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Follow us for exclusive news, annual meeting offers and more!
The RSNA Board of Directors has announced the distinguished award recipients to whom the Society will pay tribute at the 100th Scientific Assembly and Annual Meeting. They are:

- **GOLD MEDALISTS**
  - Gary J. Becker, M.D., Tufts, Ariz.
  - Erta D. Pisano, M.D. Ph.D., Charlotte, N.C.

- **HONORARY MEMBERS**
  - Zheng Yu Jin, M.D., Beijing
  - Markus Schweiger, M.D., Munich, Germany
  - Kaori Togashi, M.D., Ph.D., Kyoto, Japan

RSNA 2014 DISTINGUISHED HONOREES

During this year as RSNA celebrates its 100th Scientific Assembly and Annual Meeting, RSNA News will take a look back at milestones in the Society's history.

### RSNA 2014 CENTENNIAL SNAPSHOTs

- 1933: Annual Meeting Held in Palmer House for First Time
- 1972: Interventional Radiology Emerges in Radiology
- 1981: Radiographics Established
- 1995: 100th Anniversary of X-ray Discovery
- 2005: R&E Foundation 25th Anniversary Campaign Launched
- 2008: Focus on Structured Reporting Begins

### IN MEMORIAM

R. Brian Holmes, M.D.

Dr. R. Brian Holmes, M.D., was a pioneer in radiology who made significant contributions to the field. He helped establish medical schools in the United Arab Emirates and Oman. In addition to serving as RSNA president in 1976, Dr. Holmes led other organizations including the Association of Canadian Medical Colleges and the Canadian Association of Radiologists. He was the founding chair of the Council for Accreditation of Canadian Medical Colleges and the first Canadian voting member of its American counterpart. He was awarded gold medals from RSNA and the American College of Radiology (ACR) and received the Centennial Medal of the Canadian Association of Radiology.
RSNA Board of Directors Report

At meetings in January and March, the RSNA Board of Directors appointed volunteers to represent RSNA in various capacities and continued planning for RSNA 2014.

Strategic Plan
At the Board’s retreat in January, a refreshed Strategic Plan for 2014-2019 was approved. The new plan can be found at RSNA.org/RSNA_Strategic_Plan.aspx. A focus of the retreat was the topic of education, and discussion centered on a vision evolved as a leading source of radiology education that includes resources for an organized, mentored educational offering, a wider variety of education offerings, new audiences, alternative content delivery models, and new uses of technology.

RSNA Diagnosis Live™
Further development of RSNA Diagnosis Live and plans to expand its use are progressing, and it will be made available to radiology residency programs in July. RSNA Diagnosis Live is RSNA’s interactive learning tool which gives participants an opportunity to “play along” by answering questions using their portable, mobile wireless devices. For information, interested participants should contact Beth Locker at blockett@rsna.org.

Additional use cases are being implemented to expand utilization of RSNA Diagnosis Live for education programs by RSNA during the Annual Meeting and throughout the year.

Volunteers Represent, Support RSNA
The Board appointed volunteers to represent RSNA in groups including the American Medical Association Physician Consortium for Performance Improvement, American College of Radiology-RSNA Joint Task Force on Adult Radiation Protection and the planning committee of the 2015 American Society of Clinical Oncology Genitourinary Cancer Symposium.

Appointments were also made for the RSNA’s Education Exhibits Awards Committee and Scientific Program Committee.

The Board reviewed the composition and charge of each committee and established some targets for the appropriate inclusion of members-in-training and corresponding members in the committee appointments process for the coming year.

Radiology’s Perspective Provided
RSNA submitted comments to The Joint Commission on its proposed requirements that address the qualifications and competency for radiologists who provide diagnostic computed tomography (CT) services while RSNA Board Chairman Richard L. Baron, M.D., provided consultation to the International Atomic Energy Agency at a meeting focusing on the future of diagnostic imaging, held May 5–9 in Vienna.

International Relationships Highlighted in Programs, Collaborations
RSNA will co-sponsor the 2014 World Molecular Imaging Congress, to be held Sept. 17-20 in Seoul, Korea, and will present an RSNA educational showcase at Journées Françaises de Radiologie 2014, Oct. 17-20 in Paris.

A Regional Committee: Middle East/Africa was established, joining the Regional Committees for Latin America, Asia/Oceania and Europe in facilitating participation in RSNA activities and in coordinating outreach in the respective regions.

RSNA will provide financial support for three scholarships in 2014 for the Latin American School of Radiology, as well as RSNA membership for any non-member recipients.

The Board also has authorized an increase in the maximum number of visits through the International Visiting Professor (IVP) program from four to five annually. Learn more about the IVP program at: RSNA.org/IVP.

Bylaw Amendment
An Amendment to the RSNA Bylaws will be proposed to clarify the provisions governing the filling of a vacancy on the Board of Directors. The amendment, which will be published in the October issue of Radiology, will clarify the process and ensure that the office of Chairman of the Board is filled by a tenured member of the Board with a minimum of disruption.

RSNA 2014 Just Around the Corner
Plans continue for RSNA 2014, with the Board exploring ways to expand the Virtual Meeting. Also to be included in this year’s program is a mock trial on the topic of incidentalomas and failure to diagnose. Go to RSNA.org/Annual_Meeting.aspx for the latest on this year’s annual meeting, including events to celebrate the RSNA Centennial.

Richard L. Baron, M.D.
Chairman, 2014 RSNA Board of Directors

My Turn
Our History Makes Medicine’s Headlines

“The future ain’t what it used to be.”

The legendary baseball player and manager Yogi Berra, in his characteristic way of turning a phrase, nailed it. As we get ready to celebrate the 100th anniversary of RSNA, the only thing we can predict about the next hundred years is that everything will change. The historic medical advances in the past century are in many ways the story of radiology. And our future, in that regard, looks to be no different.

Whenever surgeons are conducting ask people to rank the medical advances they think have changed the world, the discovery of the X-ray and CT/MRI imaging are usually near the top of the list. It’s no surprise that the evolution of “modern medicine” is closely linked to improvements in diagnosis, with imaging playing a starring role at many key turning points.

The term “diagnostic imaging” was coined to distinguish what we do from laboratory medicine—but that has changed, because now we’re imaging molecules. The sensitivity of testing for serum biomarkers has increased by orders of magnitude. As we enter the era of “precision medicine,” in which therapies are tailored to individuals, radiology continues to remain vital—by adding “radiomics” and “theranostics” to the noninvasive, nondestructive armamentarium of advanced medical instruments.

And while we are in hearty times indeed, the accomplishments of the pioneers of the past cannot be understated. Their iconic names and faces should not, as old film radiographs, be stored away in dusty warehouses, whose only lasting value is their silver content. To paraphrase U.S. President John F. Kennedy, things didn’t just happen; we are here and we are today as the result of men and women who dared to ask “why not?” and made things happen.

So, on the eve of RSNA’s centennial, we pause to reflect on an illustrious hundred years and, as Kennedy so aptly put it, “celebrate the past to awaken the future.”

THIS MONTH IN THE RSNA NEWS TABLET

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

As part of this month’s story on concision research, we feature a podcast with Michael L. Lipton, M.D., Ph.D., discussing his Radiology research and a video interview with Pilar Díez-Suarez, M.D., discussing her RSNA 2013 research on attention deficit hyperactivity disorder.


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.

Please visit our 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.
Preserving, Celebrating Radiology’s Revolutionary Road

BY RICHARD S. DARGAN

The fascinating, often unpredictable history of radiology holds important lessons for today’s radiologists, according to a number of experts who are working to preserve and celebrate the story of the profession.

“Understanding the history of radiology puts our work in context, helps us to avoid cynicism and gives us a sense of meaning,” said Adrian M. Thomas, M.D., F.R.C.R., co-author of the 2013 book, “The History of Radiology” and a radiologist at Birmingham Heartlands Hospital, U.K., and chairman of the British Society For The History of Radiology. In 2011, Drs. Thomas and Banerjee helped found the International Society for the History of Radiology (ISHRAD), the first international society dedicated to the history of radiology and radiologic technology. The organization recently held its annual meeting in Vienna, where members outlined an agenda for the coming year that includes developing a book celebrating the International Day of Radiology (IDoR); the first anniversary of ISHRAID; and a military radiology symposium.

For Dr. Thomas, the motivation to preserve history stems from what he calls “an awareness of the centrality of radiology to the patient pathway.” He was in medical school the year CT was announced, and he trained in radiology at Hammersmith Hospital in London during the early days of the institution’s groundbreaking MR imaging work.

“I have seen a complete transformation in patient care during my career,” he said. “The younger generation is not aware of how much things have transformed.”

Edison Jump Starts Radiology

Indeed, a look back at radiology history reveals a remarkable number of advances over a relatively short amount of time. In the year after Wilhelm Conrad Roentgen’s 1895 discovery of the X-ray, several books and more than 1,000 papers relating to the X-ray were published. The medical possibilities of the technology were quickly apparent, although the 95-minute exposure times of early radiographs made fluoroscopy a more viable option—something the renowned inventor Thomas Edison recognized.

“Edison was the person who really jumped started radiology,” said Ronald L. Eisenberg, M.D., J.D., a professor of radiology at Harvard Medical School and the Western Roentgen Society.

The early ranks of radiologists were made up of surgical interns who had grudgingly agreed to use X-rays. “Williams Rollins is one of the people who was very important to the history of radiology, but has largely been forgotten,” Dr. Eisenberg said.

Madame Curie Pedals Her Way into History

With Rollins and others focused on improving the safety of X-ray examinations, the technology spread quickly. Soldiers in the Boer War (1899-1902) in South Africa pedalled stationary bicycles to generate electricity to run the X-ray machines. During World War I, Marie Curie developed and equipped 18 X-ray cars, known as “little Curies,” with engines that supplied the current for the X-ray apparatus.

“Madame Curie was better known for developing the radiological car as a mobile X-ray unit than she was for the discovery of radium,” Dr. Eisenberg said.

As early as the 1940s, radiology’s technological advances were making it easier to use X-rays. Some scientists blamed electrical cur- rents from the machines, but the experiments of a dentist named William Herbert Rollins proved that X-rays were the culprit. “Williams Rollins is one of the people who was very important to the history of radiology, but has largely been forgotten,” Dr. Eisenberg said.

Madame Curie was more than just a scientist; she was for the discovery of radium,” Dr. Eisenberg said.

The remarkable, revolutionary history of radiology began in 1895 when Wilhelm Roentgen discovered X-rays. Above: (1) The Roentgen X-ray Laboratory of Mihir Kassabian (1901) at the Medical-Surgical College Hospital in Philadelphia; (2) X-ray bicycles served as mobile X-ray units; (3) early hand-held fluoroscope; (4) a radiograph of the hand of British Prime Minister, Lord Salisbury (made by Campbell-Swinton in 1896); (5) Roentgen; (6) Thomas Edison’s display of the fluoroscope at the Electrical Exhibition in New York City in 1896 drew large crowds.

Alongside the breathtaking promise, dangers emerged. Edison’s chief assistant, Clarence Dally, died from disease brought on by repeated exposure to radiation. Some scientists blamed electrical currents from the machines, but the experiments of a dentist named William Herbert Rollins proved that X-rays were the culprit. “Williams Rollins is one of the people who was very important to the history of radiology, but has largely been forgotten,” Dr. Eisenberg said.

Technology played a major role in the progression of radiology. From left: the first MR imaging scanner (circa 1977) and the first clinical prototype of a CT brain scanner (circa 1972).

Electric’s research laboratory by physicist William D. Coolidge in 1913. “Early radiologists were able to see the potential of the Coolidge Tube to treat under the skin, and this led to a boon in radiation therapy,” Dr. Eisenberg said.

The practice of incorporating new and improved technologies into medi- cal practice continued throughout the 20th century. Medical ultrasound grew from radar and sonar, CT was made possible with computers and MR imaging arose from nuclear magnetic resonance research.

Continued on Next Page

Feature continues on next page
RSNA Celebrates 100 Years of History

RSNA’s pivotal role in the history of radiology will be celebrated at RSNA 2014, the 100th Scientific Assembly and Annual Meeting. Meeting attendees are invited to explore the Centennial Showcase, an immersive experience that lets attendees see, hear and touch the advancements that shaped radiology. Also on tap is the Sip & Savor Social, a “celebration of the century” featuring drinks, entertainment and tastings by some of Chicago’s top restaurants. Admission to the Centennial Showcase is free. The showcases will debut its Centennial Web Site, showcasing the achievements of Hounsfield, Dr. Donald and others set the foundation for even more dramatic growth in the future. The achievements of Hounsfield, Dr. Donald and others set the foundation for even more dramatic growth in the future.

Pioneers Paved the Way for Radiology’s Future

The achievements of Hounsfield, Dr. Donald and others set the stage for the rapid advances of recent decades that have poised the profession for even more dramatic growth in the future. None of these advances would have happened without the discovery of X-rays and the curiosity and ingenuity of the pioneers, Dr. Thomas said. "We may laugh today at how primitive radiology was, but it may be that in 50 years people will be laughing at how primitive CT was," Dr. Eisenberg added.

WEB EXTRAS

For more information on the RSNA Web Site, check out the feature story “A Century of Progress in Medicine: Centennial Showcase.”

This summer, RSNA will debut its Centennial Web Site, showcasing the Society’s evolution over 100 years and inviting readers to add their experiences to the triumphs of the specialty.

Continued From Previous Page

“With a new MRI scanner, we had great expectations for the future.” Dr. Bradley said. "We expected to see a dramatic increase in the number of patients and the number of MR studies performed. We also expected to see a significant increase in the number of MR studies performed for the diagnosis and management of musculoskeletal conditions.”

The development of MRI also led to the introduction of new imaging modalities such as functional MRI (fMRI) and diffusion tensor imaging (DTI). These modalities have revolutionized the field of radiology, particularly in the study of the brain and spinal cord. MRI has become the imaging modality of choice in the diagnosis and management of a wide range of conditions, including tumors, infections, and injuries.

The development of MRI also led to the introduction of new imaging modalities such as functional MRI (fMRI) and diffusion tensor imaging (DTI). These modalities have revolutionized the field of radiology, particularly in the study of the brain and spinal cord. MRI has become the imaging modality of choice in the diagnosis and management of a wide range of conditions, including tumors, infections, and injuries.

Diffusion Tensor Imaging

Diffusion tensor imaging (DTI) is a relatively new imaging technique that provides a quantitative measure of the diffusion of water molecules in tissues. DTI is particularly useful in the study of the brain, where it can be used to assess the integrity of nerve fibers and to detect abnormalities such as white matter damage.

The development of DTI has led to a number of important applications, including the diagnosis and management of a variety of conditions. For example, DTI has been used to study the effects of traumatic brain injury, multiple sclerosis, and other neurodegenerative diseases. In addition, DTI has been used to monitor the effects of treatment, such as the use of corticosteroids and Other treatment options, including the use of corticosteroids and Other treatment options, including the use of corticosteroids and other anti-inflammatory medications, have been shown to improve the outcomes of patients with neurodegenerative diseases.

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Diffusion-Tensor Imaging in ADHD Follow-Up

After one year of treatment, children diagnosed with attention deficit hyperactivity disorder (ADHD) showed positive behavioral changes that were accompanied by functional recovery in neuronal pathways, as evidenced by new research using diffusion tensor imaging (DTI), according to Pilar Dies Suarez, M.D., chief radiologist at the Hospital Infantil de Mexico Federico Gomez.

These results are a follow-up to original research by a multidisciplinary team led by Dr. Dies Suarez that was presented at RSNA 2013. In that study, conducted between May 2012 and May 2013, Dr. Dies Suarez and colleagues performed DTI on 23 children ages 7 to 12, including 11 diagnosed with ADHD and 12 controls. Subjects included patients with symptoms consistent with one of two major subtypes of the disorder: impulsive ADHD and inattentive ADHD.

Children with impulsive ADHD exhibit typical hyperactivity without motor deficits and respond better to behavioral therapy. Omega-3 fatty acids and atomoxetine therapies are less well understood of the two disorders. Dr. Dies Suarez said.

"It has been widely described that the frontostriatal tracts are altered in patients with impulsive ADHD," Dr. Dies Suarez said. "We hypothesized the involvement of a second neural tract, likely a frontocerebellar circuit, that may explain the inattentive clinical type of ADHD."

In the initial research, Dr. Dies Suarez examined connectivity in the frontocerebellar tracts by conducting DTI studies on 11 children exhibiting symptoms of the attentive ADHD subtype. Results showed that compared to healthy controls, the inattentive ADHD patients had fewer frontocerebellar tracts on the left side, and increased fractional anisotropy (FA) values. Healthy controls exhibited a greater number of frontocerebellar tracts and normal FA values. These data reinforce that the dysfunction in ADHD patients is primarily on the right side of the brain," Dr. Dies Suarez said.

Along with methodology, I would add that a collaborative patient-mental health relationship is important," Dr. Dies Suarez said. "Generally those kids are very kinetic, so trying to get them inside the magnet without head movement is challenging. Sedation isn’t recommended to avoid the risks implicit to anesthesia.

DTI Effective in One-Year Follow-up

The 11 patients diagnosed with inattentive ADHD were re-examined with DTI after one year of one or more of the following treatments: atomoxetine and methylphenidate drug therapies and Omega-3 supplements.

"Following one year of treatment, we found recovery of the frontocerebellar tracts, including both an increase in the number of tracts as well as normalized FA values in the ADHD patients," she said. "This recovery of function corresponded with positive behavioral changes."

The DTI study also enabled the research team to distinguish ADHD from other pathologies. "We believe children initially diagnosed with ADHD who did not respond to treatment are experiencing different kinds of problems," she said. "DTI gives physicians and parents a quantitative tool for diagnosing ADHD and monitoring the effects of treatment."

ADHD affects approximately 7 percent of the world population and is one of the most common childhood disorders.

MARY HENDERSON is a writer based in Bloomington, Ind., specializing in health and medicine.

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AT A GLANCE

Radiology played an increasingly critical role in times of war. Top left: Maria Curie at the helm of an X-ray truck known as a "little Curie" in 1917; a post-war image of the scanning of a patient in the Fluid-Filled World War II 2-B gun turntable scanner (Image courtesy of Eisenberg, R.L., "Radiology: An Illustrated History," St. Louis, Mosby, 1993).

Radiotherapy is the primary treatment for many cancers. Top right: The image shows a patient undergoing radiation therapy, with the radiation source visible at the center of the treatment area.
Imaging Sheds New Light on Concussion Consequences

BY ELIZABETH GARDNER

From peewee soccer to the National Football League (NFL), concern about the long-term risks of sports-related head injuries continues to grow. Last summer, more than 4,500 retired NFL players, all suffering from chronic traumatic encephalopathy (CTE) and other chronic conditions related to concussion, sued the league alleging that it hadn’t done enough to protect them. The lawsuit elicited a proposed settlement of $765 million, which is pending court approval.

To avert, or at least minimize, future injuries, researchers are using sophisticated imaging techniques to identify and measure the risks associated with such head trauma.

At Stanford University, researcher and neuroradiologist Michael Zeineh, M.D. Ph.D., will conduct a series of advanced imaging studies on 40 football players—half the university’s team—along with a control group of volleyball players, over two years. In the project, “Multimodal MRI in Devic Brain Injury in Athletes,” funded through a 2013-15 ASNR/RSNA Research Scholar Grant, Dr. Zeineh and colleagues will work to pin down the elusive effects of repeated concussions and subconcussion-level head injuries. Dr. Zeineh hopes to supplement previous studies showing lasting brain changes from such mild traumatic brain injuries (TBIs).

Researchers will use advanced diffusion tensor imaging (DTI) to study brain tissue, quantitative volumetric techniques to measure changes in brain structure and susceptibility-based imaging to quantify iron deposition—all findings that may not be evident during a visual examination of the brain.

At the Brain Imaging and Behavior (BIB) Center in New York City, and colleagues used DTI to study 37 amateur soccer players (average age: 30.9 years), all of whom have played the sport since childhood. DTI produces a measurement, called fractional anisotropy (FA), of the movement of water molecules within and along axons, which make up the bundles of nerves in the brain’s white matter.

“Heading” a Soccer Ball Linked to Brain Injury

Though there’s growing evidence that repeated concussions and subconcussion-level head injuries—typical in sports like football and soccer—can leave lasting effects on the brain, that evidence raises many more questions: Who’s most likely to be affected? What does the damage look like? How many impacts are too many? And what’s the best way to safeguard the brain health of athletes?

Michael L. Lipton, M.D., Ph.D., gave a jolt to the soccer community with his RSNA 2011 research on the practice of “heading,” a fundamental soccer technique using the head to return or redirect the ball—demonstrating that heading was associated with changes in brain structure and function similar to those of mild TBI. The research was also published in the September 2013 issue of Radiology.

Dr. Lipton, associate director of the Gruss Magnetic Resonance Research Center at the Albert Einstein College of Medicine and medical director of MR imaging at Montefiore Medical Center in New York City, and colleagues used DTI to study 37 amateur soccer players (average age: 30.9 years), all of whom have played the sport since childhood. DTI produces a measurement, called fractional anisotropy (FA), of the movement of water molecules within and along axons, which make up the bundles of nerves in the brain’s white matter.

They then compared the brain images of the most frequent headers with those of the remaining players and identified areas of the brain where FA values differed significantly.

“Between the two groups, there were significant differences in FA in three brain regions in the temporoparietal region,” Dr. Lipton said. “Soccer players who headed most frequently had significantly lower FA in these brain regions.”

The regions identified by the researchers are responsible for visuospatial attention, memory, multi-modality integration and higher-order visual functions.

The paper elicited contrary reactions. Dr. Lipton said, “Some people were concerned, but at the same time asked, ‘Isn’t this all very obvious and intuitive?’ Others were dismissive and said, ‘What’s the big deal? We’ve been doing this for a long time.’”

Threshold Effect Key to Research

Dr. Lipton said the paper’s key finding is the evidence of a threshold effect. “It wasn’t linear,” he said. “Players with fewer than 800 headers over the prior 12 months didn’t have elevated risk for either brain changes or cognitive effects. There’s likely to be some amount that’s not good for anyone, but there’s also a range that seems to be well tolerated.”

Dr. Lipton is now beginning a longitudinal study funded by the National Institutes of Health and the Dana Foundation. “It’s going to be a big part of the future in diagnostic imaging.”

Another question researchers are tackling is, “How do we determine when a player can return to the game after a head injury?” said Yvonne W. Lui, M.D., neuroradiology section chief at Langone Medical Center at New York University.

Dr. Lui’s June 2013 Radiology research on brain volume changes associated with mild TBI found measurable brain atrophy two years later in 52 patients who had only one concussion. “It’s hard to know with biomarkers whether someone has fully recovered,” Dr. Lui said.

Dr. Lui said anywhere from 15 to 30 percent of patients will have prolonged symptoms after a concussion. Figuring out who they are beforehand—through genetic factors or other biomarkers—will help steer the most vulnerable away from sports and activities that carry high risk of head impacts.

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

WEB EXTRAS


Click Supplemental Materials in the article above to hear Dr. Lipton discuss his research in a podcast.

The origin of the image above is rsna.org/10.1148/radiol.13122542.

Michael L. Lipton, M.D., Ph.D., gave a jolt to the soccer community with his RSNA 2011 research showing that soccer “heading” was associated with changes in the brain structure and function similar to those of mild traumatic brain injury. Above: Three ROIs in the temporal-occipital white matter detected by the initial voxelwise linear regression of estimated prior 12 months of heading on FA, shown as color regions rendered in 3D images and superimposed on T1-weighted axial (left), coronal (middle) and sagittal (right) images from the Montreal Neurological Institute template. Air (left), FA at each ROI was significantly lower as a function of greater heading exposure. / right.
R&E to Fund $3.7 Million in Grants

Earlier this year, the R&E Foundation Board of Trustees, chaired by James P. Borgstede, M.D., approved funding for 92 grants totaling $3.7 million, the highest amount ever awarded by the Foundation.

“With a 2011 RSNA/AUR/APDR/SCARD Education Research Development Grant, Carolyn Wang, M.D., Clinical Assistant Professor at the University of Washington, has shown this interactive teaching module to be as effective as the more expensive hands-on, high-fidelity simulation training. “Due to the rarity of allergic-like reactions to contrast media agents, there is a lack of standardization in the training of radiologists in the management of these potentially life-threatening events,” Dr. Wang said.

This web-based program is designed to enhance the training received by radiology residents and fellows using simulations of clinically relevant contrast reaction scenarios. The user navigates through various scenarios, determining the type of contrast reactions and deciding various treatment options, including administration of medication, and experiences real-time changes in patient status based on his/her choices. By exposing radiologists to simulations of contrast reactions they are less likely to compromise the safety of patients in the hospital and outpatient settings. It also has the potential to aid radiology residency programs to meet the milestone requirements for contrast reaction training in a widely available, cost-effective, and time efficient manner.

ContrastRxn can be viewed at: contrastrxn.com

Carolyn Wang, M.D.

Past Recipient Spotlight

Combining Academics and Business

Researcher Develops Imaging Reporter Genes for Cellular Immunotherapy

Shahriar Yaghoubi, Ph.D., M.B.A., merged the fields of cellular immunotherapy for autoimmune diseases and molecular imaging to develop imaging reporter genes, which can help customize treatment for patients.

With a 2003 Agfa HealthCare/RSNA Research Fellow grant and the guidance of three scientific advisors at Stanford University, including world renowned molecular imaging expert Sanjiv “Sam” Gambhir, M.D., Ph.D., and immunology experts C. Garrison Fathman, M.D. and Remi J. Creusot, Ph.D., Dr. Yaghoubi was able to pioneer this new combined field.

“During the period of RSNA funding, Dr. Yaghoubi began work that led to the first Investigational New Drug approval from the U.S. FDA for an imaging reporter probe: [18F]FHBG. This is the first FHBG head PET images superimposed over corresponding MRI images of therapeutic Targeted Cytolytic T Cells (CTL) illustrating increased [18F]FHBG accumulation after CTL infusions at the recurrent glioma tumor resection site. Images acquired approximately 2 hours after bolus intravenous [18F]FHBG injection.”

Dr. Wang’s program serves as a resource for contrast reaction management by using simulated scenarios.

“Due to the rarity of allergic-like reactions to contrast media agents, there is a lack of standardization in the training of radiologists in the management of these potentially life-threatening events.”

Shahriar Yaghoubi, Ph.D., M.B.A., merged the fields of cellular immunotherapy for autoimmune diseases and molecular imaging to develop imaging reporter genes, which can help customize treatment for patients.

Dr. Yaghoubi remains active in research, currently serving as principal investigator on a joint National Institutes of Health (NIH) R01 grant between CellSight and the University of California, Los Angeles.

That startup company is now known as CellSight Technologies, Inc., a privately held biotechnology company based in San Francisco. CellSight enables cell and gene therapies in living subjects through the use of imaging technologies, and offers custom imaging research services and prepackaged molecular imaging kits targeted at companies and academic institutions with the need for molecular imaging—Dr. Yaghoubi serves as the chief scientific officer.

CellSight is developing and providing mainly PET imaging technologies for tracking cell and gene expression kinetics in pre-clinical as well as clinical trials. Currently, the pre-clinical studies are all translational and CellSight’s clients and collaborators are hopeful they will form the basis for imaging studies in clinical trials. Right now most of the projects are related to cancer, but the technologies are generally applicable to other diseases, such as cardiovascular and autoimmune diseases.

Dr. Yaghoubi remains active in research, currently serving as principal investigator on a joint National Institutes of Health (NIH) R01 grant between CellSight and the University of California, Los Angeles.

During the period of RSNA funding, Dr. Yaghoubi began work that led to the first Investigational New Drug approval from the U.S. FDA for an imaging reporter probe: [18F]FHBG.
New Law Mandates Use of Imaging Appropriateness Criteria

BY BETH BURMAHL

Beginning in January 2017, referring physicians must use physician-developed appropriateness criteria when ordering advanced imaging for Medicare patients, in an effort to reduce duplicate and/or unnecessary scanning and associated costs.

The new provision, which also directs the secretary of the U.S. Department of Health and Human Services (HHS) to identify clinical decision-support (CDS) tools to help physicians navigate the appropriateness criteria, was approved April 1 as part of the Protecting Access to Medicare Act of 2014, or so-called sustainable growth rate (SGR) “patch” bill. The new measure also maintains current overall provider reimbursement for the next 12 months, preventing a 24 percent SGR-mandated physician pay cut.

Using the CDS tools embedded with appropriateness criteria is designed to improve the accuracy of ordering advanced diagnostic studies and ensure the appropriate studies are done for the right reason on the right patient.

When a long time in coming, radiology leaders are lauding the provision—and other American College of Radiology (ACR)-backed measures in the legislation—as a victory for imaging and a big step forward for healthcare reform overall. Other changes mandate greater transparency around payment policy and improve patient safety through stricter controls on radiation dose levels.

“The provision is a major step toward appropriateness of medical imaging,” said James Borgstede, M.D., an expert in radiology economics, quality and safety and healthcare politics and the RSNA Board Liaison for International Affairs. “If referring physicians embrace this concept, it will provide significant improvement in patient care.”

But that’s a big “if” according to some radiology leaders who stress that implementing these initiatives will be considerably more involved than just contacting the IT department to install CDS tools.

Buy-in and commitment from referring physicians will be critical to the initiative’s success, said Vijay M. Rao, M.D., RSNA Board Liaison for Information Technology and Annual Meeting.

“We can just provide a clinical support tool and expect it to work like a charm,” said Dr. Rao, the David C. Levin Professor and chair of Radiology and Technology and Annual Meeting.

Dr. Rao said. “As radiologists, we believe in the philosophy of reducing imaging services, using guidance from national professional medical specialty societies, including ACR, and other provider-led groups. ACR has long advocated for the use of clinical decision support systems.

When the law takes effect, referring physicians who provide imaging services will be required to pay for claims that include information about which CDS tool was used and documentation that it meets the standard. This could pose a problem for radiologists, since it would become their responsibility to make sure the ordering physician used the CDS tool properly and reported it.

Because new provisions put the onus on referring physician, it remains to be seen how seamlessly the process will be integrated into daily practice. It’s possible the task could fall into “the nuisance factor” category for physicians already dealing with significant workloads, said Dr. Rao, adding that CDS tools have been have yet to be tested on a large scale.

“We haven’t really done due diligence on the effectiveness of CDS tools,” Dr. Rao said. “As radiologists, we believe in the philosophy of reducing imaging tests, but for our clinical colleagues, we’re not sure they’re going to feel that way. That’s why the education element in it is so important to effectiveness.”

“CMS wants us to practice evidence-based medicine, but they are making decisions on multiple procedure payment reduction without any data at all.”

Vijay Rao, M.D.

Timeline for Imaging Appropriateness

- April 1, 2015: ACR also sought for a new provision that requires CMS to produce data used to justify a 25 percent multiple procedure payment reduction (MPPR) that was instituted in 2012 for a specific set of imaging procedures when they are provided to the same patient, on the same day, in the same session.

- May 2015: CMS contends the proposed cuts achieve efficiencies when multiple procedures are performed together. Calling the cuts “arbitrary,” radiologists point out they are obligated to devote the same time and attention to each image, and that there is no real time or cost saving in taking multiple scans at one time.

- November 2015: “This is another important provision in the bill, because it requires CMS to produce the scientific data to justify their indiscernable 25 percent reduction on multiple procedures, which they have never been able to do,” said Dr. Borgstede, a professor of radiology and vice-chair of professional services, clinical operations and quality at the University of Colorado, Denver.

- November 2015: “Show us the data,” Dr. Rao added. “CMS wants us to practice evidence-based medicine, but they are making decisions on multiple procedure payment reduction without any data at all.”

C T Scanners Must Meet MITA Standards

Beginning in January 2017, referring physicians must use physician-developed appropriateness criteria when ordering advanced imaging for Medicare patients, in an effort to reduce duplicate and/or unnecessary scanning and associated costs.

The “Protecting Access to Medicare Act of 2014,” (H.R. 4302) includes the following ACR-backed provisions:

- Require CMS to produce data used to justify a 25 percent multiple procedure payment reduction, instituted in 2012, to certain imaging procedures provided to the same patient, on the same day, in the same session.

- Mandate that cuts to medical services greater than 20 percent (in comparison to the previous year) are phased in over a two-year period.

- Maintain current overall provider reimbursement for the next 12 months (avoiding a 24 percent across the board cut to provider payments statutorily mandated by the SGR formula).

- Mandate that cuts to medical services greater than 20 percent (in comparison to the previous year) are phased in over a two-year period.

- Delay implementation of ICD-10 provider payment codes as ACR works to prepare radiology providers for the transition to this new system.

- Improve patient safety through stricter controls on radiation dose levels delivered by CT machines.

WEB EXTRAS

- Access the MITA NEMA XR-28 Supplemental Requirements for User Information and System Function Related to Dose in CT at medicalimaging.org.

- Access the MTA NEMA XR 28 Supplemental Requirements for User Information and System Function Related to Dose in CT at medicalimaging.org.
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Donors who give $1,000 or more per year qualify for the RSNA Pinnacle Society. Their names are shown in bold face.

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Opportunities

RSNA/AUR/ARRS Introduction to Academic Radiology Program

Sponsored by RSNA, the American Roentgen Ray Society (ARRS) and Association of University Radiologists (AUR), the Introduction to Academic Radiology program:

• Exposes second-year residents to academic radiology
• Demonstrates the importance of research in diagnostic radiology
• Illustrates the excitement of research careers
• Introduces residents to successful clinical radiology researchers

Successful applicants will be assigned to either a seminar held November 30–December 4, 2014, during the RSNA Scientific Assembly in Chicago, or the AUR Scientific Meeting in Toronto, Canada, April 19-24, 2015.

More information and the nomination form for this program are available at RSNA.org/TAR.

Final Call to Apply: RSNA Clinical Trials Methodology Workshop

Over the course of this 6½-day workshop, each trainee will be expected to develop a protocol for a clinical study, ready to include in an application for external funding.

Participants will learn how to develop protocols for the clinical evaluation of imaging modalities. A dynamic and experienced faculty will cover topics including:

• Principles of clinical study design
• Statistical methods for imaging studies
• Design and conduct of multi-institutional studies
• Sponsorship and economics of imaging trials
• Regulatory processes

Applications are now being accepted for this course designed to assist participants—generally junior faculty members in radiology, radiation oncology or nuclear medicine programs—prepare and submit a National Institutes of Health, National Sciences Foundation or equivalent grant application. The course, to be held at RSNA Headquarters in Oak Brook, Ill., will consist of four two-day sessions: October 10-11, 2014, January 30-31, 2015; March 13-14, 2015; and May 1-2, 2015. For more information and to download an application, go to RSNA.org/CT2015.

RSNA Derek Harwood-Nash International Fellowship

The Derek Harwood-Nash Fellowship program supports international scholars pursuing a career in academic radiology to study at North American institutions. Accepted participants will receive a stipend of up to $10,000 from RSNA to be used toward travel, living expenses and educational materials for the 6- to 12-week fellowship period. The application for this program is available at RSNA.org/DHN. For more information e-mail: DerekHarwoodNashFellowship@rsna.org.

Medical Meetings

• June-August 2014
• June 12-14: European Society of Thoracic Imaging (ESTI), 22nd Annual Scientific Meeting, NH Grand Hotel Krasnapolsky, Amsterdam • www.mmy.org/congress-2014
• June 18-21: European Society of Gastrointestinal and Abdominal Radiology (ESSR), 25th Annual Meeting, Goldtori Convention Centre, Austria • www.essr.org
• June 26-28: Canadian Society of Musculoskeletal Radiology (ESSR), Annual Scientific Meeting, Radiation Blu Hotel, Riga, Latvia • www.csr.org

Resident & Fellows Corner

Residents & Fellow Focus Debut in RadioGraphics

The journal RadioGraphics has unveiled a new regular online feature (pubs.rsna.org/page/radiographics/residentsfellows) with content tailored specifically to trainees: image-rich, interactive presentations designed to give viewers a thorough understanding of an important topic in radiologic imaging. Each presentation is accompanied by an extended abstract that provides additional contextual information. See the following presentations in recent and upcoming issues:

• Bladder Injury: Types, Mechanisms, and Diagnostic Imaging (May-June 2014 issue)
• Imaging Evaluation of Peritoneum with Emphasis on Embryology, Surgical Anatomy and Differential Diagnosis (July-August 2014 issue)

Development of the new feature is overseen by Jennifer A. Harvey, M.D., a professor of radiology and head of the Division of Breast Imaging at the University of Virginia Health System, and Sanjeev Bhalla, M.D., a professor of radiology and chief of the Cardiothoracic Imaging Section at Washington University in St. Louis.

“We’re pleased to be able to offer these presentations as an engaging, challenging way to help residents and fellows keep pace with practice standards and important topics in radiology,” Dr. Harvey said.
CT Angiography after 20 Years: A Transformation in Cardiovascular Disease Characterization Continues to Advance

Over a short 20-year span, CT angiography (CTA) has evolved from a fledgling imaging modality, incapable of encompassing most vascular territories, to a critical clinical tool that plays a dominant role in the diagnosis and management of disease within virtually every arterial bed in the body.

In an article in the June issue of *Radiology* [RSNA.org/Radiology], Geoffrey Rubin, M.D., of Duke Clinical Research Institute, Durham, N.C., and colleagues recount the evolution of CTA to a maturing modality that has provided unique insights into cardiovascular disease characterization and management. The authors present selected clinical challenges as contrasting examples of how CTA is changing the approach to cardiovascular disease diagnosis and management, including:

- Acute aortic syndromes
- Peripheral vascular disease
- Aortic stent-graft
- Transcatheter aortic valve assessment
- Coronary artery disease
- Critical care
- Liver tumors

The authors also explore recently introduced capabilities for multi-spectral imaging, tissue perfusion imaging and radiation dose reduction through iterative reconstruction with consideration toward the continued refinement and advancement of CTA.

“…the evolution of novel CT scanner geometries, alternative raw data reconstruction strategies, and sophisticated post-processing techniques are paving the way for the further evolution of CTA to provide greater relevance in predicting the clinical importance of cardiovascular lesions and facilitating their effective management,” the authors write.

Critical Role of Imaging in the Neurosurgical and Radiotherapeutic Management of Brain Tumors

In the past 30 years, imaging has become the primary imaging modality in the evaluation of brain tumors. Along with conventional CT and MR imaging, more advanced imaging techniques are increasingly being used by referring neurosurgeons, radiation oncologists and neurooncologists to help guide patient management.

In an article in the May-June issue of *RadioGraphics* [RSNA.org/RadioGraphics], Lily L. Wang, M.B.B.S., of the University of Cincinnati College of Medicine, and colleagues discuss how the evolution of new imaging technologies has not only improved the preoperative assessment of tumors, but also has expanded surgical approaches, aided in radiation treatment planning, and become a critical tool in evaluating therapeutic outcomes. Specifically, the authors discuss:

- Diffusion-weighted imaging
- Perfusion MR imaging
- Spectroscopy
- Functional MR imaging
- Diffusion tensor imaging

The authors stress the critical role these imaging techniques play in aiding in the diagnosis and appropriate treatment of intracranial lesions.

“As quickly as new imaging techniques develop, our neuroradiologists and colleagues adopt them into their practices, underscoring the central role that radiology plays on the multidisciplinary brain tumor team,” the authors write.

Radiology in Public Focus

A press release was sent to the medical news media for the following article appearing in a recent issue of *Radiology*.

Mammographic Performance in a Population-based Screening Program: Before, During, and after the Transition from Screen-Film to Full-Field Digital Mammography

**After the initial transitional phase from screen-film mammography (SFM) to full-field digital mammography (FFDM), population-based screening with FFDM is associated with less harm due to lower recall and biopsy rates and higher positive predictive values after biopsy than screening with SFM, new research shows.**

**Solveig Hofvind, Ph.D., of the Cancer Registry of Norway, Oslo, and colleagues analyzed anonymized data for women aged 50–69 years enrolled in the Norwegian Breast Cancer Screening Program from 1996 to 2010. A total of 1,857,360 NBCSP screening exams were performed during the study period. 58.8 years was the average age at the time of screening.**

The overall recall rate was 3.4 percent for SFM and 2.9 percent for FFDM. The biopsy rate was 1.4 percent for SFM and 1.1 percent for FFDM.

Both the rate of invasive screening-detected and interval breast cancer remained stable during the transition from SFM to FFDM and after FFDM was firmly established. The positive predictive value of recalled examinations and of biopsy procedures increased from 19.3 percent and 48.3 percent to 22.7 percent and 57.5 percent, respectively, after adoption of FFDM.

JUNE PUBLIC INFORMATION OUTREACH ACTIVITIES FOCUS ON MEN’S HEALTH AND MORE

In recognition of Men’s Health Awareness Month in June, RSNA is distributing public service announcements (PSAs) focusing on abdominal aortic aneurysm (AAA), the third leading cause of death for men over age 60.

The RSNA “60-Second Checkup” audio program will be distributed to nearly 100 radio stations across the U.S. June segments will focus on improving doctor/patient communications.
Annual Meeting Watch

News about RSNA 2014

Course Enrollment Begins July 9

The RSNA 2014 Advance Registration, Housing and Course Enrollment brochure will be mailed in late June. On July 9, the brochure will be available online at RSNA.org/Attendee. Use this brochure to make the most of your RSNA 2014 experience. The information is organized 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.

Registration Fees

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RSNA 2014 Registration

HOW TO REGISTER

There are two ways to register for RSNA 2014:

1 INTERNET (Fastest way)

Go to RSNA.org/register

2 TELEPHONE

Mon-Fri, 8 a.m. – 5 p.m. CT
1-800-650-7018
1-847-996-5862

Register by November 7 to receive the discounted registration fee and full conference materials mailed to you in advance. International visitors must register by October 24 to receive these materials in advance. Registrations received after November 7 will be processed at the increased fee and conference materials must be picked up at the McCormick Place Convention Center.

Guarantee Your Seat!

Tickets are required for various meeting components, including refresher, multisession, informatics workshops and RSNA tours and events. All ticketed courses must be confirmed prior to November 27 to guarantee a seat. RSNA ticketed courses fill up fast, so ensure you get the courses you need by enrolling at RSNA.org/register. There is no onsite course ticketing. Registrants without tickets will be allowed entrance into a course after all ticketed registrants have been seated.

Flexible Booking Policies

New this year, simplified and penalty-free cancel and change policies up to 72 hours prior to arrival make it easier than ever before to book a room through RSNA. A deposit equal to one night’s stay including tax will be charged by the hotel for each room reserved. Reservations may be secured with a major credit card at the time of booking. The credit card must be valid through December 2014 and will be charged by the hotel approximately two weeks before the annual meeting. If the credit card is declined, the reservation may be cancelled by the hotel. Registrants can also send a check, money order or wire transfer (payable to RSNA) for the hotel deposit. Attendees are responsible for all wire transfer fees.

Exclusive Airline Discounts

American Airlines

AA.com offers a 5 percent discount on the lowest applicable published airfare. Use promotional code A2SN4AZ when booking your reservation with AA.com. You can also call American (1-800-433-1760) and mention the American promotional code to be eligible for discounted fares. Service fees will apply when booking over the phone. Discounts are available on American Airlines, American Eagle and American Connection. Reservations involving any OneWorld Alliance or code-share partner airlines must be booked via phone. International attendees should call their local American Airlines reservations number and provide the promotional code A2SN4AZ.

United Airlines

United.com offers a 2 to 10 percent discount off published fares and class of service. Save an additional 3 percent if booked online. Use promotional code ZR28820672 when booking your reservation on United.com. You can also call United (1-800-243-8600) or your personal travel agent and mention the United agreement code 920672 and 2-digit ZRK8 to be eligible for discounted fares. Service fees may apply. International attendees should contact their local United Airlines reservations office, book online or email groupmeetings@united.com.

Buy Bistro RSNA

Tickets Now

Avoid long lines by purchasing Bistro RSNA tickets now. Advance tickets to Bistro RSNA—which provides a comfortable setting for attendees to eat, meet and network during the annual meeting—are only $20 a ticket.

Bistro RSNA is located in all Technical Exhibit Halls and the Lakeside Learning Center. The daily lunch menu includes salads, soup, entrée choices, vegetables, pasta and more. Menu price includes full meal, beverage choices and dessert.

Purchase tickets in advance during online registration at RSNA.org/register.
RSNA 2013 Refresher Courses Now Online

Visit RSNA.org/library to find great RSNA online SA-CME content including new refresher courses recorded at the RSNA 2013 annual meeting. Newly added refresher courses in a wide variety of subspecialties will feature a blue “New” tag in the online library. To quickly display all new content, click the blue “Browse New” button at the top of the library page. RSNA’s online refresher courses can be viewed on tablet devices for on-the-go learning.

Each online refresher course includes an interactive CME test with immediate feedback on correct or incorrect answers. Users must correctly answer a minimum of 80 percent of the questions on the CME test to earn their CME certificate. To browse new refresher courses and other SA-CME offerings from RSNA, visit RSNA.org/library. Check back weekly to take advantage of the newest online education as it becomes available from RSNA.

RSNA Education Delivers Weekly SA-CME Content in 2014

The RSNA Education Center has committed to providing a new online activity each week of 2014. From RadioGraphics CME tests to online refresher courses, RSNA’s online education offers you the tools to earn the CME credits you need, even on-the-go. Offered for SA-CME credit, all of RSNA’s online learning content combines interactive learning with instantaneous question feedback. Engage in novel and thought-provoking learning with a streamlined design and functionality optimized for the digital age and your tablet device.

RSNA online offerings include a wide variety of activities and topics. Spanning 15 subspecialty areas, each activity focuses on a specific area or topic relevant to everyday practice. Explore online RadioGraphics and Radiology CME tests, Cases of the Day, recorded refresher courses from previous annual meetings and other supplemental online education.

Included with RSNA membership, users can access all of these educational tools and have the opportunity to earn SA-CME credit for each successfully completed activity. RSNA continuously updates its SA-CME offerings. Go to RSNA.org/library and click “Browse New.”

RSNA.org

myRSNA is Your Online Toolbox

Are you taking full advantage of myRSNA—an exclusive RSNA member benefit? The site offers instant Web access to files, articles, presentations, portfolios and even the opportunity to earn CME while at work. Users can access knowledge at the point of care, providing support for better informed medical decisions.

Features include:

- mySearch: This sophisticated search feature lets you focus your search on peer-reviewed articles in the radiologic literature, on RSNA’s information resources or on the broader Web.
- myCommittees: Consolidates the files, resources and calendars for committees you are involved with in one location.
- myFiles & Bookmarks: Upload and store your personal files and bookmarks. View them online anywhere with built-in players. No software required.
- myPortfolio: Access tools needed to document your ACGME learning experiences. Ideal for residents, program coordinators and career physicians alike, integrating Core Competencies with a professional learning map to track your advancement.
- myDashboard: Access the latest updates to your groups, files that have been recently shared with you, comments users have shared and much more.
- myGroups: Create groups and participate in discussions with colleagues from around the world who share your interests and upload files to enhance the conversation.

Visit myRSNA.org to explore a video overview of myRSNA tools and resources.
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

RSNA.org/register

MEMBER REGISTRATION NOW OPEN
GENERAL REGISTRATION OPENS JUNE 4