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August 2014 Volume 24, Issue 8

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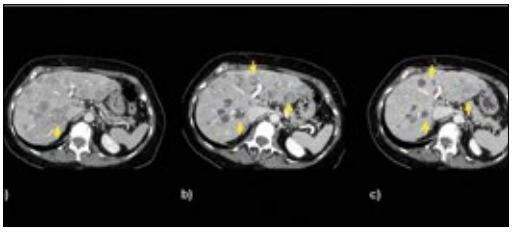

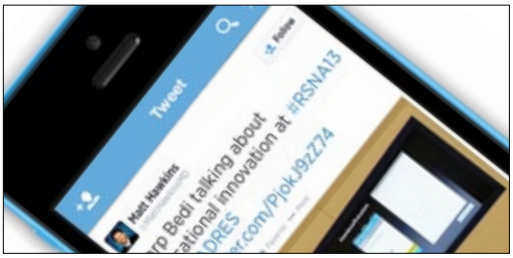

RSNA News

UP FRONT

RADIOLOGY'S FUTURE

NEWS YOU CAN USE

RSNA MISSION

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

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CENTENNIAL SNAPSHOTS

During this year as RSNA celebrates its 100th annual meeting and scientific assembly, *RSNA News* takes a look back at milestones in the Society's history.

1959: "Future of Radiology" is Annual Meeting Theme

The prevailing mood of RSNA 1959 was excitement about scientific advancement. Exhibitors talked of developing remote-controlled radiographic units, while scientific presenters demonstrated how huge computers could be used to facilitate diagnostic radiology. "I am firmly optimistic about the future of radiology," noted **Lawrence L. Robbins, M.D.**, in his presidential address. "It will require careful preparation for change: constant study, revision and application of attitudes in the education of the student (and ourselves); unrelenting search for new and real opportunities for basic research; and judicious direction of evolving methods of practice to provide the best care of the patient."

1962: Associated Sciences Committee Established

By the 1960s the medical field was growing and included more and more support personnel who were not physicians. The RSNA annual meeting welcomed allied scientists who supported radiologists and the RSNA Physics Committee was renamed the Associated Sciences Committee (now the Associated Sciences Consortium). Some 3,000 radiology support personnel now attend the RSNA annual meeting each year, with a multi-day Associated Sciences Symposium being just one of many offerings catering to their needs.

1973: Scientific Exhibits Divided into Sections and Color-coded

What present-day annual meeting attendees have experienced as the Lakeside Learning Center grew out of efforts by RSNA leaders—challenged by the limited space for the Society's annual meetings—to do everything they could to streamline the program while still including new and developing areas of radiology.

1987: First International Visiting Professor Visit

The RSNA International Visiting Professor program annually sends teams of North American professors to lecture at national radiology society meetings and visit radiology residency training programs at selected host institutions in developing nations. **Edmund A. Franken Jr., M.D.**, was RSNA's inaugural visiting professor, teaching at the University of Nairobi in Kenya for six weeks. IVP teams have traveled to 43 developing nations.

2010: Radiology Legacy Collection Unveiled

The Legacy Collection, a searchable archive of *Radiology* issues spanning 1923 to 1998, made seminal articles in the specialty available online for the first time. "Readers and researchers now have enhanced access to the literature that has shaped the field as we know it," *Radiology* Editor **Herbert Y. Kressel, M.D.**, noted as the collection made its debut.

2010: RSNA Gets a Makeover

"As medical imaging evolves, we believe it is appropriate for the RSNA to evolve also—so we have updated our look," 2012 RSNA President **George S. Bisset III, M.D.,** observed in an *RSNA News* editorial at the time, while serving as chairman of the Board of Directors. "Far from simply a cosmetic change, the new RSNA logo is the culmination of an effort to understand what people believe about the RSNA." Members, nonmembers, volunteers and leaders from throughout North America and the globe were surveyed over a multiyear period to inform the new RSNA identity.

Margulis Appointed to Chevalier of the French Legion of Honor

Margulis

Alexander R. Margulis, M.D., clinical professor of radiology at the Weill Cornell Medical College in N.Y., was appointed to the rank of Chevalier of the French Legion of Honor. Dr. Margulis was selected by the President of the French Republic for his merits and accomplishments in radiology worldwide and his contribution to expanding radiology innovation and research.

Dr. Margulis received the RSNA Gold Medal in 1983 and has served on numerous RSNA committees. The RSNA Alexander Margulis Award for Scientific Excellence, established in 2012, recognizes the best original scientific article published in RSNA's peer-reviewed journal *Radiology*.

Radiology Mourns Passing of Visionary Leader Harvey L. Neiman, M.D.

American College of Radiology (ACR) chief executive officer (CEO) and visionary in the movement to improve patient care, **Harvey L. Neiman, M.D., F.A.C.R.**, died June 5, 2014, after a long illness. He was 71.

Dr Neiman's many accomplishments included spearheading the ACR co-founding of the Image Wisely® and Image Gently® initiatives to raise awareness of opportunities to lower radiation dose used in medical imaging, and guiding the development of the Dose Index Registry®.

Neiman

Dr. Neiman was awarded the RSNA Gold Medal at RSNA 2013. At the ceremony, 2013 RSNA President Sarah S. Donaldson, M.D., said, "His visionary leadership combined with his skills at consensus building mark his truly distinguished career."

"Radiologist, educator, investigator and physician leader, Harvey Neiman was also a devoted husband and father," added N. Reed Dunnick, M.D., 2014 RSNA President. "He succeeded as an academic radiologist and as a leader of a private practice group. His integrity and focus on patient care endeared him to radiologists everywhere."

Dr. Neiman was born in Detroit. He received his bachelor's and medical degrees from Wayne State University in Detroit and completed his radiology residency and a fellowship in angiography at the University of Michigan in Ann Arbor. He began his career in Washington, D.C., as an instructor at the Armed Forces Institute of Pathology and chief of cardiovascular radiology at Walter Reed Army Medical Center. He spent the next 10 years as a professor at Northwestern University in Chicago, where he also served as director of angiography and sectional imaging. He also was director of angiography at Children's Memorial Hospital in Chicago.

Harvey L. Neiman, M.D., was presented the RSNA Gold Medal by 2013 RSNA President Sarah S. Donaldson, M.D.

Dr. Neiman was a clinical professor of radiology at the University of Pittsburgh from 1985 to 2002 and a professor of radiology at Temple University in Philadelphia from 2000 to 2003; during that time, he also served as chair of the Department of Radiology at the Western Pennsylvania Hospital in Pittsburgh. In 2003, Dr. Neiman became CEO of ACR. In that role, he helped establish the ACR Education Center, Radiology Leadership Institute and Harvey Neiman Health Policy Institute. Dr. Neiman was also involved in the creation and implementation of the *Journal of the American College of Radiology*.

Among numerous accolades bestowed on Dr. Neiman were the ACR Gold Medal in 2013 and the prestigious Béclère Medal, the highest honor awarded by the International Society of Radiology.

An RSNA member since 1977, Dr. Neiman served as a refresher course faculty member and plenary session moderator for numerous RSNA annual meetings.

RSNA/SPR-Sponsored JPR 2014 Draws more than 5,000 in Brazil

In a first-of-its-kind meeting in Latin America, RSNA partnered with the Radiological and Diagnostic Imaging Society of São Paulo (SPR), to sponsor the 44th Jornada Paulista de Radiologia (JPR) meeting held in May in São Paulo, Brazil.

The meeting—which drew more than 5,000 attendees—rapidly accelerated the engagement between RSNA and Brazilian radiologists.

Karla V. de Souza Seabra, M.D., (*second from left*) a radiologist from Brazil, was one of two RSNA iPad winners during JPR 2014. Pictured with Dr. Seabra, from left, Kolleen Klein, RSNA Director of Membership, James P. Borgstede, M.D., RSNA Board Liaison for International Affairs, and Mark Watson, RSNA Executive Director.

"This partnership exemplifies our desire to bring together the diverse skills and ideas from not only North and South America, but from around the world," said Richard L. Baron, M.D., 2014 RSNA Board of Directors Chairman and JPR Program Coordinator.

Dr. Baron and SPR Scientific Director Renato A. Mendonça, M.D., organized sessions on topics including informatics and professionalism. More than 30 RSNA speakers, including five members of the 2014 RSNA Board of Directors, lectured at dozens of sessions during the meeting.

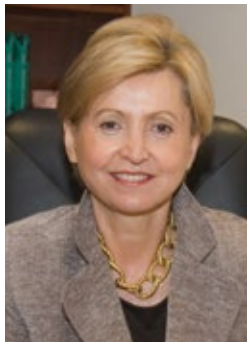
RSNA also sponsored a booth in the exhibit hall, offering an 18-month membership to new members (JPR attendees only). RSNA added more than 170 new members during JPR 2014.

JPR 2014 marks the first of three meetings (to be continued in 2016 and 2018) as part of RSNA's partnership with SPR to develop the meeting's education program.

"The RSNA and the SPR are devoted to the dissemination of the knowledge of radiology. I have the best expectations for this joint venture," Dr. Mendonca said.

AAPM SYMPOSIUM LECTURERS ANNOUNCED

Gillies



Hricak

The RSNA Board of Directors has named the lecturers who will present during the American Association of Physicists in Medicine (AAPM) Symposium at RSNA 2014. They are:

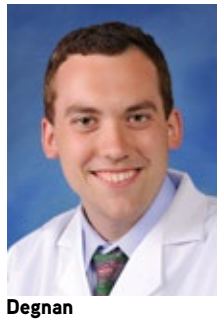
AAPM SYMPOSIUM LECTURERS

Robert Gillies, Ph.D.
Tampa, Fla.

Hedvig Hricak, M.D., Ph.D., Dr. h.c.
New York

RSNA Editorial Fellows Announced

McInnes



Degnan

Matthew D.F. McInnes, M.D., an associate professor at the University of Ottawa and radiologist and diagnostic radiology residency program director at Ottawa Hospital, has been named the 2014 RSNA Eyler Editorial Fellow. **Andrew Degnan, M.D.**, a first-year radiology resident at the University of Pittsburgh Medical Center, is the 2014 Olmsted Trainee Editorial Fellow.

Dr. McInnes' work focuses on clinical genitourinary imaging and systemic review and meta-analysis research. In 2013, he received an Editor's Recognition Award with Special Distinction from *Radiology,* for which he has reviewed 22 manuscripts since April 2012. He has also served as deputy editor for evidence-based practice for the *Journal of Magnetic Resonance Imaging*.

Dr. McInnes hopes the Eyler fellowship will allow him to mentor others at his facility. "Our department is large (more than 60 radiologists) with a strong clinical service, but is relatively inexperienced in research compared with major centers in the U.S.," Dr. McInnes said. "There are few mentors in our department who can help guide junior faculty through the process of research and publication. I hope that this fellowship will help me build the skill set required to fill this important role."

Dr. Degnan's areas of expertise are in neuroradiology and musculoskeletal radiology. He has served as journal reviewer for *Neuroradiology*, *BMC Medical Imaging* and the *Canadian Medical Association Journal*, in addition to publishing in multiple major publications. Following his undergraduate work at George Washington University, Dr. Degnan attended graduate school at the University of Cambridge, England, where he conducted research within the National Health Service. He has also collaborated on an international study with researchers in Shanghai, China.

Although Dr. Degnan believes publishing in scientific journals is key to disseminating new information, that alone is not enough, he said. "The greater challenge is to place findings into a context and ground these facts into a greater purpose directed toward enhancing scientific thought and improving the human condition," he said. "In radiology, we are fortunate to have journals that aim toward such noble aspirations."

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 Eyler fellowship lasts one month and the trainee fellowship lasts one week. Each fellow will also visit the RSNA Publications and Communications Departments at RSNA Headquarters in Oak Brook, Ill. Dr. McInnes will also work with the RSNA editorial team at RSNA 2014.

IN MEMORIAM

Alfred L. Weber, M.D.

Alfred L. Weber, M.D., an icon in head and neck radiology, passed away March 19, 2014. He was 87.

Dr. Weber was a pioneer in CT and MR imaging of the eye, ear, nose and throat. He served as chief of radiology emeritus at Massachusetts Eye and Ear Infirmary in Boston, as a professor emeritus of radiology at Harvard Medical School and a clinical professor of radiology at the University of Missouri Medical School.

After leaving Germany in the 1950s to complete his radiology residency at Massachusetts General Hospital, Dr. Weber later founded the Pediatric Radiology Department at Massachusetts General and was appointed chief of radiology at Massachusetts Eye and Ear Infirmary. He authored many books and collaborated on numerous case studies, abstracts and scientific exhibits pertaining to head and neck radiology and neuroradiology.

Dr. Weber served as a visiting professor and invited speaker at many universities, hospitals and professional radiological organizations around the world, including those in Germany, Saudi Arabia, South Africa, India and China. He was a past-president of the American Society of Head and Neck Radiology and served as co-organizer of the combined European/American Society of Head and Neck Radiology meeting held in Zurich in 1986. He was an honorary member of the Brazilian College of Radiology.

My Turn

Social Media: Not Just for Your Children

Tirath Y. Patel, M.D., is a radiology resident at the University of Toledo Medical Center and a member of the *RSNA News* Editorial Board. Find him on Twitter at *@TirathPatelMD*

Read the story, "**Physicians Connect, Problem Solve Through Social Media**," on Page 13.

To many, the phrase 'social media' conjures up visions of teenagers posting about their favorite pop star or athlete. Arguably, that's what social media represented 10 years ago. At that time, when I joined Facebook, it seemed nothing more than a website to connect with classmates. And while there are still plenty of students using it to message one another with the latest buzz, social media have matured a lot since then.

Today, I am not only a user of Facebook, but also Twitter and LinkedIn. Radiologists and entire organizations are using it to cultivate and solidify professional relationships, keep abreast of and discuss the latest advances in their field, interact with patients and promote their brand.

Any discussion of social media invariably turns into a conversation about privacy. These concerns make many apprehensive, including myself, from time to time. In real life, we have a tendency to separate our professional and personal lives, and the same partition should follow online while navigating social media. Akin to conversations in a hospital elevator, posting or discussing patient information is prohibited. By following these overarching rules, my uneasiness about crossing privacy boundaries was assuaged.

For a radiology resident, and from the educational standpoint in general, social media can afford a unique opportunity to develop a controlled online presence and to discuss recent publications with other residents and faculty physicians from around the world, and continue conversations which began at conferences. Forging professional relationships is crucial as I complete my training and start a career, and social media are playing a strong role.

Many radiology departments and organizations use social media as part of their marketing efforts. Others see it as an opportunity to inform and engage with patients. To me, all are good things and should be encouraged, as they increase the visibility of our specialty.

Social media can be a beneficial and professionally enriching experience for anyone, regardless of age, career stage, or type of radiology practice.

Editor's Note

Talk To Us!

Did you know that RSNA now invites readers to leave comments at the end of *RSNA News* articles posted online? Our stories tell you what we know and think about the latest in radiology and RSNA programs and services; we want to know what you think, too.

Visit *RSNA News* stories online to make observations, ask questions, answer other readers' questions and/or simply let us know what you think of the topics we're selecting for *RSNA News*. We value your opinion.

THIS MONTH IN THE *RSNA NEWS* ONLINE VERSION

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

Go to *RSNA.org/News* to view video interviews with James T. Dobbins III, Ph.D., and H. Page McAdams, M.D., discussing their research on digital tomosynthesis as a tool in detecting potentially dangerous lung nodules. And as you gear up for RSNA 2014, be sure to check out the video, "RSNA: A Century of Transforming Medicine," by 2014 RSNA President N. Reed Dunnick, M.D.

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Y-90 Shows Promise in Treating Metastatic Breast Cancer

BY MIKE BASSETT

New research on the minimally invasive, image-guided therapy Yttrium-90 (Y-90) radioembolization shows promise in treating breast cancer that has spread to the liver when no other treatment options remain.

In 2014, approximately 232,570 new cases of invasive breast cancer will be diagnosed, according to American Cancer Society estimates. Half of the patients who develop metastatic disease will see the cancer spread into their liver. To make matters worse, these patients may not respond to some chemotherapies or may be unable to withstand the often debilitating side effects of the therapies.

"Although this is not a cure, Y-90 radioembolization can shrink liver tumors, relieve painful symptoms, improve the quality of life and potentially extend survival," said lead researcher Robert Lewandowski, M.D., an associate professor of radiology at Northwestern University Feinberg School of Medicine in Chicago.

In research presented at the 2014 Society of Interventional Radiology Annual Meeting, Dr. Lewandowski and colleagues treated 75 women (ages 26-82) with breast cancer liver metastases, all of whom had progressive disease. In addition, 85 percent of these women had multiple liver tumors and 77 percent had disease outside the liver.

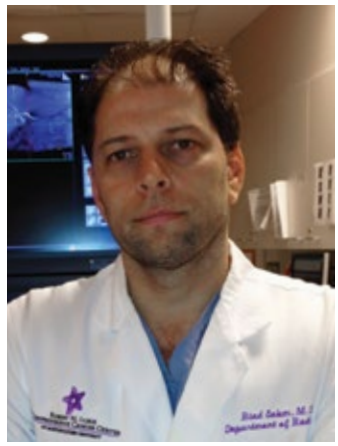
"These were patients with very advanced diseases and there were a variety of reasons why we were able to treat them," Dr. Lewandowski said. "Some were on chemotherapy and everything was stable except for the disease in the liver, while some had disease outside the liver that was limited compared to the disease burden in the liver. These are people whose disease was confined to the liver or the dominance of the disease was confined to the liver, so the idea was that radioembolization could help improve their outcomes."

Researchers determined that the tumors got smaller or remained stable in 98.5 percent of the patients after radioembolization, while tumor reduction of more than 30 percent occurred in 24 patients. Additionally, these women experienced no major side effects.

Y-90 Delivers Powerful Targeted Treatment

In Y-90 radioembolization, an interventional radiologist guides a catheter into the hepatic artery that supplies blood to the liver. Microbeads containing radioactive Y-90 are then injected and float downstream to deliver cancer-killing radiation inside the heart of the tumor.

Lewandowski

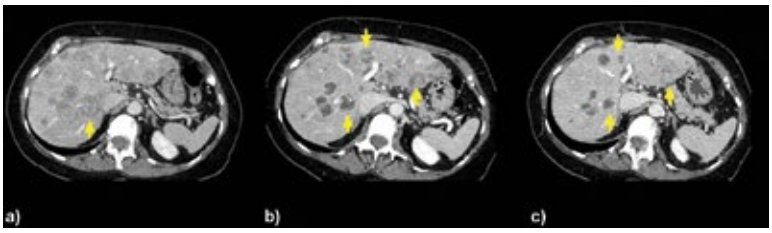


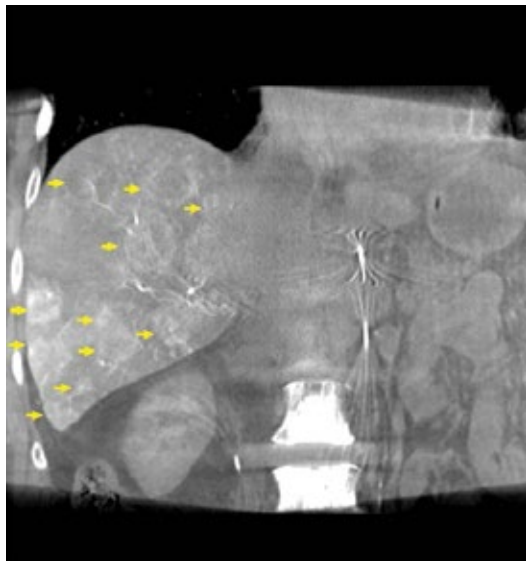
Salem

With systemic treatments like chemotherapy, "you inject something into a vein and hope it gets into the right area. Sometimes it does, but if not, whole-body side effects like hair loss or diarrhea can occur," said study author Riad Salem, M.D., a professor of radiology, medicine-hematology/oncology and surgery-organ transplantation at Northwestern. "With radioembolization, we are delivering a very potent dose of radiation only to the liver, thereby achieving better anti-tumoral treatment with fewer side effects."

> *"Although this is not a cure, Y-90 radioembolization can shrink liver tumors, relieve painful symptoms, improve the quality of life and potentially extend survival."*
>
> ROBERT LEWANDOWSKI, M.D.

In the past, Dr. Lewandowski explained, Y-90 radioembolization has been used to successfully treat primary liver cancer and metastatic colon cancer. "Because of the success of radioembolization in these settings, we are starting to see interventional radiologists being asked more and more to treat patients who have other cancers that have spread to the liver," Dr. Lewandowski said. "The liver is a very prevalent area of metastatic disease, and breast cancer is an important source."





Above: **Images of a 76-year-old woman with (*a*) multiple liver lesions in both lobes treated with selective right hepatic arterial catheterization and infusion of Y-90 followed by treatment of the left lobe 35 days later. Treatment delivered localized radiation at 131Gy and 122Gy to the right- and left-lobe tumors targeted with Y-90, respectively; (*b*) CT demonstrates treatment changes at 1 month and (*c*) 2 months imaging post-right lobe treatment; and (*c*) 1 month post-left lobe treatment confirming globally decreased hepatic disease burden. This patient had stable bone metastases without extrahepatic disease progression for 111 days after the first Y-90 treatment. *Right:* In the same patient, conebeam CT (*coronal view*) demonstrates selective visceral catheterization and angiography of hypervascular multifocal tumors perfused by the right hepatic artery. Large as well as small nodules recruited arterial perfusion and conebeam CT confirmed both catheter placement and preferential tumor perfusion over the normal hepatic tissues.**

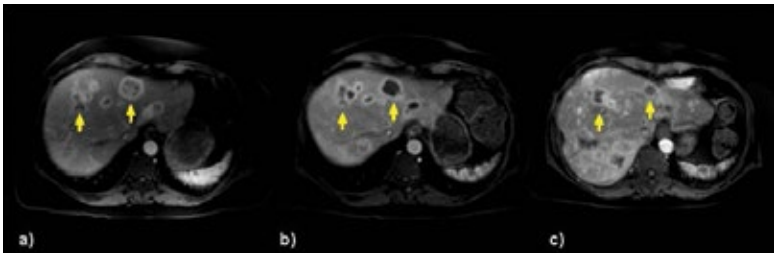
At Northwestern, patients come in for care very late in the disease, often when they have no other treatment options. While metastatic disease in colon cancer patients is often confined to the liver, breast cancer patients present a "unique challenge," Dr. Lewandowski said, because the disease spreads so readily to other parts of the body.

"You have to make sure it makes sense to use this therapy," Dr. Lewandowski stressed. "It's only going to have an effect on the disease we target, so if people have disease everywhere in the body as well as the liver, it may not make sense to treat them with a liver-directed therapy."

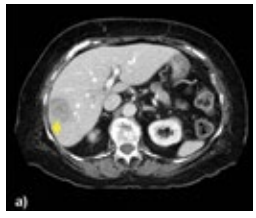
The next step will be to evaluate whether outcomes in this patient population will improve by combining treatments like chemotherapy and radioembolization, Dr. Salem said. "The idea is that we can provide combined—not sequential—treatment," he said. And provide that combined treatment earlier, Dr. Salem added.

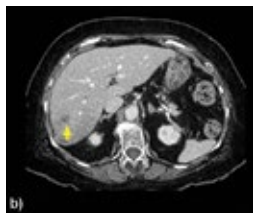
"In general, we manage the disease with chemotherapy first and then consider other options," Dr. Salem said. "We would like to see this very potent therapy moved ahead in the armamentarium of treatments so that instead of waiting until a lesion is too large or too disseminated, we're using a treatment that can result in better local disease control earlier in the process." □

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



An image of a 55-year-old woman with (*a*) multiple tumors on MR imaging treated with selective right hepatic arterial catheterization and infusion of Y-90 followed by treatment of the left lobe 46 days later. Sequential bilobar treatment delivered 118Gy and 146Gy to the right- and left-lobe tumors targeted with Y-90, respectively. MR imaging demonstrated posttreatment changes at (*b*) 4 months and (*c*) 7 months imaging post right-lobe treatment and at (*b*) 3 months and (*c*) 6 months post left-lobe treatment confirming globally decreased multifocal bilobar disease burden.





(a) **Images of an 82-year-old woman with a solitary tumor in the right lobe measuring 4.5cm x 3.3 cm. (*b*) CT 5 months later demonstrated a reduction in bidimensional size to 1.3 cm x 1.3 cm after two right-lobar treatments at 93Gy subsequently followed by 119Gy. This patient had isolated liver metastases and remained free of extrahepatic disease 666 days after the first Y-90 treatment.**

RSNA 2014 Features Interventional Oncology

The Interventional Series: "Complications in Interventional Oncology—Avoidance, Recognition and Management", will be offered at RSNA 2014. Registration for this and all RSNA 2014 courses is underway at *RSNA.org/Register*.

Radiology Part of Consolidation Trend

BY ELIZABETH GARDNER

The rapidly shifting landscape in U.S. healthcare delivery and payment is pushing more radiology practices to make necessary changes in order to survive. Many are being acquired outright by hospitals and integrated health systems, while others are banding together to compete not just locally, but nationally.

While there are some differences, the trend toward radiology consolidation mirrors the airline industry's experience in its first century, said James V. Rawson, M.D., chairman of radiology at the Medical College of Georgia, Augusta, pointing out that X-rays were discovered less than 10 years before the Wright Brothers' first airplane flight at Kitty Hawk, N.C. Although the progression from primitive one-person planes to transatlantic jetliners was initially chaotic, the process evolved into scheduled routes, elaborate infrastructure, government regulation and a few dominant companies.

"Nearly all of the early innovators are companies that don't exist anymore," said Dr. Rawson, a member of RSNA's Physician Consortium for Performance Improvement, the RSNA Quality Improvement Committee and a recipient of the Academy of Radiology and Leadership Management (ARLM) Certificate of Achievement (see sidebar). "Most of them consolidated into larger airlines."

Radiology has been slower to consolidate—the 20 largest practices currently only employ about six percent of the nation's 25,000 radiologists—but Dr. Rawson advises those in private practice to brace themselves for mergers, acquisitions, alliances and employment by integrated health systems, as the nation slowly moves to medical reimbursement based on results rather than volume of services rendered. A different set of incentives will demand a new approach to providing all types of care, he stressed.

"Consolidation is not limited to radiologists or physicians in general," he said. "Hospitals, group purchasing organizations and other stakeholders are all consolidating."

The need for consistent care protocols and widespread access to imaging will motivate integrated health systems to acquire radiology practices, said Howard Chrisman, M.D., professor of radiology and surgery at Northwestern University's Feinberg School of Medicine in Chicago. Northwestern Medicine, with a flagship facility in downtown Chicago, recently acquired Lake Forest Hospital, about 40 miles to the north, along with its affiliated radiology practice, previously an independent corporation. Integrating that practice with the downtown facility was a challenge but ultimately essential in today's environment, he said. The Lake Forest radiologists may not be required to teach or conduct research like those on the Northwestern faculty, but they must care for patients in the same way.

Rawson

Van Moore

> *"We're of the opinion that radiology is best understood by radiologists."*
>
> ARL VAN MOORE, M.D.

"From a system perspective, alignment is necessary to create a continuum of care, and on the diagnostic imaging side, you don't want disparate quality and protocols," Dr. Chrisman said. "Cost is increasingly important and needs to be standardized. The best way to do that is to have a single group of diagnostic radiologists."

Integration can be laborious on a number of fronts, according to Blair Faber, administrator at the Northwestern Medical Faculty Foundation, who is charged with making all the pieces fit together after an acquisition. For example, cash flow to the healthcare system dries up for the first couple of months because the practice typically keeps receivables that have accumulated before the acquisition date. Therefore, the healthcare system that integrated them must float the salaries and other practice expenses until it has paid for services rendered after the acquisition.

"You're flipping the billing system and contracts over to the new organization, trying to keep referring physicians from getting nervous and upsetting the established referral pattern, and hoping the radiologists won't quit," Faber said.

Radiology Groups Join Forces, Aggregate Resources

Radiology groups that remain independent of hospitals have another option: joining forces with one another, abetted by teleradiology technology that allows 24/7 access to images from any location. For example, the "supergroup" Strategic Radiology, LLC, is approaching the trend toward healthcare system acquisition by providing an increased level of integrated subspecialty services to its traditional clients. An alliance of 17 radiology practices across 15 states, the company employs about more than 1,200 radiologists.

"We believe that by aggregating our subspecialties in our collective practices and by setting up virtual subspecialty coverage across the country, our value will exceed that of what hospitals can achieve from a single radiology practice," said Arl Van Moore, M.D., current chairman and CEO of Strategic Radiology and past-board chair and past-president of the American College of Radiology (ACR).

Dr. Moore's practice joined Strategic Radiology five years ago to improve its quality and breadth of services and reduce operating costs including malpractice insurance, employee health insurance and purchases of supplies and equipment. Strategic Radiology maintains its own patient safety organization (PSO)—the only radiology-specific PSO in the country—and pools its quality data to develop and improve best practices.

Both models—large independent practices and healthcare system ownership—should be able to exist, Dr. Moore said. "If hospitals want to employ radiologists, that is their decision," he said. "But we're of the opinion that that practice of radiology is best understood by radiologists, and we're in a good position to develop an increased level of value and maintain high quality by aggregating resources."

Practices should examine how they can best fit into the new paradigm, Dr. Rawson advised. "Look at where you have core strengths and then look for gaps and how to fill them," he said. "Maybe the emphasis on consolidation is misplaced. I think sometimes it's easier to focus on ownership than on the more complicated question of how to improve outcomes and create value." □

ELIZABETH GARDNER is a Chicago-based freelance writer specializing in medical technology and health IT.

Radiology Practice-related Sessions Featured at RSNA 2014

- "**Develop Your Radiology Financial Insight: Fundamental Principles You Should Know About Business**"
  Sunday, November 30
- "**Changing the Culture of Radiology: How to Thrive in Turbulent Times**"
  Sunday, November 30
- "**Change Management in Radiology**"
  Monday, December 1
- "**The Affordable Care Act: What Does it Mean for Radiology and Radiologists?**"
  Wednesday, December 3
- "**What Is Driving Health Care Reform and How It Is Changing Your Radiology Practice?**"
  Wednesday, December 3
- "**Changing Radiologist-Hospital Relationships**"
  Thursday, December 4

Register for these and all other refresher courses at *RSNA.org/Register*.

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For more information and to access the course catalog, go to *Radleaders.org.*

Database of Pediatric MR Images Aids Diagnosis, Treatment

BY FELICIA DECHTER

By building a "cloud database" of MR images collected from children with normal and abnormal brains, researchers aim to give physicians access to a Google-like search system that will improve the way pediatric brain disorders are diagnosed and treated.

The project is being developed by a team of engineers and radiologists at Johns Hopkins University School of Medicine, Baltimore, and is supported by a three-year, $600,000 grant from the National Institutes of Health, which is investing in Big Data to Knowledge (BD2K), an initiative to enable biomedical scientists to capitalize more fully on the Big Data being generated by those research communities.

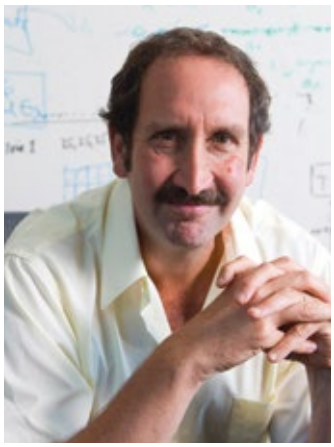
"The project will allow doctors to search imaging records and find other annotated images in the database which 'appear the same' based on their anatomical phenotype," said lead investigator Michael Miller, Ph.D., director of the Center for Imaging Science and a Hershel Seder Professor of Biomedical Engineering and Gilman Scholar at The Johns Hopkins University. "This will allow them to compare their patient's case to those that have already been logged and tagged as to etiology, disease and other clinical electronic medical records."

Doctors will be also able to view and share brain MR images of children with diagnosed illnesses. By combining a structure-by-structure analysis of each child's brain with an ontology of associated known pathology, the computer algorithm can "learn" what features are most closely related to different pathological conditions. As the computer gains more and more experience with expanding patients and studies, it will become better at recognizing subtle abnormalities.

The new data bank not only facilitates recognition and correct classification of pediatric brain disorders, but also the more objective image analysis allows identification of injury and disease that may go undetected by "eyeballing" MR images, said Thierry Huisman, M.D., director of pediatric radiology at Johns Hopkins.

"Furthermore, recognition of distinct patterns of injury and the subsequent grouping of these children based upon their characteristic patterns of MRI findings allow recognition and identification of new diseases as well as reclassification of previously unclassified diseases," Dr. Huisman said.

The pediatric data bank will search structural and functional imaging phenotype records to understand other cases that are similar and allow electronic medical record (EMR) annotation for training and correlation with rare and difficult cases, Dr. Miller said. With its machine learning capabilities, the data bank will also help with teaching and clustering to disease categories.



Miller

Lewin

Currently, all radiology images are electronically archived in PACS, said Susumu Mori, Ph.D., professor and director of the Center for Brain Imaging Science in the Department of Radiology at John Hopkins. However, the description of the anatomy and the physician's judgment process are largely unrecorded, save for a few sentences in the EMRs, Dr. Mori said.

"That expertise is shared through hands-on training, while a wealth of medical information remains in PACS and is not shared or reused, Dr. Mori said.

> *"We hope the image search will be a useful resource to support daily clinical routines."*
>
> SUSUMU MORI, PH.D.

"For us, the images in PACS are somewhat akin to the blood samples in freezers," Dr. Mori continued. "Theoretically, we can go back to the freezer and reanalyze the blood samples. Of course, we don't do that because once the blood sample is analyzed and recorded into a chart, we can use the chart to share, search, analyze and build knowledge."

By introducing a similar indexing technique, an image-based search will be possible. For example, certain image archives will allow text-based searches such as "retrieve all past cases with Batten disease."

Johns Hopkins researchers are building a detailed digital library of MR imaging scans collected from children with normal and abnormal brains, providing physicians with a Google-like search system that will enhance diagnosis and treatment of young patients with brain disorders.

"We hope the image search will be a useful resource to support daily clinical routines," Dr. Mori said.

There is a potentially broader impact as well, from using the resources as discovery tools. For example, in dementia cases, brain atrophy is often apparent in many patients. However, patterns of atrophy are very complex and their correlations with diagnosis and prognosis are often vague, Dr. Mori said.

"Even though humans have outstanding capability for feature extraction, a person is not as good as a computer at identifying pattern correlations on such a large-scale dataset," Dr. Mori said. "Once all images in PACS are converted to indices, they become available for various relational analyses. This could deepen our understanding about the pathology and anatomical manifestations."

The Power and Promise of Big Data Analytics

The project has been challenging in every area including the indexing accuracy, brain atlas inventory, cloud platform, database architecture and HIPAA compliance, Dr. Mori said. And ongoing challenges remain.

"These challenges are, however, precious experiences to help us deploy this technology in the clinical workflow," Dr. Mori said. "The cloud platform is most useful if it is accepted in many other hospitals and enhances the information sharing and utilization. Sparsely indexed information, not dense, raw images, is the key for communicating imaging information.

"In addition, the platform will facilitate contributions from developers," Dr. Mori continued. "Just like a travel website can provide services based on flight information from many air carriers, useful tools may emerge once the indexed data become widely available from many sources."

What makes this project so important is that it is one of the first true manifestations of the power of "big data analytics," said Jonathan Lewin, M.D., senior vice-president of Integrated Healthcare Delivery and the Martin Donner Professor and Chairman of the Department of Radiology and Radiological Science at Johns Hopkins.

"The ability to analyze thousands of examinations across multiple clinical conditions, combined with the advanced analysis tools developed by Drs. Mori and Miller, can serve as an 'intelligent assistant' for the radiologist, suggesting possible pathological conditions based on anatomic distortions and lesion characteristics in a manner resembling 'CAD on steroids,'" said Dr. Lewin, who is also a professor of biomedical engineering, neurosurgery and oncology at Johns Hopkins. "Rather than the current level of CAD, in which the types of lesions being detected come from a very limited set of morphologies and densities, this new imaging intelligence and analytics approach can greatly broaden the power of the computer to assess expanding data sets of a growing range of pathologies."

Beyond Johns Hopkins, the project could expand to aid other hospitals in pooling neuro data in common databases and searching and retrieving information, Dr. Miller said. The challenge would lie in data governance—in getting the partnering institutions to agree to participate and share their data in compliance with HIPAA regulations and with appropriate security, Dr. Lewin said.

WEB EXTRAS

View of video of Michael Miller, Ph.D., discussing the cloud computing project at Johns Hopkins at *RSNA.org/News*.

Technically, expansion would be relatively simple, Dr. Lewin said.

"The beauty of creating a cloud-based architecture is that it is 'scale-free,' meaning the basic database can be expanded to include other patients, other institutions or even other countries without requiring any change in the basic design," Dr. Lewin said. "Since the software learns a little bit from every brain scan it encounters, the more institutions that are added, the 'smarter' it gets, assuming that the information about underlying pathology is accurate.

"This way, other institutions can join the 'cloud' without having to reinvent anything or duplicate all of the effort and investment that went into its creation." □

FELICIA DECHTER is a Chicago-based freelance writer specializing in medical technology and health IT.

Digital Tomosynthesis May Aid in Lung Cancer Screening

BY RICHARD S. DARGAN

New research shows that digital tomosynthesis (DT) significantly outperforms chest radiography in the detection of potentially malignant lung nodules, while also improving decisions about patient management. And with a lower radiation dose than CT, a possible role for this technology in lung cancer screening is emerging, researchers said.

In the case of chest imaging, DT typically produces 40-60 section images of the patient from front to back using a limited movement of the X-ray tube behind the patient. While DT images are less detailed in the depth direction than those of CT, the technique has a substantially lower radiation dose and can locate smaller lung nodules than are detectable on conventional chest X-rays (CXR).

In the new study, James T. Dobbins III, Ph.D., professor of radiology at Duke University in Durham, N.C., and colleagues compared DT with chest CT, two-view CXR and dual-energy (DE) radiography. Presented at RSNA 2013, the study included 158 subjects at three institutions in the U.S. and one in Sweden.

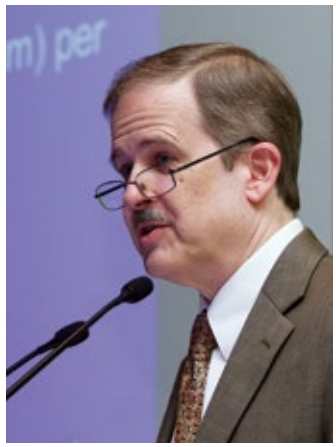
Radiologists assessed results from the various imaging approaches and determined the appropriate course of action for case management using Fleischner Society guidelines for small lung nodules. The radiologist group included three experienced thoracic radiologists to determine ground truth and five radiologists from different subspecialties as readers.

"Previous studies have relied on thoracic radiologists as readers," Dr. Dobbins noted. "This study is more indicative of the results you would get in a general radiology practice."

Overall detection sensitivity for all pulmonary nodules was 13.5 percent for DT, compared with 3.8 percent for CXR. These sensitivity values are lower than in previous studies using thoracic radiologists as readers, but show a similar three-fold improvement using DT over CXR. DT also outperformed CXR for determining the best course of action using Fleischner Society criteria.

"This study and others show that tomosynthesis triples the detection sensitivity compared to conventional radiography," Dr. Dobbins said. "We've also shown that tomosynthesis correctly guides management of patients more often than with conventional X-ray imaging."

These findings put tomosynthesis in the spotlight as a potentially lower-dose, lower-cost option for lung cancer screening, researchers said. Lung cancer screening continues to be hotly debated, as indicated by the mixed signals coming from government advisory groups (*See sidebar*). Proponents of screening point to the National Lung Screening Trial (NLST), a large, randomized study of over 50,000 subjects published in 2011 in which participants who received low-dose helical CT scans had a 20 percent lower risk of dying from lung cancer than participants who received standard CXR.



Dobbins

Kazerooni

Opponents worry about CT's relatively high radiation dose and false-positive rate, two main concerns that tomosynthesis may address. "It could be that the sensitivity and specificity of tomosynthesis puts it in the sweet spot for lung cancer screening," Dr. Kazerooni said. "However, a lot of research would be necessary to determine if this makes sense for clinical practice."

Potential Roles for Tomosynthesis

With strong evidence of the advantage of DT over CXR, key questions moving forward involve clinical implementation of the technology, researchers said.

"For instance, tomosynthesis also might be a useful intermediate test for detecting cancers that have a tendency to spread to the lungs, for example, for patients with cancers like melanoma or sarcoma," said study co-author Ella Kazerooni, M.D., a professor of radiology at the University of Michigan Health System in Ann Arbor. "Since tomosynthesis has a higher sensitivity than traditional chest radiographic images for detecting small lung nodules, it may have a viable role as a first screening technique in these individuals who are at high risk for developing lung nodules."

DT also has a potential role as an alternative to CT for tracking changes in nodules over time, an important factor in treatment decisions. "Nodules that are growing are the ones that really need our

attention," Dr. Kazerooni said. Another potential application for DT is as a problem-solving tool for suspicious findings on CXR, which is perhaps better suited to some healthcare environments than others. "For instance, tomosynthesis fits more easily as a problem-solving tool in European practices because they keep patients in the clinic until they've read their images," Dr. Dobbins said. "In the U.S., where the exams are read later, it would be more difficult to call patients back in and use tomosynthesis for this purpose."

Dr. Kazerooni recently led a a group that developed a Lung Imaging Reporting and Data System (Lung-RADS), analogous to the widely used Breast Imaging and Reporting System (BI-RADS). As a quality assurance tool designed to help standardize lung cancer screening, Lung-RADS includes recommendations based on nodule size and appearance and is expected to reduce the false positive rate from one in 4 patients seen in NLST to approximately one in 10 patients.

WEB EXTRAS
Access LungRADS at *www.acr.org/Quality-Safety/Resources/LungRADS.*

As far as the imaging component of screening is concerned, a low-cost, low-dose procedure such as DT may play an important role as part of an overall movement toward identifying nodules most likely to be malignant. "But further research is needed before we can say this definitively," Dr. Dobbins said. □

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

Lung cancer screening continues to be hotly debated among government agencies. While a government advisory panel recently voted against recommending Medicare coverage for low-dose CT (LDCT) screening in patients at high risk for lung cancer, in June the American Medical Association House of Delegates voted to recommend that coverage of screening LDCT for patients at high risk for lung cancer by Medicare, Medicaid and private insurance be a required covered benefit.

Lung Cancer Screening Focus of RSNA 2014 Session

- The refresher course, "**From Research to Reimbursement: Lung Cancer Screening and Healthcare Payment Policy (In Conjunction with the American College of Radiology),**" will be held Thursday, December 4. Registration for these and all RSNA 2014 courses is underway at *RSNA.org/Register.*

PANEL OPPOSES MEDICARE COVERAGE FOR CT LUNG CANCER SCREENING

A government advisory panel recently voted against recommending Medicare coverage for low-dose CT (LDCT) screening in patients at high risk for lung cancer.

In making its decision, the 2014 Medicare Evidence Development and Coverage Advisory Committee (MedCAC), made up mostly of clinicians, cited high false-positive rates and the possibility of screening gradually being extended to a wider range of people, among other issues.

Ella Kazerooni, M.D., chair of the American College of Radiology (ACR) Committee on Lung Cancer Screening, expressed disappointment with the decision. Dr. Kazerooni, who spoke on behalf of ACR at the April session in Washington, noted that the U.S. Preventive Services Task Force (USPSTF) has already supported screening of asymptomatic adults aged 55 to 80 years with a history of smoking. The December 2013 USPSTF decision came out of a more deliberative process than that of the MedCAC hearings, Dr. Kazerooni said.

"The USPSTF put a lot of thought into their decision, even going so far as to request a modeling study," she said. "Unfortunately, the MedCAC panel was not as willing to get into the details and didn't give the topics their due time."

In discussing potential benefits of screening, Dr. Kazerooni pointed to the National Lung Cancer Screening Trial, a study of more than 53,000 current or recent cigarette smokers that showed a reduction in lung cancer mortality for those who underwent low-dose CT.

"The MedCAC panel said there was not enough data to support screening," she said. "Given the size of the National Lung Cancer Screening Trial, that's a hard pill to swallow."

The MedCAC panel's decision is not binding. The Centers for Medicare & Medicaid Services (CMS) is expected to issue a proposed decision by November 2014 and a final decision by February 2015.

In June, the American Medical Association (AMA) House of Delegates voted to recommend that coverage of screening LDCT scans for patients at high risk for lung cancer by Medicare, Medicaid and private insurance be a required covered benefit.

ACR, the Lung Cancer Alliance and the Society of Thoracic Surgeons, released a statement supporting the AMA's vote and urging others on Capitol Hill to join them in seeking full Medicare coverage of these lifesaving exams.

"We look forward to continued positive dialogue with CMS and to working with them to develop safety checks and make sure the right people are getting screened," Dr. Kazerooni said.

Under the Affordable Care Act, private insurers are required to cover all medical exams or procedures without a co-pay that receive a grade of "B" or higher from the USPSTF. The USPSTF gave lung cancer screening with low-dose CT a "B."

"Effective January 2015, insurers will be required to cover it, and anyone under 65 can get a lung cancer screening," Dr. Kazerooni said.

Physicians Connect, Problem Solve Through Social Media

BY BETH BURMAHL AND LYNN TEFFT HOFF

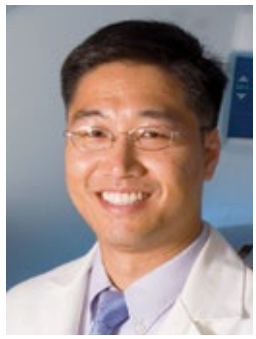
Physicians are increasingly using social media to connect around shared interests and goals and brainstorm solutions to problems.

"Social media allows people to highlight the issues they think are important and find others with whom to discuss them," said RSNA member Matt Hawkins, M.D., a pediatric interventional radiologist at Emory University in Atlanta. Dr. Hawkins interacts on social media almost daily.

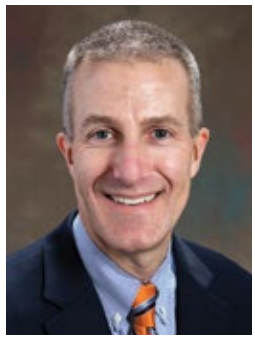
"There is also the opportunity for people who have met through Twitter or Facebook to actually meet in person—a 'tweet-up,' if you will," Dr. Hawkins continued. "These in-person meetings can prove very valuable and are integral to re-establishing our professional community."

Dr. Hawkins is among the fans of RSNA's Facebook page and one of thousands who follow RSNA on Twitter.

Hawkins
@MattHawkinsMD



Choy
@GarryChoy



Duszak
@RichDuszak

Meetings Drive Use of RSNA Social Media

RSNA made its first Facebook post and sent its first tweet on Twitter in 2008. The Society's social media presence has grown considerably since then, with more than 40,000 fans on Facebook and a Twitter following of nearly 15,000.

Much of that momentum was gained during recent RSNA annual meetings, where social media became a place where attendees passed on wisdom they'd gained, continued conversations about hot topics and shared tips for optimizing the meeting experience. Engagement with RSNA social media sites, measured in user likes, shares and comments on content, increased by 155 percent from RSNA 2012 to RSNA 2013, while new Twitter followers increased by 98 percent.

Hundreds of Twitter users participated in conversations at RSNA 2013. Tweets and retweets with the #RSNA13 hashtag covered a diverse range of topics including upcoming sessions, memorable presenter quotes and the day's hot topics. Tweets also included lighter fare such as tips on comfortable footwear (#RSNAShoes) to survive the hard McCormick Place floors. At meeting's end, content that included the #RSNA13 hashtag had received some 25 million impressions—that's a count of each time such content was delivered to a Twitter user's tweet stream—10 million-plus more than the previous year.

Conversations are a "Positive Outcome"

"A positive outcome from a conference is the interesting conversations people can have with one another," said Garry Choy, M.D., M.B.A., a diagnostic radiologist at Massachusetts General Hospital and active social media user who co-founded the radiology social media network RadRounds.

Those Twitter conversations have persisted after the meeting, on topics ranging from RSNA sightings at meetings around the world, applications of the RSNA Radiology Cares initiative and reaction to new articles in *Radiology*, *RadioGraphics* and *RSNA News*. Twitter is also an emerging educational tool, users say.

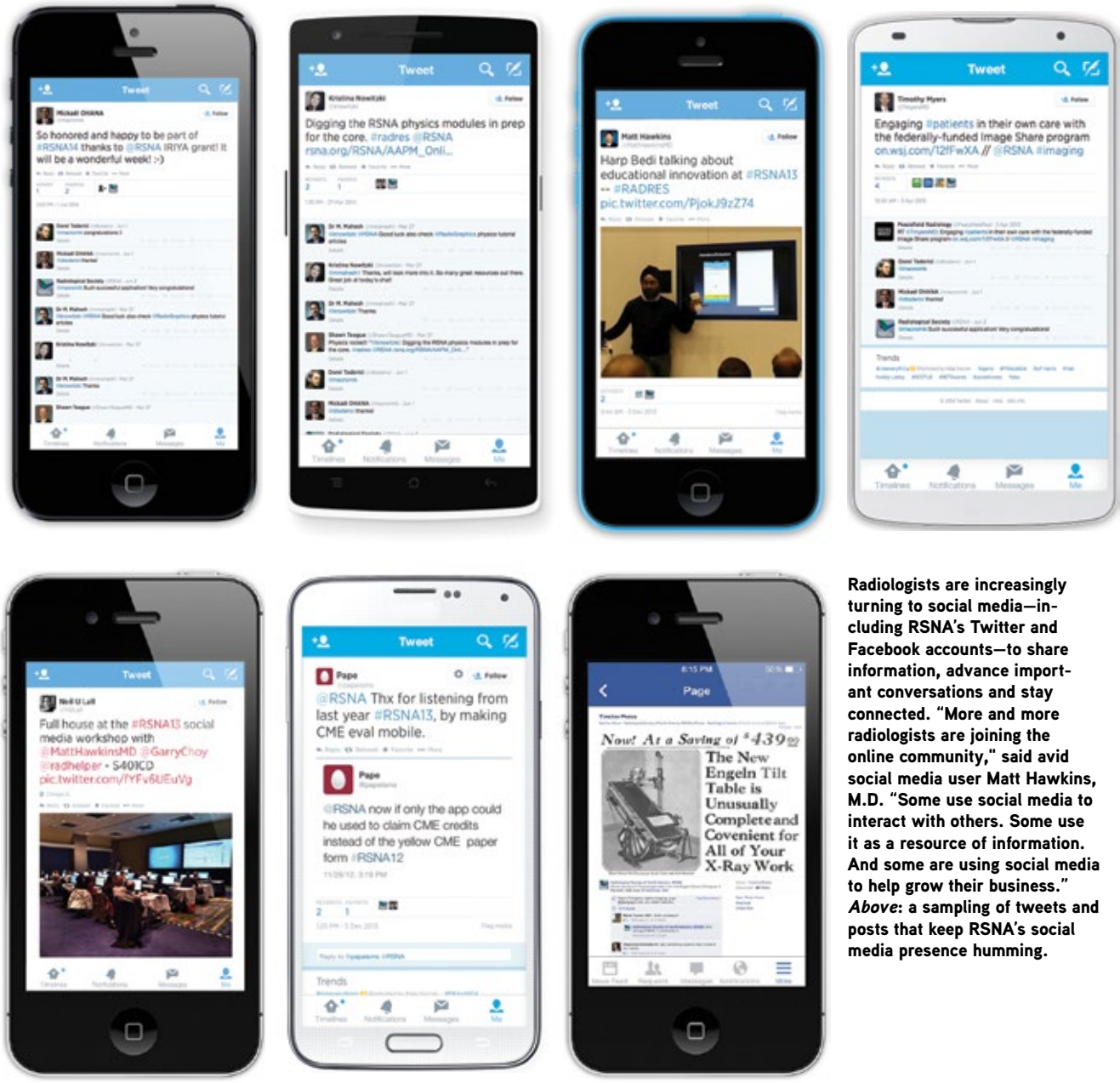
"Over time, social media has turned into a great opportunity to advance important conversations about health reform—and also for users to learn a lot in the process," added avid social media user Richard Duszak Jr., M.D., vice-chair of radiology at Emory University.

If discourse is at the heart of Twitter, images are the cornerstone of Facebook. Appropriately enough as RSNA celebrates its centennial, users are gathering in cyberspace to flip through the Society's photo album, responding enthusiastically to nostalgia-related posts such as a black-and-white image of a World War I radiographer wearing protective headgear; a 1928 *Radiology* ad of a tilt fluoroscopic table garnered particularly significant attention. Fans can also turn to RSNA's Facebook page to find news, scientific articles, alerts about grants and educational opportunities and updates from RSNA and beyond.

Social Media Workshops Offered at RSNA 2014

For those looking to learn or broaden their Facebook and Twitter skills, social media expert Drs. Hawkins and Choy will present "Introduction to Social Media," with a focus on Twitter in two sessions at RSNA 2014: 4:30-6 p.m., December 1 (RCB25) and 8:30 a.m.-10 a.m. December 3 (RCB41). Registration for RSNA 2014 is underway at *RSNA.org/Register.* □

BETH BURMAHL is the Managing Editor of *RSNA News*.
LYNN TEFFT HOFF, M.C.M., is the Executive Editor of *RSNA News*.



Radiologists are increasingly turning to social media—including RSNA's Twitter and Facebook accounts—to share information, advance important conversations and stay connected. "More and more radiologists are joining the online community," said avid social media user Matt Hawkins, M.D. "Some use social media to interact with others. Some use it as a resource of information. And some are using social media to help grow their business." *Above*: a sampling of tweets and posts that keep RSNA's social media presence humming.

YOUR GUIDE TO TWITTER TERMS

Despite its popularity, Twitter can seem daunting to the uninitiated. After creating an account (at *Twitter.com*), users need to get familiar with the terms and symbols before venturing a tweet. Below is a glossary of the basics:

Twitter: An information network made up messages from all over the world.

Tweet: A message posted via Twitter containing 140 characters or fewer, in real time. Tweets can also contain photos and videos.

Hashtag: The # symbol is used to mark keywords or topics in a Tweet. It was created organically by Twitter users.

The @ sign: The symbol is used to call out usernames in Tweets, like this: Hello @Twitter! When a username is preceded by the @ sign, it becomes a link to a Twitter profile.

Retweet (verb): The act of forwarding another user's Tweet to all of your followers.

Retweet (noun): A Tweet by another user, forwarded to you by someone you follow.

Timeline: A real-time list of Tweets on Twitter.

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Steve H. Fung, M.D.
Michael C. Gates, M.D.
Ayca Gazelle, M.D. & G. Scott Gazelle, M.D., M.P.H., Ph.D.
Pedro J. Gonzalez, M.D., Ph.D.
Horacio Grande Miranda, M.D.
Charles K. Grimes, M.D.
Alexander C. Guo, M.D.
Mary R. & Donald P. Harrington, M.D.
Laura A. Howlett, M.D.
Rachel B. Hulen, M.D.
Jessica Kaniowski, M.D.
Salil Karkhanis, M.B.B.S.
Harmeet Kaur, M.B.B.S.
Rosemary J. Klecker, M.D.
Suzanne Freitag & Philip D. Kousoubris, M.D.
Drazen Kovacevic, M.D.
Elizabeth T. Kutella, M.D. & Doug Kutella
Michele F. la Torre, M.D.
Jonathan F. Lasich, M.D.
Kara L. Leonard, M.D., M.S.
Sue Yin Liong, M.B.B.Ch.
Vasantha & Mahadevappa Mahesh, M.S., Ph.D.
Azat Mikhaylov, M.Sc.
Andrew K. Moriarity, M.D.
Kambiz Motamedi, M.D.
Ingrid E. Naugle, M.D.
Obi O. Nobi, M.D.
Shigeyuki Okitsu, M.D., Ph.D.
Olubukola A. Omidiji, M.B.B.S.
Hugo J. Paladini, M.D.
Lawrence P. Panych, Ph.D.
Fanny Maud Pinel-Giroux, M.D.
Robert S. Plowman, B.S., M.Sc.
Andreas Pomschar, M.D.
Ana Carolina P. Quirici, M.D.
Berta Ramos, M.D.
Nor-Eddine Regnard, M.Med.
Enkhbold Sereejav Jr., M.A., M.D.
Bruno C. Silva, M.D.
Mirella O. Silva, M.D.
Linda P. Thomas, M.D.
Yoko Uchikawa, M.D.
Lorraine Vazquez de Corral, M.D.
Bethel Livingstone & Subramani Venugopal, M.B.B.S., M.M.Ed.
Danilo T. Vieira Das Neves, M.D.
Kristen & Mark A. Wendel, M.D.
Jian-De Ye, M.D.
Edson Luiz C. Zaparoli, M.D.
Lori & Steven Zieber, M.D.

YOUR DONATIONS IN ACTION

Curriculum Developed by Education Grant Recipient Adopted by Neuroradiology Fellowship Training Programs

"The education grant I received from the RSNA R&E Foundation in 2008 provided the resources for me to create, test and implement a Cervicocerebral Catheter Angiography curriculum and assessment tool which has now been adopted by over 20 neuroradiology fellowship training programs across North America. Importantly, the RSNA Grant support I received fostered my interest in pursuing substantive, hypothesis-driven research. I now lead a multidisciplinary research program studying traumatic brain injury with R01 funding from the NIH. I thank the Foundation for their support of my early research efforts."

Yvonne Lui, M.D.
Associate Professor of Radiology, Neuroradiology Section Chief
NYU Langone Medical Center

Residents & Fellows Corner

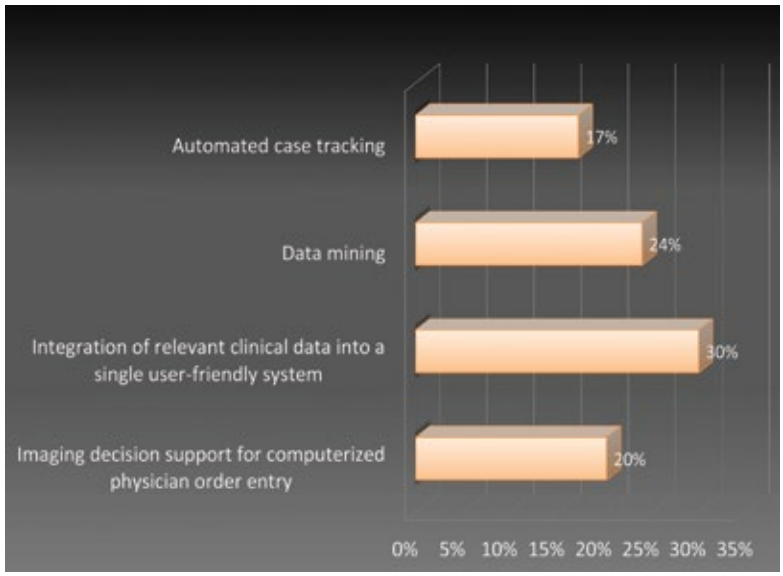
Survey Respondents Weigh In on New ABR Core Exam

Residents have concerns about changes to the format and timing of the American Board of Radiology (ABR) Core Exam, according to a recent survey administered by the American Alliance of Academic Chief Residents in Radiology (A^3CR^2). The survey elicited responses from 212 chief residents representing 136 unique radiology residency programs.

Concerns about the new exam, which debuted in fall 2013, included that it deemphasizes critical thinking, differential diagnoses and communication skills by substituting multiple choice questions for oral examinations. Respondents also questioned the decision to administer the exam in the third year of residency, with the certifying exam to follow 15 months later. "Residents are no longer board certified coming out of training," a respondent observed. "We need to study for three months at the beginning of a job. Will practices adjust?"

Some respondents praised the new exam as more objective than its predecessor and noted that the timing gets fourth-year residents back into service rather than perpetually studying.

RESIDENT USE OF INFORMATICS TOOLS



For the first time, use of radiology informatics was assessed in this year's American Alliance of Academic Chief Residents in Radiology survey.

Other key findings from the survey included:

- **Salary and Benefits:** Resident salaries have mirrored inflation, increasing 37 percent since 2002. Fewer respondents, however, reported receiving various benefits including book funds, lead aprons and registration fees and time off for conferences. More respondents reported receiving tuition and a travel stipend for ABR core exam review courses, tablets and other electronics. In particular, the RADPrimer reference has become increasingly offered to respondents, increasing from 16 percent in 2011 to 77 percent in 2014.
- **Call and Weekends, Attending Coverage, Readout:** The number of radiology resident programs providing full-day Saturday and Sunday coverage has increased about 20 percent over the last three years. Twenty-four hours attending radiologist coverage of the emergency department has increased from 15 percent to 24 percent since 2010. Face-to-face post-call resident readout of cases has decreased.
- **Job Market Sentiment**: There is a slightly greater optimism regarding the job market compared with prior years. A smaller percentage of respondents than the previous year reported being willing to make concessions on vacation, salary, location and call and weekend shifts in order to secure a position.
- **Radiology Informatics**: While A^3CR^2 has conducted the survey annually since 2001, this year's was the first to assess use of radiology informatics. About a third of respondents reported using a system that integrates relevant clinical data into a single program, while about one-quarter reported using data mining tools. Twenty percent of respondents use imaging decision support for computerized physician order entry and 17 percent use automated case tracking.

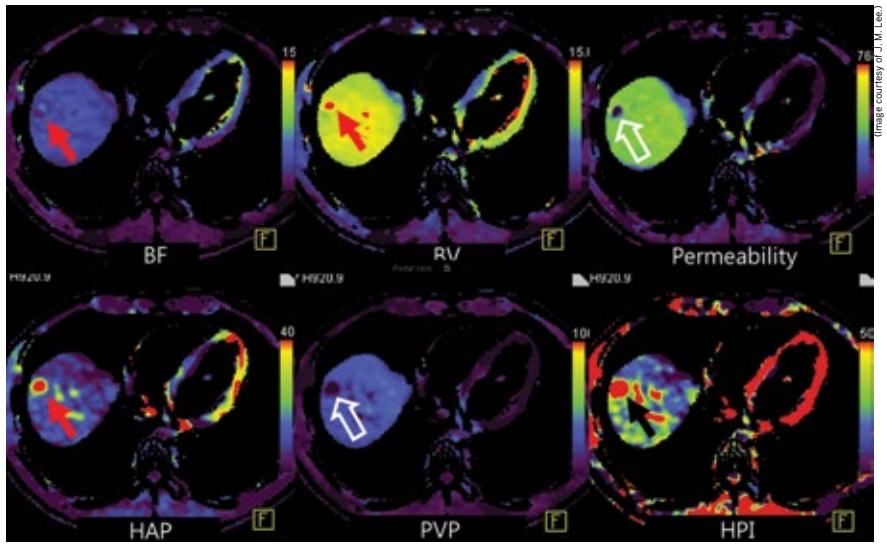
View the full results of the 2014 Chief Resident Survey, as well as results from previous surveys, at *aur.org/A3CR2-Surveys*.

Journal Highlights

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

CT Perfusion of the Liver: Principles and Applications in Oncology

CT perfusion imaging of the liver provides functional information about the microcirculation of normal parenchyma and focal liver lesions and is a promising technique for assessing the efficacy of anticancer treatments. Many limitations of early CT perfusion studies performed in the liver, such as limited coverage, motion artifacts, and high radiation dose, are being addressed by technical advances. While other issues must still be solved, CT perfusion has now reached technical maturity, allowing for its use in larger-scale prospective clinical trials.



(Image courtesy of J.M. Lee.)

Perfusion software used in this example automatically generates color-coded perfusion maps of entire liver representing blood flow (BF), blood volume (BV), permeability, hepatic arterial perfusion (HAP), portal venous perfusion (PVP) and hepatic perfusion index (HPI). Note increased blood flow, blood volume, HAP and HPI (*solid arrows*) and decreased permeability and PVP (*open arrows*) in the hepatic nodule.

(*Radiology* 2014;272;2:322–344) ©RSNA 2014 All rights reserved. Printed with permission.

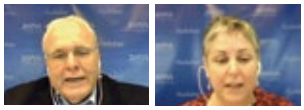
In a review in the August issue of *Radiology* (*RSNA.org/Radiology*), Se Hyung Kim, M.D., of the Molecular Imaging Program at Stanford University, and colleagues discuss the basic principles, current acquisition protocols and pharmacokinetic models used for CT perfusion imaging of the liver. In addition, various oncologic applications are discussed in detail:

- Early detection of liver tumors
- Assessment of prognosis based on tumor perfusion
- Monitoring therapeutic effects
- Diagnosing tumor recurrence

The authors also discuss possible solutions to challenges that remain in CT perfusion of the liver, including radiation dose, reproducibility, motion correction and protocol standardization.

"The lack of standardization in image acquisition and the methodologies applied for data analysis is an acknowledged issue by researchers in the field of perfusion imaging, and there is fortunately increasing efforts toward the standardization and harmonization of both data acquisition and analysis," the authors note. "Such developments are of paramount importance for the wider clinical acceptance of the technique and industry-academia collaborations are being developed to address such challenges."

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 *pubs.rsna.org/page/radiology/podcasts*:

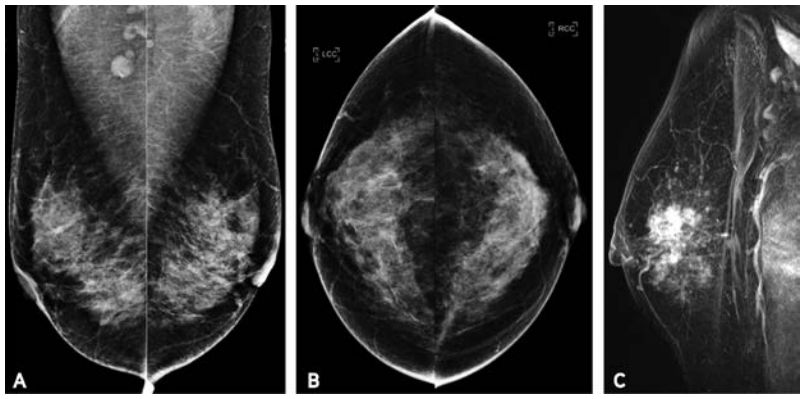
"Two-View Digital Breast Tomosynthesis Screening with Synthetically Reconstructed Projection Images: Comparison with Digital Breast Tomosynthesis with Full-Field Digital Mammographic Images," Per Skaane, M.D., Ph.D., and colleagues.

"Comparison of Two-dimensional Synthesized Mammograms versus Original Digital Mammograms Alone and in Combination with Tomosynthesis Images," Margarita Zuley, M.D., and colleagues.

"Thyroid Cancers Incidentally Detected at Imaging in a 10-year Period: How Many Cancers Would Be Missed with Use of the Recommendations from the Society of Radiologists in Ultrasound?" Manisha Bahl, M.D., M.P.H., and colleagues.

Digital Breast Tomosynthesis: Lessons Learned from Early Clinical Implementation

In light of the limitations of mammography, including low sensitivity in detecting some cancers and high false-positive recall rates, controversy exists over when and how often screening mammography should occur. Digital breast tomosynthesis (DBT) is rapidly being implemented in breast imaging clinics around the world as early clinical data demonstrate that it may address some of the limitations of conventional mammography.



IDC in a 42-year-old woman. Bilateral MLO (*a*) and craniocaudal (*b*) screening DM images show subtle architectural distortion in the lateral and subareolar right breast, a finding that is more conspicuous on DBT images. The extensive nature of the finding is also appreciated on the DBT images. (*c*) Sagittal contrast-enhanced fat-saturated T1-weighted MR subtraction image of the right breast shows patchy extensive enhancement in the region of architectural distortion. Pathologic analysis confirmed extensive IDC. (*RadioGraphics* 2014;34;E89–E105) ©RSNA 2014 All rights reserved. Printed with permission.

In an article in the July-August issue of *RadioGraphics (RSNA.org/RadioGraphics)*, Robyn Gartner Roth, M.D., of the Department of Radiology at the Hospital of the University of Pennsylvania, and colleagues detail the clinical applications of digital breast tomosynthesis in both screening and diagnostic settings. Specifically the authors:

- Describe the principles of DBT and how information obtained at 3D DBT may replace the need for some 2D diagnostic imaging in the evaluation of suspicious breast lesions
- Discuss how a combination of digital mammography and DBT can be used to decrease callback rates, increase cancer detection and assist with problem solving
- Identify the limitations of DBT and issues to consider in clinical implementation

"This article focuses on our early clinical experiences with DBT in both screening and diagnostic settings," the authors note. "One year after implementing DBT for all screening patients, we demonstrated a substantial reduction in our overall callback rate and a trend toward increased cancer detection … As with any new technology, several issues must be considered when implementing DBT into daily practice. Ongoing large-scale prospective trials will help guide the evidence-based utilization of this new technology."

In an accompanying invited commentary, Stephen A. Feig, M.D., of the Department of Radiology at the University of California Irvine Medical Center, notes that while many supplementary screening modalities, including breast US and MR imaging, have been developed to supplement digital mammography, DBT could perhaps provide the most clinically significant benefit for most women.

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

Value of Membership

Use Fellowship Connect to Find, Post Fellowship Positions

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

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

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

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

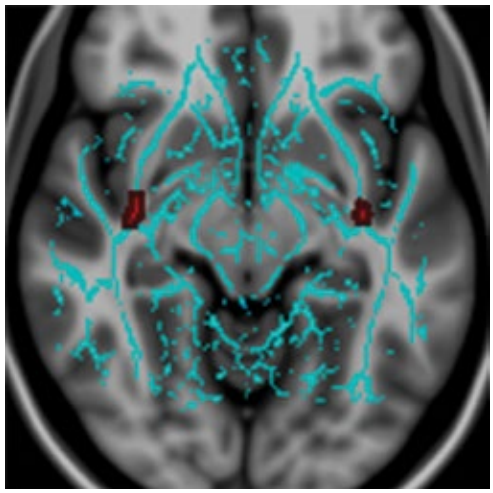
Radiology in Public Focus

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

Sex Differences in White Matter Abnormalities after Mild Traumatic Brain Injury: Localization and Correlation with Outcome

Male sex and uncinated fasciculus (UF) values are independent risk factors for persistent postconcussion symptoms after three months and are stronger predictors of time to symptom resolution (TSR) than initial symptom severity, new research shows.

Saeed Fakhran, M.D., of the University of Pittsburgh School of Medicine, and colleagues retrospectively reviewed diffusion tensor imaging (DTI) in 69 patients with mild traumatic brain injury (mTBI)—47 male and 22 female patients—and 21 control subjects—10 male and 11 female subjects—with normal conventional MR images.



UF, an important tract connecting the two extrahypothalamic regions with greatest concentration of progesterone receptors, demonstrates greater injury in males than females after mTBI. Axial images derived from TBSS results and rendered on T1-weighted images from the MNI atlas indicate that the regions of significantly decreased FA in male patients with mTBI relative to female patients with mTBI involve the UF bilaterally. Significant voxels (P < .05, corrected for multiple comparisons) were thickened by using the TBSS fill function into local tracts (*red*) and overlaid on the white matter skeleton (*blue*).
(*Radiology* 2014;271;3:InPress)

Patients with mTBI underwent serial neurocognitive testing with Immediate Post-Concussion Assessment and Cognitive Testing (ImPACT). Correlation between sex, white matter FA values, ImPACT scores and time to symptom resolution (TSR) were analyzed with multivariate analysis and tract-based spatial statistics (TBSS).

Male patients with mTBI have significantly decreased fractional anisotropy (FA) values in the UF bilaterally (P < .05) compared with female patients with mTBI and control subjects, results showed.

"This finding may indicate a role for UF FA values as a sex-neutral metric for evaluating the severity of mTBI injuries and predicting subsequent clinical outcome," the authors write.

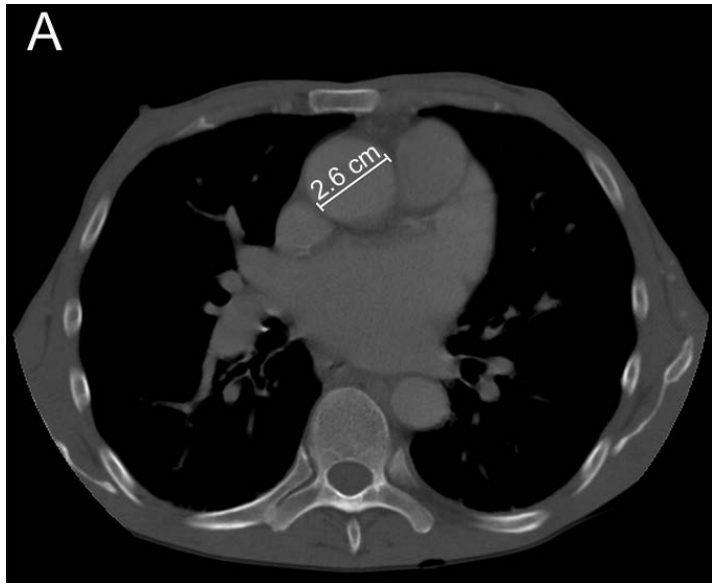
Incidental Imaging Findings from Routine Chest CT Used to Identify Subjects at High Risk of Future Cardiovascular Events

Structured reporting of incidental CT findings can mediate accurate stratification of individuals into clinically relevant risk categories and subsequently allow those at higher risk of future cardiovascular (CVD) events to be distinguished, new research shows.

In a retrospective study by Pushpa M. Jairam, M.D., Ph.D., of the University Medical Center Utrecht, the Netherlands, the derivation cohort comprised 10,410 patients who underwent diagnostic chest CT for noncardiovascular indications. During a mean follow-up of 3.7 years (maximum, 7.0 years), 1,148 CVD events were identified. By using a case-cohort approach, CT scans from the cases and from an approximately 10 percent random sample of the baseline cohort (n = 1,366) were graded visually for several cardiovascular findings.

The final model demonstrated good discriminative value, with a C statistic of 0.71 (95 percent confidence interval: 0.68, 0.74) and a good overall calibration, as assessed in the validation cohort.

"The use of the score derived in this study is simple and quick and allows accurate stratification of individuals into clinically relevant risk categories and permits those at risk for CVD events in the near future to be distinguished," the authors write.



Examples of cardiovascular chest CT findings: Ascending thoracic aorta diameter measurement.
(*Radiology* 2014;271;3:InPress)

Media Coverage of RSNA

In May, 1,224 RSNA-related news stories were tracked in the media. These stories reached an estimated 257 million people.

A study published online in *Radiology* received widespread attention in the press during April and May. "Effect of Diabetes on Brain Structure: The Action to Control Cardiovascular Risk in Diabetes MR Imaging Baseline Data," was covered by more than 875 print, broadcast and online outlets, including *Time*, *Newsday*, *U.S. News & World Report*, Doctor Radio, KCAL-TV (Los Angeles), *MSN.com*, *Yahoo! Health*, *CNN.com*, *FoxNews.com* and *WebMD*.

Outlets covering other studies included WGN America, WABC-TV (New York), KABC-TV (Los Angeles), WBBM-TV (Chicago), *Los Angeles Times*, *Chicago Tribune*, *The Huffington Post*, *Toronto Sun* and *Philly.com*.

AUGUST PUBLIC INFORMATION OUTREACH ACTIVITIES FOCUS ON MR IMAGING

In August, RSNA's 60-Second Checkup radio program will focus on the use of MR imaging to reveal brain disorders in patients.

New on *RadiologyInfo.org*

Visit *RadiologyInfo.org*, the public information website produced by the RSNA and ACR, to read the latest content posted to the Disease/Conditions section on Prostate Cancer.

- Prostate Cancer:
  Radiologyinfo.org/en/info.cfm?pg=prostate-cancer

RadiologyInfo.org
The radiology information resource for patients

Technology Forum

CIBR Hosts 5th Medical Technology Showcase

In its fifth year, the annual Medical Technology Showcase hosted by the Coalition for Imaging and Bioengineering Research (CIBR) engaged federal budget decision makers on the impact of medical imaging technology.

The late April event spotlighted collaborative imaging displays presented by representatives of academic radiology departments, patient advocacy groups and industry. In addition, the Academy of Radiology Research—the umbrella organization for CIBR and the driver of legislation which led to the creation of the National Institute for Biomedical Imaging and Bioengineering (NIBIB) at the National Institutes of Health (NIH)—presented Sen. Richard Burr (R-N.C.) and Rep. Anna Eshoo (D-Calif.) with Imaging Research Advocacy Awards, a.k.a. "Academy Awards."

The medical technology showcase followed two days of meetings at NIH institutes and on Capitol Hill to highlight the value of imaging research and the need to support NIH funding in the federal budget process.

***From left*: Stanley Baum, M.D., and C. Douglas Maynard, M.D., past-presidents of the Academy of Radiology Research, attended the fifth annual CIBR Medical Technology Showcase where Rep. Anna Eshoo (D-Calif.) (*right*) accepted the organization's Imaging Research Advocacy Award, a.k.a. "Academy Award." Dr. Baum, an emeritus professor of radiology at the University of Pennsylvania, received the RSNA Gold Medal in 2003. Dr. Maynard, who served as 2000 RSNA President, is a professor emeritus of radiology at Wake Forest University in Winston-Salem, N.C. He received the RSNA Gold Medal in 2005.**

Annual Meeting Watch

Enroll Now for Courses

Course enrollment for RSNA 2014 is underway. The RSNA 2014 Advance Registration, Housing and Course Enrollment brochure is available at *RSNA.org/Register*. Use this brochure to make the most of your RSNA 2014 experience. RSNA has organized the information in the course brochure to help you complete your enrollment in just a few steps. Find the courses you need, build your schedule and enroll quickly and easily online or via the print form. You must be registered for RSNA 2014 in order to enroll for courses.

RSNA 2014 Registration

Internet
(fastest way)
Go to *RSNA.org/Register*

Telephone
(Mon.-Fri. 8 a.m. – 5 p.m. CT)
1-800-650-7018 • 1-847-996-5862

Registration Fees

BY NOV. 7	AFTER NOV. 7	
$0	$100	RSNA/AAPM Member
0	0	RSNA/AAPM Member Presenter
0	0	RSNA Member-in-Training, RSNA Student Member and Non-Member Student
0	0	Non-Member Presenter
180	280	Non-Member Resident/Trainee
180	280	Radiology Support Personnel
825	925	Non-Member Radiologist, Physicist or Physician
825	925	Hospital or Facility Executive, Commercial Research and Development Personnel, Healthcare Consultant and Industry Personnel
325	325	One-day registration to view only the Technical Exhibits

Important Dates for RSNA 2014

October 24	International deadline to have full conference badge mailed
November 7	Final housing and discounted registration deadline
November 26	Deadline to guarantee a seat for all ticketed courses
Nov 30 - Dec 5	100th Scientific Assembly & Annual Meeting

International Visitors

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

Virtual Meeting

Register for the Virtual Meeting to access selected live-streamed and on-demand sessions, scientific presentations and education exhibits, Cases of the Day and virtual technical exhibits. Participate in live-streamed courses and earn CME credits from anywhere in the world.
The fee is $100 for RSNA members; $300 for non-members. RSNA members-in-training, RSNA medical student members and retired members can access the virtual meeting for free. For more information or to register, go to *RSNA.org/Virtual*.

Virtual Meeting Registration Fees

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

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 7 (October 24 for international registrants). Technical exhibits-only registrants must pick up badges on the day of the exhibit attendance at McCormick Place.

Guarantee Your Seat!

Tickets are required for various meeting components, including refresher and multisession courses, informatics workshops and RSNA tours and events. All ticketed courses must be confirmed prior to November 26 to guarantee a seat. RSNA ticketed courses fill up fast, so ensure you get the courses you need by enrolling at *RSNA.org/Register*. There is no onsite course ticketing. Registrants without tickets will be allowed entrance into a course after all ticketed registrants have been seated.

5k Fun Run

Tuesday, December 2, 6:30 a.m. Arvey Field, South Grant Park, Chicago

Enjoy a 5k event with your colleagues along Chicago's beautiful Lake Michigan shore and show your commitment to partnership and a promise to your specialty. During online registration or onsite at McCormick Place, you can sign up as a runner or walker for the 5k Fun Run. The signup donation of $40 will benefit the RSNA R&E Foundation and is fully tax deductible. Participants receive a commemorative T-shirt.

Reserve Your Room Now

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

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 +1 011 630-227-3873 or *rsna@ganttravel.com*.

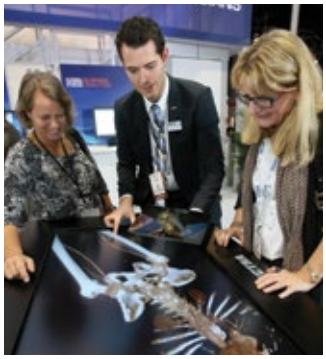
Take in Chicago's Signs, Sounds at RSNA 2014

RSNA will once again offer a series of exciting Chicago tours and events during meeting week, including these attractions:

- "A Christmas Carol" at the Goodman Theatre
- Glass blowing at Ignite
- "Annie" at the Cadillac Palace Theatre
- Chicago Symphony Orchestra: Vienna Boys Choir
- "Porgy & Bess" at the Lyric Opera of Chicago

The lineup also features city tours, shopping excursions, culinary experiences, museum exhibits and much more. For tickets, go to *RSNA.org/Register* and click on Tours and City Events.

RSNA Gears up for 2014 Technical Exhibits



The world's largest exhibition of radiology-related products, the 2014 RSNA 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. Experience a special Technical Exhibits Grand Opening Ceremony on Sunday, November 30 at 11 a.m. in the Grand Concourse of McCormick Place.

Highlights of the 2014 Technical Exhibits:

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

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

Enjoy the Sip & Savor Social

When registering for RSNA 2014, purchase tickets to the Sip & Savor Social celebrating RSNA's centennial on Wednesday, Dec. 3, in the Skyline Ballroom at McCormick Place. Enjoy drinks, entertainment and tastings by some of Chicago's top restaurants. Tickets are $40 (children under age 16 will not be admitted). The event will be held from 5 to 7 p.m.

Spouse/Family Member Badge

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

Arrange Childcare

To uphold the professional and educational standards of the RSNA annual meeting, children under 16 years of age are not permitted in the exhibit halls or sessions or issued a badge. Onsite childcare will be available for children six months to 12 years through ACCENT on Children's Arrangements, Inc.

Online registration and application forms are available at *RSNA.org/ServicesAndFAQs* (click childcare).

Education and Funding Opportunities

Grantsmanship Workshops

November 29, 2014
McCormick Place
Registration **Now Open**

Registration for the NIH Grantsmanship Workshop and RSNA/ARR Study Section Reviewers Workshop is now open.

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.

The RSNA/ARR Study Section Reviewers Workshop, "What It Takes to Be an Expert Reviewer for the NIH: The Peer Review Process Demystified," prepares potential reviewers and grant authors with an overview of grant mechanisms, evaluation criteria and the skills needed to become a study section

reviewer. The workshop provides insight into the reviewers' perspective, which may be helpful when responding to grant reviews. Each workshop features a mock study section.

The workshops will be held before the start of RSNA 2014 on Saturday, November 29, 2014, 1-5 p.m., at McCormick Place, Chicago. Registration is available via the RSNA annual meeting site at *RSNA.org/Register*. There is $35 registration fee for each workshop.

RSNA Faculty Skills Update

September 23, 2014
InterContinental Hotel Chicago O'Hare
Registration **Now Open**

Bisset

DiSantis

Bedi

Registration for the RSNA Faculty Skills Update (formerly the Faculty Development Workshop), a day-long course on the best techniques for designing and delivering radiology education, is now open. The workshop is led by 2012 RSNA President 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. Attendees will also have the chance to submit item-writing questions for faculty and group discussion, including CME test questions submitted by fellow attendees. Faculty will walk through acceptable and unacceptable methodologies, focusing on best practices for question writing and rewriting.

Attendees will explore challenging case-based questions that can be adapted to a variety of media, including in-print and Audience Response System (ARS) testing. They will learn how 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 September 23, 2014, at the InterContinental Hotel Chicago O'Hare. The fee is $150. Registration, housing and workshop information is available at *RSNA.org/Faculty-Skills-Update/*. For more information, contact Jennifer Comerford at *jcomerford@rsna.org* or 1-630-590-7772.

Medical Meetings

August – September 2014

AUGUST 25-28
Canadian Association of Radiation Oncology (CARO), Canadian Organization of Medical Physicists (COMP), 2013 CARO Annual Scientific Meeting, Delta St. John's Hotel & Conference Center, St. John's, Newfoundland
• *www.caro-acro.ca*

SEPTEMBER 3-6
Sociedad Mexicana de Radiologia e Imagen/ Mexican Society of Radiology and Imaging (SMRI), XIII Curso Annual de Ultrasonido, 13th Annual Ultrasound Course, World Trade Center, Mexico City
• *www.smri.org.mx*

SEPTEMBER 4-7
The Royal Australian and New Zealand College of Radiologists (RANZCR), Australasian College of Physical Scientists & Engineers in Medicine (ACPSEM), and **Australian Institute of Radiography (AIR),** 2014 Combined Scientific Meeting, Melbourne Convention and Exhibition Centre, Australia
• *www.csm2014.com*

SEPTEMBER 8-10
Royal College of Radiologists (RCR), Annual Scientific Meeting, The Barbican, London
• *www.rcr.ac.uk*

SEPTEMBER 9-12
International Society of Radiology (ISR), 28th International Congress of Radiology (ICR), World Trade Center, Dubai
• *www.icr2014.org*

SEPTEMBER 10-13
American Society of Emergency Radiology (ASER), Annual Scientific Meeting and Postgraduate Course, Nine Hotel, Portland, Oregon
• *www.erad.org*

SEPTEMBER 10-14
American Society of Head and Neck Radiology (ASHNR), 2014 Annual Conference, Sheraton Seattle Hotel, Washington
• *www.ashnr.org*

SEPTEMBER 13-17
Cardiovascular and Interventional Radiological Society of Europe (CIRSE), CIRSE Annual Meeting, Scottish Exhibition and Conference Centre Exhibition Way, Glasgow, UK
• *www.cirse.org*

SEPTEMBER 14-17
American Society of Radiation Oncology (ASTRO), 56th Annual Meeting, Moscone Center, San Francisco
• *www.astro.org*

SEPTEMBER 14-17
International Society of Ultrasound in Obstetrics and Gynecology (ISUOG), 24th World Congress on Ultrasound in Obstetrics and Gynecology, Centra Convencions Internacional Barcelona, Spain
• *www.isuog.org/WorldCongress/2014*

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

RSNA.org

Lend Your Voice to RSNA's Centennial Website

As RSNA gears up for its 100th Scientific Assembly and Annual Meeting, the Society is unveiling a fun, interactive way to lend your voice and participate in RSNA's once-in-a-lifetime Centennial celebration. RSNA's Centennial website, *RSNA.org/Centennial,* will be rolled out in three sections:

RSNA Timeline:
Available now, the interactive timeline features key milestones in the history of RSNA and radiology. Click on a milestone (e.g., 1895: Roentgen Discovers X-ray) to explore captivating images and descriptions, post a comment and vote for your favorite milestone. Users are also invited to add their own unique story to the public milestone section and share their entry on social media.

Image Gallery/Photo Contest:
Beginning September 1, RSNA will host an online contest for medical images in various categories, creating a virtual photo gallery. After users upload medical images, visitors can "like" their favorites. The three most liked images in each category will be announced as winners at the end of the contest on November 1.

Centennial Showcase:
Replicate the experience of being live in the Centennial Pavilion at RSNA 2014. Be inspired by the RSNA Milestones video and learn from digital displays representing RSNA's achievements in research, education, innovation, patient care and radiologic community.

Part of RSNA's two-year Centennial celebration, the website will be updated throughout 2015 and remain as a permanent website offering easy access to RSNA and radiology history as well as a vital link to the specialty's future.

COMING NEXT MONTH

As RSNA 2014 approaches, explore our annual roster of Chicago attractions and Insiders Guide to Chicago's Best Deals to help make the most of your trip to the Windy City.

100th SCIENTIFIC ASSEMBLY AND ANNUAL MEETING

RSNA® 2014

A Century of Transforming Medicine

NOV 30 *thru* DEC 05

McCORMICK PLACE, CHICAGO

The Celebration of a *Century*

The finest education and never-before-seen science

Groundbreaking technology from across the globe

An interactive historic showcase of RSNA and radiology

This activity has been approved for *AMA PRA Category 1 Credit™*

RSNA.org/Register