Second Checkup" audio program, distributed to nearly 100 radio stations across the U. S., will also focus on September's cancer awareness topics.

Media Coverage of RSNA

In June, 623 RSNA-related news stories were tracked in the media. These stories reached an estimated 778 million people.

Coverage included *U.S. News & World Report*, *Forbes*, WGN-AM (Chicago), *MSN.com*, HealthDay, *MedPage Today*, Reuters, *Philly.com*, *ScienceDaily*, *DOTmed Business News*, *Diagnostic Imaging* and *Medical News Today*.

Journal Highlights

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

Imaging Review of the Temporal Bone: Part II. Traumatic, Postoperative, and Noninflammatory Nonneoplastic Conditions

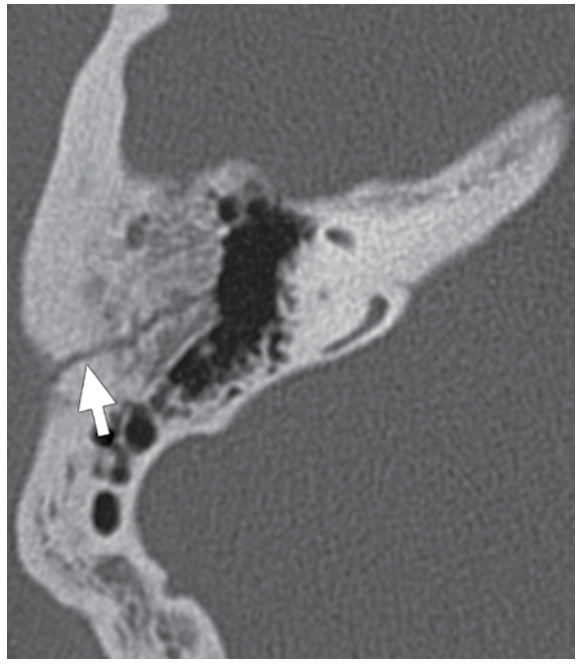
While high-spatial resolution temporal bone CT is the modality of choice for evaluating temporal bone trauma—particularly fractures—CT arteriogram/venogram or MR arteriogram/venogram and high-spatial resolution MRI may be helpful for the assessment of complications.

In the second part of a review in the September issue of *Radiology* (*RSNA.org/Radiology*), Amy F. Juliano, M.D., of the Department of Radiology, Massachusetts Eye and Ear Infirmary, Boston, and colleagues discuss findings related to trauma in the temporal bone region and complications radiologists should be aware of and consider in imaging evaluation.

The authors highlight the more common surgical procedures performed in the temporal bone and their postoperative appearance on CT and MRI, and include several nonneoplastic, noninflammatory entities of the temporal bone: otosclerosis, superior semicircular canal dehiscence and large vestibular aqueduct syndrome. These entities have distinctive clinical presentations and imaging findings that radiologists may easily miss or underdiagnose if they are unaware of the precise locations to inspect on imaging studies.

"Temporal bone imaging may be performed in patients with a history of otologic or neurotologic surgery, specifically for evaluating the results of the surgery or for unrelated reasons. In either case, it is important to be familiar with some of the more commonly performed procedures and their corresponding imaging findings," the authors write.

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



Traditional classification of temporal bone fractures. Axial CT image demonstrates a longitudinal fracture in two different patients. The longitudinal fracture is parallel to the long axis of the petrous pyramid (*arrow*), and traverses the mastoid portion of the temporal bone. (*Radiology* 2015;276;3;InPress) ©RSNA, 2015. All rights reserved. Printed with permission.

Radiology EXTRA PODCASTS

Listen to *Radiology* Editor Herbert Y. Kressel, M.D., deputy editors and authors discuss the following article in the July issue of *Radiology* at *RSNA.org/Radiology-Podcasts*.

- "Effect of Public Reporting on MR Imaging Use for Low Back Pain," Cecilia M. Ganduglia, M.D., Mark Zezza, Ph.D., Jonathan D. Smith, M.S., Susan D. John, M.D., and Luisa Franzini, Ph.D.

"Golden Oldies" Spotlighted in September *Radiology* Issue

As part of the RSNA Centennial Celebration, each month *Radiology* is featuring 15 "Golden Oldies" articles based on their significance to the advancement in the field of radiology. The special supplement in the September issue spotlights cardiac, including:

- "Mechanics of Selective Coronary Artery Catheterization via Femoral Approach"; 1967
- "Acute Myocardial Ischemia - Magnetic-Resonance Contrast Enhancement with Gadolinium-DTPA"; 1984
- "An Improved MR Imaging Technique for the Visualization of Myocardial Infarction"; 2001

Radiology GOLDEN OLDIES

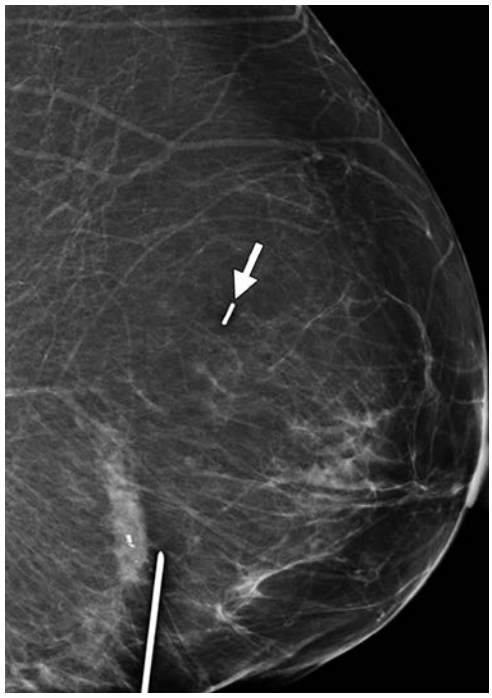
The online-only articles will be available to RSNA members and *Radiology* subscribers. For more information, and to view a video of *Radiology* Editor Herbert Y. Kressel, M.D., and Senior Deputy Editor Deborah Levine, M.D., discussing the series, go to *RSNA.org/Golden-Oldies*.

Misplanted Seeds and Other Mishaps: Possible Complications and Their Solutions During Preoperative Breast ^{125}I Radioactive Seed Localization

Iodine 125 (^{125}I) radioactive seed localization (RSL) as emerged as a reliable and safe alternative to wire localization for guidance during the surgical resection of nonpalpable breast lesions. The breast imager has a responsibility to be familiar with the general principles of this evolving technique, including its advantages and disadvantages, as well as the technical differences involved in placement of seeds versus traditional wire localization.

RadioGraphics

In the July-August issue of *RadioGraphics (RSNA.org/RadioGraphics)*, Sally H. Goudrea, M.D., of the University Hospital Breast Imaging Services, University of Texas Southwestern Medical Center, Dallas, and colleagues present clinical cases to illustrate examples of the proper technique of 125I radioactive seed localization for nonpalpable breast lesions to highlight difficulties encountered during placement of these radioactive seeds at the researchers' institution, and to suggest practical tips and safety measures to employ to avert these potential mishaps.



Inadvertent deployment of a self-loaded seed during mammographically guided RSL. (a) Lateromedial image of the left breast was taken after the RSL procedure was complicated by a vasovagal reaction by the patient. The needle tip is adjacent to the target with the seed misplanted into the superior part of the breast (*arrow*). (*RadioGraphics* 2015;35;InPress) ©RSNA, 2015. All rights reserved Printed with permission.

Additional safety measures should be employed when radioactive seeds are used, and appropriate guidelines and precautions for the safe and secure handling of these radioactive seeds should be meticulously followed to prevent any mishaps.

"Recognizing the potential pitfalls of radioactive seed localization and understanding the appropriate guidelines and precautions for the safe, secure handling and placement of radioactive seeds is essential for a successful radioactive seed localization program," the authors write.

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

Value of Membership

Use Fellowship Connect to Find, Post Fellowship Positions

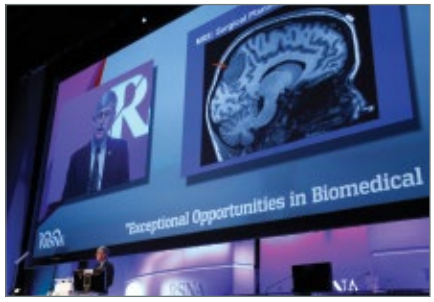
With RSNA's online resource Fellowship Connect, residents and practicing radiologists can search for fellowship positions by specialty, location and institution. Users can read institutional profiles, find out if fellowship positions are available, get contact information and more. Gaining access to RSNA Fellowship Connect is easy.

RSNA Members: Using your RSNA member login, you can personalize your searches by entering key words such as institution name, state or specialty. Fellowship Connect provides a print feature and save option that allows members to store search results for later viewing.

Institutions: After creating an account, institutions can post company profiles, available fellowship positions, contact information and website links. Each institution is responsible for keeping fellowship information current on the website.

To access Fellowship Connect, go to *fellowships.RSNA.org*.

Annual Meeting Watch



Registration Fees - Valid Until Nov. 6

McCORMICK PLACE	VIRTUAL	COMBO	
0	$100	$100	RSNA/AAPM Member
0	25	25	RSNA Member-in-Training, RSNA Student Member
0	300	300	Non-Member Student
200	300	500	Non-Member Resident/Trainee
200	300	500	Radiology Support Personnel
900	300	1,200	Non-Member Radiologist, Physicist or Physician
900	300	1,200	Hospital or Facility Executive, Commercial Research and Development Personnel, Healthcare Consultant and Industry Personnel
325	300	625	One-day registration to view only the Technical Exhibits

Important Dates for RSNA 2015

October 16	International badge mailing deadline
November 6	Deadline for discounted registration and hotel reservations
Nov. 29 - Dec 4	RSNA 101st Scientific Assembly and Annual Meeting

Receive Registration Materials Prior to the Meeting

Register by November 6 to receive the discounted registration fee and have full conference materials mailed to you in advance. International visitors must register by Oct. 16 to receive these materials in advance. Registrations processed after November 6 will reflect a $150 increase over advance registration rates and conference materials will need to be obtained at the McCormick Place Convention Center. No hotel reservations will be accepted after November 6.

Name Badge

A name badge is required to attend RSNA courses or events and to enter the exhibit halls. Your badge serves as a virtual business card and you can scan it to leave information with exhibitors.

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, 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.

Exclusive Airline Discounts – No blackout dates – No online airline service fees

Save on airfare using the exclusive discounts offered by United Airlines and Delta Air Lines. To view the terms and conditions go to: *RSNA.org/register* and select "Domestic & International Airfare."

Hotel Rooms Available—Reserve Yours Now

RSNA contracts over 80 hotels offering the lowest room rates, flexible change and cancellation terms, and an easy booking process. When booking through the RSNA housing system, you are supporting the association. View the hotel list and room rates at *Meeting.RSNA.org*. Register and make your hotel reservations today.

Enhance Your Experience with the Virtual Meeting

Add the Virtual Meeting to your registration to tune into 66 live streaming courses. Content captured through live streaming will remain online for on-demand viewing through Monday, December 21. Earn CME credits for select live sessions only. No CME credits are awarded for viewing on-demand sessions. Live sessions available for *AMA PRA Category 1 Credit™*. Read more about the Virtual Meeting on Page 24.

RSNA Gears up for 2015 Technical Exhibits

As the world's largest exhibition of radiology-related products, RSNA 2015 Technical Exhibits will feature 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 technology—all under one roof. Highlights include:

- **"Germany Presents" Pavilion**: This RSNA-sponsored pavilion will highlight Germany's contributions to radiology technology.
- **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.

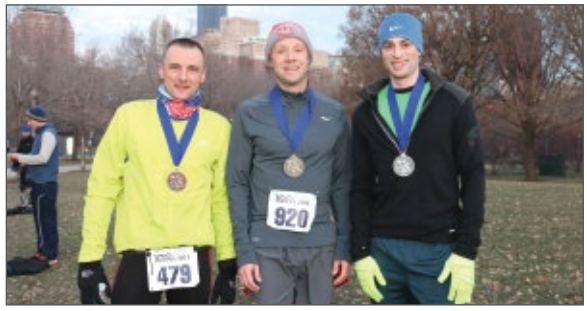
Go to *RSNA.org/ExhibitingCompanies* and search the interactive list of exhibitors and floor plan to find the companies you want to visit.

5k Fun Run

Enjoy a 5k event with your colleagues along Chicago's beautiful Lake Michigan shore and help fuel critical research to keep our specialty at the forefront of healthcare. Sign up as a runner or walker for the 5k Fun Run during the online registration period or onsite at McCormick Place. Your registration donation of $40 will benefit the RSNA R&E Foundation and is fully tax deductible. Participants receive a commemorative T-shirt.

Event Date:

Tuesday, December 1 • 6:30 a.m.
Arvey Field, South Grant Park, Chicago



Meeting Central is Your Source for RSNA 2015

Access the RSNA 2015 Meeting Central site at *Meeting.RSNA.org*, offering one central location for registered attendees to plan their meeting experience.

Education and Funding Opportunities

RSNA's Online Refresher Courses Continue to Grow

RSNA continues to be your source for SA-CME with the release of several new refresher courses on *RSNA.org/library*. New this year, sessions are separated by speaker into "mini" courses instead of one full-length session—an advantage for busy participants seeking shorter, more specialized educational content.

Spanning 15 subspecialties, the courses offer more specific focus on disease entities, specialized imaging techniques, or other highly specific subspecialty concerns. Each course is designed with both desktop and tablet experience in mind and includes a visual presentation side-by-side with speaker commentary.

An interactive CME test at the end of the course allows users to enter answers onscreen and receive immediate feedback. CME credit is earned by correctly answering all of the questions. If you don't achieve a passing score, you can take the examination an unlimited number of times.

RSNA.org/library will continue to post new courses as they become available. Use the "Browse New" filter to access the newest online education.

Earn Academy of Radiology Leadership and Management (ARLM) Credit

Earning Academy of Radiology Leadership and Management (ARLM) credit is easier than ever with online and in-person ARLM courses. New online opportunities are frequently added to the ARLM catalog at *RadLeaders.org*, providing a wealth of content to bring you closer to earning an ARLM Certificate of Achievement.

To access in-person courses offering SA-CME and ARLM credit, visit *RadLeaders.org*, click on "Course Catalog" and filter by "In Person."

Once you have completed online or in-person ARLM courses, be sure to log in to *RadLeaders.org* and document your progress inside the ARLM Credit Tracker system, which provides a summary of earned credits. ARLM accounts are free and users can also claim credits for completed ARLM courses.

Upcoming Events:

SCARD 2015
Oct. 15-17, 2015 • Seattle, WA • *SCARDweb.org*

RSNA 2015: Annual Meeting and Scientific Assemebly
Nov. 29-Dec. 4, 2015 • Chicago, IL • *RSNA.org*

2015 CORE Workshop

Oct. 2-3
Registration Closes Sept. 3

The 2015 Creating and Optimizing the Research Enterprise (CORE) workshop will take place Oct. 2-3, 2015 in Oak Brook, Illinois. The workshop will focus on strategies for developing and/or expanding research programs in radiology, radiation oncology and nuclear medicine departments. New sessions include Managing Research Finances in the Era of Constrained Resources and Building Diversity in Imaging Research. The CORE program features a combination of presentations, case studies and group discussions.

More information and free registration is available at *RSNA.org/CORE*.

NIH Grantsmanship Workshop

Nov. 28, 2015 1-5 p.m.
McCormick Place, Chicago

The NIH Grantsmanship Workshop introduces participants to the process of preparing a competitive research or training grant application. Designed for junior faculty in academic centers who wish to pursue a career in radiologic research, this didactic workshop is led by a faculty of leading researchers with extensive experience in the grant application process. Workshop attendees will get the opportunity to learn from a mock study section.

To attend this workshop, you must be registered for the Annual Meeting. You may add the workshop to My Agenda through Meeting Central at *Meeting.RSNA.org*.

More information for these programs is available at *RSNA.org/ResearchCourses*. Questions can be directed to Rachel Nelson at 1-630-368-3742 or *rnelson@rsna.org*.

For Your Calendar

SEPTEMBER 22, 2015
Faculty Skills Update
Westin O'Hare, Chicago
Registration Open Now
• *RSNA.org/Faculty-Skills-Update*

OCTOBER 2-3, 2015
Creating and Optimizing the Research Enterprise (CORE) Workshop
RSNA Headquarters, Oak Brook, Illinois
Registration Closes Sept. 3
• *RSNA.org/CORE*

OCTOBER 18–21, 2015
American Society for Radiation Oncology (ASTRO), San Antonio
Visit the RSNA Booth
• *www.astro.org*

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

RSNA.org

Experience RSNA 2015 from Anywhere via the Virtual Meeting

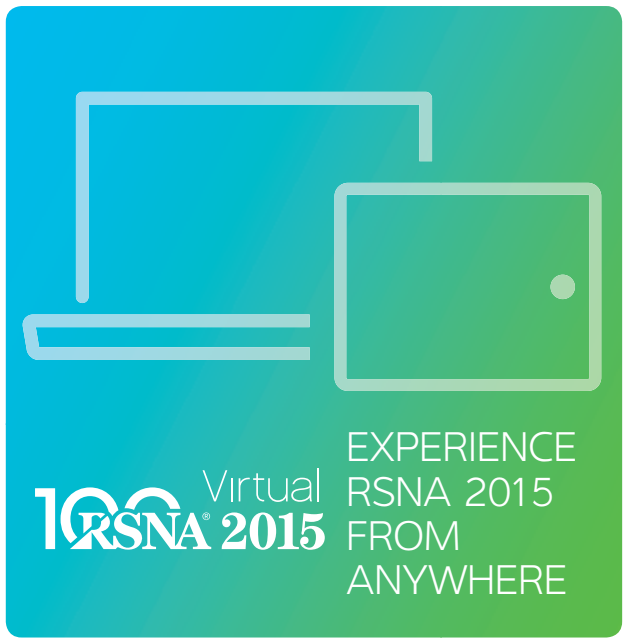
With the vast offerings RSNA 2015 provides, it's impossible to see it all at McCormick Place. The RSNA Virtual Meeting offers access to 66 courses live or on-demand, Cases of the Day, and digital Education Exhibits and Scientific Posters from anywhere in the world.

Participants in live-streamed courses can earn CME credits. Live sessions also offer *AMA PRA Category 1 Credit™* and Category A and A+ credit for technologists. A printable PDF of the entire virtual program with easy-to-view listings of all courses is available at *RSNA.org/Virtual*.

The fee is $100 for RSNA members, $300 for non-members, and $25 for RSNA members-in-training and RSNA medical student members. Retired members are free.

The Virtual Meeting begins Nov. 28 and continues until Dec. 21 – more than two weeks after the end of RSNA 2015.

For more information or to register for the Virtual Meeting, go to *RSNA.org/Virtual*.



COMING NEXT MONTH

Get ready for RSNA 2015 with our Special Meeting Preview issue featuring everything you need to know about this year's annual meeting. Among many other highlights, we preview the RSNA 2015 "Presents" sessions spotlighting Germany and Mexico.

THEME: PEDIATRIC IMAGING

Celebrate!

International Day of Radiology

NOVEMBER 8, 2015

Build greater awareness of radiology and its contribution to patient care.

Help spread the word and build support with ready-to-use promotional materials available at *RSNA.org/IDoR*.

INTERNATIONAL DAY OF RADIOLOGY

AN INITIATIVE OF THE RSNA, ESR AND ACR

100 YEARS RSNA®

Radiological Society of North America