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Biophotonics Pushes the Boundaries of Radiology

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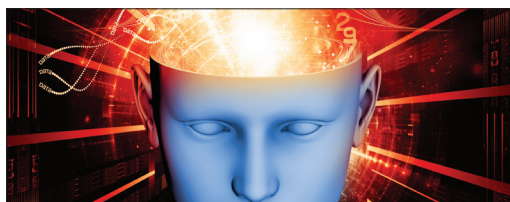


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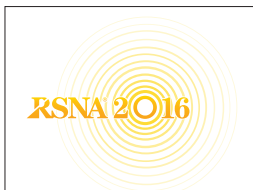
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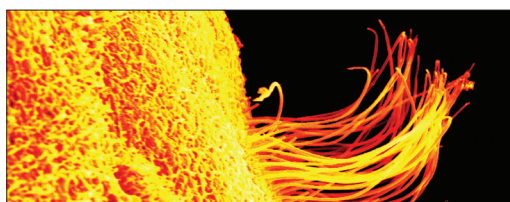
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Ramírez-Arias Awarded by Mexican General Health Council

José L. Ramírez-Arias, Sr., MD, PhD, a 2000 RSNA Gold Medal honoree, received the Dr. Guillermo Soberón Acevedo Award for Institution Building from Mexico's General Health Council (GHC). The award was presented to Dr. Ramírez-Arias by Mexican President Enrique Peña Nieto and Health Minister Juan Mercedes during a recent World Health Day event in Mexico City.

Dr. Ramírez-Arias, of Hospital Angeles Pedregal, School of Medicine, National Autonomous University of Mexico, Mexico City, was one of nine health merit award recipients honored at the event. Through the awards, the GHC seeks to recognize health professionals who have excelled in the fields of medicine, chemistry and pharmacy, dentistry, nursing and other health areas.

Dr. Ramírez-Arias served as second vice-president on the RSNA Board of Directors from 1996 to 1997 and was also a member of the



José L. Ramírez-Arias, MD, (right) receives the Dr. Guillermo Soberón Acevedo Award for Institution Building from Mexico's General Health Council.

RSNA Committee on International Radiology Education. He received an RSNA Special Presidential Award in 1996.

Numbers in the News

2,000

The number of new codes to be added to the ICD-10 coding system on October 1. Read more on [Page 13](#).

30

The approximate time of a CT lung screening exam at St. Luke's Hospital, Kansas City, Mo. Read more about the program on [Page 3](#).

175

Number of organizations, including RSNA, comprising the Integrating the Healthcare Enterprise (IHE®), which recently held a World Summit. Read more on [Page 20](#).

50

Number of credits in Academy of Radiology Leadership and Management (ARLM) approved educational courses needed to earn an ARLM certificate. Read more on [Page 23](#).

New Safety Exhibits Posted in Image Wisely®

A curated series of radiation dose and safety education exhibits from the RSNA 2015 annual meeting can now be accessed through Image Wisely®, an initiative of RSNA, ACR, AAPM and ASRT to raise awareness and provide educational resources for medical professionals on the use of ionizing radiation in



adult medical imaging examinations.

Additional RSNA 2015 education exhibits will be posted over the next few months. Access is free and does not require login.

Access all the exhibits at ImageWisely.org/RSNA-Educational-Exhibits.

Annual International Day of Radiology

Breast imaging and the essential role that radiologists play in the detection, diagnosis and management of diseases of the breast is the focus of this year's International Day of Radiology (IDoR) set for Nov. 8.

More than 140 radiology-related professional societies from around the globe will celebrate the advances that radiologic innovations have brought to patients worldwide.

IDoR is sponsored by RSNA, the European Society of Radiology (ESR) and the American College of Radiology (ACR), with a dedicated website (IDoR2016.com) and social media activities.

Visit RSNA.org/IDoR for more information.



INTERNATIONAL DAY OF RADIOLOGY

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RSNA's Inaugural Spotlight Course Draws More Than 200 Attendees

RSNA's first Spotlight Course, *Radiología de Urgencias: Curso Interactivo con Casos* (Emergency Radiology: Interactive Course with Cases), held June 2 to 4 in Cancun, Mexico, drew 204 attendees



Soto



Elizondo

from 17 countries including speakers, guests and company personnel.

RSNA's Regional Committee for Latin America (RCLA), part of RSNA's International Advisory Committee, assisted in planning the course and recommended emergency radiology based on the educational needs of RSNA members in Latin America. The RCLA also recommended the two course directors, Jorge Soto, MD, and Guillermo Elizondo Riojas, MD,

PhD, who said the course was a resounding success.

"Attendees' comments were excellent," said Dr. Elizondo, head of the Department of Radiology and Imaging at the University of Nuevo Leon in Monterrey, Mexico. "They kept asking when and where the next RSNA Spotlight Course is going to be held."

The 2 ½-day program featured interactive and case-based courses including the popular plenary sessions, "The 10 Diagnoses You Cannot Miss," utilizing the RSNA Diagnosis Live™ quiz-based learning format. Feedback from attendees was positive and there was significant interest in future courses throughout Latin America. The

program was presented entirely in Spanish.

"One of the most important factors in the success of the course was — without a doubt — the case-based learning format, as well as the utilization of Diagnosis Live," Dr. Elizondo said.

"With this inaugural course, RSNA launched a new initiative: bringing radiologic education of the highest quality to its international members in their native language and in a location closer to their countries," said Dr. Soto, a professor of radiology and vice chairman of research at Boston University School of Medicine.



RSNA members — stopping for a group photo, above — were critical to the success of the Society's first Spotlight Course held in Cancun, Mexico.



Emergency radiology was the focus of the Spotlight Course that was presented entirely in Spanish. Left to right: Course Director Jorge A. Soto, MD, Diego B. Nunez Jr, MD, MPH, and Diego F. Lemos, MD.

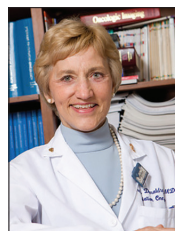
Former RSNA President Donaldson Receives ASCO Mentorship Award

The American Society of Clinical Oncology (ASCO) honored **Sarah S. Donaldson, MD**, of Stanford University School of Medicine (SUSM) and Lucile Packard Children's Hospital, with its inaugural Women Who Conquer Cancer Mentorship Award.

Dr. Donaldson, who served as RSNA president in 2013, received the award during the recent ASCO annual meeting in Chicago. An international leader in pediatric radiation oncology for four decades, Dr. Donaldson has mentored countless trainees and young oncologists, providing them with both personal and professional guidance.

The ASCO award recognizes an extraordinary female leader in oncology who is a role model and mentor committed to the professional development of female colleagues.

Dr. Donaldson is the Catharine and Howard Avery Professor in the Department of Radiation Oncology at SUSM. She is also associate director of the residency program for Stanford's Department of Radiation Oncology and chief of the Radiation Oncology Service at the Packard Children's Hospital in Stanford.



Donaldson

Larson Receives Leksell Gamma Knife Society Pioneer Award



Larson

David A. Larson, MD, PhD, recently received the 2016 Leksell Gamma Knife Society Pioneer Award, which is bestowed on a researcher who has consistently pioneered new approaches and methods that enhance the results of Gamma Knife surgery.

A past president of the American Society for Radiation Oncology (ASTRO), Dr. Larson is professor emeritus of radiation oncology at the University of California, San Francisco (UCSF) and a radiation oncologist for the Washington Hospital Healthcare System Gamma Knife Program.

Dr. Larson is an internationally recognized authority on brain tumors and on central nervous system and body radiosurgery, intensity modified radiotherapy and highly conformal radiotherapy.

He is a member of RSNA's Quality Improvement Committee.

RSNA Board of Directors Report

The RSNA Board of Directors met in June to approve the Society's 2016-2017 budget, continue planning for the annual meeting and many ongoing activities, and review requests for support from related organizations.

Think A-Head Campaign Support

The Board agreed to endorse the "Think A-Head" campaign of the Image Gently® Alliance. The new initiative will promote awareness of considerations in imaging minor head trauma in children and seeks to establish patient size-specific imaging techniques and protocols for head CT.

RSNA 2016 Stays on Point with New Sessions

The Board approved several additions to the RSNA 2016 program, including a new Special Interest Session, proposed by the Academy of Radiology Research and its member societies, to prepare investigators to successfully pitch product commercialization proposals to potential investors. Another program addition is a "Meet the Professor" session for radiation oncology residents, to follow one of the Monday BOOST (Bolstering Oncoradiologic and Oncoradiotherapeutic

Skills for Tomorrow) courses. Look for more information about RSNA 2016 sessions in the Annual Meeting Preview issue of *RSNA News* and at *Meeting.RSNA.org*.

New Quality Improvement Storyboard Award

Quality Improvement (QI) Storyboard presenters at RSNA 2016 will be eligible for a new award established by the Board to recognize outstanding hard-copy entries. The QI Storyboard poster walk introduced in 2015 will be available again in 2016 with two times planned.

Looking Ahead to 2017

RSNA 2017 will recognize the accomplishments and contributions of Colombia and Israel to the radiologic community with the Country Presents series, the Board determined.



VIJAY M. RAO, MD
Chair
RSNA Board of Directors

Patient Focus

Patient Interaction Drives Success of CT Lung Screening Program

Melissa L. Rosado de Christenson, MD, believes patients should know their radiologist by name — and face.

So when she was asked to develop a CT lung screening program at St. Luke's Hospital in Kansas City, Mo., in 2013, one-on-one time with patients was central to the plan.

"We speak to each patient after their lung screening," said Dr. Rosado de Christenson, a professor of radiology at the University of Missouri-Kansas City School of Medicine and chief of thoracic imaging at St. Luke's Hospital. "We want every patient to understand the importance of screening, of re-screening and of what we see on their scan."

Radiologists often use the time to talk to patients about smoking cessation, which can be more effective if patients see scans of their lungs with their own eyes, said Dr. Rosado de Christenson, an internationally renowned thoracic radiologist in her fourth decade of practicing.

The other component of the St. Luke's

lung cancer screening program — delivering test results in about 30 minutes — is also in the patient's best interest, no matter the outcome.

"If the results are fine, patients are extremely relieved they didn't have to wait three weeks to find out," she said. "If the results are positive, we pick up the phone right then and begin expediting the next step immediately."

Such a tight turnaround can be a challenge — especially since Medicare began covering lung cancer screenings in 2015. Dr. Rosado de Christenson and the staff's three other thoracic radiologists and one fellow work in shifts, alternating to cover the lung cancer screenings.

The hugely successful program also benefits the specialty in one critical way: By helping patients understand what they are seeing, radiologists are increasing their own visibility.

"Often radiologists make amazing diagnoses and the result goes back to the referring physician who explains it to the



Melissa Rosado de Christenson, MD, advises a patient following a lung screening.

patient, and we become invisible," Dr. Rosado de Christenson said.

That's not the case at St. Luke's. As she had hoped, patients ask for her and the other radiologists by name — and know their faces.

"They say, 'Dr. Rosado is my chest radiologist,'" she said. "Many even tell me they wish they could interact with a radiologist for every single imaging exam, not just lung screening."

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LOOK AHEAD

Challenges and Opportunities for Ethics and Professionalism in Radiology

BY STEPHEN D. BROWN, MD

Tasked with looking ahead to the challenges and opportunities for ethics and professionalism in radiology over the next century, I find myself wondering what one would have predicted given the same assignment 100 years ago. The response then might today appear as fanciful and naive as any current response may look 100 years in the future. Nonetheless, some predictions seem reasonable.

Radiologic Innovations Will Drive Healthcare Costs

Many of us look forward to radiology's contributions to molecular medicine, genomics, bioinformatics, precision medicine and procedural guidance. Albeit invaluable, these innovations will be expensive. How radiologists respond is a harder prediction. Some project that radiologic innovations may ultimately contribute to lowering healthcare costs as diagnostic and therapeutic selections become more precise and productivity is optimized. Radiology leaders have particularly emphasized radiologists' obligations as stewards of efficient utilization.

Nonetheless, radiology may not realize its full potential to influence future healthcare services unless its leaders acknowledge openly what they are discussing with such terms as "stewardship of appropriate imaging," "evidence-based medicine," "decision-support," "appropriateness criteria," and "efficient utilization of imaging services." Often what they are talking about is rationing, "the controlled distribution of scarce resources, goods or services."¹

It is interesting to note how prominently radiologic services are mentioned in the ethics literature about rationing, but how relatively infrequently rationing is explicitly addressed in the radiology literature (at least in the United States). As those few articles describe, rationing is everywhere in medicine, including radiology, where it is as common as an incidental pulmonary nodule.

At issue is whether radiology will reinforce a system where rationing remains ubiquitous but subterranean, or whether it will lead policy makers in thinking without prejudice or conflict about how to implement rationing transparently, equitably and consistently.

Radiologic Innovation Will Continue to Spark Controversy

Radiologic technology is often associated with intensely debated ethical issues that create real dilemmas for patients and society. Prenatal imaging is a conspicuous example. This awesome technology has provided huge benefits to patients and families, but at times generates



Brown

STEPHEN D. BROWN, MD, is a radiologist at Boston Children's Hospital, an associate professor of radiology at Harvard Medical School and serves on the faculty of the Harvard Medical School Center for Bioethics. He is a member of the *RSNA News* Editorial Board and has served as chair of the RSNA Professionalism Committee and as a member of the RSNA Patient-Centered Radiology Steering Committee.

The Birth of Prenatal Imaging



excruciatingly difficult clinical decisions. Even as the technology contributed to intractable societal tensions around such hot button issues as abortion, the radiology literature paid little attention to the potential ethical implications of prenatal imaging as it was being developed.

Like many biomedical innovations, the technology was advanced for the sake of science and the benefit of patients, without much reflection within the community of innovators about the potential ethical consequences.

Such a dynamic persists with advancing radiologic technologies. Neuroimaging has spawned particularly vibrant discourse. An already extensive body of “neuroethics” literature will surely burgeon as neuroimaging transforms our understanding of consciousness and illuminates previously undetectable biological substrates underlying neurological and psychiatric disorders. Among other potential applications, neuroimaging may alter courtroom evidence standards, influence marketing methodology and demonstrate biomarkers corresponding to personality, intelligence, biases and criminality.

As with prenatal imaging, neuroimaging represents a technology that radiologists have presented to society without contributing meaningfully to the conversation about ethical consequences. Instead of overlooking such issues, radiology

might instead realize a previously untapped and rich opportunity to enhance its societal value: to support the public and policy makers in better understanding radiologic technologies, anticipating potential ethical implications, and determining prospectively what technologies should be developed and how they should be applied.

Weighing the Benefits/Risks of Radiologic Innovation

Radiologic technologies have often surprised radiologists with unanticipated adverse consequences. Awareness of numerous serious safety issues associated with CT and MRI emerged late relative to their market penetration. The imaging field has responded reactively to mitigate concerns related to radiation dosage, high-field magnets, intravenous contrast, incidental findings and requirements for sedation and anesthesia.

Radiology is certainly not alone as a field where brisk implementation of technological innovations has preceded understanding of safety risks. As John D. Lantos, MD, and William L. Meadow, MD, PhD, describe in their 2006 book about neonatology:

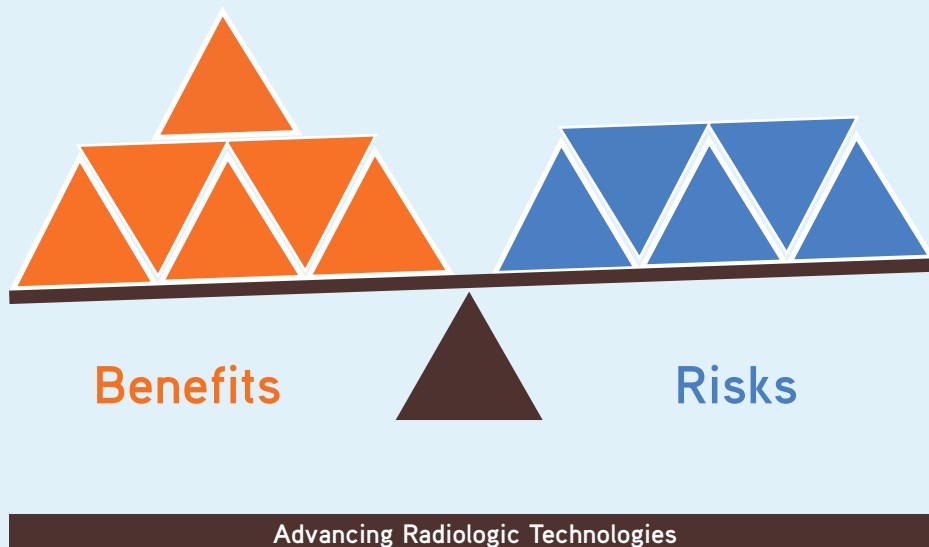
“Scientific and technological innovation was so rapid that important questions about the safety and efficacy of interventions could not be conceptualized until the scientific and technological innovations stimulated our imaginations to ask questions.”²

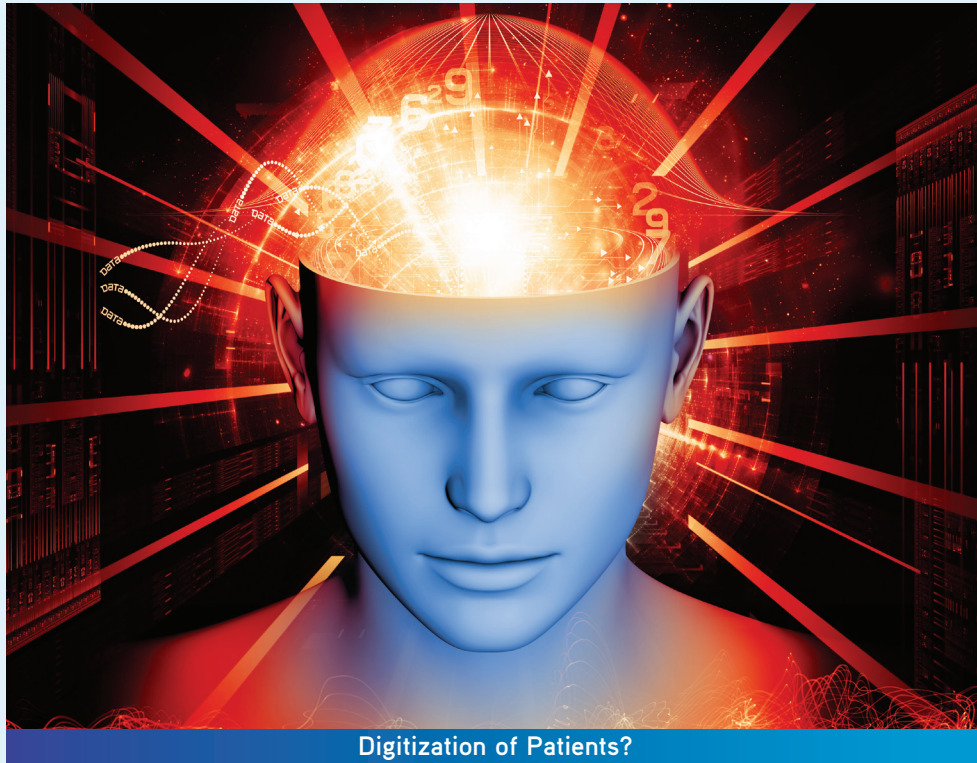
A similar dynamic will undoubtedly persist for evolving radiologic technology. Radiology will continue to face the same dilemma described by Drs. Lantos and Meadow: “The cost of protection from risk is the slowing of progress.”²

Conflicts of Interest Will Remain Inherent to Radiologic Innovation

Powerful potential conflicts of interest reside where industry and medicine intersect. As with many specialties, such intersections are common in radiology.

One needs only to peruse the RSNA annual meeting’s technical exhibits, where substantial business is conducted at every corner. General Electric’s corporate headquarters relocation from suburban Connecticut into an innovation hub for biotechnology and biomedical imaging, and IBM’s specific harnessing of massive computing capacity toward medical





applications with considerable relevance to radiology, are two notable examples suggesting the likelihood that corporate interests will remain important drivers of radiologic innovation. So, too, will the financial interests of research institutions increasingly seeking to monetize innovation.

While industry-academic collaboration remains essential and beneficial to radiology's future, the question is whose interests will prevail in driving radiologic innovation? Who will determine research and clinical priorities and who will speak for the interests of patients and society in setting the agenda for future technological development?

As healthcare costs rise, perhaps the most difficult balance may be between the competing interests of society and individual patients. This conflict underlies public enmity with healthcare rationing. Radiology has a vital role to play in helping society adjudicate this issue, but it will undermine its credibility if it cannot successfully manage its own conflicts of interest.

Will Radiologic Innovation Increasingly Digitize Human Lives?

A major emerging theme of radiologic innovation regards the synergy of machines and data. Radiology's role in harnessing the power of big data is an exceptionally exciting prospect for patient care. But if more meaningful extraction of data from machines is a key focus of radiologic innovation, it will be essential to remember what those data may represent: a mathematical composite of human health and disease in which individual human experiences are converted into minute packets, aggregated and mined for their value.

Some interesting ethical questions follow this digital "socialization" of medicine. Here are but a few: If massive patient data aggregation permits personally tailored medical care, should every potential beneficiary contribute to the data pool? How might privacy be compromised? Should

private data networks be permitted "members only" access? Should corporate or academic enterprises be permitted to claim proprietary ownership and use the data for their own commercial interests? Will we all now share the powerless immortality of Henrietta Lacks?

Finally, for radiologists, it is hard enough to remember that any given chest radiograph represents an actual patient. As patients become further digitized, will their humanity become more diluted in our eyes? Will radiologists remain mindful that each data parcel is attached to a human life, a family and a story? Will we tap into the well of human experience that is inextricably linked to the data being exploited? What will be the cost as we further decouple patient narratives from the biomarkers that directly shape their experiences?

Radiology Will Shape Its Role in the Next Century

Radiology's prospects over the next century are truly exciting. It nonetheless remains imperative to consider the risks and costs of emerging innovation as matters not only of health and economics, but also of ethical importance to society.

Radiologists can only fortify their stature by engaging substantively around such issues. Their success in doing so may well be a reflection of their professional values 100 years from now.

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1. Kelly, A, Cronin, P, "Rationing and Health Care Reform: Not a Question of If, but When," (*JACR* 2011;8;12;830-837)
2. Lantos, J., Meadow, W., *Neonatal Bioethics: The Moral Challenges of Medical Innovation*, John Hopkins University Press, 2006.

Experience Chicago during RSNA® 2016

BY CINDY LENART

Extend your Chicago stay or head out after hours during RSNA 2016 to explore one of the world's most spectacular cities. RSNA has assembled some of the area's premier sightseeing, shopping and entertainment options to offer attendees a variety of organized tours and events. For a complete list or to reserve your spot, visit RSNA.org/Tours-and-Events.

SATURDAY, NOVEMBER 26

"Les Troyens" at Lyric Opera of Chicago 5:30 p.m. | \$110

The drama of the Trojan War comes vividly to life in French opera's most astounding work.

SUNDAY, NOVEMBER 27

Blue Man Group at Briar Street Theater 4 p.m. | \$81

Music, technology and comedy that appeals to all ages. The Blue Man Group is innovative, energetic and wildly entertaining.

MONDAY, NOVEMBER 28

Architectural Walking Tour (English) 9 a.m. | \$35

Experience Chicago's great landmarks on a walk through the Loop (the City's central business district) to see noteworthy structures and significant buildings. (Offered in French on Monday at 10 a.m.)

Millennium Park Walking Tour (French) 2 p.m. | \$35

Tour the work of world-renowned architects, planners, artists and designers, showing how a former railway and parking lot transformed into a park envied by cities across the globe. (Offered in English on Tuesday at 10 a.m.)

Best of Second City and Chicago Pizza 5 p.m. | \$132

Indulge in deep dish pizza at one of Chicago's oldest and most famous pizzerias before taking in the laughs at the home of legendary comedians like Dan Aykroyd and John Belushi.

TUESDAY, NOVEMBER 29

Frank Lloyd Wright Experience 8:30 a.m. | \$108

Journey to Oak Park to tour Wright's home and studio. Learn about Wright's famous Prairie Style architecture and stroll through the neighborhood's Historic District, boasting 25 other Wright buildings.

Chicago City Highlights with Willis Tower Skydeck (English) 9:30 a.m. | \$70

Experience Chicago's lakefront and architecture on a three-hour bus tour. Learn about the Gold Coast, Museum Campus, Magnificent Mile, Merchandise Mart and Great Chicago Fire. (Offered in French on Tuesday at 10:30 a.m.)

"Finding Neverland" at Cadillac Palace Theatre 7:30 p.m. | \$108

This breathtaking smash hit "captures the kid-at-heart" (*Time* magazine). Directed



Image courtesy of Skydeck-Chicago

by visionary Tony winner Diane Paulus, "Finding Neverland" tells the story of the beloved character Peter Pan.

WEDNESDAY, NOVEMBER 30

Chicago Sculpture Walking Tour (English) 8:30 a.m. | \$35

Take in Chicago's vast array of public art. Discover the changing relationship between architecture and sculpture and learn how artists and architects collaborate to create successful public art. (Offered in French on Wednesday at 10 a.m.)

Shopping at Aurora Outlet Mall 9 a.m. | \$50

Visit Chicagoland's discount shopping destination and find savings at stores including Ann Taylor, Banana Republic, Calvin Klein, Coach and Kate Spade.

THURSDAY, DECEMBER 1

Architectural Walking Tour (English) 9 a.m. | \$35

Experience Chicago's great landmarks on a walk through the Loop to see noteworthy structures and significant buildings. (Offered in French on Thursday at 9:30 a.m.)



Precision Imaging in Medicine Focus of RSNA/AAPM Symposium

BY PAUL LATOUR

Paul Kinahan, PhD, admits to having a partially self-motivated reason for suggesting precision medicine as the topic for the 2016 RSNA/American Association of Physicists in Medicine (AAPM) Symposium: He wanted to learn more about it.

“Precision medicine is not a clearly defined issue — at least not to me. But it’s such a major initiative that we need to understand what it means and how it’s going to impact our field.”

PAUL KINAHAN, PHD

“Precision medicine is a major initiative that is receiving a great amount of attention, but I don’t feel like those of us in the radiology and medical imaging physics fields have a full grasp yet on what it means for us,” said Dr. Kinahan, vice chair of radiology research and head of the Imaging Research Laboratory at the University of Washington, Seattle.

Dr. Kinahan will moderate the symposium, “Precision Imaging in Medicine,” to be held Thursday, Dec. 1, at RSNA 2016. Presenters are Maryellen L. Giger, PhD, A.N. Pritzker Professor of Radiology, the Committee on Medical Physics and the College at the University of Chicago (UC), and Daniel C. Sullivan, MD, professor emeritus, Department of Radiology at Duke University Medical Center, Durham, N.C.

“The goal of the symposium is to gain an understanding of precision medicine and for us to propagate that to RSNA and AAPM members,” Dr. Kinahan added.

President Obama announced the precision medicine initiative (PMI) during his State of the Union address in January 2015. According to the fact sheet at WhiteHouse.gov, the initiative will “pioneer a new model of patient-powered research that promises to accelerate biomedical discoveries and provide clinicians with new tools, knowledge, and therapies to select which treatments will work best for which patients.”

The symposium will help radiologists and radiology physicists further understand what their roles will be within the PMI.

“Precision medicine is not a clearly defined issue — at least not to me. But it’s such a major initiative that we need to understand what it means and how it’s going to impact our field,” Dr. Kinahan said.

As part of the PMI, radiology will need to change from focusing on the diagnosis to focusing on the overall outcome, he added.

“We can have a very precise diagnosis, but if it has no impact on the eventual outcome for the patient, either good or bad, then is it really useful? Like most advanced diagnostic tools, we put a lot of time and effort into making it as precise as possible. But that is to some extent independent for how it is useful,” he said.

Dr. Giger will review the methods needed to adapt to the PMI from a research-based perspective. Considered one of the pioneers in the development of computer-aided diagnosis (CAD), Dr. Giger is past-president of AAPM, a former RSNA third vice president and a member of RSNA’s Public Information Advisors Network (PIAN) and the Scholar Advisor Panel. She is also vice chair of radiology for basic science research at UC.

Dr. Sullivan will speak on what the PMI means to radiology and the medical imaging physics fields, and how that relates to potential changes. Dr. Sullivan founded and chaired the Quantitative Imaging Biomarkers Alliance (QIBA) and served as RSNA science advisor from 2007 to 2015. He currently serves as the QIBA external relations liaison.



Kinahan



Giger



Sullivan

RSNA® 2016



WEB EXTRAS

Go to Meeting.RSNA.org to add the symposium to My Agenda.

USPSTF Approval of CT Colonography a “Big Win for Patients”

BY MIKE BASSETT

In a decision many advocates say was a long time coming, the United States Preventive Services Task Force (USPSTF or Task Force) has finally recommended CT colonography (CTC) as an acceptable option for colon cancer screening.

In final recommendations published in the June 21 issue of the *Journal of the American Medical Association*, the USPSTF reaffirmed a 2008 recommendation to screen all adults ages 50 to 75 for colon cancer. In addition, CTC was listed as one of the acceptable options for colorectal cancer screening (in addition to colonoscopy, flexible sigmoidoscopy, guaiac-based fecal occult blood test, fecal immunochemical test and multi-targeted stool DNA test.)

In its recommendation statement, the Task Force stated that screening for colorectal cancer has been a “substantially” underused preventive health strategy in the U.S.

“In addition, there are no empirical data to suggest that any of the strategies provide a greater net benefit,” the Task Force noted. “Accordingly, the best screening test is the one that gets done, and the USPSTF concludes that maximizing the total proportion of the eligible population that receives screening will result in the greatest reduction in colorectal cancer deaths.”

Judy Yee, MD, professor and vice chair of radiology and biomedical imaging at the University of California, San Francisco, and chair of the American College of Radiology’s Colon Cancer Committee, called the recommendations “the culmination of many years of hard work and research demonstrating the effectiveness and safety of CTC as a screening tool for colorectal cancer.

“Although this is a long overdue triumph for CTC advocates, most importantly this is a big win for patients,” said Dr. Yee, a member of RSNA’s Public Information Advisors Network and former chair of the Society’s Public Information Committee. “CTC is a safe and minimally invasive exam that may be more appealing to some patients and will help bring them in to get screened. No sedation is required so that patients can return to normal daily activities immediately after the scan making it a more convenient test for many people.”



Yee



Pickhardt

Dr. Yee said that the Affordable Care Act requires private insurers to cover all screening tests recognized by the USPSTF and that the Centers for Medicare and Medicaid Services will likely follow the USPSTF lead, resulting in Medicare coverage of CTC.

CTC Results in a “Net Benefit”

The USPSTF decision to recognize CTC as an acceptable colon cancer screening tool was a “pleasant surprise” said Perry Pickhardt, MD, professor of radiology at the University of Wisconsin, Madison, a member of RSNA’s Public Information Advisors Network and a noted CTC expert who has published more than 100 peer reviewed papers on the topic.

“We wondered whether at this point it just wasn’t going to happen,” Dr. Pickhardt said.

Just last year the Task Force issued a draft recommendation stating there was a lack of “mature evidence” showing CTC as a satisfactory option for colon cancer screening, he said.

Dr. Pickhardt believes the USPSTF has been hesitant to greenlight CTC because of concerns related to associated radiation

exposure as well as the extracolonic findings that can be a by-product of CTC.

“I think there was just a lack of understanding about the data and confusion surrounding those two factors that are unique to CTC,” he said.

However, he points out that research has shown a possible net benefit in detecting incidental extracolonic findings such as previously undisclosed abdominal aortic aneurysms and osteoporosis.

On the other hand, potential harms associated with extracolonic findings include the possibility of further work-ups and increased patient expense and anxiety for something that may actually be benign, he said.

“But if handled correctly and responsibly — which every radiologist should do for any CT scan he or she reads — on balance CTC will result in a net benefit because of all of that information we gain outside the colon,” he said. “When you take into account all of the advantages of screening with CTC, in my opinion it is the best test — by far.”

With private insurance coverage guaranteed — and possible Medicare coverage down the road — the demand for CTC is likely to increase, Dr. Pickhardt said.

“The big take away for radiologists is that we need to gear up for CTC in terms of training and being able to provide the service,” Dr. Pickhardt said. “Right now, as a community, we are nowhere near the point where we can handle a huge increase in demand. Every radiology group is going to have to figure this out.”

“The big take away for radiologists is that we need to gear up for CTC in terms of training and being able to provide the service.”

PERRY PICKHARDT, MD

The Netherlands, Turkey Spotlights at RSNA 2016 Country Presents Sessions

BY CINDY LENART

With more than 10,000 international professional attendees in attendance, the RSNA annual meeting continues to shine the spotlight on top research from across the globe. This year, at RSNA's 102nd Scientific Assembly and Annual Meeting, the Society honors the Netherlands and Turkey with its Country Presents series, acknowledging the nations that are helping shape the global future of radiology. The sessions are held Monday, Nov. 28, and Tuesday, Nov. 29, respectively, and can also be viewed live or on-demand through the RSNA 2016 Virtual Meeting.

THE NETHERLANDS PRESENTS

The Netherlands Focuses on Neurological Disease

The Netherlands Presents featured session will look at "Advances in Neuro-degenerative and Neuro-vascular Diseases."

Meike Vernooij, MD, PhD, will present The Rotterdam Scan Study aimed at predicting stroke and dementia based on population imaging; Mark van Buchem, MD, PhD, will present the Heart-Brain Connection Study evaluating hemodynamic contributions to cognitive decline; and Jeroen Hendrikse, MD, PhD, will discuss experiences in the Virtual Institute of Seven Tesla Applications (VISTA), evaluating



Majoie

high-resolution brain imaging in old age. Finally, Charles Majoie, MD, PhD, interventional neuroradiologist and head of the Department of Neuroradiology at Academic Medical Center, Amsterdam, the Netherlands, and chair of the Dutch Society of Neuroradiology, will discuss the "Multicenter Randomized Clinical Trial of Endovascular Treatment of Acute Ischemic Stroke in the Netherlands" (MRCLEAN) and follow-up results.

"The MRCLEAN trial is an example of how nationwide intensive

multidisciplinary collaboration may change clinical practice in a short time frame," Dr. Majoie said. "We demonstrated that IA [intra-arterial aneurysm] treatment of acute ischemic stroke using mechanical thrombectomy with retrievable stents significantly improves outcome in patients with proximal large vessel occlusions."

Dr. Majoie said that after the MRCLEAN research was published in the *New England Journal of Medicine*, the results were confirmed by four other trials in 2015.

The MRCLEAN group collaborates with six other acute ischemic stroke interventional trial groups — collectively known as the HERMES collaboration — pooling data that enables robust analyses of the subgroups. The HERMES collaboration is spearheaded by Mayank Goyal, MD, Calgary, Alberta.

"During teleconferences and face-to-face meetings at conferences like RSNA, we can share experience and knowledge to further improve personalized care for our patients," Dr. Majoie said.

Presenting research results on behalf of the Radiological Society of the Netherlands (NVvR) is a great honor, he said. "The Netherlands is a small country with excellent infrastructure to perform high quality research," Dr. Majoie said.

TURKEY PRESENTS

Turkey Looks to the Future of Radiology, Neuroradiology

Turkey Presents at RSNA 2016 will include the presentation, "The Meaning of Evolution for Radiology and Medicine" and "Advances in Neuroradiology."

Tamer Kaya, PhD, an interventional radiologist with Acibadem Healthcare Group, Turkey, and president of the Turkish Society of Radiology (TSR), said the topic was selected to draw attention to the practice of evolution in medicine and its advantages for medical education in an international platform offered by RSNA. "Evolutionary medicine is growing," he said. "As radiologists, nearly all of our practice is about three dimensional imaging of the body. Evolution shows us another dimension.

"Taking this topic into consideration at an international meeting will provide attendees with educational sessions and will make a huge contribution to medical practice," he said.

The neuroradiology session, "Hemodynamic Basics Governing Endovascular Treatment of Intracranial Aneurysms," will focus on underlying hemodynamic factors leading to aneurysm formation and the biochemical definition of endovascular aneurysm treatment.

Attendees from the Netherlands and Turkey will be recognized with badge ribbons during these special courses and attendees will be able to visit the countries' booths throughout the week to learn about the radiology communities in the Netherlands and Turkey.



Kaya

WEB EXTRAS

Access the full line-up of Country Presents sessions at Meeting.RSNA.org.

BIPHOTONICS

Pushes the Boundaries of Radiology

BY RICHARD DARGAN

Biophotonics — the development and application of optical techniques for the study of biological molecules, cells and tissue — is expanding the scope of radiology by bringing clinicians and researchers new tools for noninvasive imaging of cancer and other diseases.

While the x-rays and gamma rays commonly used in imaging represent high-energy light sources, biophotonics typically relies on sources at the lower end of the energy spectrum like infrared, near infrared, visible and ultraviolet light. This lower energy light helps preserve the biological cells examined even as the optical equipment visualizes structures too small to be seen with x-ray, CT and MRI.

“With biophotonics, we can image very small-scale physiology at high-speed resolution,” said Michael A. Choma, MD, PhD, principal investigator at the Yale Biophotonics Laboratory in New Haven, Conn., and assistant professor of radiology & biomedical imaging, pediatrics, biomedical engineering and applied physics at Yale University. “It’s highly complementary to MRI and CT and the technology continues to develop with advances in computing, light sources and cameras.”

While biophotonics is a highly interdisciplinary field encompassing medicine, biology, physics, engineering and technology, among others, it is moving radiology in exciting new directions, Dr. Choma said.

“Biophotonics is pushing the boundaries of what is meant by radiology,” he said.

Biophotonics Impacts Cancer Care

While optical techniques such as pulse oximetry and Lasik surgery are already well established in everyday practice, more and more applications for biophotonics are emerging in a variety of settings.

In cancer care, optical biopsy systems provide real-time detection of abnormal tissue. During conventional biopsies, the tissue sample is removed and sent to the lab, which can be a lengthy process. Optical biopsies allow the sample to be studied in the operating room, improving the



Choma



Gmitro

process and helping to avoid the sampling errors common to conventional methods.

“In conventional biopsy, we take the tissue to the microscope, but with optical biopsy, we’re taking the microscope to the tissue,” said Arthur F. Gmitro, PhD, professor and head of the Department of Biomedical Engineering and professor of medical imaging and optical sciences at the University of Arizona in Tucson.

For example, conventional biopsy of Barrett’s esophagus, a potential precursor to esophageal cancer, involves periodic four-quadrant biopsies. Even with as many as 20 samples removed, surgeons still may miss areas with abnormal cells.

“With optical biopsy, you scan across the tissue in real time and make a less invasive and potentially more accurate diagnosis,” Dr. Gmitro said.

Dr. Gmitro’s lab pioneered the development of the confocal microendoscope, an imaging system that joins a confocal microscope to a fiber optic imaging bundle with a lens and a focusing mechanism. The setup allows for remote use of the microscope outside of the surgical field. Fluorescent dyes can be delivered to tissue surface to label molecules and look for abnormalities.

“It’s basically an endoscopic use of a microscope,” Dr. Gmitro said. “Anywhere you can do an endoscopy — the colon, esophagus, bladder, ovary — you can use this type of system.”

Dr. Gmitro and colleagues recently used the imaging system to study ovarian cancer, an often deadly cancer that usually does not present until it is at an advanced stage. Evaluation of a laparoscopic system on patients showed a clear distinction between normal and abnormal regions within the ovarian surface, suggesting a role for early detection in patients with ovarian cancer risk factors like BRCA genes.

The researchers are also developing a system to help distinguish lung cancer from Valley fever, a fungal infection of the lung that is endemic to people who live in the arid climates of the American Southwest. Since Valley fever mimics lung cancer on CT, optical scanning could help spare patients from much more invasive conventional lung biopsies.

OCT Expands Beyond the Eye

Optical coherence tomography (OCT), a high-speed, cross-sectional microscopic imaging modality, is another well-established area of biophotonics. Like ultrasound, OCT operates on an echo-based paradigm except that in OCT the ultrasonic waves are replaced by light waves. OCT is commonly used in the eye to study the retina and diagnose glaucoma, macular degeneration and other conditions.

“OCT is now used for image-guided surgery in the retina and has potential importance for interventional and vascular radiology,” Dr. Choma said.

Dr. Choma used OCT to image ciliary physiology. Cilia are minute hair-like organelles that extend from cells on respiratory epithelial surfaces and beat rhythmically to move mucus out of the lungs. This mucus contains bacteria, viruses, allergens and pollution; as such, defects in flow can have significant health ramifications. The small size makes ciliary physiology difficult to image and quantify using conventional

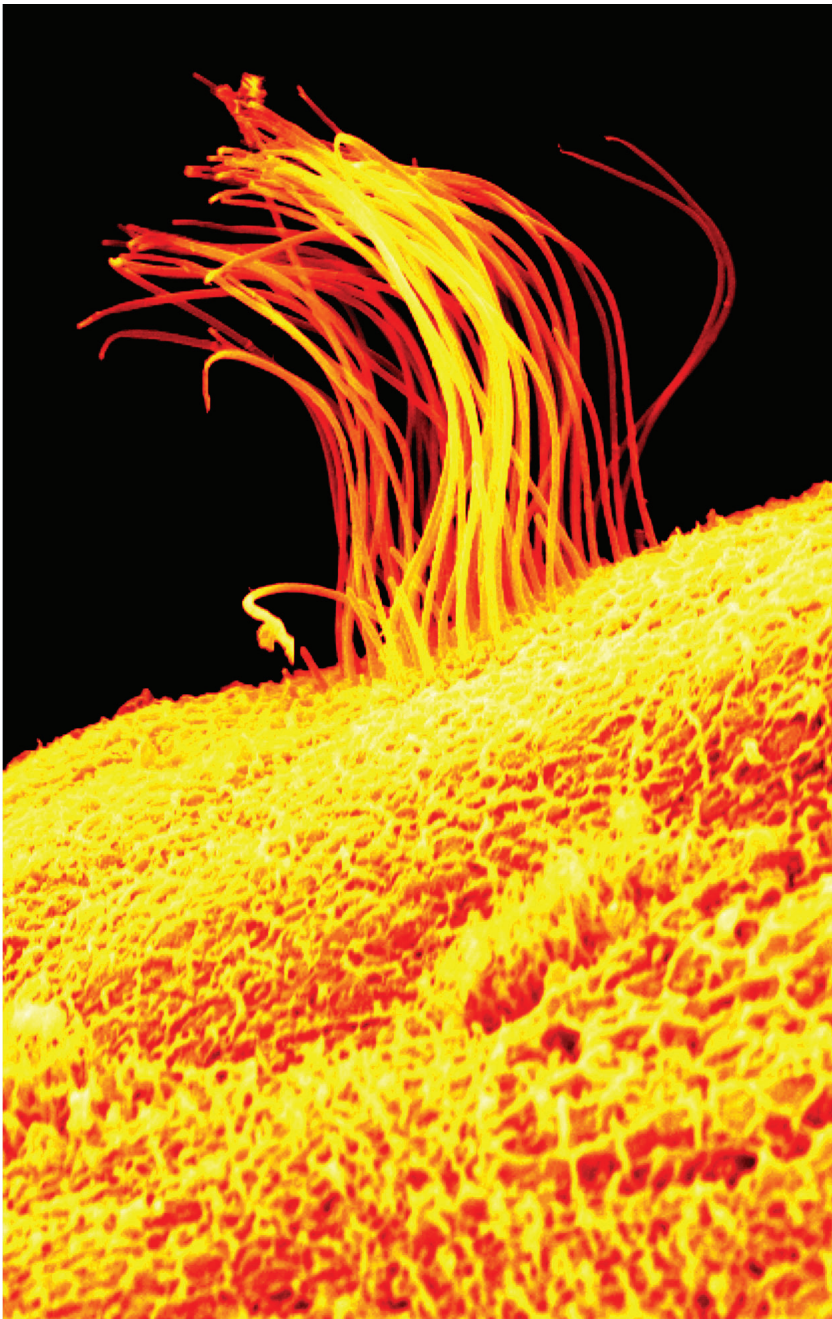
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☑ For more information on the Yale Biophotonics Laboratory, go to medicine.yale.edu/lab/choma/index.aspx

☑ To read the *RadioGraphics* July-August 2015 article, “Invited Commentary: The Rise of Microradiology,” go to pubs.rsna.org/doi/full/10.1148/rg.2015140311.

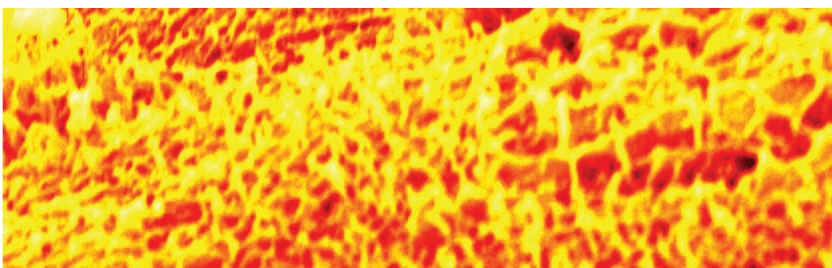
“Biophotonics is pushing the boundaries of what is meant by radiology.”

MICHAEL A. CHOMA, MD, PHD



On the cover and above: A scanning electron micrograph of a multi-ciliated cell. Advances in biophotonics are opening up new ways to image and study respiratory ciliary physiology, an important but incompletely understood aspect of diseases ranging from cystic fibrosis to primary ciliary dyskinesia to asthma.

(Biomedical Optics Express 2011;2,7:2022-2034) ©OSA 2011. Printed with permission.



radiologic modalities, but Dr. Choma has been able to study them with OCT.

“It started off as a curiosity five or six years ago and now with collaborators, we are looking at human specimens,” he said.

Recent research from Dr. Choma's lab and several others suggests that OCT has promise in better understanding and diagnosing lung disease ranging from asthma to cystic fibrosis to lung failure in the ICU. For example, “lungs require speed to image and the ability to look at microscale processes like air exchange in the alveoli,” Dr. Choma said. “We started our research with tadpoles, which have skin ciliated like human lungs, and we've developed better imaging systems and image processing software to improve the information we get from looking at specimens.”

Biophotonics also has potential applications in evaluating the effectiveness of radiation therapy by optically examining the treatment site.

“Some blue light is generated by radiation interacting with tissues,” Dr. Choma said, discussing the work of Brian W. Pogue, PhD, professor of engineering and science and adjunct professor of physics at Dartmouth College. “This tells you where the radiation actually went and if the treatment was able to match the plans.”

Biophotonics Pushes the Boundaries

Diffuse optical tomography (DOT) is another promising biophotonics approach that uses light in the near-infrared spectrum for imaging soft tissues like the breast and brain.

Other emerging possibilities for biophotonics include intravascular imaging, tumor margin assessment in the operating room, chemotherapy treatment response and image-guided cardiovascular interventions.

“Biophotonics is somewhat like magnetic resonance: a rich technology that can measure many different things,” Dr. Gmitro said. “There are a host of parameters, such as phase, polarization and fluorescence, that we can use to detect disease.”

“The possibilities are expanding as the people who develop the technology work with the people who use it to improve screening and treatment,” Dr. Choma added.

One Year After ICD-10: The Conversion Went Well, but More Changes are Coming

BY PAUL LATOUR

Much like the Y2K technology concerns that ultimately proved baseless, the conversion from ICD-9 to ICD-10 diagnostic coding systems arrived in October 2015 with little disruption to the lives of most radiologists and their billing partners.

“October 1 came, we took our pulses and we were all still alive, so that was good,” said Richard Duszak Jr., MD, professor and vice chair for Health Policy and Practice in the Department of Radiology and Imaging Services at Emory University School of Medicine (EUSM), Atlanta.

“But we all realized if we were going to see a disaster, it would be about 45 to 90 days after October 1. That’s when the checks start coming in for services provided,” Dr. Duszak added.

Yet as a whole, the disaster never arrived for radiology practices and departments. The smooth transition was due in large part to two previous deadline extensions that provided ample opportunity for healthcare providers and billing staffs to get ready.

After ICD-10 was adopted by the U.S. Department of Health and Human Services in January 2009, Congress delayed implementing the provision in 2013 and 2014 to give healthcare providers more time to transition to the new set of diagnostic procedures and codes.

“Overall it was a positive experience because of our institution’s preparation,” Dr. Duszak said. “What I don’t know is what would have happened if we had done nothing. I don’t know if it would have been a Y2K-like doomsday scenario, but it clearly would not have been as seamless as it ended up being for us.”

But now another deadline looms, creating another period of uncertainty among healthcare providers. On Oct. 1, 2016, unspecified codes — known as “bucket codes” — may no longer be automatically accepted. The Centers for Medicare and Medicaid Services (CMS) opted to delay

“Overall it was a positive experience because of our institution’s preparation.”

RICHARD DUSZAK JR., MD

enforcement of bucket codes as a way of helping practices adapt to the conversion.

“I don’t think referring physicians have seen the full impact of the ICD-10 conversion,” said Melody Mulaik, president and co-founder of Coding Strategies in Atlanta. “You’ve got a lot of specialties defaulting to unspecified codes right now.”

Getting Ahead of the Game

By the time the 2015 conversion deadline arrived, Dr. Duszak and his colleagues at Emory were more than prepared. Actually, they were prepared for the original deadline in 2013 and then again when it was pushed to 2014.

“When this finally came, we were like, ‘Let’s get this over with,’” Dr. Duszak said.

Their preparation included a push to educate all of Emory’s healthcare providers. Dr. Duszak set up informational intra-departmental meetings to explain the differences and to raise awareness among the staff about the upcoming change.

In addition, Margaret Fleming, MD, MSc, a former breast imaging fellow and now faculty member at EUSM, spearheaded a study published in the *Journal of the American College of Radiology (JACR)* that assessed the magnitude of the impact the conversion would have on radiology claims.

Dr. Fleming and her colleagues predicted the new system would cause a nearly six-fold increase in new codes for the radiology department. Overall, ICD-10 consists of nearly 70,000 diagnostic codes, compared with fewer than 15,000 under ICD-9.

The study showed musculoskeletal (MSK) would be the subspecialty impacted the most (28.8-fold code increase), while breast imaging would be the least (1.1-fold) impacted at Emory.

“Anything related to a fracture had a code explosion with ICD-10,” Dr. Fleming said.

With ICD-10, far greater specificity is necessary to describe a fracture’s precise location and status. For example, separate codes are used if a fracture is displaced or not displaced, and if it is on the right or left foot, among others.

“We were already dictating in our reports to the increased specificity that ICD-10 requires, so our job as radiologists is to continue being specific while we’re dictating,” Dr. Fleming said.

Since Oct. 1, 2015, Dr. Fleming has tracked the actual impact the conversion had at Emory through February 2016, and discovered it has actually been less than she estimated.

Instead of an overall six-fold increase, the department experienced more in the range of a one- or two-fold increase. Although MSK and breast imaging remained the outliers, the increase was only 3.3-fold for MSK and 0.5-fold for breast.

“Part of our overestimation was the way we had to look at it,” Dr. Fleming said. “We had to take some of the generic ICD-9 codes and then find all the potential ICD-10 codes. So the potential was huge, but for one particular study, only one or two codes will be used. We’re not using all the ICD-10 codes on every report.”

ICD-10



Dr. Fleming said she will continue tracking the numbers for a full year beyond the Oct. 1, 2015, implementation date so the before and after data will correspond.

Some Bumps Along the Way

The ICD-10 conversion wasn't completely without its problems for radiologists. For example, CMS hadn't incorporated specified codes indicating where a condition was located when using dual-energy x-ray absorptiometry (DEXA) into their National Coverage Determination Policy.

"Everybody was submitting detailed codes that they knew were correct, but the claims were being denied by the payers," Mulaik said. "Medicare had to update their national coverage policy on DEXA. It took them a while, but they got it done. It was a blip for radiology, but that's a small volume compared with all the other exams that are performed in imaging."

Mulaik said Medicare also recently updated its national coverage policy regarding mammography by removing many of the unspecified codes, an

ongoing process for all coding.

"What they did to update mammography is a precursor for how CMS will handle the phasing out of accepting all unspecified codes," Mulaik said. "We'll start seeing it on the local level, as well. We'll slowly see them all removing certain diagnosis codes and saying those are not covered."

The End of the Code Freeze

Oct. 1, 2016, also marks the day when the code freeze implemented by CMS ends. An additional 2,000 codes are expected to be added to ICD-10, resulting in what Mulaik called a "snowball effect."

"Every year there are updated codes and new ones added, but the CMS put a freeze on that for the past few years to ease the transition to ICD-10. So now we're getting the effect of three or four years of code updates at one time," Mulaik said.

While the changes may be burdensome to some extent for healthcare providers, Mulaik said in the long run moving to ICD-10 fits into other ongoing initiatives regarding medical payment reform, such as the merit-based incentive payment system (MIPs) and alternative payments models (APMs).

"People need to understand that ICD-10 is part of the fabric of all these other things that are going to be impacting us," Mulaik said. "A lot of the data for MIPs and APMs is going to be driven by clinical information and diagnosis codes."



Duszak



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Moving Toward an Improved Decision-making Model for Treating Full Thickness Rotator Cuff

Using his 2016 Hitachi Medical Systems/RSNA Research Seed Grant, **Derik L. Davis, MD**, assistant professor, Department of Diagnostic Radiology & Nuclear Medicine at the University of Maryland School of Medicine, will evaluate the association of intramuscular fatty infiltration (IFI), functional outcomes and re-tear rate following surgical repair of rotator cuff tears (RCTs).

“Differences in functional outcomes and re-tear rates following rotator cuff repair among patients with varying quantitative percentages of IFI is poorly understood,” Dr. Davis said. He will investigate whether quantitative measurement of pre-operative IFI and extramyocellular lipids will demonstrate

higher correlation to the American Shoulder and Elbow Surgeons score than the current standard—the qualitative Goutallier classification system—in older adults six months after surgical repair of full-thickness RCT.

“Exploring the relationship among post-operative shoulder function, re-tear rate and IFI may help foster improved algorithms for clinical decision making in older adults who present with RCTs,” Dr. Davis said.

“Successful completion of this research may provide clinical radiologists, orthopaedic surgeons and rehabilitation specialists with a new paradigm to improve treatment of rotator cuff tears over the current standard of care,” Dr. Davis said.



Derik L. Davis, MD

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Radiology in Public Focus

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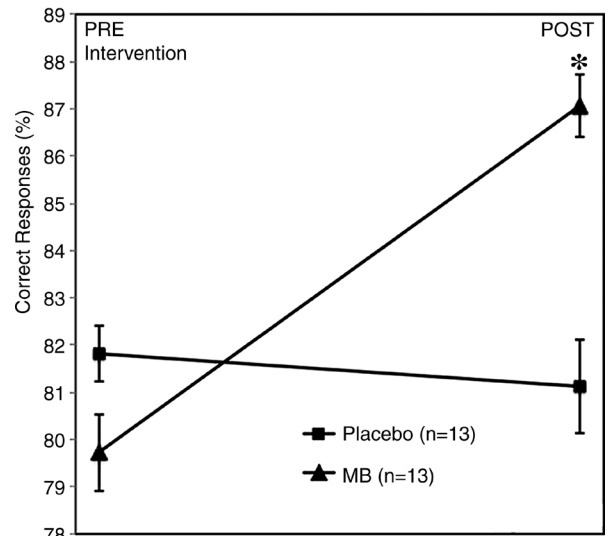
Methylene Blue Shows Promise for Improving Short-Term Memory

Low-dose methylene blue can increase functional MRI activity during sustained attention and short-term memory tasks and enhance memory retrieval, according to new research.

Pavel Rodriguez, MD, of the Research Imaging Institute in San Antonio, Texas, and colleagues studied 26 subjects to investigate the sustained-attention and memory-enhancing neural correlates of the oral administration of methylene blue in the healthy human brain.

The administration of methylene blue increased response in the bilateral insular cortex during a psychomotor vigilance task and functional MRI response during a short-term memory task involving the prefrontal, parietal and occipital cortex, according to results. Methylene blue was also associated with a 7 percent increase in correct responses during memory retrieval.

“The results support the notion that methylene blue enhances memory performance and functional MRI activity in brain regions associated with a visuospatial short-term memory task. This work provides a neuroimaging foundation to pursue clinical trials of methylene blue in patients undergoing healthy aging and those with cognitive impairment, dementia, or other conditions who may benefit from drug-induced memory enhancement,” the authors write.



Analysis of delayed match-to-sample task performance change (after intervention to before intervention) during the retrieval phase shows a significant increase in correct responses only in the methylene blue (MB) group (P = .01). Error bars = standard error of mean.

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CT Follow-up Sufficient for Some Lung Nodules

Awareness of the indolent course of cancers that manifest in non-solid nodules (NSNs) has been increasing, especially among those in which the NSN is solitary or dominant. New research adds support to findings showing that lung cancers that manifest as NSNs have an indolent course and can be managed with annual follow-up.

Rowena Yip, MPH, of the Icahn School of Medicine at Mount Sinai Medical Center in New York, and colleagues searched the National Lung Screening Trial (NLST) database to identify all participants with at least one NSN on CT scan with lung cancer as the cause of death documented by the NLST endpoint verification process.

Among the 26,722 NLST participants enrolled in the CT portion of the study, 2,534 (9.4 percent) had at least one NSN identified as a result of the screening. Among the 27 patients who died of lung cancer and had an NSN that manifested in the same lobe as the cancer, the cause of death was most likely because of another dominant solid or part-solid nodule.

“This report adds further support toward taking a conservative approach for annual follow-up for the management and treatment of NSNs, especially when they are solitary. Whereas some of these NSNs may become aggressive lung cancers over time, the changes in the nodule appearance can be documented with CT scans, which for now remains the best biomarker for cancer progression. The current evidence suggests they can be managed effectively by careful monitoring on an annual basis,” the authors write.

For Your Calendar

SEPT. 8-10
Interamerican College
of Radiology (CIR)
Lima, Peru
Visit the *RSNA Booth*
• WebCIR.org

SEPT. 13
RSNA Faculty Skills Update
Sheraton Chicago
O'Hare Airport Hotel
• [RSNA.org/
Faculty-Skills-Update](http://RSNA.org/Faculty-Skills-Update)

SEPT. 21-24
International Congress
of Radiology (ICR)
Buenos Aires, Argentina
Visit the *RSNA Booth*
• ICR2016.org

SEPT. 29-OCT. 1
Society of Chairs of Academic
Radiology Departments (SCARD)
Fall Meeting
Annapolis, Maryland
• SCARDweb.org

OCTOBER 14-17
Societe Francaise
de Radiologie (SFR)
Paris, France
Visit the *RSNA Booth*
• SFRnet.org

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

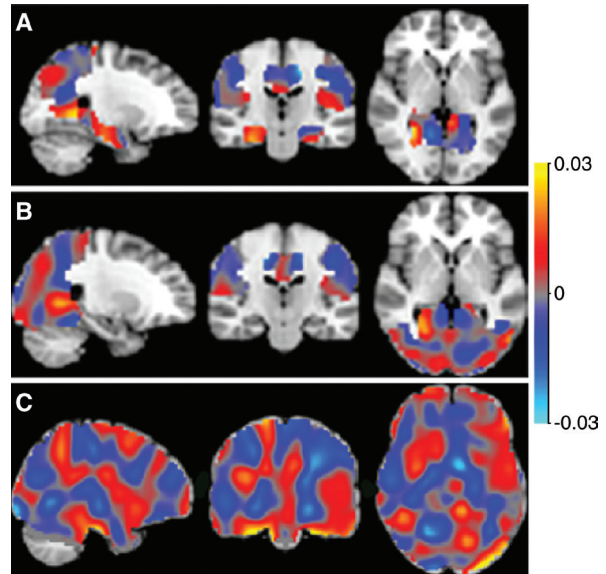
Artificial Intelligence May Aid in Alzheimer's Diagnosis

With automated methods, age- and sex-adjusted arterial spin labeling (ASL) perfusion maps can be used to classify and predict diagnosis of Alzheimer's disease (AD), conversion of mild cognitive impairment (MCI) diagnosis to AD, stable MCI, and subjective cognitive decline (SCD) with good to excellent accuracy and area under the receiver-operating characteristics curve (AUC) values, a new study shows.

Lyduine E. Collij, BSc, of VU University Medical Centre in Amsterdam, the Netherlands, and colleagues acquired pseudocontinuous 3.0-T ASL images in 100 patients with probable AD; 60 patients with MCI — of these, 12 remained stable, 12 were converted to a diagnosis of AD and 36 had no follow-up; 100 subjects with SCD; and 26 healthy control subjects. The AD, MCI and SCD groups were divided into a sex- and age-matched training set and an independent prediction set.

Single-subject diagnosis in the prediction set by using the discrimination maps yielded excellent performance for AD versus SCD, good performance for AD versus MCI, and poor performance for MCI versus SCD. Application of the AD versus SCD discrimination map for prediction of MCI subgroups resulted in good performance for patients with MCI diagnosis converted to AD versus subjects with SCD and fair performance for patients with MCI diagnosis converted to AD versus those with stable MCI.

"Our results support the way automated classification can facilitate and possibly improve diagnosis, specifically in centers without experienced (neuro) radiologists. In addition, automated classification may be applicable for screening purposes, considering the high prevalence of AD," the authors write.

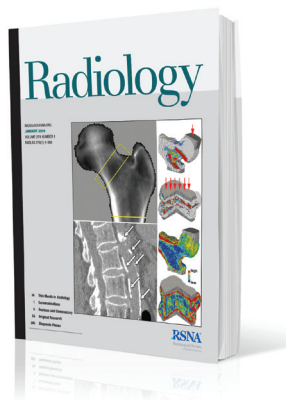


Discrimination maps for training analysis with the main diagnostic groups. A, for AD versus SCD: In the parietal lobe and hippocampus, AUC was 0.93, and accuracy was 89.0 percent. B, for AD versus MCI: In the parietal and occipital lobe, AUC was 0.88 and accuracy was 83.8 percent. C, for MCI versus SCD: In the whole brain, AUC was 0.49 and accuracy was 57.5 percent. MNI coordinates are as follows: $x = 26, y = 220, z = 0$. (*Radiology* 2016;281;3;InPress) ©RSNA 2016. All rights reserved. Printed with permission.

Media Coverage of RSNA

In May, 344 RSNA-related news stories were tracked in the media. These stories reached an estimated 122 million people.

Coverage included Yahoo! Finance, *CNBC.com*, WNBC-TV (New York), KNBC-TV (Los Angeles), WMAQ-TV (Chicago), WCAU-TV (Philadelphia), *Philly.com*, *International Business Times*, *Health.com*, *Radiology Today*, *BioSpace.com*, *MedicineNet.com* and *The Palm Beach Post*.



New "Your Radiologist Explains" Video

Visit RadiologyInfo.org, the public information website produced by the RSNA and ACR, to view the newest "Your Radiologist Explains" video, Pediatric Ultrasound.

September Public Information Outreach Activities Focus on Ovarian and Prostate Cancers

In recognition of Ovarian Cancer and Prostate Cancer Awareness Month in September, RSNA is distributing public service announcements (PSAs) focusing on risk factors, screening methods and possible treatment options for ovarian and prostate cancers.

The RSNA "60-Second Checkup" audio program, distributed to more than 60 radio stations across the U.S., will also focus on the symptoms, risk factors and screening methods for prostate cancer.

Journal Highlights

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

Management of Uterine Fibroids: A Focus on Uterine-sparing Interventional Techniques

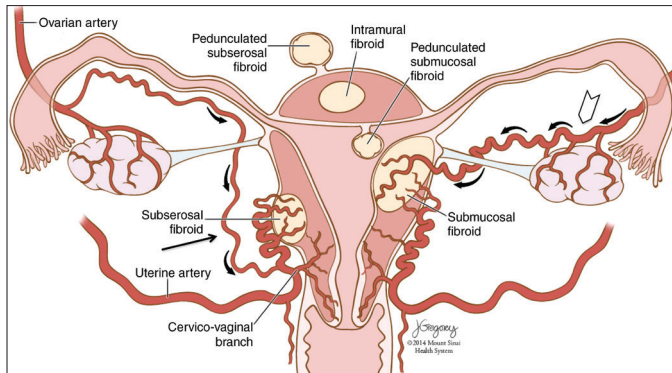


Illustration of fibroid location classification. A type I utero-ovarian anastomosis is depicted on the left of the figure (*straight arrow*) with flow from the ovarian artery toward the uterus in the tubo-ovarian segment feeding into the intramural portion of the uterine artery (*curved arrowheads indicate direction of blood flow*). A type II utero-ovarian anastomosis is depicted on the right of the figure (*open arrowhead*) with at least partial direct supply of the fibroid by the ovarian artery without prior connection to the uterine artery. Note that less common extrauterine locations, such as cervical or broad ligament fibroids, are not included (the incidences of which have not been well studied).

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Various techniques are available and are being investigated for the treatment of symptomatic fibroids, which occur in approximately 50 percent of women over the age of 40 years. An estimated 50 percent of those are symptomatic.

In an article in the September issue of *Radiology* (RSNA.org/Radiology), James E. Silberzweig, MD, of Mount Sinai Beth Israel in New York, and colleagues discuss the nature of fibroids and their diagnosis, pharmacotherapy, surgical treatment and nonsurgical interventional treatment, including uterine artery embolization (UAE) and MR-guided focused ultrasound (FUS).

Radiology

Treatment approach in many cases depends on the likelihood of success given the nature, size and distribution of the fibroids, the patient's anatomy and treatment goals.

"UAE is a highly effective, safe and cost-effective approach. While there is risk of failure requiring re-intervention, patient satisfaction may be higher and major morbidity lower compared with surgical techniques. In select patients, MR-guided FUS is proving to be an even safer approach, with an extremely short recovery period and low morbidity," the authors write.

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

PI-RADS Version 2: A Pictorial Update

The revised Prostate Imaging Reporting and Data System (PI-RADS) version 2 introduces important changes to the original system used for assessing the level of suspicion for clinically significant cancer with multiparametric MRI.

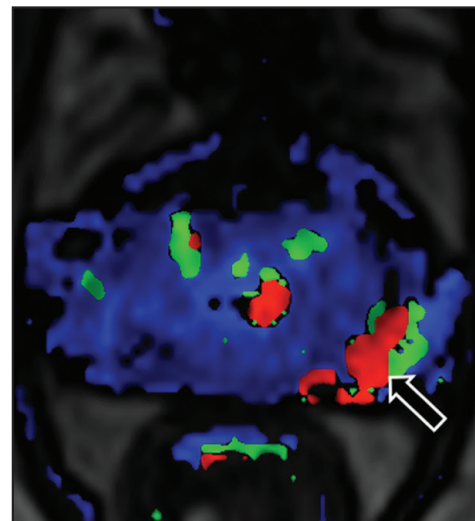
In an article in the September-October issue of *RadioGraphics* (RSNA.org/RadioGraphics), Andrei S. Purysko, MD, of the Imaging Institute, Cleveland Clinic, Ohio, and colleagues provide a pictorial overview of the revised PI-RADS

version 2 assessment categories for the likelihood of clinically significant cancer.

The critical components of the new PI-RADS version 2 are a standardized lexicon facilitating consistent use of a uniform terminology for describing imaging findings, revised systems for scoring the level of suspicion with individual MR pulse sequences, and development of a standardized scheme for deriving an overall assessment category that is based on the scores assigned to the findings from pulse sequences.

"PI-RADS version 2 is expected to evolve with time, with updated versions being released as experience in the use of PI-RADS version 2 increases and as new scientific evidence and technologies emerge," the authors write.

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



Prostate cancer (Gleason score, 3 + 4) detected at systematic transrectal ultrasound-guided biopsy in a 72-year-old man. He was referred for multiparametric MRI for staging. Color-coded parametric map shows that the lesion (arrow) has red areas, which represent rapid wash-in and wash-out of contrast material, and green areas, which represent rapid wash-in followed by persistent contrast enhancement or "plateau." The blue areas represent tissue with normal progressive enhancement.

(*RadioGraphics* 2016;36;InPress) ©RSNA 2016 All rights reserved.



Radiology EXTRA PODCASTS

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

- “Quantitative Analysis of Prostate Multiparametric MR Images for Detection of Aggressive Prostate Cancer in the Peripheral Zone: A Multiple Imager Study,” Au Hoang Dinh, MD, and colleagues.
- “Prostate Cancer: PI-RADS Version 2 Helps Preoperatively Predict Clinically Significant Cancers,” Sung Yoon Park, MD, PhD, and colleagues.
- “Radiogenomic Analysis Demonstrates Associations between ¹⁸F-Fluoro-2-Deoxyglucose PET, Prognosis, and Epithelial-Mesenchymal Transition in Non-Small Cell Lung Cancer,” Shota Yamamoto, MD, and colleagues.

Technology Forum

IHE World Summit Underscores Need for Interoperable Solutions

The Integrating the Healthcare Enterprise (IHE®) International’s second World Summit drew more than 100 attendees to the event held June 7-8 in Amsterdam, the Netherlands.

IHE International comprises more than 175 member organizations from around the world — including RSNA — committed to improving the interoperability of healthcare information systems.

Along with an overview of IHE, topics at this year’s summit included health information exchanges (HIEs), worldwide interoperability, natural language processing, conformity assessment (interoperability testing and validation), personal medicine and health level 7 (HL7) fast healthcare interoperability resources (FHIR).

IHE International co-chair David S. Mendelson, MD, vice chair of radiology IT at Mount Sinai Health System, professor of radiology at Icahn School of Medicine at Mount Sinai, New York, and a member of RSNA’s Radiology Informatics Committee and chair of the Society’s IHE Subcommittee, answered a few questions about the summit.



Mendelson



The IHE World Summit in Amsterdam, the Netherlands.

Q: What was your overall impression of this year’s event?

A: This year’s summit featured increased attendance. There was a good exchange of ideas through the academic conference and accompanying social event. The need for interoperable solutions is recognized worldwide.

Q: What were some of the key takeaway messages from the summit?

A: Interoperability — transparent but secure — is cardinal to the delivery of the highest quality of care to our patients. Interoperability is dependent upon standards

and testing. There is a rapid growth of exciting new technologies, and as we adopt these, we must ensure that the basic principles of security, confidentiality and interoperability are recognized.

Q: What is the role of radiology and radiologists in interoperability and technological advancement?

A: Radiology has been a leader in recognizing that adopting and observing standards leads to the efficient and robust delivery of healthcare services. An infrastructure supporting interoperability is cardinal to delivering the high level of services and information critical to radiology. We are seeing a growing recognition of the need for standards adoption and interoperable solutions by radiologists and vendors. Patients recognize these benefits when they need to move their radiological exams and results from one setting to another.

Annual Meeting Watch

News about RSNA 2016

Advance Registration and Housing is Now Open

Register online at RSNA.org/Register.

Registration Fees - On or Before Nov. 4 - fees increase \$150 after Nov. 4 for most categories

ANNUAL + VIRTUAL MEETING PACKAGE *	ANNUAL MEETING ONLY	VIRTUAL MEETING ONLY	
\$100	Free	\$100	RSNA/AAPM Member
\$25	Free	\$25	RSNA Member-in-Training, RSNA Student Member
\$300	Free	\$300	Non-Member Student
\$500	\$200	\$300	Non-Member Resident/Trainee
\$500	\$200	\$300	Radiology Support Personnel
\$1200	\$900	\$300	Non-Member Physician/Physicist
\$1200	\$900	\$300	Hospital or Facility Executive and Industry Personnel
\$625	\$325	\$300	One-day Technical Exhibits Only

*Register for the RSNA Annual + Virtual Meeting Package and get access to both the physical meeting at McCormick Place and the Virtual Meeting. This package gives you the maximum flexibility by providing access to selected live-streamed and on-demand sessions, scientific presentations, education exhibits and Cases of the Day. The meeting is available on demand until Dec. 23 at 4 p.m. CT.

For more information about registering for RSNA 2016, visit RSNA.org/Register, email reginfo@rsna.org, or call 1-800-381-6660 or 1-630-571-2670 x7862.

RSNA® 2016

Important Dates for RSNA 2016

- Oct. 1 Deadline for Badge Mailing*
- Nov. 4 Final Discounted Registration Fee and Housing Deadline at 5 p.m. Central Time (CT)
- Nov. 5 Increased Registration Fee Applied, \$150 for most categories
- Nov. 27 102nd Scientific Assembly & - Dec 2 Annual Meeting
- Dec 23 Virtual Meeting closes

*** NEW FOR 2016** Badge materials will be mailed to all professional attendees registered by Oct. 1. For registrations processed after Oct. 1, badges will be available for pickup at McCormick Place

Plan your RSNA 2016 Experience

When you plan your trip to Chicago, add Bistro RSNA to your registration and sign up for RSNA tours and events. Bistro RSNA offers an extensive gourmet menu and ample seating in a convenient location that allows attendees to sit down to a comfortable lunch and network with colleagues during RSNA 2016. Tickets are available in advance for just \$22 per day. RSNA has teamed up with Hosts Chicago, a Hosts Global Alliance member, and Bloomingdale's, to offer attendees an exciting Chicago experience during RSNA 2016. Enjoy the sounds of music, view architectural wonders, explore unique neighborhoods and more. Learn more at bistroticket.com/RSNA and RSNA.org/Tours-and-Events.



Virtual Meeting Expands for RSNA 2016

Register for the RSNA 2016 Virtual Meeting, now featuring 25 percent more content, extended access, CME credit for live sessions — plus select CME-eligible courses on demand. Select Virtual Meeting on-demand courses qualify for CME credit upon completion of a test and course evaluation. All live-viewed Virtual Meeting courses qualify for CME with a completed evaluation. Enjoy all this content plus Cases of the Day, scientific presentations and education exhibits.

Visit RSNA.org/Virtual for more information.

Virtual
RSNA® 2016



Meeting Central is Your Source for RSNA 2016

Manage your RSNA 2016 experience as you discover programming options, add courses to your agenda and plan which exhibitors to visit. Meeting Central, at Meeting.RSNA.org, lets you organize your activities in advance so you arrive ready to make the most of your RSNA 2016 visit.

RSNA R&E Foundation 5k Fun Run



6:30 a.m., Tuesday, Nov. 29
Arvey Field, South Grant Park,
Chicago



Join the RSNA 2016 5k Fun Run and support radiology research and education with proceeds benefiting the RSNA Research & Education (R&E) Foundation. Whether you run, jog or walk, enjoy an outing for a good cause and network with your colleagues along Chicago's beautiful Lake Michigan shoreline.

Your fully tax-deductible donation benefits the RSNA R&E Foundation. Participants receive a commemorative T-shirt, while supplies last. Sign up during meeting registration at RSNA.org/Register.

Please note, in case of inclement weather, the Fun Run may be canceled. All Fun Run fees are non-refundable and non-transferable.

Save Up to 10 Percent through Exclusive Airfare Discounts

Delta Airlines: Delta offers special discounts off most fares. Applicable restrictions may apply. Discounts are applicable to passengers originating in the U.S. or Canada. Book online at delta.com and enter Meeting Event Code NMNG3 or call 1-800-328-1111. Service fee applies for phone reservations.

United Airlines: United offers discounts from 2 to 10 percent off applicable fares. Discounts apply on United Airlines and flights operated by United or other airlines branded United Express. International discounts are allowed on flights operated and/or marketed on the following carriers provided such flights are booked by a travel agency or United Reservations. Flights via the Atlantic: Air Canada, Austrian Airlines, Tyrolean Airways, Brussels Airlines, Lufthansa Airlines, Swiss International Airlines. Flights via the Pacific: United codeshare flights operated by All Nippon Airways. Applicable terms and restrictions apply. Book online at united.com, enter offer code ZVQ6520692, or call United at 1-800-426-1122 and provide the offer code. Service fee applies for phone reservations.

Reserve Early For Best Choice of Hotels

Discounted rates and flexible terms negotiated by RSNA make it easy to reserve a hotel room for RSNA 2016. Choose from 90 hotels with rates starting as low as \$42 per bed at hostels to luxury 5-star/Diamond hotels. Visit Meeting.RSNA.org to review a list of hotels and room rates. Better yet, register and make your hotel reservation online today at RSNA.org/Register, or call toll-free 1-800-650-7018 or 1-847-996-5862.



Change in Policy for Visa Waiver Program

As of April 1, 2016, travelers using the Visa Waiver Program (VWP) must have an e-Passport, which includes an embedded electronic chip. An e-Passport has a unique symbol on the cover (See right).

Additionally, international travelers should be aware of a change in policy regarding the VWP. Travelers in the categories below are no longer eligible to travel or be admitted to the United States under the VWP.

- Nationals of VWP countries who have traveled to or been present in Iran, Iraq, Libya, Somalia, Sudan, Syria or Yemen on or after March 1, 2011.
- Nationals of VWP countries who are also nationals of Iran, Iraq, Libya, Somalia, Sudan, Syria, or Yemen.

e-Passport
symbol



These individuals will still be able to apply for a visa using the regular appointment process at a U.S. Embassy or Consulate. For more information, go to cbp.gov/travel/international-visitors/visa-waiver-program.

Education and Funding Opportunities

Demonstrate Leadership Skills by Earning an ARLM Certificate of Achievement

Earn an Academy of Radiology Leadership and Management (ARLM) Certificate of Achievement to demonstrate dedication to gaining professional leadership skills. Create a free account at RadLeaders.org to get started.

To claim the certificate, participants must complete at least 50 educational credits in ARLM-approved courses, both online and in-person; at least 30 credits must come from in-person courses. A minimum of three credits in each of the core learning domains is required. A maximum of 20 credits offered by organizations other than one of the five major sponsors can be applied toward the certificate.

Check for eligible courses in the online course catalog at RadLeaders.org. Each course meets one or more of the elements of identified key learning domains and represents an integral part of a well-rounded leadership curriculum. New courses are added throughout the year.



Upcoming Fall 2016 In-person Meetings with ARLM-approved Courses

**Society of Chairs of Academic Radiology
Departments (SCARD) 2016 Fall Meeting**
Sept. 29 – Oct. 1
Westin Annapolis
Annapolis, Maryland

RSNA 2016 Annual Meeting
Nov. 27 – Dec. 2
McCormick Place
Chicago



NIH Grantsmanship and Study Section Reviewers Workshops

Nov. 26, 1–5 p.m.
McCormick Place
Chicago

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.

Workshop attendees must be registered for the RSNA annual meeting. Add the workshop to My Agenda at Meeting.RSNA.org.

More information is available at RSNA.org/ResearchCourses.

Writing a Competitive Grant Workshop

March 10–11, 2017
RSNA Headquarters
Oak Brook

Registration is open for the Writing a Competitive

Grant Proposal workshop designed for researchers in radiology, radiation oncology, nuclear medicine and related sciences who are interested in actively pursuing federal funding.

Guided by a faculty of leading researchers

with extensive experience in all aspects of grant applications and funding, the program will focus on developing specific aims to be included in a grant application.

Participants will be provided tools for getting started in the grant writing process and developing realistic expectations. Faculty includes Udo Hoffmann, MD, MPH, of Massachusetts General Hospital in Boston; Ruth Carlos, MD, of the

Questions about these programs can be directed to dor@RSNA.org or Rachel Nelson at 1-630-368-3742.

University of Michigan Health System in Ann Arbor; Martin Pomper, MD, PhD, of Johns Hopkins School of Medicine in Baltimore; Antonio Sastre, PhD, of the National Institute of Biomedical Imaging and Bioengineering, and David Shuster, MD, of Emory University in Atlanta.

The course fee is \$225. Register online at RSNA.org/CGP.

Test Skills and Earn CME through Radiology's Diagnosis Please

Hone your diagnostic skills and earn CME when you participate in Diagnosis Please, the competitive Radiology case diagnosis activity. Check out the new user interface and improved mobile optimization at RSNA.org/Radiology.

Participating is simple:

- Read the article/case published in Radiology.
- Submit your most likely diagnosis.
- View correct diagnoses for past cases in future issues and on the website.

Demonstrate your skills:

- Recognize normal and abnormal structures.
- Identify indicated pathologic conditions.
- Use clinical reasoning skills to generate potential diagnoses.

Radiology
Diagnosis Please



Access Diagnosis Please through your tablet, mobile phone or computer.

Eligible participants who submit a correct diagnosis receive 1.0 AMA PRA Category 1 Credit™ for this journal-based CME activity.

Residents & Fellows Corner

RSNA News to be Delivered Digitally Starting in January

In response to the general reading and mailing preferences of RSNA members-in-training, beginning in January 2017 *RSNA News* will be distributed to training members digitally via the monthly RSNA Insider email and can be accessed anytime from *RSNA News* Digital First postings and RSNA.org/News. This change also supports the Society's ongoing efforts to be environmentally conscientious. Training members who want to receive the print version of *RSNA News* can "opt in" at any time to continue or begin receiving the monthly magazine in their postal mail.

To opt in to the print magazine, call 1-630-571-7873 or 877-776-2636 (toll free in the U.S.), or email membership@rsna.org and supply your eight-digit membership number from the mailing label on *RSNA News*.

As a benefit of membership, RSNA members — other than training members — automatically receive *RSNA News* in print unless they opt out. If you wish to "opt out" of the print mailing and receive digital *RSNA News* through the monthly RSNA Insider email, *RSNA News* Digital First postings and from RSNA.org/News:

1. Go to RSNA.org/membership
2. From the left navigation column click "My Account"
3. Log in with your username and password
4. From the Account Tools table click "Print Journal Opt-Out"
5. Select "Opt Out" to *RSNA News*

Contact membership@rsna.org with questions.

**COMING
NEXT
MONTH**

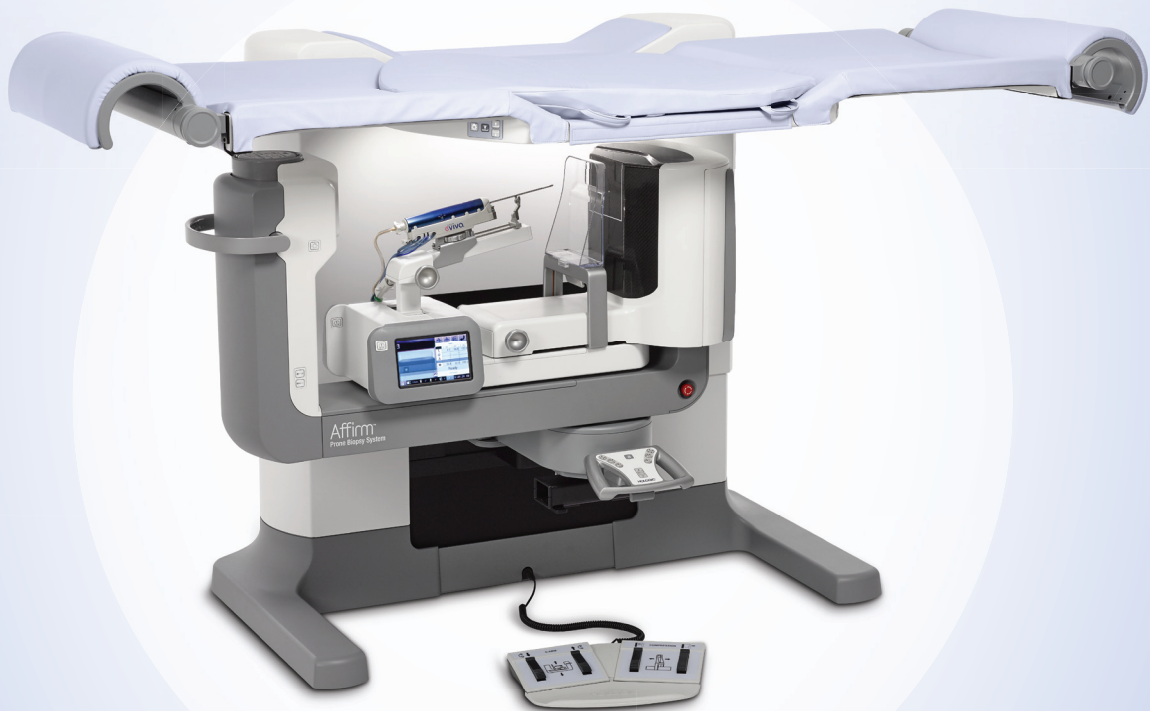
Want to know how Diagnosis Live™ became a staple at RSNA annual meetings? A full report on RSNA's innovative audience response system is just one highlight of our October/November Meeting Preview issue spotlighting all things RSNA 2016.

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