

## ICD-10: Are You Prepared for the Transition?

### ALSO INSIDE:

**LOOK AHEAD:** The Future of Medical Imaging  
RSNA's Resident & Fellow Committee Adds Resources  
Research Targets MRI Contrast Agents  
Ultrasound Aids Carpal Tunnel, Plantar Fasciitis



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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<sup>1</sup>. While body MR imaging has grown 28% since 2013<sup>2</sup>, 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<sup>3</sup>.

Expand your service coverage in MRI and become a preferred provider for pediatric<sup>4</sup>, 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.

<sup>4</sup>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.

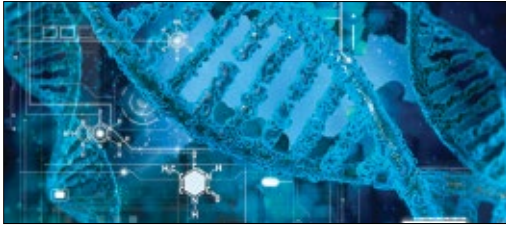
<sup>1</sup>American College of Radiology Appropriateness Criteria 2014

<sup>2</sup>IMV 2014 MR Market Outlook Report

<sup>3</sup>This option is Pending 510(k) clearance, and is not yet commercially available in the United States.

Answers for life.

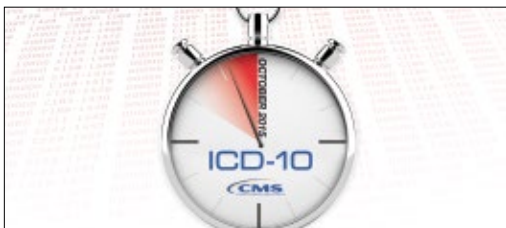
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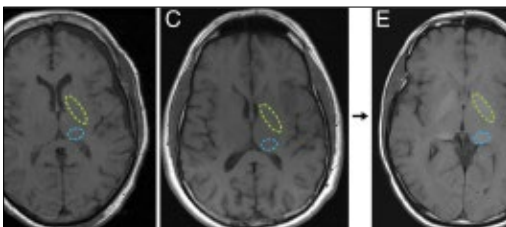
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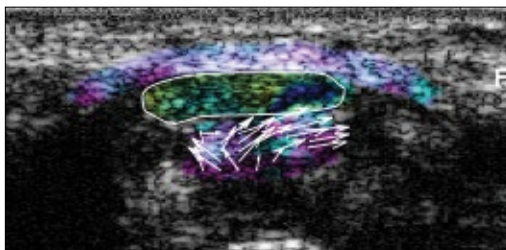
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The RSNA promotes excellence in patient care and healthcare delivery through education, research and technologic innovation.



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## Bisset, Resnick Honored at JPR



Bisset

RSNA past-president **George S. Bisset III, M.D.**, and **Donald L. Resnick, M.D.**, were honored during the recent 2015 Jornada Paulista de Radiologia (JPR) annual meeting in São Paulo, Brazil.

JPR, organized by the Sociedade Paulista de Radiologia (SPR), is the largest diagnostic imaging meeting in Latin America. RSNA began a partnership with SPR to co-sponsor the event in 2014 and will continue as a co-sponsor in 2016 and 2018.

Dr. Bisset, Chief and Edward B. Singleton Endowed Chair of Pediatric Radiology at Texas Children's Hospital and Professor of Radiology at Baylor College of Medicine, both in Houston, and 2012 RSNA President, was named an honorary member at JPR 2015. Dr. Bisset served on the JPR 2014 program planning committee.

Dr. Resnick, professor of radiology and chief of osteoradiology at the University of California, San Diego (UCSD), was named the JPR 2015 president of honor. He was recognized for training over 150 Brazilian research fellows at UCSD. He is a member of the RSNA Public Information Advisors Network and was named the 2006 RSNA Outstanding Educator.



Resnick

### EDITOR'S NOTE

## Same Quality News, Now Even Faster

When RSNA began publishing *RSNA News* as an 8-page photocopied newsletter some 24 years ago, our goal was to provide important information about the products, services and many other benefits that RSNA provides its members. We had also hoped to become a respected news source about what is happening in the larger radiology community.

We have worked hard to earn your trust and continually strive to keep *RSNA News* interesting, informative, and relevant.

We are excited to bring you a new enhancement to the online version of *RSNA News* that we are calling Digital First. The latest news items about radiologic science and technology, as well as the important issues facing our specialty, will be posted as they break—long before the print magazine arrives in your mailbox.

Find the newest headlines on the *RSNA News* homepage at [RSNA.org/News](http://RSNA.org/News) or follow RSNA on Facebook ([Facebook.com/RSNAfans](https://www.facebook.com/RSNAfans)) and Twitter ([twitter.com/RSNA](https://twitter.com/RSNA)), where we'll be sharing our latest news as well.

Thanks for welcoming the print edition of *RSNA News* into your mailbox month after month. Now I invite you to give us the chance to become your digital destination for keeping up-to-date on the most important developments in our burgeoning specialty.

**David Hovsepian, M.D.**

**RSNA News Editor**



Hovsepian

## Numbers in the News

# 2

The number of times the transition to ICD-10 as the new national coding standard has been delayed since the rule was first published in 2009 by the U.S. Department of Health and Human Services. Read how radiologists are preparing for the transition, which—barring another act of Congress—goes into effect on October 1, on [Page 9](#).

# 80

The approximate number of hotels RSNA offers to annual meeting attendees, with many rooms available at discounted rates. Read the top reasons why you should reserve your hotel rooms via the RSNA housing system on [Page 22](#).

# 90

Percentage of patients with chronic plantar fasciitis who experienced relief after undergoing ultrasound therapy during research conducted at one Nebraska clinic. Read more about the growing benefits of ultrasound therapy—including its effectiveness in treating carpal tunnel syndrome—on [Page 13](#).

# 8

The number of "Reasons to be Optimistic about the Future of Radiology," according to the title of a Career 101 presentation by Jonathan Berlin, M.D., M.B.A., as part of the RSNA 2015 Resident & Fellow Symposium. For more on the symposium and to read about the recent RSNA Resident and Fellow Committee (RFC) meeting, go to [Page 7](#).

## RSNA CONTRIBUTES TO DRG FOR RÖNTGEN BIRTHPLACE RESTORATION

RSNA recently contributed \$25,000 to the Deutsche Röntgengesellschaft's (DRG) ongoing restoration of the Wilhelm Röntgen birthplace in Lennep, Germany.

DRG, the German Radiological Society, embarked on the project in 2011 when it purchased the property and launched plans to restore the landmark honoring the German physicist and Nobel Prize winner who discovered the X-ray in 1895. To date, DRG has received more than 250,000€ in contributions and welcomes additional donations for this important project.

"The RSNA was very inspired by the DRG's presentation about the ongoing project to restore the birthplace of Wilhelm Conrad Röntgen and recognizes how important it is to preserve his memory," said 2015 RSNA President **Ronald L. Arenson, M.D.**, who attended the DRG Congress in May 2015, where RSNA also staffed a booth. "We believe this birthplace museum will serve not only as a symbol of Röntgen's remarkable life and career, but also as an inspiration to the radiology community."

The RSNA contribution also honors the past and celebrates the future of this birthplace museum—and the future of radiology—in honor of the Society's 100th anniversary.

Röntgen was born on March 27, 1845. The Röntgen property has changed little in 170 years and requires significant redevelopment and renovation. With a team of museum experts and specialists for conservation, DRG plans to restore the landmark and create an international meeting place for science.

RSNA encourages its members to consider making individual donations to this important project. View full details on the restoration project at [www.roentgen-geburtshaus.de/en-GB/427/welcome](http://www.roentgen-geburtshaus.de/en-GB/427/welcome).



**Left: 2015 RSNA President Ronald L. Arenson, M.D., far right, and RSNA Executive Director Mark G. Watson, far left, presented Deutsche Röntgengesellschaft (DRG) President Norbert Hosten, M.D., center, with a \$25,000 contribution to the birth home of Wilhelm Conrad Röntgen. The 170-year-old Röntgen property (left) will undergo extensive redevelopment and renovation.**

## RSNA Editorial Fellows Announced

**Rajesh Krishnamurthy, M.D.**, director of research and director of cardiovascular imaging at Texas Children's Hospital in Houston, has been named the 2015 RSNA William R. Eyer Editorial Fellow.

**Manisha Bahl, M.D., M.P.H.**, a breast imaging fellow at Duke University Medical Center in Durham, N.C., is the 2015 William W. Olmsted Trainee Editorial Fellow.

Dr. Krishnamurthy earned his medical degree from Stanley Medical College, Madras University, in Chennai, India. He completed his internship at the Hospital of St. Raphael at Yale University School of Medicine and his fellowship in nuclear radiology at the Yale New Haven Hospital. He completed his residency in diagnostic radiology at The University of Texas Houston Health Sciences Center and MD Anderson Cancer Center, Houston, in 2001, as well as fellowships in pediatric radiology and pediatric cardiac MRI at Harvard Medical School's Children's Hospital.

Dr. Krishnamurthy is a member of the editorial board for *Congenital Heart Disease* and has served as a journal reviewer for multiple publications, including *RadioGraphics*. He serves as the pediatric radiology subcommittee chair for the RSNA Scientific Program Committee.

Dr. Bahl earned her Master of Public Health in Health Policy and Management from the Harvard School of Public Health in 2009 and her doctor of medicine degree at the University of California, San Francisco School of Medicine in 2010. She completed her radiology residency at Duke University Medical Center in 2015 and is currently a breast imaging fellow at Duke.

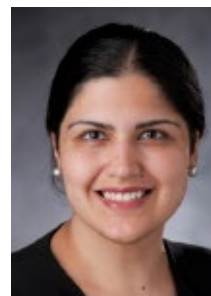
Dr. Bahl has co-authored articles for numerous peer-reviewed publications including *Radiology*, *American Journal of Roentgenology* and the *New England Journal of Medicine*. Her editorial background also includes serving as associate editor of the *Stanford Undergraduate Research Journal* and as a writer for *San Francisco Medicine*.

Honors for Dr. Bahl include the 2014 American Association for Women Radiologists Lucy Frank Squire Distinguished Resident Award in Diagnostic Radiology and the 2015 American Roentgen Ray Society President's Award.

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 Editorial Fellowship lasts one month and the Olmsted Trainee Editorial Fellowship lasts one week. Each fellow will also visit the RSNA Publications Department at RSNA Headquarters in Oak Brook, Ill. Dr. Krishnamurthy will also work with the RSNA editorial team at RSNA 2015.



**Krishnamurthy**



**Bahl**

## IN MEMORIAM

**Carol A. Mittelstaedt, M.D.**

Mittelstaedt

Ultrasound pioneer Carol A. Mittelstaedt, M.D., known to all as "Dr. Mitt," died March 12, 2015, at 69.

Dr. Mittelstaedt, who grew up in Little Rock, Arkansas, earned a Bachelor of Science degree from the University of Arkansas, Fayetteville, and graduated from the University of Arkansas Medical School in 1971. She completed a radiology residency at the same institution in 1975, finishing her fellowship in diagnostic ultrasound at the University of California, San Diego in 1976, studying under *Journal of Ultrasound in Medicine* Editor Emeritus George R. Leopold, M.D.

During her lengthy career at the University of North Carolina (UNC), Chapel Hill, Dr. Mittelstaedt founded the clinical ultrasound service and was one of the first women appointed to the faculty of the Department of Radiology where she served as director of ultrasound until 2004. She also founded a school of sonography at UNC.

A fellow of the American Institute of Ultrasound in Medicine (AIUM), Dr. Mittelstaedt's lengthy service to AIUM included serving as member of its board of governors from 1995 to 1998.

She researched and authored two globally acclaimed medical textbooks: *Abdominal Ultrasound* and *General Ultrasound*, as well as numerous related articles. Dr. Mittelstaedt was a frequent invited lecturer at many national and local radiology conventions as well as foreign medical convocations in Chile, Egypt, Hong Kong and Thailand.

In her position as a leader in both the AIUM and the Society of Radiologists in Ultrasound, Dr. Mittelstaedt mentored and supported the careers of many young sonologists who later became leaders in the ultrasound community. Her efforts to introduce ultrasound to young faculty inspired many to choose ultrasound as their main specialty of interest.

## IN MEMORIAM

**Anna S. Lev-Toaff, M.D.**

Lev-Toaff

Anna S. Lev-Toaff, M.D., a prolific researcher and respected clinician, died April 3, 2015, from complications secondary to multiple myeloma. She was 60.

Dr. Lev-Toaff served as a professor of radiology at the Hospital of the University of Pennsylvania since 2008. Prior to that, she served on the faculty at Thomas Jefferson University for 18 years and at Temple University from 1986 to 1990. After receiving her bachelor's and medical degrees at New York University, she trained in surgery at Pennsylvania Hospital in Philadelphia and at Tel Aviv University in Israel. Dr. Lev-Toaff completed her radiology residency at Thomas Jefferson University Hospital in Philadelphia and earned her fellowship in abdominal imaging at the Hospital of the University of Pennsylvania.

Dr. Lev-Toaff was an accomplished academic physician and radiologist, specializing in abdominal imaging with exceptional skills in gastrointestinal radiology and ultrasound. She was elected to fellowship in the American College of Radiology, American Institute of Ultrasound in Medicine and Society of Radiologists in Ultrasound for her many accomplishments in research, education, clinical and volunteer work for various radiology organizations.

She published 75 papers and over 100 abstracts, and presented more than 200 invited lectures. Dr. Lev-Toaff also co-edited the textbook, *Clinical Pelvic Imaging: CT, Ultrasound and MRI*.

THIS MONTH IN THE *RSNA NEWS* ONLINE VERSION

Get more of this month's news online at [RSNA.org/News](http://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 highlighting *Radiology* research on gadolinium-based contrast agents, viewers are invited to listen to a podcast of *Radiology* Editor Herbert Y. Kressel, M.D., and study authors discussing the research. Readers can also tour the RSNA 2015 Meeting Central website featured in *RSNA.org*, on Page 24.



## RSNA NEWS

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## LETTERS TO THE EDITOR

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# LOOK AHEAD

## *The Future of Medical Imaging*

BY JAMES H. THRALL, M.D.

The essence of medical imaging lies in understanding the relationship between patterns of energy emanating from tissues and the underlying state—healthy or diseased—of those tissues. This fundamental paradigm will not change in the future. However, the way we study biological tissues with different forms of energy and how we draw inference from image data will change continuously at a relentless pace.

### **From Radiographs to Parametric Imaging**

For the better part of 100 years, physics was the dominant scientific basis of radiology and X-ray attenuation was the paramount measurable parameter. Radiologists spoke of “images” and “radiographs” not “attenuation maps.” New energy sources—magnetic, radiofrequency, sonic, optical and nuclear—combined with fast, dynamic, digital methods of applying and recording them, have added dozens of parameters to the imaging toolkit.

The richness of measurable parameters has taken medical imaging beyond organ anatomy and pathology into the realms of physiology, pharmacology and cellular and molecular biology. The scale of measurement has been extended from centimeters and millimeters to encompass micrometers and nanometers. Taken together these developments are moving radiology into the age of molecular medicine and genomics.

### **Images as Data—Derivation of Additional Parameters**

Digital images are more than pictures; they are sources of data that contain important information not qualitatively perceptible by human observers. Hun-

dreds of secondarily derived parameters can be extracted from image data sets by advanced computational methods, such as analysis of tumor textures, that can be empirically linked to different tumor genotypes. Computationally derived images can depict information from multiple parameters allowing us to see how they relate to each other temporally and spatially. Going forward, we will still talk about images, but the conceptual key to diagnostic inference will be gaining an understanding either directly or empirically of what each parameter represents and how that parameter is manifest in a given disease process.

### **Radiation Dose Reduction and Phase Contrast Imaging**

Improvements in X-ray based imaging in the next decade will result in reductions of radiation doses to the point where the issue will no longer be of discussion or concern. Current calculations projecting excess cancers and cancer deaths from CT seriously inflate the risks, because they are derived from 10-year-old data that don't take into account new reconstruction methods and scanning systems developed in the last decade that have reduced radiation doses substantially.

*Continued on next page*



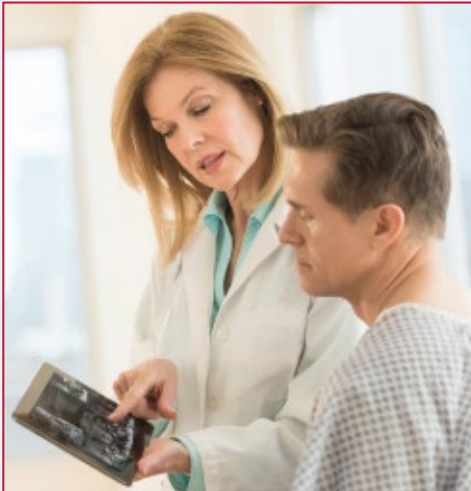
**Thrall**

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**JAMES H. THRALL, M.D.**, is Chairman Emeritus, Department of Radiology, at Massachusetts General Hospital, Boston. A renowned researcher, Dr. Thrall's clinical interests include nuclear cardiology, PET scanning and skeletal scintigraphy. Dr. Thrall has lectured internationally on radiology in medicine, and is considered a preeminent authority on the subject worldwide. He is also a nationally recognized expert in radiology and economics. Dr. Thrall received the RSNA Gold Medal in 2007 and will present the RSNA 2015 Annual Oration in Diagnostic Radiology.

*“The richness of measurable parameters has taken medical imaging beyond organ anatomy and pathology into the realms of physiology, pharmacology and cellular and molecular biology.”*

JAMES H. THRALL, M.D.



**Technology will continue to fuel the growth of radiology at a relentless pace. *Top*: Phase contrast X-ray imaging is likely to be the next new imaging method to be explored clinically, while (*bottom*) mobile and wearable media will make access to data and distribution of information faster and more efficient than ever—presenting challenges and opportunities for patients and radiologists alike.**

Phase contrast X-ray imaging is likely to be the next new imaging method to be explored clinically. Compared to attenuation based X-ray imaging, phase contrast has the theoretical potential to reduce doses by 10- to 100-fold or more due to the inherently high contrast it affords. Predictably, it will take time to achieve these levels of benefit but the underlying physics is favorable—phase shift versus linear attenuation of X-rays in biological tissues will usher in the submillisievert era of CT imaging.

#### **Information and Communication Systems**

With the Internet, borders have blurred between the concepts of information and communication systems, making access to data and distribution of information faster and more efficient. Mobile and wearable media will accelerate these trends. Timing of information delivery will be tailored to medical need. Biometric and/or wearable patient identification media will facilitate the “electronic round trip”—automated patient identification and no reentry of patient data or selection from pick lists required from the time of computer order entry by a referring physician until report delivery.

Direct patient access to information will democratize the medical record; all physicians, including radiologists, will need to learn how to craft reports that convey necessary information without unduly alarming patients and be mindful that many patients are not medically literate. These are unsolved challenges today.

#### **Big Data, Data Mining and Value Creation**

Radiology led the way into the era of digital medicine. Now in the era of “big data,” radiology will continue to lead in mining and mobilizing data—turning dumb data into smart knowledge to be delivered in real time—just-in-time—at

the point of care. Decision support (DS) systems for referring physicians will be built into the work process for computerized physician order entry (CPOE).

DS systems will guide radiologists in their recommendations and reduce wasteful variations in practice. Real-time data-mining during the reporting process will be used to help avoid errors—for example, checking consistent use of right versus left and comparing terms used in the body of the report versus the impression.

Standardized nomenclature based on imaging ontologies such as BIRADS™ and RADLEX™ and structured reporting will facilitate data-mining for many applications, including the aggregation of similar cases to look for new patterns in the image data or to test new imaging biomarkers for accuracy. Radiology subgroups and the specialty more generally must work together to agree on unambiguous standardized nomenclatures to avoid confusing referring physicians and each other—is it a heart attack or a myocardial infarction, a cyst or an inclusion cyst, a tumor or a mass?

#### **Imaging in the Era of Precision (Personalized) Medicine**

The fundamental principle of precision medicine or personalized medicine is a definition of ever smaller, more precise subgroups of patients with similar characteristics who have similar prognoses and are likely to benefit from the same therapies. The term “biomarker” is used for any finding that is linked to the presence or severity of a disease such as blood pressure, heart rate, hematocrit and other laboratory values. By analogy, what we have historically called “Roentgen Signs” may be thought of as imaging biomarkers.

Conceptually, the radiology report is an enumeration of the imaging biomarker and, as such, constitutes an “imaging phenotype” at that point in time. Imaging phenotypes are systems





for scoring, categorizing and classifying disease processes and their severity. They define these “precise” subpopulations. Establishing linkages between genotypes and imaging phenotypes (radiogenomics) will serve as the foundation for surveillance of disease manifestation—occurrence, location, extent, severity—and discovery of genetic polymorphisms.

Radiologists should begin considering their interpretations in this conceptual framework if we are to take a leadership role in the era of precision medicine as productive, vital members who speak a common language.

### Challenges and Opportunities

Future developments will certainly entail vastly increased complexity in imaging technology and radiology practice, and the increased educational activities those advancements will require. Competition, both clinically and in research for “ownership” of imaging methods, will continue to increase due to the high value inherent in medical information.

On a positive note, the future will bring new capabilities that have even greater medical value. We will



see radiation dose continue to drop and utilization of imaging services become more efficient, with fewer healthcare resources wasted, including the increasingly scarce commodity of time—to the benefit of patients, physicians and workers in the health-care system. □

**In the era of precision, or personalized medicine, radiology is central to the “genomics revolution” in determining clinically useful linkages between genotype/gene expression and imaging phenotypes, *above*, while mining data from millions of patients will allow radiologists to create the complete, detailed patient reports that lead to better, more personalized healthcare.**

# RSNA Resident and Fellow Committee Continues to Build Trainee Resources

BY PAUL LaTOUR

*Given that many radiology trainees experience information overload, some residents and fellows may not be aware of the plethora of resources available to them through RSNA.*

AT THEIR RECENT ANNUAL RSNA Resident and Fellow Committee (RFC) meeting, members discussed how the committee and RSNA can help provide trainees with the most relevant information and make them more aware of the resources already available to them. In surveying trainees, the committee reported that residents and fellows are most interested in general education programs and tools, preparing for the American Board of Radiology (ABR) core exams, and career advancement.

“RSNA is working hard to meet the needs of radiology trainees,” said committee Chair Richard E. Sharpe Jr., M.D., M.B.A., a radiologist at Kaiser Permanente in Denver, at the May RFC meeting held at RSNA headquarters in Oak Brook, Illinois.

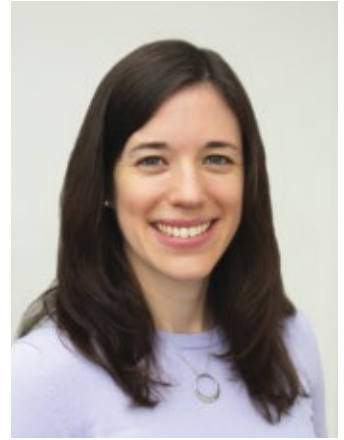
Along with a wide array of resources available through RSNA (See Web Extras), each RSNA Annual Meeting and Scientific Assembly is filled with trainee-focused sessions and resources including the Resident and Fellow Symposium, which is just one of the initiatives implemented by the RFC Committee since its 2010 inception. At *RSNA.org*, trainees get free access to online content, such as a wide variety of lectures and the popular RSNA/AAPM online physics modules.

As an aid to help residents prepare for the ABR core exam, the RSNA journal *RadioGraphics* has spearheaded an initiative linking relevant articles to the ABR’s Core Exam Study Guide (*RSNA.org/RadioGraphics*). The RFC hopes to add additional material in the future.

“Trainees feel very overwhelmed with the large volume of study materials available and are having trouble finding the highest-yield materials at the appropriate time in their training,” said Nancy J. Benedetti, M.D., RFC vice-chair and a clinical fellow in the Department of Radiology at the University of California, San Francisco, School of Medicine. “With a vast library of educational resources, RSNA is in a position to serve the educational needs of trainees by presenting them with the educational content they need at the appropriate time in the training.”



Sharpe



Benedetti

*“All trainees are welcome to speak up to have your ideas heard. The RSNA and the Resident and Fellow Committee are listening.”*

RICHARD E. SHARPE JR.  
M.D., M.B.A.

## Career Advancement Focus of RSNA Resident and Fellow Symposium

Another topic of great interest to residents is career advancement—especially in today’s changing healthcare environment. At RSNA 2014’s Resident and Fellow Symposium, trainees were interested in learning what steps they can take after their residency or fellowship to secure a new position.

Other common job-related concerns include whether or not trainees should pursue a second fellowship and whether changes to the ABR certification process would impact their ability to get a job, Dr. Sharpe said.

The consensus is that second fellowships may not be necessary and that changes to the certification process are not likely to significantly impact the job search process, Dr. Sharpe said.

“We expect similar needs and interests to be addressed at the RSNA 2015 Resident and Fellow Symposium and we have created a program focusing on those areas,” Dr. Sharpe said.

The RSNA 2015 Resident and Fellow Symposium will include a variety of sessions on career-related topics of interest to trainees (See sidebar).

Also, this year, the symposium has been restructured to separate the day-long session into two sections with a break in between. The symposium will also be moved from its previous Wednesday slot to Tuesday to allow more residents to attend.

“The new format is designed to give trainees an opportunity to meet and network with speakers and recent graduates during a lunch provided by



The RSNA Resident and Fellow Committee (RFC), recently met at RSNA headquarters in Oak Brook, Ill., to discuss how RSNA can help trainees address their most critical needs.

the RSNA,” Dr. Sharpe said. “We recognized that the previous four-hour continuous session was long, and this restructuring will allow participants to get up, move around, eat and network in between sessions.”

Another useful educational tool available at the annual meeting is the interactive teaching tool RSNA Diagnosis Live™, a Web-based Audience Response System (ARS) that helps engage students in learning.

“By actively engaging in the lecture and solving problems, trainees can test their knowledge and the lecturer can assess the success of the group’s learning,” Dr. Benedetti said, add-

#### WEB EXTRAS

To access the full roster of RSNA resources for trainees, go to [RSNA.org/Trainees](http://RSNA.org/Trainees)

ing that hers is one of the 24 residency programs currently utilizing Diagnosis Live.

Throughout the year, residents and fellow are encouraged to access RSNA’s Career Connect Web portal, featuring a listing of radiology-based jobs that are updated daily.

As one of the original RFC members, Dr. Sharpe said he’s honored and excited about the progress that has been made, but said more work needs to be done and the committee is prepared to build on its progress.

“All trainees are welcome to speak up to have your ideas heard. The RSNA and the Resident and Fellow Committee are listening,” he said.

PAUL LaTOUR is an RSNA News staff writer.

## RSNA 2015 Resident and Fellow Symposium Topics Announced

The RSNA Resident and Fellow Symposium will be held Tuesday, Dec. 1, during RSNA 2015. Attendees must be registered for RSNA 2015 and can add the symposium to My Agenda at [Meeting.RSNA.org](http://Meeting.RSNA.org).

Topics include:

**Career 101:** “Essentials for Every New Attending Radiologist: 8 Reasons to be Optimistic About the Future of Radiology,” Jonathan W. Berlin, M.D., M.B.A.; “Medical Melpractice: Common Pitfalls New Attending Radiologists Should Avoid,” Leonard Berlin, M.D., J.D.

**Career 102:** “Essentials for Residency and Job Success: How to Convert an Interview Into a Job Offer,” Fred T. Lee Jr., M.D.; “Six Must-Know Strategies for Success Every Radiology Trainee Should Master,” Richard E. Sharpe Jr., M.D., M.B.A.; “Candid, Frank and Personal Job Advice From Recent Grads,” a 30-minute question and answer session with Nancy Benedetti, M.D., Candice Bookwalter, M.D., Ph.D., and two other recent graduates.



# ICD-10: Are You Prepared for the October Transition?

BY MIKE BASSETT

**In 2009 the U.S. Department of Health and Human Services published a final rule establishing ICD-10 as the new national coding standard, with an implementation date of October 1, 2013.**

SINCE THEN THE IMPLEMENTATION date has been delayed twice—first to 2014, and then to October 2015. Barring another last-minute Congressional delay, ICD-10 will go into effect on October 1, 2015, which means that radiology practices and departments should be vigorously preparing for the transition.

“If you go back a couple of years when it was supposed to be implemented, there were definitely people who weren’t going to be ready,” said Ron Bucci, administrative director at the Metro-Health System in Cleveland. “But since it’s been delayed twice, people have had enough time to get with the program. They’ve been working on it long enough that they should be ready to go.”

If they haven’t already, radiologists should be taking steps such as training coders and allowing them to practice with ICD-10 by giving them the opportunity to dual code with ICD-9 and ICD-10, says Melody Mulaik, president of Coding Strategies, Inc., Atlanta.

“This should give coders a good comfort level with the new code set,” she said.

Mulaik also said that radiology groups should be working with their referring physicians on the ICD-10 transition. “A lot of groups are saying that while they can control things within their own practices, they don’t get a lot consistency from their referring physicians,” she said.

A similar point about the need for radiology groups and referring physicians to get on the same page was made by Pat Kinsley, coding and compliance manager for Suburban Radiologic Consultants in the Minneapolis-Saint Paul area, and a member of the Coding Subcommittee of the Radiology Business Management Association.

“Because ICD-10 has such a high level of specificity in assigning diagnosis codes, it’s going to be important to get better clinical information from ordering physicians in order for radiologists to code signs and symptoms or any underlying disease that could have an impact on the findings from an imaging study,” she said.

Consequently, Suburban Radiologic Consultants has revised its patient information sheets to reflect the fact that the information gathered will be more ICD-10-focused, Kinsley said. “Radiology practices should talk to their high-referring groups to make sure they understand there are going to be more specific questions asked at the point of scheduling.”

## Radiologists Should Understand Coding

As for radiologists themselves, Kinsley said that while they won’t be coding, it is important to have them on board concerning preparations for the ICD-10 transition since they will need to understand the key factors they must include in their dictation, such as laterality, the severity of a finding, and whether the finding is due to an underlying condition or postoperative complications.

When it comes to the transition from ICD-9 to ICD-10, radiologists have one thing working in their favor. “Radiology is in a better position than many other specialties,” Mulaik said. “There is a support structure in place for radiology because radiologists don’t code—they have relied on either medical coders or computer-assisted coding for support.”

While they aren’t doing the actual coding, radiologists do play an integral role in improving the clinical documentation that is critical to ICD-10, said Naveen Garg, M.D., an assistant professor of diagnostic radiology at The University of Texas MD Anderson Cancer Center, Houston, who serves as a radiology representative for the facility’s ICD-10 transition.

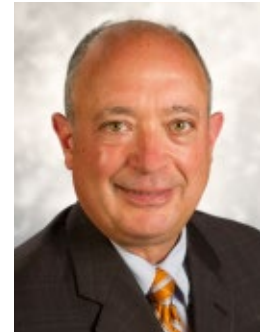
“Radiologists should pay attention to the metadata automatically imported into the history and indication fields from the Radiology Information Systems and add as many of the five details (laterality, anatomy, episode or care, etiology and acuity) as they can,” Dr. Garg said.

Nevertheless, radiologists are likely to have questions, such as: Should the five details be included in the history/indication or in the findings/impression category? Should it go in multiple places?

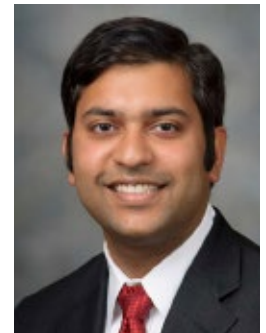
“It’s the same issue we have now with structured reporting,” Dr. Garg said. “I am sure more reports will bounce back from billing for added clarification until we get used to the ICD-10 way of doing things.”

As for those radiology groups that have yet to start preparing for the transition to ICD-10—and according to Mulaik, there are several of them still out there—they are rapidly running out of time and could be in trouble if they don’t start moving immediately.

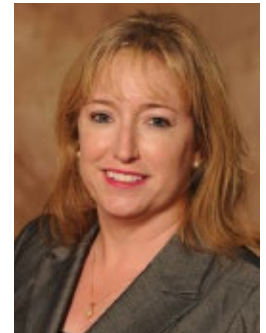
“They can do the ‘let’s hurry up and try to do it all in the summer’ kind of thing, which is what I think some of them are doing,” Mulaik said. “The challenge comes when we get to August and September and practices will need training and



Bucci



Garg



Mulaik



implementation help and there will be no one available because everyone is already scheduled with other organizations."

#### Countdown to October 1

So what will happen when October 1 hits? Possible problems could be relatively benign. For example, Kinsley pointed out that the fact that ICD-10 codes have more characters than ICD-9 codes, which could result in data input delays because it will simply take longer to type in the codes.

Other problems could be more serious. For example, what will happen if practices start experiencing serious reimbursement delays because of problems transitioning to the new coding system? With that in mind, organizations such as the Ameri-

can Medical Association are strongly urging groups to set aside enough in cash reserves or lines of credit to mitigate cash flow disruptions.

Mulaik said that any problems won't be apparent on October 1. In fact, Mulaik has heard that many payers don't intend to have their tightest edits in place at first, but instead expect to be flexible.

"But eventually, I think things will tighten up," she predicts. □

**MIKE BASSETT** is a writer based in Holliston, Mass., specializing in health and medicine.

## ICD-10 Two-Year Grace Period Proposed to Congress

As of press time, no action had been taken on a bill introduced to the U.S. House of Representatives in June that proposes a two-year grace period for healthcare providers submitting ICD-10 codes. Representative Gary Palmer (R-AL-6) introduced the bill, "H.R. 2652, Protecting Patients and Physicians Against Coding Act of 2015," that would give providers a two-year grace period during which any claims submitted to the Centers for Medicare & Medicaid Services (CMS) "would not be denied due to coding errors." The proposal does not seek to delay implementation of ICD-10 on October 1, 2015.

## Preparation for ICD-10

- The Centers for Medicare and Medicaid Services (CMS) provides a variety of resources, as well as ICD-10 news and updates on its website, [CMS.gov/Medicare/Coding/ICD10/ProviderResources.html](http://CMS.gov/Medicare/Coding/ICD10/ProviderResources.html).
- The Radiology Business Management Association (RBMA) provides an ICD-10 coding toolkit containing tools needed to prepare practices for ICD-10 implementation, at [www.rbma.org/ICD-10](http://www.rbma.org/ICD-10).
- Another source for ICD-10 issues (as well as other issues related to billing and coding) is the American College of Radiology Economics & Health Policy Staff, which offers a number of resources specifically geared to ICD-10. Go to [www.acr.org/Advocacy/Economics-Health-Policy/Billing-Coding](http://www.acr.org/Advocacy/Economics-Health-Policy/Billing-Coding).



# Radiology Should Take Lead in MRI Contrast Media Use, Research

BY RICHARD DARGAN

*Recent research has determined that a component of some MRI contrast agents remains in the brains of people who undergo repeat examinations, raising new concerns about the safety of these widely used agents. Although no harmful effects have yet been shown, radiology experts said the findings highlight the need for more research and a more prominent role for radiologists regarding the use of MRI contrast media.*

GADOLINIUM-BASED CONTRAST AGENTS (GBCAs)—first approved by the U.S. Food and Drug Administration (FDA) for use in MRI in 1988—are widely used for brain imaging. The gadolinium ion is toxic to humans, so it is attached to a ligand, a kind of molecular escort that carries the agent into the bloodstream and out of the body through the urinary system without leaving any of the toxic ion behind. However, concern that gadolinium may become dissociated from the ligand in certain agents began to grow in 2006, when reports first surfaced of patients contracting nephrogenic systemic fibrosis (NSF), a disease of the skin and internal organs, after GBCA administration.

“As we acquired more knowledge about NSF, we found that some contrast agents have a higher risk of dissociation of gadolinium from its protective ligand molecule,” said Emanuel Kanal, M.D., a radiology professor at the University of Pittsburgh Medical Center (UPMC) and chairman of the American College of Radiology MR Safety Committee from 2002-2012, in an interview with *RSNA News*. “The gadolinium stuck around longer than normal in patients with kidney impairment, increasing the risk of dissociation of the gadolinium ion from its ligand molecule while it was still within the patient.”

Along with Michael F. Tweedle, Ph.D., Dr. Kanal co-authored the editorial, “Residual or Retained Gadolinium: Practical Implications for Radiologists and Our Patients,” in the June 2015 issue of *Radiology*.

In recent years, new research of MRI studies of patients with a history of multiple GBCA administrations detected hyperintensity indicative of gadolinium in two brain regions: the dentate nucleus and the globus pallidus. The research team led by Tomonori Kanda, M.D., Ph.D., of the Teikyo University School of Medicine in Tokyo, followed up their initial findings with research published in the June 2015 issue of *Radiology*.

Researchers used mass spectroscopy to compare brain tissues obtained at autopsy in five subjects who received GBCA with five subjects who had no history of GBCA administration. Gadolinium was

detected in all brain specimens from the GBCA group, with significantly higher concentrations in the dentate nucleus and globus pallidus. The non-contrast group had no detectable levels of gadolinium in those areas.

In a separate June 2015 *Radiology* study, researchers from the Mayo Clinic in Rochester, Minn., led by Robert J. McDonald, M.D., Ph.D., used mass spectroscopy and electron microscopy (EM) to compare brain samples from 13 patients who underwent at least four GBCA-enhanced brain MR examinations between 2000 and 2014 with those of 10 patients who did not receive GBCA. The brain tissue of patients from the contrast group contained up to 58.8 micrograms gadolinium per gram of tissue, while no gadolinium was detected in the control patients. The dentate nucleus contained the highest median concentration of elemental gadolinium. Using EM, gadolinium deposits were detected within the neuronal interstitium of the dentate nucleus, suggesting that gadolinium is somehow able to cross the blood brain barrier.

While neither of these studies was able to identify whether the residual gadolinium was in free or chelated form, these results are especially concerning because the abnormalities were found in patients with normally functioning kidneys.

“NSF is a severe condition, but it applies to only a very small section of the population,” said Dr. Kanal. “Now we’re talking about patients with normal kidneys. There are tens of millions of patients in the United States alone who are receiving these contrast agents and we don’t at this point know what the significance may be, if any.”

## Radiology Should Play Central Role in MRI Contrast Research

Rather than being defensive about the findings, radiologists should take the lead in studying their clinical implications, Dr. Kanal said. One potentially important area of study is cognitive function in people who receive multiple GBCA administrations.



Kanal



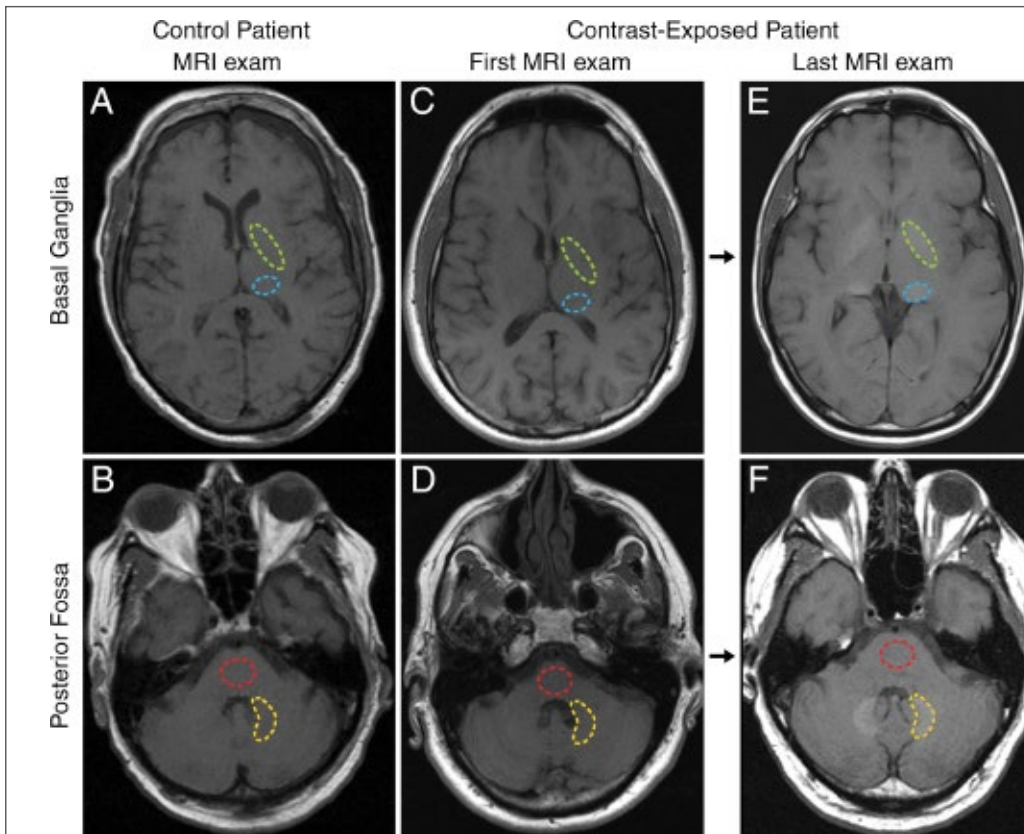
Tweedle



McDonald



Radbruch



In June 2015 *Radiology* research, Robert McDonald, M.D., Ph.D., and colleagues set out to determine if repeated intravenous exposures to gadolinium-based contrast agents (GBCAs) are associated with neuronal tissue deposition. **From left:** Axial T1-weighted MR images through, A, C, E, basal ganglia and, B, D, F, posterior fossa at level of dentate nucleus. Images are shown for, A, B, control group patient 4, and the, C, D, first and, E, F, last examinations performed in contrast group patient 13. Regions of interest used in quantification of signal intensity are shown as dashed lines for globus pallidus (green), thalamus (blue), dentate nucleus (yellow), and pons (red).

(*Radiology* 2015; 275;3;772-782)  
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“The question of clinical consequence has to be front and center until we can answer it,” Dr. Kanal said.

Future research will also focus on the relationship between gadolinium deposition and the nine different GBCAs approved for use by the FDA. GBCAs are classified as linear or macrocyclic based on their structure. Linear agents have an open chain structure, while the gadolinium ion in macrocyclic agents is “caged” inside the ligand. Macrocyclic GBCAs are considered more stable.

“From the knowledge we have, macrocyclic agents as a class are better at rendering the gadolinium excretable,” said Dr. Tweedle, a professor and Stefanie Spielman Chair in Cancer Imaging, Department of Radiology, Ohio State University Medical School, Columbus, in an interview with *RSNA News*. “That’s why molecules of this class are recommended for patients with renal impairment.”

Macrocyclic GBCAs may also be less likely to be retained in brain tissue, according to another June 2015 *Radiology* study.

Alexander Radbruch, M.D., J.D., of the University of Heidelberg Medical Center, Germany, and colleagues used MRI to compare two groups of 50 patients who had undergone at least six MRI examinations with either Magnevist, a linear GBCA, or Dotarem, a macrocyclic agent. The researchers found a signal intensity increase in the dentate nucleus and globus pallidus in the linear group but not in the macrocyclic group.

“These findings are especially important for people who receive multiple contrast administration, such as multiple sclerosis patients, pediatric patients and patients with metastases,” Dr. Kanal said. “If you have a choice and if all other considerations are equal, would you rather have a 5-year-old receive one of these agents associated with brain deposition or one that isn’t?”

The recent findings of gadolinium deposition in the brain have the potential to change the practice of radiology, which would ideally involve a higher profile for radiologists in the selection of MRI contrast, Dr. Kanal said.

At the institution level, radiologists could be involved in decisions about which GBCAs are kept in stock—decisions predominantly made today by non-physicians. At the patient level, radiologists can have a more prospective role in ensuring that MRI with contrast is used only when absolutely necessary. Dr. Kanal, who notes that he often cancels orders for contrast MRI when working in emergency neuroradiology, likened the potential role of the radiologist to that of a physician writing a prescription for medication.

“If we have a choice as to what GBCA to prescribe for our patients, why would I specifically choose to prescribe a contrast agent that has been shown to be associated with intracranial gadolinium accumulation rather than one that has not been shown to do so?” he asked.

Although future ramifications of the new research remain to be seen, the best-case scenario for patients involves a more central role for the radiologist, Dr. Kanal said.

“I hope that these new findings awaken us to the fact that current practices with respect to MRI contrast will no longer be acceptable,” he said. “Patients need to know that someone is watching their back and safeguarding their best interests, and the radiologist is in the best position to do that.” □

#### WEB EXTRAS

Access the *Radiology* studies:

- “Gadolinium-based Contrast Agent Accumulates in the Brain Even in Subjects without Severe Renal Dysfunction: Evaluation of Autopsy Brain Specimens with Inductively Coupled Plasma Mass Spectroscopy” (Kanda).
- “Intracranial Gadolinium Deposition after Contrast-enhanced MR Imaging,” (McDonald).
- “Gadolinium Retention in the Dentate Nucleus and Globus Pallidus is Dependent on the Class of Contrast Agent,” (Radbruch), and the editorial,
- “Residual or Retained Gadolinium: Practical Implications for Radiologists and Our Patients,” at [RSNA.org/Radiology](http://RSNA.org/Radiology).

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

# Ultrasound Aids Carpal Tunnel, Plantar Fasciitis

BY ED BANNON

**Applications for ultrasound continue to grow with one recent study demonstrating the modality's effectiveness in diagnosing carpal tunnel syndrome (CTS) and another showing its potential in treating chronic plantar fasciitis.**

IN A STUDY PUBLISHED in the April 2015 issue of *Radiology*, Taiwanese researchers who developed a new 2D ultrasound strain imaging technique demonstrated its effectiveness in diagnosing CTS, and at an earlier stage than other imaging techniques. The study found that ultrasound strain imaging can quantify and map tissue kinematics effectively enough to detect CTS.

Researchers who studied the wrists of 26 patients (10 healthy and 16 diagnosed with CTS) in real time determined that the standard deviation of the cumulative strain (SDCS) for the shear strain of the flexor retinaculum was significantly lower in patients with CTS than in healthy volunteers. Researchers also determined that the axial strain of the median nerve was higher in healthy volunteers than in patients with CTS.

It was important that the subjects followed a prescribed finger-motion described in the study to properly measure the strain. "Subjects have to practice and follow the physician's instructions to perform one cycle of standardized finger motion from the neutral posture to maximum flexion and then to full extension during a span of 2-3 seconds," said study author Chih-Kuang Yeh, Ph.D., a professor and biomedical researcher at National Tsing Hua University in Taiwan.

Combining ultrasound strain imaging with the prescribed finger motion enabled researchers to quantify the SDCS in the problem region. By adding the temporal variation of the tissue deformation within one cycle of active finger motion, they were able to quantify the cyclic carpal tunnel tissue mobility.

Although commercial software of strain imaging is provided by most ultrasound imaging companies, "our proposed technique

Dr. Yeh added that further research was necessary to confirm their preliminary results due to the small sample size of their study.

## Ultrasound Aids Chronic Plantar Fasciitis

In another study published online in February 2015 in the *Journal of Vascular and Interventional Radiology*, radiologists in Nebraska determined that ultrasonic therapy brought relief to 90 percent of patients with chronic plantar fasciitis. Interventional radiologists at Advanced Medical Imaging, Lincoln, treated 65 patients starting in August 2013 after medication, activity modification, physical therapy and arch supports failed to help patients.

"We have treated well over 100 patients with chronic plantar fasciitis and we are seeing greater than 90 percent improvement," said Rahul S. Razdan, M.D., the study's lead author and an interventional radiologist at Advanced Medical Imaging.

Patients in the study were chronic sufferers who had tried other treatments. "Our patients were at their wits end and were planning to resort to surgery," Dr. Razdan said.

Ultrasound is used in every step of the therapy and is especially crucial for targeting the unhealthy tissue, he said. "The most integral part of the procedure is to know what you're looking at and seeing where the bad collagen is in real time," Dr. Razdan said.

According to the study, a percutaneous ultrasonic fasciotomy was performed with ultrasound guidance from a TX1 device.

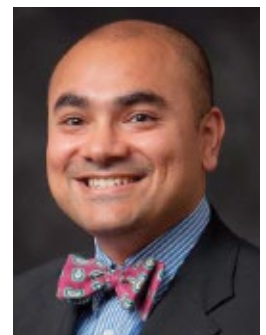
When activated, the device's hollow 18g needle tip emulsifies tissue using high-frequency, low-amplitude motions, which is then extracted via a pump.

The clinic treats plantar fasciitis as an overuse injury that leaves behind scar tissue that displaces healthy tissue. "Our job is to remove the diseased collagen and to give healthy collagen a chance to deposit," Dr. Razdan said.

Patients were evaluated based on the Foot and Ankle Disability Index (FADI) pre-procedure and post-procedure at two weeks,



Yeh



Razdan

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*"We have treated well over 100 patients with chronic plantar fasciitis and we are seeing greater than 90 percent improvement."*

RAHUL S. RAZDAN, M.D.

is easier to implement on available clinical ultrasound platforms. We just apply a color map that corresponds to strain information) and overlap it with a B-mode image to show the ultrasound strain imaging," Dr. Yeh said.

Ultrasound imaging is not only less expensive and less invasive than MRI, "there are some cases of subclinical CTS or early-stage CTS where electrodiagnostic testing cannot detect median nerve dysfunction," Dr. Yeh said



In recent *Radiology* research, investigators sought to determine the feasibility of 2D ultrasonographic strain imaging for quantifying and mapping mechanical behaviors of the median nerve, flexor retinaculum and flexor tendons within the carpal tunnel in normal and carpal tunnel syndrome (CTS) disease states during active finger motion. *Right:* Ultrasound strain imaging of carpal tunnel scanned transversely at the wrist in a patient with severe CTS. A, US B-mode image shows the flexor retinaculum (red dashed line) and the median nerve (blue solid line). B, C, US strain images at B, 25% of one cycle (finger flexion phase) and C, 75 percent of one cycle (finger extension phase) of the finger motion. FCR = flexor carpi radialis, U = ulnar side, R = radial side. Arrows = motion of the flexor tendons (direction and magnitude); the flexor retinaculum and the median nerve are characterized by their incremental shear (cyan-to-purple color map) and axial normal (rainbow color map) strains, respectively. D, Graph shows temporal profile of the MCS values for the flexor tendons, flexor retinaculum, and median nerve during one complete cycle of finger motion. S = strain.

(*Radiology* 2015;276;2:205-214) ©RSNA 2015. All rights reserved. Printed with permission.

six weeks and six months. Dr. Razdan said some of the earliest treated patients are showing no signs of reversal after almost two years.

The ultrasound therapy still must be combined with physical therapy to correct the habits that caused the overuse injury in the first place, Dr. Razdan said. But the treatment can get more people back to the recreation they love or the jobs they need to make a living.

Applications for ultrasound therapy have been expanding to injuries in the elbow, patella and Achilles tendon, he added.

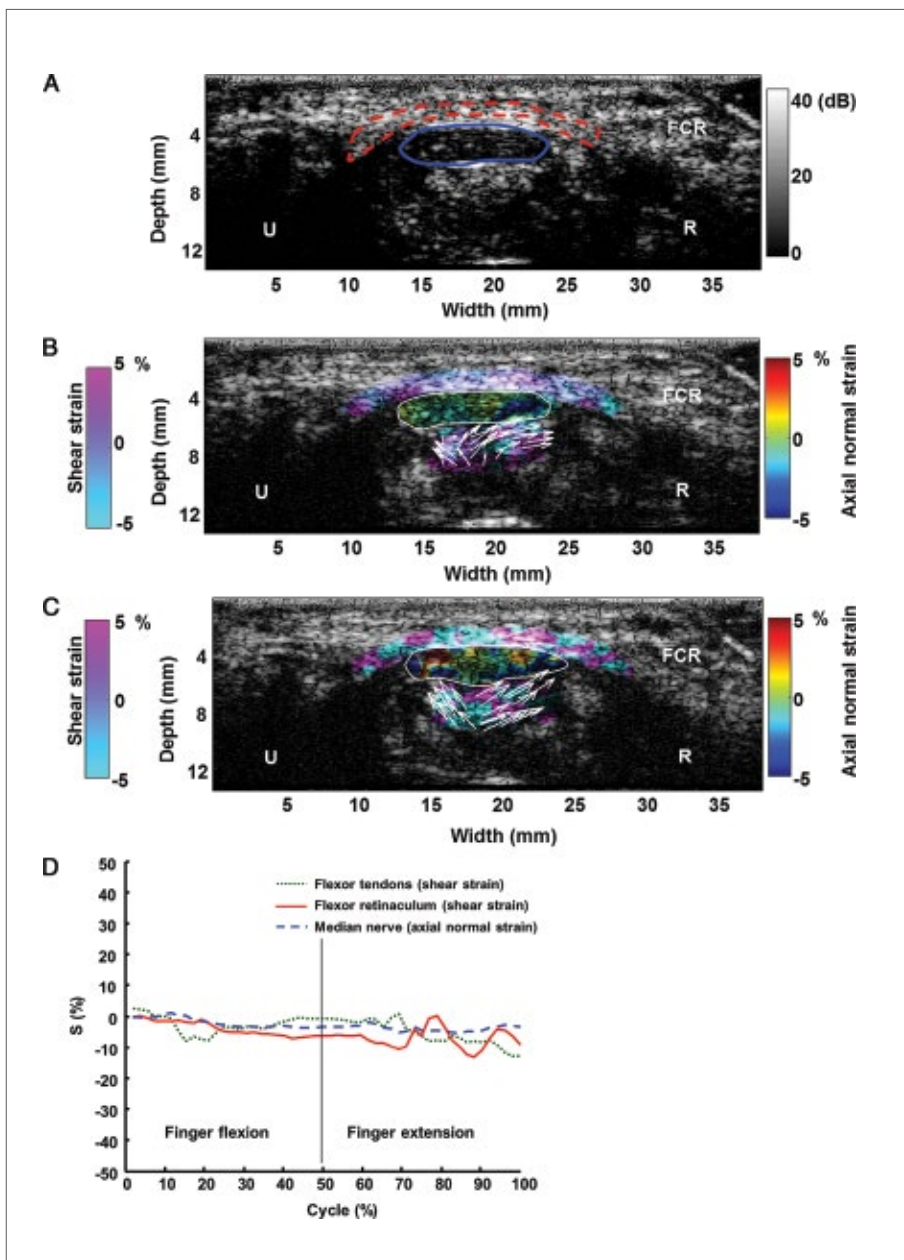
Although not included in the study, Dr. Razdan said data showed a correlation between the duration of the ultrasonic therapy and higher FADI scores, which he attributes to the removal of greater amounts of bad collagen, allowing more blood cells to flow into the area and stimulate healing. □

#### WEB EXTRAS

☑ Access the study "Carpal Tunnel Syndrome: US Strain Imaging for Diagnosis," at [RSNA.org/Radiology](http://RSNA.org/Radiology).

☑ Access the study "Percutaneous ultrasonic fasciotomy: a novel approach to treat chronic plantar fasciitis," at [jvir.org](http://jvir.org).

ED BANNON is a Chicago-based freelance writer.



## Radiology Select Focuses on Imaging of Joints

Imaging and joints is the focus of Volume 6 of *Radiology Select*—a continuing series of articles that highlight developments in imaging science, techniques and clinical practice. Articles in Volume 6 were personally selected by guest editor Thomas M. Link, M.D., Ph.D., a radiology professor in the departments of radiology and biomedical imaging at the University of Muenster, Germany, and cover:

- Anatomy, technique and scanning pitfalls of shoulder ultrasounds
- Bilateral MRI of the hand and wrist from early inflammatory arthritis to rheumatoid arthritis
- Evaluating the articular cartilage of knee joints by adding T2 mapping sequences to routine MR imaging protocol
- MRI for diagnosis and reconstruction of the knee, including clinical importance, possible infection and follow-up
- New imaging developments for hip, pelvis, ankle and foot issues to help identify athletic pubalgia, ligament damage and bursae development

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Mahadevappa Mahesh, M.S., Ph.D.**  
Carolina Bethania S. Martinez, M.D.  
Ryogo Minamoto, M.D.  
**Kambiz Motamedi, M.D.**  
Rebecca J. Mueller, M.D.  
Obi O. Nobi, M.D.  
Obiora C. Okeke, M.B.B.S.  
Eva & Eduardo C. Padilla, M.D.  
Oscar Perez Rocha, M.D.  
Guy Saint-Georges, M.D.  
Yuki Saito Sr., B.S.  
Arsalan A. Siddiqui, M.D.  
Venugopal Thota, F.R.C.R., M.B.B.S.  
Lorraine Vazquez de Corral, M.D.  
Zengmin Yan, M.S., M.D.

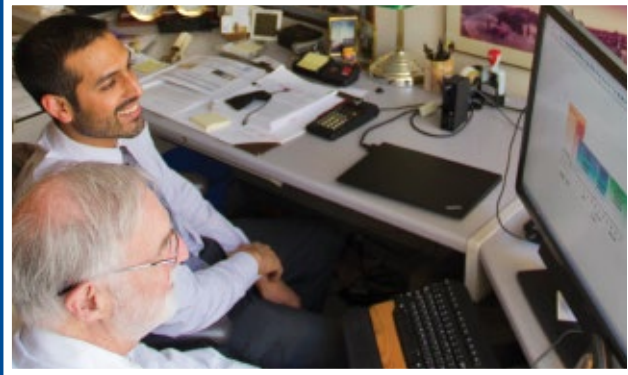
**INSPIRE**

## YOUR DONATIONS IN ACTION

### *Integrating Brain Imaging and Metabolomics in Malnourished Children*

Through a collaborative effort between the RSNA Research & Education (R&E) Foundation and the American Society of Neuroradiology (ASNR), 2015–2017 ASNR/RSNA Research Scholar Grant recipient, [Manu S. Goyal, M.D., MS.c.](#), and his scientific advisor [Marcus Raichle, M.D.](#), will join a team of investigators to study the neurological effects of childhood malnutrition on the brain by integrating data from brain MRI and serum metabolomics. Such integrative methods are expected to provide further insight into the nutritional and metabolic needs of the developing brain.

The goal of the \$150,000 two-year award is to fund additional research in neuroradiology and to help prepare the next generation of researchers to become fully funded physician-scientists with their own research programs.



Goyal, seated rear, and Raichle, front.

## Canon Supports the Inspire-Innovate-Invest Campaign

The RSNA Research & Education (R&E) Foundation is proud to announce that Canon U.S.A. has made a new \$50,000 commitment to support the R&E Inspire-Innovate-Invest Campaign. As a Vanguard donor since 1999, Canon has supported a total of 19 grantees, and its dedication continues with this new five-year commitment to the Foundation.

By endowing two Research Medical Student Grants, Canon invests in young researchers in the earliest stage of their career—planting the seeds of innovation for the future.

“We are proud to be a partner with the RSNA Research & Education Foundation in its mission to improve patient care by funding research and education in radiology,” said Tsuneo Imai, vice president and general manager, Healthcare Solutions Division, Business Imaging Solutions Group, Canon U.S.A., Inc., and president, Virtual Imaging, Inc. “Canon is committed to helping build a better world for future generations, and we are driven to collaborate with our customers to constantly innovate and challenge convention, as is reflected in our ‘Canon See Impossible’ theme. We want to enable our customers to achieve something that was previously unobtainable, and we are pleased to support the RSNA R&E Foundation to help advance radiologic research, education and practice.”

Canon U.S.A., Inc., and Virtual Imaging, Inc., a wholly owned subsidiary of Canon U.S.A., Inc., offer a full range of digital radiography solutions for general and portable radiographic applications. Canon’s expertise in the application of optical and image-processing technologies has resulted in a wide array of solutions and flat panel detectors for the radiology needs of hospitals, imaging centers and clinics. Canon is focused on providing the clinician with consistently excellent image quality, utilizing technology breakthroughs to reduce patient dose and to improve the productivity of health care providers.



## R&E Recognizes Donors

The RSNA R&E Foundation will recognize donors during RSNA 2015. To be included on the Donor Wall and ensure other recognition and benefits, make your gift by September 30, 2015. Donors of \$300 or more enjoy access to the Donor Lounge throughout the meeting.

Visit [RSNA.org/Donate](http://RSNA.org/Donate) to learn more and make a gift today.

## Radiology in Public Focus

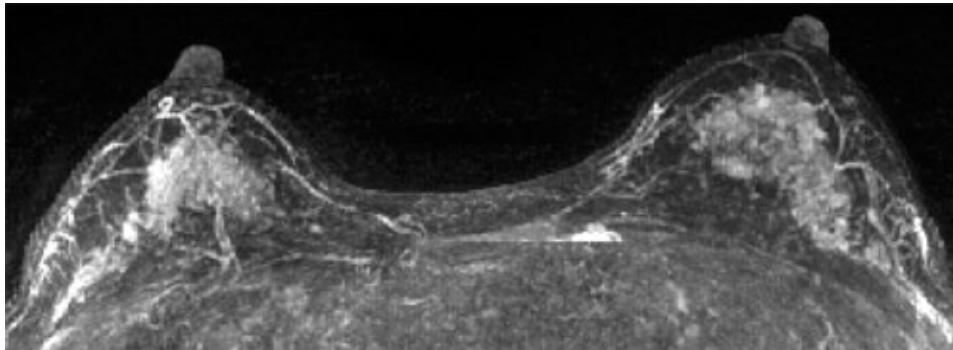
Press releases were sent to the medical news media for the following articles appearing in recent issues of *Radiology*.

### MRI Shows Potential to Improve Breast Cancer Risk Prediction

WOMEN WITH AN MRI ASSESSMENT OF MILD, moderate or marked background parenchymal enhancement (BPE) were nine times more likely to develop breast cancer than were women with minimal BPE, according to new research. The results suggest that this breast MRI feature has the potential to improve upon standard clinical models to more accurately determine a woman's individual breast cancer risk.

Brian N. Dontchos, M.D., of the Seattle Cancer Care Alliance, and colleagues screened breast MRI scans obtained from January 2006 to December 2011 in women aged 18 years or older and at high risk for but without a history of breast cancer. Women in whom breast cancer was diagnosed after index MRI comprised the cancer cohort, and one-to-one matching (age and BRCA status) of each woman with breast cancer to a control subject was performed by using MRI scans obtained in women who did not develop breast cancer with follow-up time maximized. Amount of BPE, BPE pattern (peripheral vs. central), amount of fibroglandular tissue (FGT) at MRI and mammographic density were assessed on index images. Imaging features were compared between cancer and control cohorts by using conditional logistic regression.

Twenty-three women at high risk (mean age, 47 years  $\pm$  10 [standard deviation]; six women had BRCA mutations) with no history of breast cancer underwent screening breast MRI; in these women, a diagnosis of breast cancer (invasive, n = 12; in situ, n = 11) was made during the follow-up interval. Women with mild, moderate or marked BPE were nine times more likely to receive a diagnosis of breast cancer during the follow-up interval than were those with minimal BPE (P = .007; odds ratio = 9.0; 95 percent confidence interval: 1.1, 71.0). BPE pattern, MRI amount of FGT and mammographic density were not significantly different between the cohorts (P = .5, P = .5, and P = .4, respectively).



Contrast-enhanced maximum intensity projection in a 41-year-old woman with a family history of breast cancer shows marked BPE. This patient was found to have invasive ductal carcinoma 183 days after index MR imaging. (The maximum intensity projection image from the age- and history-matched control subject is provided in Figure E1 [online].)

(*Radiology*2015;276;2:323-338) ©RSNA 2015 All rights reserved. Printed with permission.

“Mammographic density and MRI assessment of amounts of FGT, while known risk factors in women at average risk, may be less predictive in women already determined to be at high risk for breast cancer. If this biomarker is verified in larger multicenter cohorts, the integration of BPE into clinical risk assessment tools could enable screening and chemoprevention strategies to be better tailored to each individual's true risk,” the authors write.

### News on *RadiologyInfo.org*

Did you know that in addition to radiologic procedure descriptions, screening/wellness articles and disease/condition content, *RadiologyInfo.org* also provides the latest in radiology news?

Produced by RSNA and ACR, the public information website features press releases on a variety of radiology topics, including new developments, emerging technologies and more. Check out the *RadiologyInfo.org Radiology News* section today.

**RadiologyInfo.org**  
For patients

### Media Coverage of RSNA

In May, 963 RSNA-related news stories were tracked in the media. These stories reached an estimated 995 million people.

Coverage included Good Morning America, KABC-TV (Los Angeles), KTTV-TV (Los Angeles), WLS-TV (Chicago), WGN-AM (Chicago), *Yahoo! Finance*, *Bloomberg News*, *MSN.com*, *HealthDay*, *WebMD*, *Reuters*, *Philly.com*, *ScienceDaily*, *RedOrbit*, *Medical News Today* and *DOTmed Business News*.

## AUGUST PUBLIC INFORMATION OUTREACH ACTIVITIES FOCUS ON BREAST MRI

In August, RSNA's 60-Second Checkup radio program will focus on the use of breast MRI to screen for a woman's future risk of developing breast cancer.

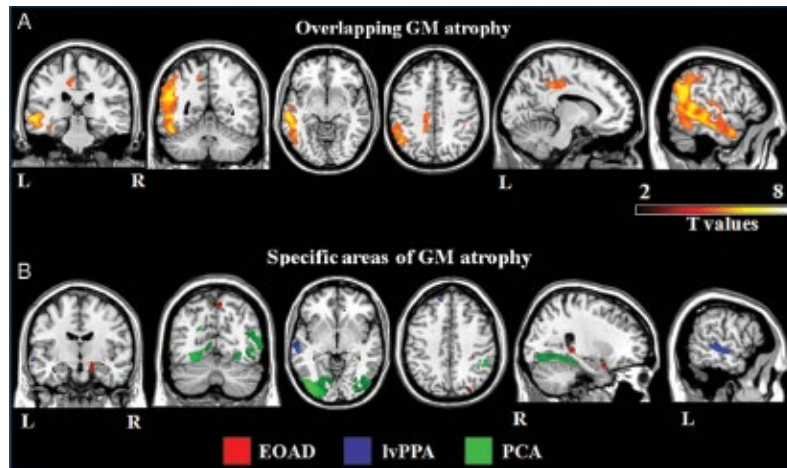
## Imaging Test May Identify Biomarker of Alzheimer Disease

IN ATYPICAL ALZHEIMER DISEASE (AD) clinical phenotypes, the distribution of white matter (WM) damage exceeds cortical atrophy and may reflect the pathologic dissemination through structural connections from atrophic to unaffected cortical regions. WM degeneration may be an early marker of AD pathologic changes in early-onset AD (EOAD) and focal AD forms, new research shows.

Francesca Caso, M.D., of the San Raffaele Scientific Institute in Milan, Italy, and colleagues assessed WM tract damage and cortical atrophy by using diffusion-tensor MRI and voxel-based morphometry, respectively, in 28 patients with EOAD, 12 patients with logopenic variant of primary progressive aphasia (lvPPA), and 13 patients with posterior cortical atrophy (PCA) relative to age- and sex-matched healthy subjects. Conjunction and interaction analyses were used to define overlapping and syndrome-specific patterns of brain damage.

The researchers found patients with EOAD, lvPPA and PCA shared a common pattern of WM damage that involved the body of the corpus callosum, fornix and main anterior-posterior pathways ( $P < .05$ ). They also shared cortical atrophy of the left temporoparietal regions and precuneus ( $P < .05$ , family-wise error corrected). Patients with EOAD also had specific damage to the genu and splenium of the corpus callosum and parahippocampal tract bilaterally ( $P < .05$ ). In all patients with AD, particularly in the two focal forms (lvPPA and PCA), WM damage was more severe and widely distributed than expected on the basis of cortical atrophy.

“Our study indicates that WM degeneration may be an early marker of AD pathologic changes in EOAD and atypical AD forms, preceding gray matter atrophy. Our findings also suggest that the clinical heterogeneity of AD may be related to the fact that the disease process starts from different medial temporal or lateral neocortical hubs and then eventually progresses along the same WM network to converge to a similar pattern of involvement, matching the brain areas that are included in the default mode network,” the authors write.



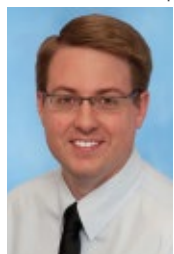
MR images of A, common and B, syndrome-specific patterns of cortical atrophy across the AD variants. A, Voxel-based morphometry results show the common pattern of cortical atrophy in patients with EOAD, lvPPA, and PCA, displayed in yellow to red. B, Voxel-based morphometry results show regions of specific cortical atrophy in each AD group: The EOAD-specific pattern is displayed in red, the lvPPA-specific pattern is displayed in blue, and the PCA-specific pattern is displayed in green. Results are overlaid on the coronal (left two columns), axial (middle two columns), and sagittal (right two columns) sections of the Montreal Neurologic Institute standard brain in neurologic convention (the right side appears on the right) and displayed at a P value less than .05, family-wise error corrected for multiple comparisons. GM = gray matter, L = left, R = right.

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## Value of Membership

### R&E Foundation Grants Are Gateway to Success for Recipients

RSNA Research & Education (R&E) Foundation grants not only move radiology forward with new research, they also help build careers for recipients.



Dillman

Just ask Jonathan Dillman, M.D., who received a 2011-2013 AGFA HealthCare/RSNA Research Scholar Grant, which he used to fund his study, “Comparative Effectiveness of MR Enterography, Enteric Ultrasound, and Ultrasound Elastography Imaging in the Evaluation of Pediatric Small Bowel Crohn Disease.”

Building on the momentum from his R&E grant—which are available only to RSNA members—Dr. Dillman was able to secure further funding from the National Institutes of Health (NIH).

“My RSNA Research Scholar Grant has clearly had a trickle-down effect,” said Dr. Dillman, director, thoracoabdominal imaging, Cincinnati Children’s Hospital Medical Center. “I was able to acquire grant-writing skills that allowed me to receive my NIH/CTSA KL2 award—a mentored career development award that will allow me to collect the preliminary data necessary to obtain further funding from the NIH.”

In 2015, the Foundation will fund 92 grant projects totaling \$3.6 million. An R&E grant often serves as a pathway to additional funding. Surveys show that R&E grant recipients have gone on to receive over \$1.8 billion in subsequent funding from other sources such as the NIH.

But the grants are about more than funding—they’re gateways to success for recipients.

“The Research Scholar Grant allowed me to make important connections within RSNA, as an organization, as well as outside of RSNA,” Dr. Dillman said. “Without the help of RSNA and its R&E Foundation, I don’t think I would be where I am today.”

Visit [RSNA.org/Foundation](http://RSNA.org/Foundation) for more details or to submit an application.



## Journal Highlights

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

### Imaging for Staging and Response Assessment in Lymphoma

Diagnostic imaging plays a critical role in the initial evaluation, monitoring and follow-up of lymphoma patients.

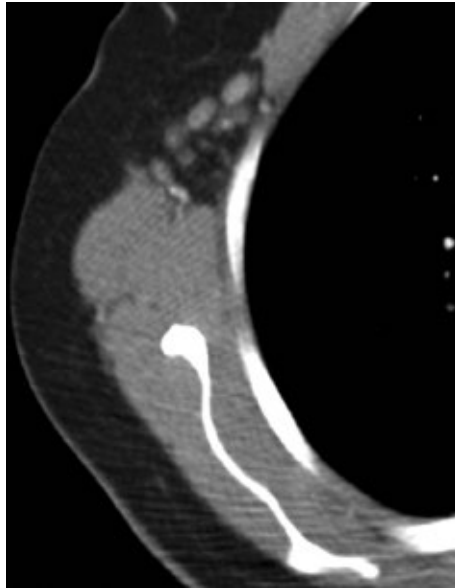
In an article in the July issue of *Radiology* ([RSNA.org/Radiology](http://RSNA.org/Radiology)), Sarah A. Johnson, M.D., of Memorial Sloan-Kettering Cancer Center

**Radiology** in New York City, and colleagues provide an overview of the updated CT and 18F-fluorodeoxyglucose positron emission tomography/vCT (FDG-PET/CT) response criteria to familiarize the radiologist with the most important and clinically relevant aspects of lymphoma imaging.

Over the years, staging systems have been refined, and dedicated criteria have been developed for evaluating response to therapy with both CT and 18F-FDG-PET/CT. The most recent system proposed for staging and response assessment, known as the Lugano classification, applies to Hodgkin and non-Hodgkin lymphoma. The use of standardized criteria for staging and response assessment is important for making accurate treatment decisions and for determining the direction of further research.

The new Lugano classification represents a consensus statement of clinical experts in lymphoma and is therefore expected to serve as a unified guideline for all physicians involved in lymphoma diagnosis and management.

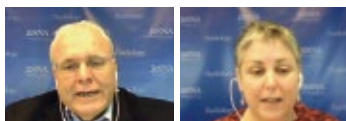
"Improved familiarity with the Lugano classification, and with potential pitfalls in imaging interpretation, will allow the radiologist to provide added value as a member of the clinical oncology team," the authors write.



Contrast-enhanced axial CT scan in a 57-year-old woman with small cell lymphocytic lymphoma/chronic lymphocytic leukemia (SLL/CLL) shows numerous representative small-volume lymph nodes in the right axilla. An increased number of small nodes is often seen in patients with SLL. These pathologic small nodes are usually followed in patients with small cell lymphocytic lymphoma/chronic lymphocytic leukemia, with treatment only initiated if nodes increase in size or clinical symptoms develop. These nodes are too small to be considered measurable disease by the Lugano criteria.

(*Radiology* 2015;276;2:323-338)  
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This article meets the criteria for AMA PRA Category 1 Credit™. SA-CME is available online only.



**Radiology** EXTRA  
PODCASTS

Listen to *Radiology* Editor Herbert Y. Kressel, M.D., deputy editors and authors discuss the following articles in the June issue of *Radiology* at [RSNA.org/Radiology-Podcasts](http://RSNA.org/Radiology-Podcasts).

- ▶ "Residual or Retained Gadolinium: Practical Implications for Radiologists and Our Patients," Emanuel Kanal, M.D., and Michael F. Tweedle, Ph.D.
- ▶ "Intracranial Gadolinium Deposition after Contrast-enhanced MR Imaging," Robert J. McDonald, M.D., Ph.D., and colleagues.
- ▶ "Gadolinium Retention in the Dentate Nucleus and Globus Pallidus Is Dependent on the Class of Contrast Agent," Alexander Radbruch, M.D., and colleagues.
- ▶ "High Signal Intensity in Dentate Nucleus on Unenhanced T1-weighted MR Images: Association with Linear versus Macrocytic Gadolinium Chelate Administration," Tomonori Kanda, M.D., Ph.D., and colleagues.

### "Golden Oldies" Spotlighted in August *Radiology* Issue

As part of the RSNA Centennial Celebration, *Radiology* is featuring 15 Golden Oldies each month based on their significance to the advancement of the field of radiology. The special supplement in the August issue spotlights therapy and radiation risk, including:

- "The Effect of Radiation Applied Directly to the Brain and Spinal Cord: I. Experimental Investigations on Macacus Rhesus Monkeys," 1938
- "Experience with Altered Fractionation in Radiation Therapy of Breast Cancer," 1968
- "Radiation Hazards to the Embryo and Fetus," 1952

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](http://RSNA.org/Golden-Oldies).

**Radiology**  
GOLDEN OLDIES

## Transsphenoidal Approach in Endoscopic Endonasal Surgery for Skull Base Lesions: What Radiologists and Surgeons Need to Know

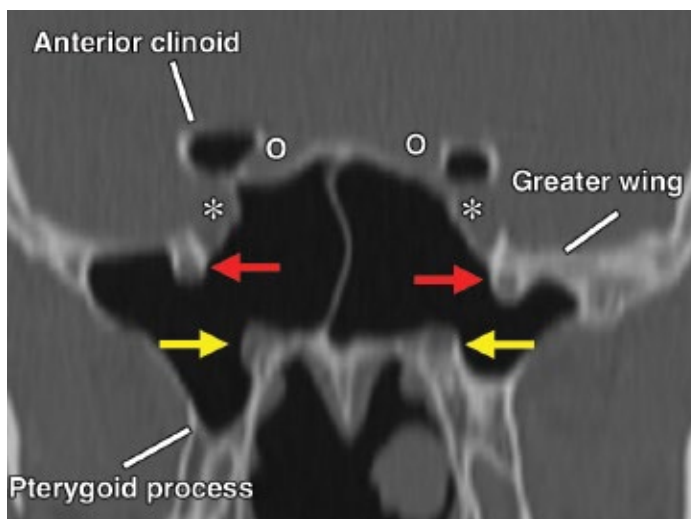
Use of endoscopic endonasal transsphenoidal surgery has grown rapidly in the last decades as a therapeutic modality for skull base lesions. Extended approaches have been developed to widen the list of indications for the technique. Image-guided surgery provides real-time anatomic navigation with use of triplanar radiologic images and allows surgeons to avoid damage to important neurovascular structures.

### RadioGraphics

In an article in the July-August issue of *RadioGraphics* (RSNA.org/RadioGraphics), Elena García Garrigós, M.D., of Hospital General Universitario de Alicante in Alicante, Spain, and colleagues review the anatomy and relationships of the sphenoid bone and skull base structures (with cadaver head, endoscopic and CT correlation); explain the neuro-navigation CT protocol and use of intraoperative navigation systems; discuss surgical techniques and approaches, as well as their indications and challenges; and describe anatomic aspects that increase the risk for complications during endoscopic endonasal transsphenoidal surgery.

Preoperative imaging techniques with neuronavigation protocols and multiplanar reconstructions provide accurate depictions of tumor extension, associated bone changes, and anatomic variants. Radiologists must note the extension of sphenoidal pneumatization, recesses and septations of the sinus, and all other relevant anatomic variants to facilitate safe and effective endonasal transsphenoidal surgical treatment of skull base lesions.

"Knowledge of surgical techniques and understanding of the role of imaging in preoperative workup are essential for all radiologists who treat these patients. A well-coordinated team of otorhinolaryngologists, neurosurgeons and radiologists who specialize in endoscopic surgery and skull base lesions is a prerequisite for successful transsphenoidal surgery," the authors write.



**Extensions of sphenoid pneumatization.** Coronal CT image shows full lateral pneumatization of the right sphenoid sinus, greater wing pneumatization of the left sphenoid sinus, and bilateral lesser wing pneumatization. Note the bulging optic nerves (O), internal carotid arteries (\*), maxillary nerves (red arrows), and vidian nerves (yellow arrows), some of which are dehiscent. (*RadioGraphics* 2015;35:1170-1185) ©RSNA 2015 All rights reserved. Printed with permission.

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

## Access Online Tutorials for RSNA Journals

Go to [RSNA.org/Journals](http://RSNA.org/Journals) to watch a number of related RSNA tutorials, including:

- SA-CME Test Help: How to Find and Complete the SA-CME Tests for *Radiology* and *RadioGraphics*
- *Radiology*/*RadioGraphics* Features: Learn how to navigate the homepage for *Radiology* and *RadioGraphics*, while discovering its useful features.
- Managing your Account: Learn how to access your account to add favorite articles, manage your alert and search settings, update your personal information and more.
- RSNA Image Viewer: Learn how to compare, magnify and archive images with RSNA's image viewer tool for both *Radiology* and *RadioGraphics*



## Download the RSNA Journal Apps

*Radiology* and *RadioGraphics* mobile apps are available in the App Store for the iPhone® and iPad® and in Google Play for Android® devices. The apps are free to download. Learn about features and functionalities here:



## Annual Meeting Watch

### News about RSNA 2015



#### 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

RSNA will mail registration materials in late October/early November to all full-conference registrants enrolled by November 6 (October 16 for international registrants).



#### Virtual Meeting—Experience RSNA From Anywhere

With the vast offerings RSNA 2015 provides, it's impossible to see it all at McCormick Place. Register for the Virtual Meeting to watch 60 courses live or on-demand, diagnose Cases of the Day and view digital Education Exhibits and Scientific Posters. Participants in live-streamed courses can earn CME credits. The fee is \$100 for RSNA members, \$300 for non-members, and \$25 for RSNA member-in-training and RSNA medical student members. Retired members are free.

For more information or to register for the Virtual Meeting, go to [RSNA.org/Virtual](http://RSNA.org/Virtual).

#### Meeting Central is your Source for RSNA 2015

Access the RSNA 2015 Meeting Central site at [Meeting.RSNA.org](http://Meeting.RSNA.org), offering one central location for registered attendees to plan their meeting experience. Read more about Meeting Central in [RSNA.org](http://RSNA.org) on Page 24.

#### International Visitors

If you must apply for a temporary non-immigrant visa to attend RSNA 2015, you are advised to apply as soon as U.S. travel is decided and no later than three to four months in advance of the travel date. The RSNA offers an official letter of invitation for RSNA 2015 attendees. For more information, go to [RSNA.org/Visas](http://RSNA.org/Visas).



#### 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.

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

#### 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.

#### Arrange Childcare

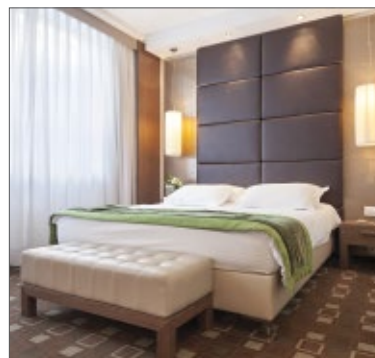
To uphold the professional and educational standards of the RSNA annual meeting, children under 16 years of age are not issued badges nor permitted in the exhibit halls or sessions. Onsite childcare will be available for children six months to 12 years through ACCENT on Children's Arrangements, Inc. Online registration and application forms are available at [RSNA.org/Register](http://RSNA.org/Register); click Childcare.



## Reserve Your Room Now

Top Reasons to Reserve Hotel Rooms Through RSNA:

- **Lowest Rates:** More than 80 hotels in the heart of the city offering a wide range of options, price points and the lowest rates possible.
- **Flexible Terms:** Book today, and have the flexibility to change or cancel your reservation without charge up to 72 hours prior to arrival.
- **Easy Booking:** You can easily book a hotel while registering.
- **Customer Service:** RSNA acts as an advocate if a dispute or problem arises and is also available to assist with housing questions or concerns.
- **Support the Association:** Booking through our system helps RSNA negotiate the best deals on room rates.
- **Free Transportation:** Free Metra train service to Randolph Street Station, as well as shuttle bus service between all RSNA-contracted hotels and McCormick Place.



## Gant Travel

RSNA attendees who book air travel through Gant Travel experience the following benefits:



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

For more information, contact Gant Travel at 1-877-613-1192, international +1630-227-3873 or [rsna@ganttravel.com](mailto:rsna@ganttravel.com). Service fees apply.



## Take in Chicago's Sights, Sounds at RSNA 2015

Chicago offers an exciting array of sights, sounds and scenes you can't afford to miss. RSNA will once again offer a series of exciting tours and events during the week. Here's a peek at just some of the RSNA-sponsored attractions coming to Chicago during RSNA 2015:

- "A Christmas Carol" at the Goodman Theatre
- Glass Blowing at Ignite
- "The Lion King"
- Chicago Symphony Orchestra: Vienna Boys Choir
- "Beautiful: The Carole King Musical"

The lineup also features city tours, shopping excursions, culinary experiences, museum exhibits and much more. See what the city has to offer and secure your tickets at [RSNA.org/Register](http://RSNA.org/Register); click on RSNA Tours & Events.

## 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.
- **International Pavilions:** Visit exhibitors from Canada, China, France, Japan and Korea.
- **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](http://RSNA.org/ExhibitingCompanies) and search the interactive list of exhibitors and floor plan to find the companies you want to visit.



## Education and Funding Opportunities

### RSNA Faculty Skills Update Workshop

**Sept. 22, 2015**  
Westin O'Hare, Chicago  
Registration Now Open

Don't miss your chance to participate in the 2015 RSNA Faculty Skills Update Workshop—a one-day meeting designed to provide instruction on lecture and presentation skills, as well as developing quality question-writing strategies. The workshop will be led by physician faculty George S. Bisset III, M.D., David J. DiSantis, M.D., and Harprit S. Bedi, M.D.

Attendees will explore how adults—especially physicians—learn best, and will offer best-practice methodologies for question writing. Attendees will have the opportunity to submit their item-writing questions for faculty and group discussion, including a review of CME test questions submitted by fellow attendees. Using real-life question examples, faculty will walk through acceptable and unacceptable question-writing methodologies, focusing on the best practices for question writing and rewriting.

Attendees will explore challenging case-based questions that can be adapted to a variety of deployment mediums, including print and Audience Response System (ARS) testing. They will learn to utilize RSNA Diagnosis Live™ technology to engage the audience with thought-provoking ARS questions. Faculty will offer instruction on formatting course materials and slides for ARS presentations and will share their experiences using an ARS system.

The workshop will be held Sept. 22, 2015, at the Westin O'Hare in Chicago. The fee is \$150. For more information on attending the workshop, go to [RSNA.org/Faculty-Skills-Update](http://RSNA.org/Faculty-Skills-Update) or contact Jennifer Comerford at [jcomerford@rsna.org](mailto:jcomerford@rsna.org) or 630-590-7772.

### 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](http://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.

Attendees must be registered for the Annual Meeting and can add the workshop to My Agenda at the RSNA Meeting Central website, [Meeting.RSNA.org](http://Meeting.RSNA.org).

More information for these programs is available at [RSNA.org/ResearchCourses](http://RSNA.org/ResearchCourses). Questions can be directed to Rachel Nelson at 1-630-368-3742 or [rnelson@rsna.org](mailto:rnelson@rsna.org).

### For Your Calendar

**JULY 20-23, 2015**  
The Association for Medical  
Imaging Management (AHRA),  
Las Vegas  
[Visit the RSNA Booth](#)  
• [www.ahraonline.org](http://www.ahraonline.org)

**SEPTEMBER 22, 2015**  
Faculty Skills Update  
Westin O'Hare, Chicago  
**Registration Open Now**  
• [RSNA.org/Faculty-Skills-Update](http://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](http://RSNA.org/CORE)

**OCTOBER 18-21, 2015**  
American Society for  
Radiation Oncology  
(ASTRO), San Antonio  
[Visit the RSNA Booth](#)  
• [www.astro.org](http://www.astro.org)

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

## Meeting Central is Your Go-to Spot for RSNA 2015 Planning

With RSNA 2015 getting ever closer, be sure to check out the newly launched RSNA 2015 Meeting Central site at *Meeting.RSNA.org*, offering one central location for registered attendees to plan their meeting experience.



Registered attendees will find a host of valuable information at Meeting Central, including:

- **Meeting program**  
Browse the listings of educational courses.
- **Virtual Meeting program**  
Browse virtual courses available live or on-demand from anywhere across the globe.
- **My Agenda**  
Build your calendar and stay organized with a handy schedule personalized to your needs, perfect for planning ahead.
- **Technical exhibitors list**  
Learn about the companies unveiling the latest equipment and technology.

Designed for tablets and mobile devices, Meeting Central is an invaluable resource for navigating RSNA 2015. Join us as we celebrate the 100th anniversary of RSNA's founding and discover the innovations that will drive radiology into the future.

Get started now at *Meeting.RSNA.org*.

COMING  
NEXT  
MONTH

Read about the recent redesign of the RSNA-ACR public information website, *RadiologyInfo.org*, and check out our list of Chicago attractions to see while you're in the Windy City for RSNA 2015.

A woman with dark hair, seen from behind, stands in a vast field of tall, golden grass. Her arms are outstretched horizontally to the sides. In the background, there is a body of water and a line of trees under a clear sky.

**SIEMENS**

[www.usa.siemens.com/tomo](http://www.usa.siemens.com/tomo)

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acquires 25 images of the breast across a 50° angle, resulting in better depth resolution and tissue layer separation—and increased breast cancer detection rates.

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