RSNA News™

January 2016 Volume 26, Issue 1

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FEATURES

RSNA News™

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Baron is RSNA President

Renowned researcher and educator **Richard L. Baron, M.D.,** is RSNA president. Dr. Baron is professor of radiology at the University of Chicago Medical Center, where he has been since 2002, serving as chair of the Department of Radiology from 2002 to 2011 and dean for clinical practice from 2011 to 2013. At the University of Pittsburgh, he served as chair of the Department of Radiology from 1992 to 1999, and as founding president and CEO of the University of Pittsburgh Physicians from 1997 to 2002.

As RSNA president, Dr. Baron will place a priority on patient-centered radiology, fostering the development of new radiological innovations, and facilitating education into the daily practices of RSNA members. Bringing together RSNA members and participants from around the world to maximize their educational opportunities and experiences will be an important emphasis.

In 1972, Dr. Baron graduated cum laude from Yale University and earned his medical degree in 1976 at the Washington University School of Medicine in St. Louis, where he was elected to Alpha Omega Alpha Honor Medical Society. An internship in internal medicine at Yale University was followed by his radiology residency and abdominal radiology fellowship at the Mallinckrodt Institute of Radiology at Washington University. He continued his education at the Katz Graduate School of Business at the University of Pittsburgh.

Dr. Baron has authored or co-authored 118 peer-reviewed scientific articles, one book, 53 book chapters and review articles, and numerous scientific and educational exhibits. He has presented hundreds of invited lectures. He has served on the editorial boards and as manuscript reviewer for multiple journals, including *Radiology*, *American Journal of Roentgenology*, *Journal of Computer Assisted Tomography*, *Liver Transplantation*, *Gastroenterology* and *European Radiology*. He served as an associate editor of *Radiology* from 1991 to 1996 and *Liver Transplantation* from 2004 to 2009.

Dr. Baron has been principal investigator on a dozen research projects and has earned research awards from numerous national radiology societies, especially in the area of diagnostic imaging of liver disease. The RSNA has presented Dr. Baron with two Magna Cum Laude Awards, and the American Roentgen Ray Society awarded him gold and silver medals for educational exhibits. The European Society of Gastrointestinal and Abdominal Radiology awarded Dr. Baron honorary fellowship in 2008. The Asian Oceanian Society of Radiology awarded Dr. Baron its gold medal in 2014.

An RSNA member since 1978, Dr. Baron has served on many committees including the Scientific Program Committee, Public Information Advisors Network, Finance Committee and the Education Exhibits Committee, where he served as chairman from 2006 to 2008. In 2008, he was elected to the RSNA Board of Directors and served as the liaison for education and international activities. He served as Board Chairman from 2013 to 2014, and President-Elect from 2014 to 2015.

Rao Named RSNA Board Chair

Vijay M. Rao, M.D., is chair of the RSNA Board of Directors. A global authority on head and neck imaging and also recognized for her health services research in radiology, Dr. Rao is The David C. Levin Professor and Chair of Radiology at Jefferson Medical College of Thomas Jefferson University in Philadelphia.

As chair of the RSNA Board, Dr. Rao brings her expertise in health services and policy matters to bear in a shifting healthcare landscape of increasing complexity and declining reimbursements.

Dr. Rao has published more than 200 papers, 250 abstracts in medical literature, and a dozen book chapters, and co-edited *MRI and CT Atlas of Correlative Imaging in Otolaryngology*. She is a sought-after lecturer and educator and has given nearly 200 invited lectures at academic universities and meetings worldwide.

Dr. Rao has served on the editorial boards of multiple journals, including *Academic Radiology*, *Journal of the American College of Radiology* and *American Journal of Roentgenology (AJR)*. She has served as a manuscript reviewer for *Radiology*, *AJR* and *American Journal of Neuroradiology*. She served as editor of the American Society of Head and Neck Radiology publication, *ASHNR News* in 2001.

An RSNA member since 1981, Dr. Rao has led numerous courses and sessions at RSNA annual meetings and served on the Health Services Policy & Research Subcommittee of the RSNA Scientific Program Committee. She has served the RSNA Research & Education (R&E) Foundation in various roles, including as a member of the Board of Trustees since 2008. She was elected to the RSNA Board of Directors in 2011 serving as the RSNA Board of Directors liaison for information technology and annual meeting from 2011 to 2015.

Ehman is President-Elect

Richard L. Ehman, M.D., is RSNA president-elect. Dr. Ehman is professor of radiology and Blanche R. & Richard J. Erlanger Professor of Medical Research at the Mayo Clinic in Rochester, Minnesota.

As president-elect, Dr. Ehman will continue to emphasize RSNA's commitment to advancing medical imaging through its annual meeting programming and the efforts of the Research & Education (R&E) Foundation.

Dr. Ehman has authored or co-authored more than 270 peer-reviewed scientific articles and completed more than 250 invited lectures and visiting professorships. He has served on the editorial boards for multiple journals, including *Radiology* and *Magnetic Resonance in Medicine.*

A National Institutes of Health (NIH)-funded clinician-scientist and inventor, Dr. Ehman holds more than 40 U.S. and foreign patents, and many of these inventions are widely used in medical care. Dr. Ehman was awarded the gold medal of the International Society for Magnetic Resonance in Medicine in 1995 and received the RSNA Outstanding Researcher Award in 2006. He was named Mayo Clinic Distinguished Investigator in 2014. He is a Fellow of the American College of Radiology. In 2010, Dr. Ehman was elected as a member of the Institute of Medicine of the National Academies of Science, which is one of the highest honors in medicine in the U.S.

As an RSNA member, Dr. Ehman has served on the Refresher Course Committee, Scientific Program Committee, *Radiology* Editorial Board, Research Development Committee, Grant Program Committee and the R&E Board of Trustees. In 2010, he was elected to the RSNA Board of Directors as the Liaison for Science. He served as Board Chair from 2014 to 2015.

Mauro Named to RSNA Board

Matthew A. Mauro, M.D., an accomplished vascular interventional radiologist, is the newest member of the RSNA Board of Directors. Dr. Mauro joins the Board as Liaison for Information Technology and Annual Meeting as Vijay M. Rao, M.D., becomes chair of the Board of Directors.

Dr. Mauro is chairman of the Department of Radiology at the University of North Carolina at Chapel Hill (UNC) School of Medicine, where he also holds the Ernest H. Wood Distinguished Professorship. In addition, he has assumed the role as the Chief Executive Officer of the UNC Faculty Physicians where he is responsible for the professional clinical activities at the UNC Medical Center. He has been a faculty member at UNC since 1982.

A prolific researcher, his interests include interventional oncology, venous access, embolotherapy, the management of vascular malformations and stent grafts.

Dr. Mauro has co-authored five books and written dozens of book chapters, as well as over 150 journal articles. He is a frequent invited lecturer, and his textbook *Image-Guided Interventions* serves as a standard reference in the field.

A dedicated RSNA volunteer, he served on the Scientific Program Committee since 2005, and as chair from 2009 to 2013. He served on the Public Information Advisors Network from 2002 to 2011. Dr. Mauro is a regular faculty member for annual meeting educational courses and was the associate editor of *Radiology* from 2002 to 2007. He has served as a Research & Education (R&E) Foundation grant reviewer since 1992. Other R&E volunteer activities include the Public Relations Committee and the Corporate Giving Subcommittee.

Letter from the Editor


Whitman

Welcome to 2016 and the *RSNA News!* We look forward to bringing important, exciting information to you.

Special thanks to Dr. David Hovsepian who recently completed his term as *RSNA News* editor. David is a great writer and editor and has a wonderful eye for producing a high-quality publication. I thank David for mentoring me and for his fantastic service to *RSNA News*.

Many thanks also to the RSNA leadership and the *RSNA News* Editorial Board. In this issue, RSNA President Dr. Richard Baron discusses patient-centered radiology, which is the essence of what we do and try to do. We aim to do the right thing for the right reason at the right time in the right way.

At *RSNA News,* we will strive to get it right. We welcome your suggestions and comments at *rsnanews@rsna.org.*

Gary J. Whitman, M.D., is a tenured professor of radiology and radiation oncology at The University of Texas MD Anderson Cancer Center, Houston.

A well-known expert on breast imaging, Dr. Whitman directs the Mobile Mammography Program and serves as chair of the Breast Imaging Research Committee at MD Anderson.

Dr. Whitman served as editor of the *Daily Bulletin,* the official newspaper of the RSNA annual meeting, from 2011-2013, and is a current member of the RSNA Public Information Advisors Network (PIAN), the RSNA Public Information Committee (PIC) and the RSNA Publications Council.

He has served as editor of the Society of Breast Imaging newsletter, *SBI News,* and in 2003, as a Melvin M. Figley Fellow of the American Roentgen Ray Society (ARRS) working closely with the editor of the *American Journal of Roentgenology.*

He is president of the Association of University Radiologists and currently serves as the chair of the American Roentgen Ray Society Program Committee and the chair of the Society of Breast Imaging Fellowship Committee.

Dr. Whitman is a former chair of the American Institute of Ulstrasound in Medicine (AIUM) Continuing Medical Education Committee and the former AIUM treasurer.

He has been awarded fellowships from the American College of Radiology, the Society of Breast Imaging, the Society of Radiologists in Ultrasound and the AIUM.

Also at the University of Texas MD Anderson Cancer Center, Dr. Whitman serves on the institution's Shared Governance Committee and is past-chair of the Faculty Senate.

Numbers in the News

2

Number of weeks the RSNA International Visiting Professors (IVP) spent in Santiago, Chile, visiting healthcare institutions and teaching radiology residents. Read more about the 2015 IVP trip on Page 13

29

Percentage of RSNA's more than 54,000 members who are non-North-American. Read about RSNA's new Spotlight Course in Cancun on Page 24

31

The number of *Radiology* articles included in Volume 7 of *Radiology Select,* a collection of articles highlighting the most important advances in liver imaging. Read more on Page 20

79

Percentage of patients surveyed who believe the benefits of an imaging exam outweighs the risks associated with radiation, according to RSNA 2015 research. Read more about patients perceptions of imaging in our feature story on Page 6

THIS MONTH IN THE *RSNA NEWS* ONLINE VERSION

Get more of this month's news at *RSNA.org/News.*

As part of this month's RSNA 2015 Annual Meeting coverage, we spotlight video interviews with presenter Charlotte Tutein Nolthenius, M.D., discussing her research on CT colonography, and Daddy Mata Mbemba, M.D., Ph.D., discussing his research on follow-up head CT and MRI after a small brain hemorrhage.

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

SUBSCRIPTIONS
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1-888-600-0064
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permissions@rsna.org
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ADVERTISING
jkapicak@rsna.org
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My Turn

BY RICHARD L. BARON, M.D.

Teaming up for Patient-centered Care

Richard L. Baron, M.D., is RSNA President. Dr. Baron is professor of radiology at the University of Chicago Medical Center, where he has been since 2002 serving as chair of the Department of Radiology from 2002 to 2011 and dean for clinical practice from 2011 to 2013.

I have seen many changes to the field of radiology and healthcare at large throughout my career. As I begin my term as RSNA president and the Society enters its second century, it feels appropriate to take stock.

As we consider the most important issues facing radiologists today, the shift in philosophy of healthcare delivery to a patient-centered model stands out. Through initiatives such as RSNA's "Radiology Cares" and ACR's "Imaging 3.0" campaigns, development of education and tools to assist radiologists to optimize the patient experience has begun in earnest. Most radiologists have grasped the concept of creating an atmosphere of warmth and reception, optimizing patient safety, communicating directly with patients, and providing timely reports.

However, reflecting literally on the phrase "patient-centered care" and recognizing a radiologist's responsibility to provide as impactful input as possible for patient care, one realizes there are many other interactions and processes that our radiology community should be embracing to lead in imaging healthcare delivery and truly be patient centered. Considering what is in the best interest of the patient should be the guiding principle driving all professional decisions and behavior. Radiologists' clinical activities should extend beyond the patient experience to ensure that our examinations and reports are performed and created with the best interests of the patients as the primary focus—above all other potential interests.

The Right Exam at the Right Time

A common mantra is "to perform the right examination at the right time," and I would add with the right radiologist. When we focus on the patient, it becomes obvious that the best course is to practice within one's skill set, and allow others who are trained and capable to practice in other areas. When all radiologists—and other medical specialists as well—embrace this principle, our patients will benefit. It is equally important that examinations be performed and interpreted at the appropriate time, no matter the hour of the day.

Quality examinations drive impactful reports. Radiologists have an obligation to ensure the latest examination protocols and best available equipment are used to optimize diagnostic accuracy. And when technologists and radiologists work as a team, complementing each other to produce the best examination utilizing different skill sets and training, together they can optimize the patient's experience. Radiologists need to take time to continually provide in-service education for technologists so that no knowledge gap exists in terms of information needs, examination techniques, and real-time monitoring of examinations in process. Technologists, along with all hospital staff, should be educated, respected and welcomed as partners providing differing expertise in the imaging process. Our patients' experiences will be positive only if the entire team works together in a respectful environment.

Collaboration Leads to Better Care

In the same way, positive, efficient interactions between radiologists and referring physicians lead to effective patient-centric care. This requires open communication and respect between all physicians. Once the exam is complete, the radiology report should strive to answer questions and solve problems. Merely recommending another imaging examination that often results in the same uncertain, descriptive report is not enough. Taking the time to find relevant patient history or educational information to help solve the problem is a key step toward delivering patient-centered radiology.

Achieving this quality of reporting in a real-time continuous manner, combined with ensuring the right radiologist oversees and interprets examinations, requires more widespread subspecialty radiology practice. Truly patient-centric care might require more radiologists in a specific practice group to provide complete subspecialty coverage but should result in better patient outcomes and more respect from local specialty physicians. Spike Lee said, "Do the right thing," a motto which, if followed, might ultimately protect the long-term local group practice viability and the practice of radiology in general.

Patient-centered care takes time, as processes are not "physician-centered." Rather than focusing on reimbursable expenses, we should recognize the need to undertake all these activities as the right thing to do. In fact we are well reimbursed — as evidenced by the relatively high salaries that most radiologists command. And by embracing patient-centered activities, radiologists will solidify their position with patients, hospitals and referring physicians as an essential member of the healthcare team, in turn protecting their future reimbursements. I hope that radiologists will establish themselves in the community at large as physicians who chose their profession because they truly care for — and about — their patients.

Practicing patient-centric care is not hard — simply think about how you would hope that you and your family would be treated, and treat every patient and every report accordingly. And as we traverse the ever-changing healthcare landscape through the second century of RSNA, let us always remember that our primary focus should remain on our patients' care and well-being.

Embracing Patient-centered Care

BY CINDY LENART

The call for patient-centered care is one of the primary drivers of change within radiology today and stands to transform the way the specialty is practiced, according to one of the foremost experts on the topic.

Radiologists who heed that call are advised to embrace a new mindset about patient care, said Mary C. Mahoney, M.D., in the RSNA 2015 session, "A New Model of Patient Care: Value over Volume." She discussed tactics and resources that can help radiologists put the concepts of patient-centeredness and value vs. volume into practice.

"Being patient-centered means you've considered the patient experience holistically—from the first time they have contact with any member of your staff until the time they are given their reports—and, I would argue, into your follow-up communications," said Dr. Mahoney, the RSNA Board Liaison for Publications and Communications.

The benefits are considerable, Dr. Mahoney said. They include improved patient care, improved communication between radiologists and their patients and referring physicians, and greater awareness of the essential role that radiologists play in patients' overall healthcare.

Mary C. Mahoney, M.D., Christine Zars, M.S., R.D., James V. Rawson, M.D., and Jennifer L. Kemp, M.D.

One patient presented a first-hand account of the value of patient-centered care. Christine Zars, M.S., R.D., was diagnosed with a grade 4 glioblastoma on her brain when she was just 19 years old. Now, 13 years later, she credits her medical team with not only saving her life, but also helping her and her support group through the trying ordeal. "A smile and a genuine interest in their personal life makes the patient feel like the doctor cares about them as a person, rather than just another patient," she said.

Jennifer L. Kemp, M.D.

Zars said genuine compassion and building trust are key factors. She cited specific mannerisms such as smiling, shaking hands, listening with eye contact, and not rushing through appointments as important. She also appreciated being related to as a person, a continual interest in her personal life, the compassion extended to her family and friends and follow-up calls of assurance.

She said that trust was built through transparency and instilling confidence. "I believed that both of us were fighting this disease," Zars said.

Presenter Jennifer Kemp, M.D., chair of the RSNA Patient-centered Radiology Steering Committee that oversees the RSNA Radiology Cares® initiative, said, "Radiology can be a scary maze for our patients and we have the power to make the patient experience a little bit easier."

Dr. Kemp encouraged attendees to learn from others, starting with the *RadiologyCares.org* website, which offers numerous resources for physicians building a patient-centered practice, as well as the American College of Radiology (ACR) Imaging 3.0 initiative.

"There is no such thing as a perfect experience, but we can make it better," she said. Dr. Kemp suggested tools such as a patient postcard that explains what a radiologist does and when they will receive their results. She also recommended giving out a phone number and email address for follow-up questions, and offering amenities such as valet parking and Internet access to make patients more comfortable.

Finally, Dr. Kemp said, treat others as you want to be treated by streamlining your entrance questionnaire and expediting scheduling.

Dr. James Rawson, M.D., chair of the ACR Patient and Family-

Centered Care Commission that is part of the Imaging 3.0 campaign, advocates for the creation of patient-focused care committees that include patients and focus on collaboration, flexibility, and empowerment.

"We need to look at the roles that patients can play in design teams, committees, planning teams, and even interviewing candidates," he said.

Dr. Rawson said listening to patients has led to improvements including a skylight over an MRI machine and a blanket warmer at his institution in the MRI room resulting from a patient who complained of being cold. Patient input also led to a mammography center that is more spa-like and less clinical.

"As our payment model changes in healthcare, patient satisfaction and the patient experience will play an increasing role," Dr. Rawson said. "Patient participation can help to change cultures. You are not the expert of their experience; they are.

"It will be hard to put the patient in the center of healthcare if we are standing there ourselves," he added.

For more information visit *RadiologyCares.org* ☐

Explaining, Discussing Medical Imaging is Key to Patient Understanding

BY ED BANNON

Given the overall lack of awareness many people have about the risks versus benefits of imaging exams, physicians should make deliberate efforts to hold discussions with their patients about their viewpoints of imaging procedures, according to another RSNA 2015 session.

"A lack of patients' knowledge regarding both medical imaging and use of radiation has the potential to harm patient cooperation and trust," said Leila Mostafavi, M.D., of the University of California, Los Angeles. "Ideally, information such as type of procedure and technique as well as potential risks and benefits of the imaging test, including risk related to radiation exposure and accuracy of the test, should be available to the referring physician and shared with their patients."

Over a six-month period, 192 patients between the ages of 18 and 92 years presenting for various types of cardiac imaging examinations completed a survey about radiation exposure. Less than half of the patients knew that MR does not involve ionizing radiation; of the patients undergoing MR exams, 35.8 were aware that MR does not involve ionizing radiation and 45.7 percent of non-MR patients knew.

Leila Mostafavi, M.D.

CT patients were more likely to know that CT utilized radiation (85 percent) as compared to those receiving other imaging procedures (43.5 percent). Most patients (84 percent) correctly stated that the X-ray imaging requires radiation.

Overall, the study showed that patients lack a general understanding of how much radiation they receive from cardiac CT and MRI. On average patients mistakenly associated MRI with the use of radiation and underestimated the amount of radiation associated with a cardiac CT.

To combat this knowledge deficit, doctors should start by making time to initiate discussions with patients about their perceptions of medical imaging, Dr. Mostafavi said. "As patients may not be forthright with their opinions or views, this physician-initiated discussion may be beneficial," she said.

Physicians can then move on to explain the risks and benefits of cardiac imaging modalities. For example, patients should be informed about the expected accuracy of cardiac imaging diagnostics, Dr. Mostafavi said.

Also, explaining radiation doses with common relatable measurements can reduce patient confusion, Dr. Mostafavi said. Participants in the study were asked to rate the amount of exposure on a radiation benchmark arranged on a logarithmic scale, with 1 being the highest dose and 5 being the lowest. The benchmarks were: 1) the limit for a radiation worker per year; 2) the average yearly background dose; 3) the average annual dose from food; 4) the dose from an airplane flight from Los Angeles to New York City; and 5) the extra dose from spending two days in Colorado.

Finally, there is a need for standardized information that can be distributed to patients, she said.

The good news, however, is that despite a low level of knowledge about radiation exposure, the majority of patients in the study indicated a high level of trust in the appropriateness of cardiac CT and MRI and in their physicians, Dr. Mostafavi said. For example, 73 percent agreed that radiation risk is acceptable when their physician recommends an exam and 79 percent believed the benefits from exams outweigh the risks associated with radiation.

Non-radiologist Physicians May be Uninformed

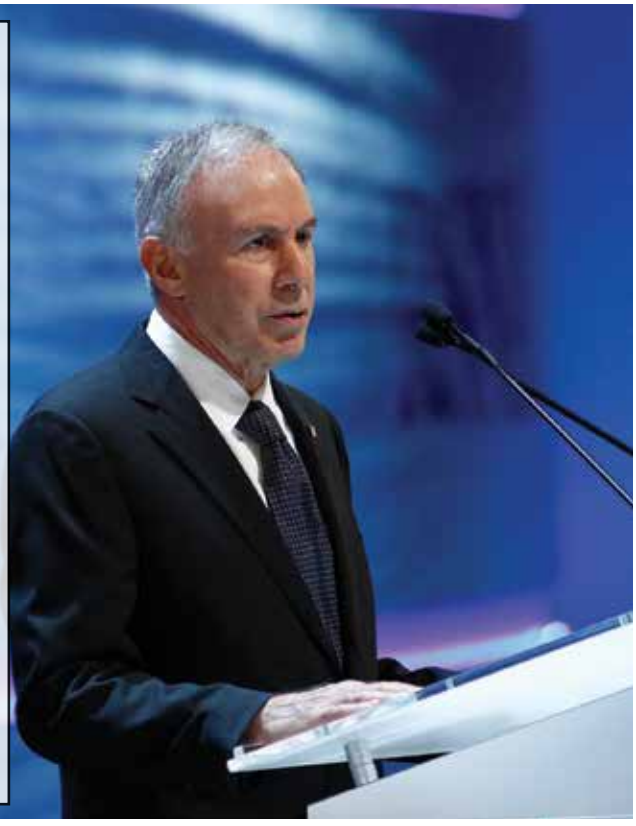
Radiologists might run into problems educating patients, however, if most communication is done through non-radiologist physicians, Dr. Mostafavi said. "Previous studies have shown that non-radiologist physicians are often relatively uninformed about the involvement of radiation for imaging tests—most specifically the dose and therefore the risk patients may be exposed to," she said.

Another challenge is that published data regarding radiation exposure is often confusing and undergoing rapid change, Dr. Mostafavi said. And referring physicians don't always know the type of equipment being used at referring hospitals. ☐

RSNA 2015 Turned Focus Toward Next 100 Years

Wrapping up a year-long celebration of RSNA's Centennial, RSNA 2015 looked toward the future with an eye on how technology and innovation will shape the future of radiology. Clinical applications for 3-D printing and mobile technology, along with practical ways to provide patient-centered care were recurring themes in the meeting program, which offered education and research updates across all subspecialties.

The Centennial Showcase returned with new exhibits demonstrating virtual reality, 3-D printing and cutting edge research, offering a glimpse into how innovation might change the way radiology is practiced in the future. The popular Virtual Roentgen and Art & Science Gallery returned, and attendees tested their skills with "Cases of the Future."



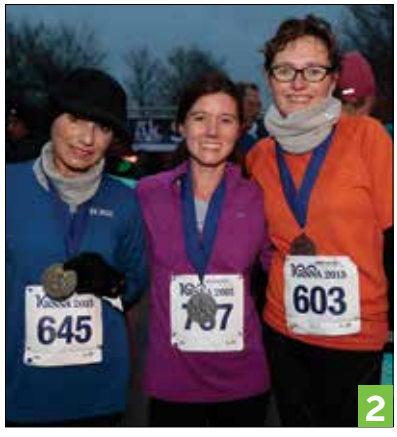
2015 RSNA President Ronald L. Arenson, M.D., delivers his president's address to an enthusiastic crowd in the Arie Crown Theater.

Residents and fellows gathered for a lively reception.

Diagnosis Live™ sessions continued to challenge and entertain participants.

The RSNA Centennial celebration culminated with a focus on innovation at RSNA 2015. (1) Attendees joined the celebration taking photos with the RSNA 100 logo. (2,3) More than 475 runners raised over $28,000 for the annual R&E Foundation 5K Fun Run. (4) The Centennial Showcase featured new exhibits highlighting the future of healthcare, including virtual reality solutions. (5) Attendees registered for the RSNA Spotlight Course at the Global Connections Booth (6) and explored over 400,000 square feet of exhibit space.

INNOVATION IS THE KEY TO OUR FUTURE



Alzheimer's Research Receives the RSNA Margulis Award

BY BETH BURMAHL

While amyloid plaque is considered a hallmark of Alzheimer's disease, researchers have yet to determine how the protein deposits found in the brains of Alzheimer's patients relate to changes in the brain's structure and function.

In an effort to unravel the ongoing mystery of Alzheimer's, one researcher, Jeffrey W. Prescott, M.D., Ph.D., began investigating the differences in the structural connectome to determine any association between the connectome and amyloid deposits.

The resulting study, "The Alzheimer Structural Connectome: Changes in Cortical Network Topology with Increased Amyloid Plaque Burden," published in the October 2014 issue of *Radiology,* has earned Dr. Prescott and colleagues the fourth annual RSNA Alexander R. Margulis Award for Scientific Excellence. The award recognizing the best original scientific article published in *Radiology* was presented at RSNA 2015.

"One of our main goals was to investigate how early structural changes occur in the brain, and how these structural changes may relate to amyloid burden," said Dr. Prescott, a radiology resident at Duke University Medical Center in Durham, N.C. "Dementia has many different symptoms, and people decline at different rates. Neuroimaging may be the best way to investigate why those rates of decline are different."

Using data from the Alzheimer's Disease Neuroimaging Initiative (ADNI), Dr. Prescott and colleagues investigated the brain's structural connectome to identify differences between patients with normal cognition, mild cognitive impairment (MCI) and Alzheimer's disease to examine how structural connectivity might change with increased cortical amyloid deposition.

Researchers studied results from 102 patients enrolled in a multicenter biomarker study, ADNI 2, who had both baseline diffusion-tensor imaging (DTI) and florbetapir PET at the time of analyses in November 2012. Standardized update value ratios (SUVr) were calculated from the PET scans for the frontal, cingulate, parietal and temporal lobes.

RSNA President Ronald L. Arenson, M.D., left, presents Jeffrey W. Prescott, M.D., Ph.D., with the RSNA Alexander R. Margulis Award for Scientific Excellence.

Findings showed a strong association between increased florbetapir uptake and decreased strength, local efficiency and clustering coefficient of the structural connectome.

Dr. Prescott and colleagues concluded that increased amyloid burden—measured with florbetapir PET imaging—is related to changes in the topology of the large-scale cortical network architecture of the brain as measured with graph theoretical metrics of DTI tractography—even in the preclinical stages of Alzheimer's disease.

"The prominence of these changes in patients with normal cognition raises the possibility that damage to the structural connectome may occur at a preclinical stage in patients at risk," Dr. Prescott said.

Research Could Impact Alzheimer's Trials

These findings may offer a role in assessing brain damage in early Alzheimer's and monitoring the effect of new therapies, according to *Radiology* editor, Herbert Y. Kressel, M.D.

"This type of analysis could have substantial impact on trials of Alzheimer's disease therapies," Dr. Kressel said. "Specifically, biomarker information, including the integrity of the connectome, might be studied to reduce development times for new drugs, diminish costs associated with clinical trials, improve drug safety and optimize drug efficacy."

Dr. Prescott credits the success of his research to the efforts of his colleagues on the study as well as the ADNI in granting access to its database.

"The research would not have been possible without the efforts of everyone involved with the Alzheimer's Disease Neuroimaging Initiative," Dr. Prescott said. "ADNI gave us access to a large, well-curated database of images and clinical information, so that we were able to investigate our hypothesis in a powerful but timely manner."

Although the *Radiology* study was his first published research on Alzheimer's disease, Dr. Prescott is continuing to investigate the disease, primarily in its early stages. At RSNA 2015, his research, "Default Mode Network Structural-functional Connectivity and Beta-Amyloid Pathology in Autosomal Dominant Familial Alzheimer's Disease," used data from the Dominantly Inherited Alzheimer's disease Network (DIAN) to evaluate relationships between structural connectivity, functional connectivity and amyloid burden. This research was awarded a 2015 RSNA Trainee Research Prize — Resident.

Still in the early stages of his career, Dr. Prescott plans to pursue Alzheimer's disease research for the foreseeable future.

"My interest in this research is pretty straightforward. Alzheimer's is a big problem and it's becoming even bigger," Dr. Prescott said. "There is a lot of opportunity for neuroimaging to make advancements in diagnosing and treating the disease, and that role will only continue to grow." □

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Access Dr. Prescott's full *Radiology* study at *RSNA.org/journal/radiology*.

Studies Investigate Significance of Follow-up Head CT, MRI

BY ELIZABETH GARDNER

Kavi Devulapalli, M.D.

Daddy Mata Mbemba, M.D.

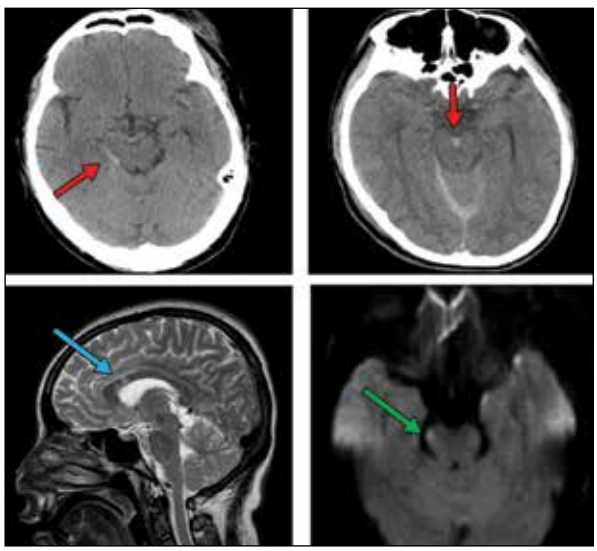
Patients with isolated small brain hemorrhages may not benefit from the repeat head CT scans that are now the treatment norm for any intracranial hemorrhage, according to a study presented at RSNA 2015.

In "Utility of Repeat Head CT in Mild Traumatic Brain Injury (mTBI) Patients Presenting with Small Isolated Falcine or Tentorial Subdural Hematoma (SDH)," a study team at UCSF Medical Center sought to evaluate the common practice of ordering CTs at six-hour intervals for mild traumatic brain injury patients with small, deep brain hemorrhages that can't be decompressed surgically.

Only three out of 90 patients studied had any increase in bleeding evident on follow-up CT, and all three had impaired clotting ability, due to either medications or underlying blood conditions. For the other patients, the hemorrhages either were stable or decreased in size on a follow-up scan.

"Nothing much happens to these patients—they stay the same," said radiology resident Kavi Devulapalli, M.D., who presented the findings. If they are confirmed by additional studies, Dr. Devulapalli said the standard of care may—and should—shift to doing follow-up CT scans only on patients who have issues with anticoagulation. The presence of intracranial hemorrhage might prompt starting the patient on an anti-seizure medication or changing their anticoagulant medication, but follow-up CT might not be worth the time, expense or extra radiation exposure for the patient, he said.

The study examined images from all patients presenting to UCSF's Level 1 trauma center from January 2013 through March 2015 undergoing initial and short-term follow-up head CT with initial findings positive for isolated subdural hemorrhages along the falx and/or tentorium. Patients with penetrating trauma, other sites of intracranial hemorrhage, brain contusion or depressed skull fractures were excluded. An electronic health record review provided information including gender, age and history of anticoagulation.



An image from Dr. Mbemba's research showing the initial CT performed 50 minutes after onset showed the presence of midline (perimesencephalic) subarachnoid hemorrhage (→), which predicted the presence of severe DAI [DAI located in the corpus callosum (→) or in the brainstem (→)] as shown on subsequent MRI performed 3 days later.

Intraventricular Hemorrhage on Initial CT

A second study looked at whether midline subarachnoid hemorrhages detected on CT could predict severe diffuse axonal injury and be used as a marker for referring patients for follow-up MRI. The study received a 2015 RSNA Trainee Research Prize.

Intraventricular hemorrhage (IVH) on initial CT has been reported to predict diffuse axonal injury in the corpus callosum or brain stem on subsequent MRI. Presenter Daddy Mata Mbemba, M.D., and colleagues at Tohoku University in Sendai, Japan, tested a hypothesis that midline subarachnoid hemorrhages (SAH), commonly associated with IVH on initial CT, could have a similar clinical value in predicting severe diffuse axonal injury (DAI).

Researchers studied 270 head trauma patients who underwent CT within 24 hours and MRI within 30 days. Six CT findings were studied as potential predictors of DAI: status of basal cistern, status of midline shift, epidural hematoma, IVH, SAH, and volume of hemorrhagic mass. The SAH findings were further analyzed based on six locations, two of which, interhemispheric and perimesencephalic, were classified as midline. Based on MRI results, the patients were divided in two groups: DAI present (77 patients) and DAI absent (193 patients).

The presence of midline SAH on CT turned out to be a better predictor than IVH for severe DAI, Dr. Mbemba said. Sensitivity was 60.7 percent, specificity was 81.8 percent, positive predictive value was 43.6 percent and negative predictive value was 90 percent.

While the finding may not be strong enough to change the overall utilization of follow-up MRI for patients without midline SAH, especially when MRI capabilities are in the same building or nearby, Dr. Mbemba said it could potentially serve as a useful screening indicator in locations where obtaining a follow-up MRI might entail transferring an unstable patient to a distant location. □

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Go to *RSNA.org/News* to view video interviews with Dr. Devulapalli and Dr. Mbemba discussing their research at RSNA 2015.

CT Technique Shows Promise with Colonoscopies, Colon Cancer

BY ELIZABETH GARDNER

Studying the natural evolution of medium-sized polyps with volumetric measurements instead of linear measurements might better inform the management of these polyps, in particular determining whether surveillance or colonoscopy should be recommended, according to research from the University of Amsterdam presented at RSNA 2015.

Charlotte Tutein Nolthenius, M.D.

David Little, M.B.Ch.B.

"Previous literature showed a 3-6.6 percent chance of harboring advanced histology for medium-sized (6-9 mm) polyps, but little is known about their natural course," said presenter Charlotte Tutein Nolthenius, M.D., of the Department of Radiology at the Academic Medical Center of the University of Amsterdam. "CTC is probably the best method for determining longitudinal growth of these polyps, because we leave them in place allowing a reproducible localization and measurement," she added.

The study looked at 70 participants who had one or two 6-9 mm polyps at primary screening CTC and received surveillance CTC after three years. Those who still had lesions 6 mm or larger were offered colonoscopy and polypectomy. Semi-automated volumetric measurements were performed at both CTCs, and mean volume was calculated for prone and supine volume measurements.

The polyps were classified into baseline growth categories. Polyps that increased more than 30 percent in volume were classified as progressing, while those that decreased more than 30 percent were classified as regressing. Polyps whose volume changes fell in between those parameters were classified as stable. "The 30 percent threshold was chosen because it exceeds the margin of error for measurements made using CTC, and therefore represents genuine changes," Dr. Nolthenius said. Polyp growth was then correlated to histopathological findings.

In total, 95 polyps on initial CTC were studied. Thirty-five percent of these polyps progressed, while 38 percent remained stable and 27 percent regressed, including complete resolution in 14 percent. Growing polyps were more likely to be advanced adenomas at removal than stable or regressing polyps (45 versus 17 and 0 percent respectively). Of the 21 proven advanced adenomas, 71 percent progressed and 29 percent remained stable. Out of 35 non-advanced adenomas, only 39 percent progressed, and 44 percent remained stable.

No polyps progressed to colorectal cancers or adenomas with high-grade dysplasia during the surveillance interval.

Comparing CT Colonography, Colonoscopy

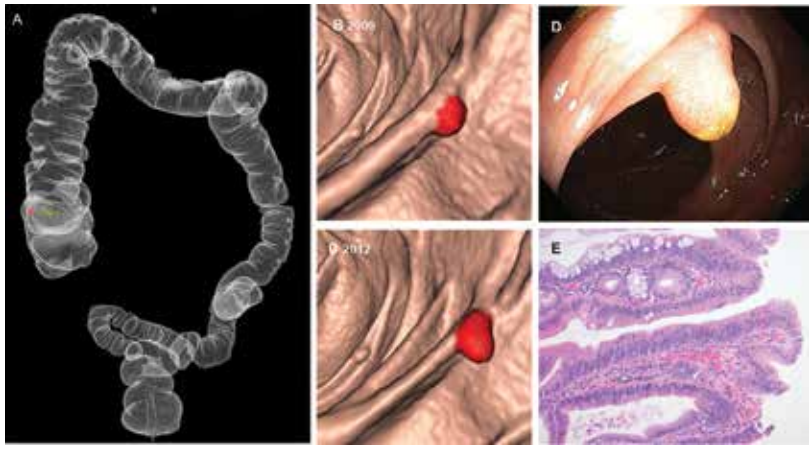
A separate study looked at how well CT colonography compares with colonoscopy at detecting cancers.

A team from Bristol, England, found that the sensitivity of CTC was 98.9 percent in almost 5,000 patients screened during the study period, which slightly exceeded the performance of CTC in other published studies. Only five cancers were missed by CTC, and three of them were also not visible on follow-up scans post-diagnosis.

The sample included 198 patients with a diagnosis of colorectal carcinoma entered into the cancer registry between January 2010 and January 2015 who had had a CTC before being diagnosed. These patients represented about four percent of the total number of patients screened with CTC.

The two missed cancers had specific characteristics that made them difficult to spot on CTC, said presenter David Little, M.B.Ch.B. Lesions that are flat, close to the ileocaecal valve, ulcerated, or hidden by a complex fold are more likely to be missed on CTC, he said. Both patients were treated and are currently cancer-free.

Dr. Little said the research team plans to follow the patients in the study until 2018. □



An image from Dr. Nolthenius' research showing progressing advanced adenoma. Sessile polyp in the ascending colon on 3-D images (A), measuring 104.1 mm3 in volume on index CT colonography in 2009 (B). After a surveillance period of 3.1 years volume (205.1 mm3) had increased (C). After endoscopical removal (D) histopathological analysis revealed a tubulovillous adenoma with low-grade dysplasia (x100 magnification and H&E stained section) (E). On both 3-D images is a small sessile polyp (5 mm) visible in the background which was not included in this study as it was <6mm.

WEB EXTRAS

Go to *RSNA.org/News* to view video interviews with Dr. Nolthenius and Dr. Little discussing their research at RSNA 2015.

New Imaging Analysis Technique Provides Faster Treatment Assessment for Liver Cancer

BY RICHARD S. DARGAN

A novel MRI analysis technique provides assessment of the effectiveness of liver cancer treatment far sooner than existing methods, according to preliminary results of a study presented at RSNA 2015.

Hepatocellular carcinoma (HCC) is the second leading cause of cancer-related death worldwide. Many patients undergo treatment with transarterial chemoembolization (TACE), an image-guided procedure that blocks the tumor's blood supply while delivering chemotherapeutic drugs directly to the tumor. Identifying patients who don't respond to TACE is critical so that they can be treated again or have their therapy changed in a timely fashion.

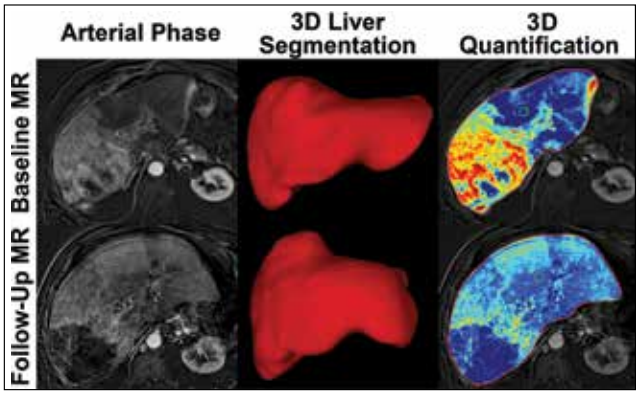
"In clinical oncology, it is very challenging to assess tumor response to treatment," said study co-author Julius Chapiro, M.D., of the Yale University School of Medicine. "Up until now, we could measure the extent of tumor diameter or uptake with manual tools like the caliper on the screen, which are highly unreliable due to reader bias."

Dr. Chapiro and colleagues used the quantitative European Association for the Study of the Liver (qEASL) technique, a new 3-D approach the researchers developed in collaboration with Philips Research North America that provides whole liver volumetric enhancement quantification on MRI.

"The radiologist can segment the entire tumor with the assistance of the computer," Dr. Chapiro said. "It's a work-flow efficient, semi-automated process that takes 15 to 20 seconds to segment and allows you to delineate the tumor in 3-D."

The researchers used qEASL on 68 liver cancer patients with infiltrative HCC to measure treatment response and predict survival. The ill-defined borders and the sheer number of lesions in infiltrative HCC can pose a challenge in treatment response assessment after TACE with traditional methods.

"Up until now we haven't had any kind of objective measurement for infiltrative liver cancer," said study co-author Susanne Smolka, one of several medical students from Charité University Medicine in Berlin who worked on the project at Yale through a grant from the R.W. Günther Foundation. "This new technique is quantitative and we can apply it to the whole liver, giving us for the first time an objective measurement."



Liver images captured before (top row) and after (bottom) treatment. The bottom right image shows less cancer after treatment, as evident by the reduction in red and yellow areas.

Susanne Smolka

The patients underwent qEASL before and one month after their first TACE. The whole liver was segmented and viable tumor was identified by the degree of enhancement above surrounding healthy liver tissue. The researchers set a threshold of a 65 percent reduction in viable tumor between baseline and follow-up MRI to separate responders from non-responders.

Responders had an overall survival of approximately 21 months, compared with 6.8 months in non-responders, and a mean 57.8 percent decrease in enhancing volume, compared with a 19.1 percent increase in non-responders on average.

"The findings show that quantitative tumor enhancement is possible with 3-D qEASL and can predict survival after TACE for infiltrative and multifocal HCC," Dr. Chapiro said.

Dr. Chapiro emphasized that qEASL is not a diagnostic tool but rather a means of comparing differences before and after treatment to identify non-responders.

"The earlier the non-responders are identified and treated, the better their outcomes," he said.

Along with liver cancer, the approach has been validated for benign brain and uterine lesions and also could be applied to systemic therapy. It can be used with additional imaging modalities like cone-beam CT, MDCT, and SPECT, according to Jeff Geschwind, M.D., principal investigator of the project and chairman of the Department of Radiology and Biomedical Imaging at Yale.

"With this tool, we started a small revolution in how we use follow-up imaging in clinical cancer management, not only for local but for all cancer therapies," Dr. Geschwind said. "Most importantly, we are now looking at the broad clinical application of qEASL, which has now been introduced to the community as a commercially available product." □

IVP Team Teaches, Learns from Radiology Residents in Chile

BY FELICIA DECHTER

Although private healthcare in Santiago, Chile, shares similarities with U.S. healthcare, three radiologists who recently visited the city as part of the RSNA International Visiting Professor (IVP) program also discovered some unexpected differences during their October trip.

"This was a great international experience and Chile is now one of our favorite countries."

JOHN BAYNE SELBY, M.D

The 2015 RSNA International Visiting Professors (IVP): Left to right: Abid Irshad, M.B.B.S., Evan Unger, M.D., Claudio Silva, M.D., M.Sc., (RSNA IVP organizer from Chile) and John Bayne Selby, M.D.

Dr. Irshad speaking at the Chilean Radiological Society Annual Meeting in Santiago.

"As visiting professors, one of the most interesting parts of the trip was the cases presented by residents," said Evan Unger, M.D., a professor of radiology and biomedical engineering at the University of Arizona. "We saw very different cases involving infectious diseases including hydatid cyst disease and unusual manifestations of tuberculosis which we don't generally see in the U.S."

Dr. Unger is one of three U.S. doctors who visited Santiago for two weeks as part of the RSNA IVP program, which annually sends teams of professors to lecture at national radiology society meetings and visit radiology residency training programs at selected host institutions in developing nations. The two-week trip was hosted by Sociedad Chilena de Radiología (SOCHRADI, the Chilean Society of Radiology).

The doctors learned about the state of healthcare in Chile in various public and private institutions, said Dr. Abid Irshad, M.D., a professor of radiology and director of breast imaging at the Medical University of South Carolina in Charleston. While private hospitals are very similar to most private U.S. hospitals, public healthcare facilities in Chile are operating with limited resources in many cases, Dr. Irshad said.

There is a significant difference in the public and private sector as far as the services available, with the public sector often facing a shortage of resources," Dr. Irshad said. "Additionally, there are long wait times for the imaging in public hospitals—often months."

"The care in the public hospitals was very good and based on modern medical teaching and technique—however the imaging equipment was quite limited," said John Bayne Selby, M.D., a professor of Medicine, Division of Vascular/Interventional Radiology, Department of Radiology at the Medical University of South Carolina in Charleston. "One public hospital had no angiography room and the other had one angiography room shared by all specialties."

IVP Team Teaches at Joint Resident Academic Meeting

Compared to the U.S., resident training is markedly different in Chile. Medical school starts after high school and lasts seven years, while the last two years are devoted to a clinical internship, Dr. Irshad said.

Radiology residency is three years while most fellowships are one year (neuroradiology and interventional radiology are two years). Nevertheless, only 10 to 20 percent of residents participate in fellowships, primarily because radiology is in extreme demand and residents are needed on the job.

Most residents receive a modest salary and often face a very difficult, competitive road, said Dr. Selby, who also participated in an RSNA IVP trip to Thailand several years ago.

"The majority end up working in other parts of the country, at least for a while as a payback process," he said.

The IVP team taught at two of the largest

Drs. Selby, Irshad and Unger *(center)*, and students, after lecturing at Clinica Alemana, a private hospital in Santiago; top right: the IVP team enjoyed some social time with residents; bottom right: Drs. Irshad and Selby take a "selfie" with the residents at Clinica Alemana, a private hospital in Santiago.

radiology residency programs—Hospital Clínico Universidad de Chile (Universidad de Chile) and Hospital Padre Hurtado (Universidad de Desarrollo), said Claudio Silva, M.D., MS.c., the local liaison for IVP Chile 2015 for SOCHRADI and academic director of the Radiology Department, Medical School Clinica Alemana—Universidad del Desarrollo, in Santiago.

A rotating schedule allowed the professors to spend an equivalent amount of time in each institution, Dr. Silva said.

"They gave lectures followed by case discussions with the active participation of our residents," Dr. Silva said. "Residents had the opportunity to present selected cases to the professors and discuss the diagnostic approach for each one."

The doctors also participated in the first-ever joint resident academic meeting between these institutions. All residents from both programs met in an auditorium at Clinica Alemana (campus for Universidad del Desarrollo) for lectures by the professors, followed by case presentations by residents/fellows which the professors discussed, Dr. Silva said.

"It was a very novel occasion with strong participation," Dr. Silva said. "The residents are enthusiastic to repeat such an activity."

The IVP team also presented lectures at the local radiological meeting where the more than 600 participants broke an attendance record. "All of their lectures were of the highest quality and very engaging," Dr. Silva said.

From left: Dr. Irshad and wife Ruby Abid (right) and Dr. Selby and wife Lynda Selby (center) enjoyed some downtime at the Valle Navado skiing resort.

"The performance of the professors both in small groups and in the larger radiological meeting was of high academic quality, very goal-oriented and highly professional," Dr. Silva said. "Residents and fellows were very comfortable engaging with them."

The residents, said Dr. Unger, were "bright, energetic and highly motivated."

IVP Team Takes in Sights, Sounds of Chile

While the group devoted a lot of time to work, the IVP team was also able to experience Santiago's remarkable local color. They rode subways and bicycles, visited the coast and snow skied. Dr. Selby and his wife even extended their stay.

"My wife and I took extra time and went south to Patagonia where we saw condors, guanacos (similar to an alpaca), huge Andes mountain peaks and did some amazing hiking and kayaking," Dr. Selby said. "This was a great international experience and Chile is now one of our favorite countries."

The Chileans also invited the doctors to a number of delicious dinners hosted by Dr. Silva. "We left with a very warm feeling about Chile and look forward to continuing interactions with our Chilean colleagues," Dr. Unger said.

Past IVP teams have traveled to Malaysia, Brazil, Nepal, Vietnam and Russia. In 2016, the team will travel to Mexico, Mongolia, the Philippines, and Ghana. □

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For more information on the RSNA International Visiting Professors (IVP) program, go to *RSNA.org/International.aspx.*

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Automatic Image Quality Evaluation for CT Protocol Guidances

Bruce Lehnert, M.D.

2015 RSNA Research Seed Grant recipient **Bruce Lehnert, M.D.,** plans to develop and validate automated techniques to quantify the acquisition quality and the contrast enhancement adequacy of CT scans.

"Automating the process of acquiring quantitative image quality metrics from production line CT scans will allow for continuous CT quality assurance, including radiation dose and diagnostic performance optimization, as protocols are modified and CT equipment updated."

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Jorge A. Soto, M.D.
Gilles P. Soulez, M.D.
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Kimiichi Uno, M.D.
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Takashi Ushimi, M.D., Ph.D.
Emilie Vallee, M.D.
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Journal Highlights

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

Pitfalls in Liver Imaging

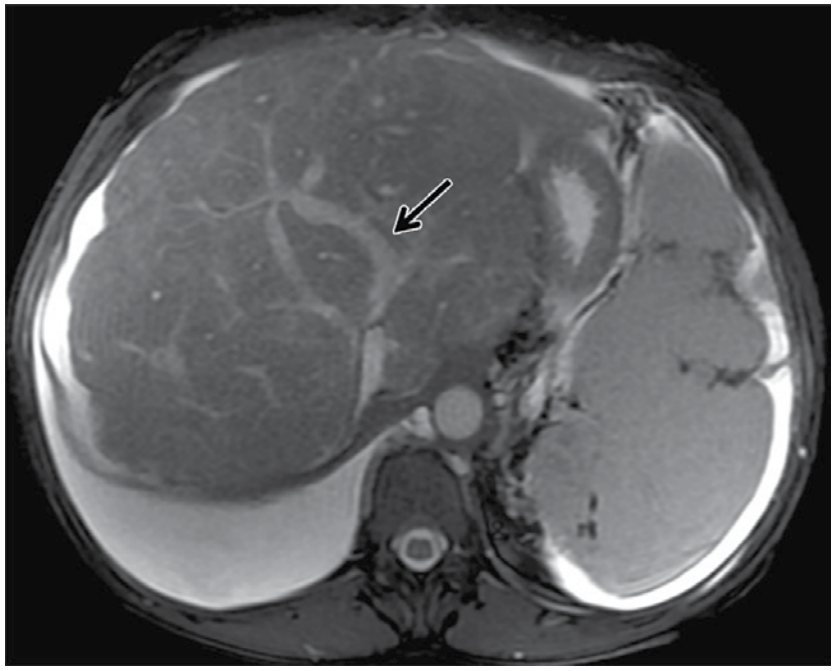
The liver is a tricky organ for radiologists. The external structure (lobes separated by the falciform ligament) does not reflect the internal structure, which has been clearly described by the anatomist Charles Couinaud.

In a review article in the January issue of *Radiology* (*RSNA.org/Radiology*), Valerie Vilgrain, M.D., Ph.D., Matthieu Lagadec, M.D., and Maxime Ronot, M.D., Ph.D., of Université Paris Diderot and Hôpital Beaujon in Paris, discuss the major traps in image interpretation and give diagnostic clues to confidently interpret CT or MRI.

Cirrhosis is the most common chronic liver disease, but certain other liver diseases may have a pseudocirrhotic appearance on imaging and require different patient management. The differentiation of true liver tumors from pseudotumors can be challenging.

Essentials from the review include:

- The majority of the noncirrhotic liver diseases, which mimic cirrhosis are of vascular or biliary origin.
- Careful analysis of the large intra- and extrahepatic vessels is helpful to assess whether a large tumor originates from within or outside the liver.
- The most common pseudolesions in segment 4 are related to focal fatty sparing or focal steatosis.



MR image in a 39-year-old woman with morphologic changes of the liver secondary to Budd-Chiari syndrome. Fat-suppressed fast SE T2-weighted MR images (2500–8000/90; flip angle, 90˚; section thickness, 4 mm) show atrophy of the right and left liver lobe and hypertrophy of the caudate lobe. Hepatic veins are not patent and large hepatic venous collaterals (*arrow*) drain into the IVC. Splenomegaly and ascites are seen.
(*Radiology* 2016;278;1:34-51) ©RSNA 2016 All rights reserved. Printed with permission.

Radiology

"Most of these pitfalls can be avoided by the careful analysis of all imaging findings in relation to their fit with the clinical background of the patient," the authors write.

Radiology EXTRA PODCASTS

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

- "Influence of Cardiac MR Imaging on DNA Double-Strand Breaks in Human Blood Lymphocytes," Michael Brand, M.D., and colleague.
- "Focal Nodular Hyperplasia and Hepatocellular Adenoma: Accuracy of Gadoxetic Acid–enhanced MR Imaging—A Systematic Review," Matthew D. F. McInnes, M.D., and colleagues.
- "CT Screening for Lung Cancer: Nonsolid Nodules in Baseline and Annual Repeat Rounds," David F. Yankelevitz, M.D., and colleagues.

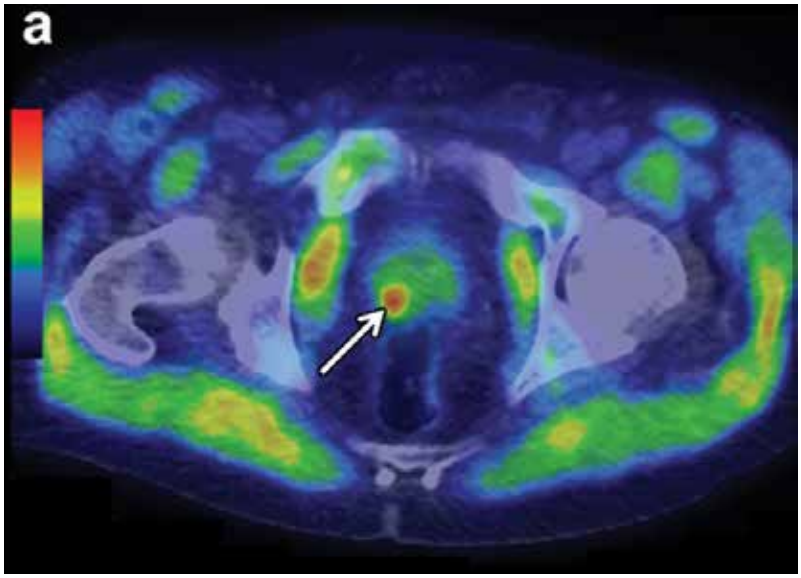
Molecular Imaging of Prostate Cancer

In the management of prostate cancer, the methods currently applied for risk stratification, treatment selection and response prediction, as well as estimation of prognosis, are considered suboptimal. Molecular imaging of prostate cancer is a rapidly emerging field that aims to provide noninvasive insights into tumor biology and diversity on a whole-body scale.

In an article in the January-February issue of *RadioGraphics* (*RSNA.org/RadioGraphics*), Andreas G. Wibmer, M.D., of Memorial Sloan Kettering Cancer Center, and colleagues provide an overview of the molecular imaging methods that are presently used or are undergoing clinical evaluation, including imaging of cell metabolism, hormone receptors and membrane proteins. They examine the advantages and disadvantages of each imaging strategy, its diagnostic value and its appropriate use.

Key points include:

- Radiolabeled metabolites are not specific to prostate cancer, and tracer accumulation may be observed at other sites of increased cell metabolism, including areas of inflammatory change, benign tumors and nonprostatic malignancies.
- The binding of ^{18}F-fluorodihydrotestosterone (FDHT) to the androgen receptor is drastically reduced by physiologic testosterone levels and the administration of antiandrogenic drugs. Thus, it is crucial to consider the patient's current antiandrogenic medication when interpreting FDHT PET examinations.
- The availability of both diagnostic and therapeutic versions of the same tracer allows implementation of a "theranostic" approach, in which an imaging probe can reliably predict the in vivo binding of its therapeutic "sister" agent and can also allow patient-tailored dosage calculations.
- Despite its name, prostate-specific membrane antigen (PSMA) is not perfectly specific for prostate cells or prostate cancer, and possible pitfalls should be kept in mind in the interpretation of PSMA-based imaging studies.
- Bone-seeking tracers will accumulate in the bone matrix but not in cancer cells, thus reflecting the osteoblastic response to the cancer rather than reflecting the tumor itself.



Newly diagnosed prostate cancer (Gleason score, 4 + 4 = 8; PSA level, 30 ng/mL) found at biopsy in a 64-year-old man who was referred for cancer staging. Carbon 11–labeled acetate PET/CT image shows a suspicious lesion (*arrow*) in the right prostatic peripheral zone. Note the physiologic uptake of ^{11}C-acetate in the skeletal muscle.
(*RadioGraphics* 2016;36;InPress) ©RSNA 2016 All rights reserved. Printed with permission.

RadioGraphics

"Selection of the imaging strategy most appropriate for the clinical situation, as well as knowledge about the biologic mechanisms underlying each imaging approach and the pharmacologic properties of the individual tracers, will help realize the full potential of tracers and avoid pitfalls. Also, there is an urgent need to develop standardized methodology for evaluating new and existing tracers that are relevant to prostate cancer imaging, to allow comparison of the results reported with different compounds," the authors write.

This article is accompanied by an Invited Commentary by Peter L. Choyke, M.D., from the Molecular Imaging Program at the National Cancer Institute.

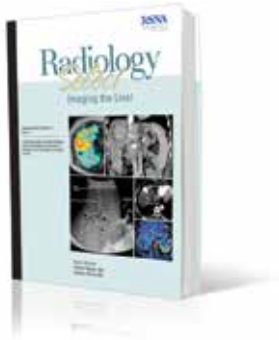
This article meets the criteria for *AMA PRA Category 1 Credit™*. SA-CME is available online only.

Latest *Radiology* Select Volume 7 Spotlights Imaging the Liver

In Volume 7 of *Radiology* Select, guest editors Valérie Vilgrain, M.D., and Maxime Ronot, M.D., have curated a collection of 31 *Radiology* articles that cover the most important advances in liver imaging.

Subject areas include:

- Diagnostic imaging with US, CT, and MRI
- Disease detection and characterization with diffusion MRI
- Quantitative imaging techniques
- Liver-specific contrast agents
- Advances in treatment of liver diseases



The Online Educational Edition includes 13 tests with an opportunity to earn 13 SA-CME credits. This enduring material can be applied toward the ABR self-assessment requirement.

Access all volumes of *Radiology* Select at *RSNA.org/RadiologySelect*.

Radiology in Public Focus

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

MRI Shows Heart Ages Differently in Women than in Men

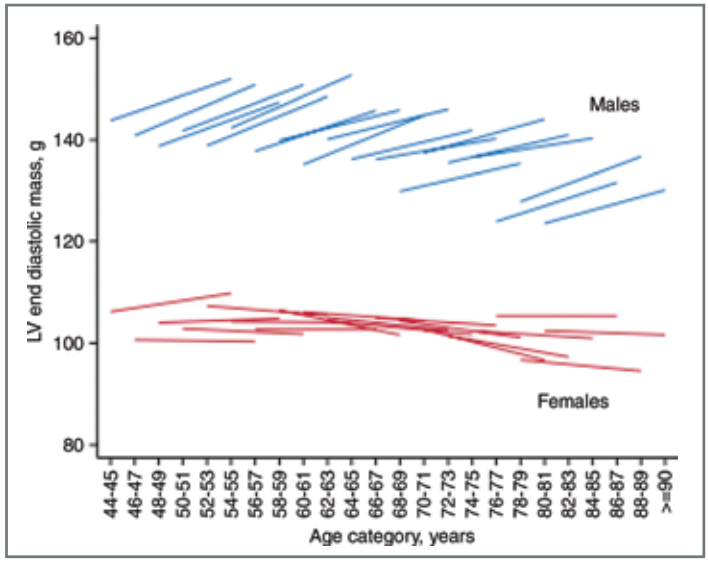
As patients age, the left ventricular (LV) responds differently in its mass and volume between men and women, although both men and women experience increased concentric LV remodeling with age, new research shows. In men, the opposition of longitudinal and cross-sectional changes in LV mass highlights the importance of longitudinal study.

John Eng, M.D., of the Russell H. Morgan Department of Radiology and Radiological Science at Johns Hopkins University School of Medicine, and colleagues used MRI to identify longitudinal changes in LV structure and function in 2,935 participants who underwent baseline and follow-up cardiac MRI in the Multi-Ethnic Study of Atherosclerosis. Participants were aged 54–94 years at follow-up, and 53 percent of the participants were women. Median time between baseline and follow-up cardiac MR imaging was 9.4 years.

Over this period, LV mass increased in men and decreased slightly in women (8.0 and -1.6 g per decade, respectively; P < .001). In both men and women, LV end-diastolic volume decreased (-9.8 and -13.3 mL per decade, respectively; P < .001), stroke volume decreased (-8.8 and -8.6 mL per decade, respectively; P < .001), and mass-to-volume ratio increased (0.14 and 0.11 g/mL per decade, respectively; P < .001). Change in LV mass was positively associated with systolic blood pressure and body mass index and negatively associated with treated hypertension and high-density lipoprotein cholesterol level. In men, the longitudinal LV mass increase was in contrast to a cross-sectional pattern of LV mass decrease.

The changes combined to produce significant increases in adverse remodeling of the LV as shown by increasing mass-to-volume ratios in both men and women.

"The LV mass in men implies an underlying cohort effect that operates in a direction opposite of the age effect," the authors write. "These results highlight the importance of longitudinal study and suggest sex-specific differences in age-related cardiac remodeling."



Age-related longitudinal and cross-sectional changes of LV mass and volume by sex. Individual line segments represent observed longitudinal changes for each age group, and the trends between successive line segments represent cross-sectional patterns among the age groups. LV mass increased longitudinally and decreased cross-sectionally in men.
(*Radiology* 2016;279;1:InPress)

RadiologyInfo.org Content Review Program

RadiologyInfo.org, produced by the RSNA and ACR, is dedicated to being the trusted source of information for the public about radiology and the unique and vital role radiologists play in healthcare. The website, which consists of more than 200 procedure descriptions, diseases/conditions, screening/wellness and safety topics, receives more than 900,000 monthly visitors.

RadiologyInfo.org
For patients

Each year, beginning in January, content on *RadiologyInfo.org* is reviewed by physicians to ensure the public has access to the most up-to-date and accurate radiologic information. These physicians are then recognized on the *RadiologyInfo.org* Medical Advisors page.

Are you interested in contributing your expertise to patient-friendly content as a *RadiologyInfo.org* reviewer? Send your curriculum vitae to Joshauna Strong at *jstrong@rsna.org*, noting your area of expertise and interest.

High-Grade DCIS Detection Rates Increase in Older Women

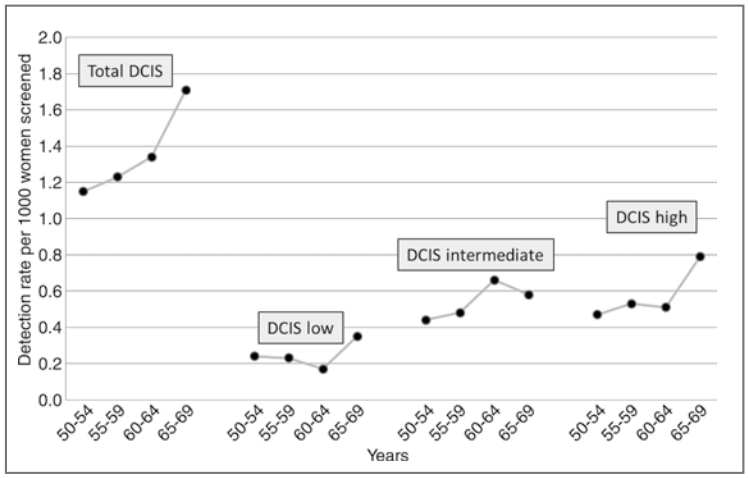
Total ductal carcinoma in situ (DCIS) detection rates increase with age, mostly because of an increase in high- and intermediate-grade DCIS, which are precursor lesions that carry a higher risk for transition to more aggressive invasive breast cancer than low-grade DCIS, new research shows.

Stefanie Weigel, M.D., Ph.D., of the University of Muenster in Muenster, Germany, and colleagues retrospectively studied 733,905 women aged 50–69 years who participated in a screening program for the first time in 2005 to 2008 (baseline examinations were performed with digital mammography). DCIS detection rates were determined for 5-year age groups (detection rates per 1,000 women screened) to distinguish high-, intermediate-, and low-grade DCIS. Multivariable logistic regression was used to compare detection rates between age groups by adjusting for screening units ($P < .05$).

There were 989 graded DCIS diagnoses among the women (detection rate, 1.35 percent): 419 diagnoses of high-grade DCIS (detection rate, 0.57 percent), 388 diagnoses of intermediate- grade DCIS (detection rate, 0.53 percent), and 182 diagnoses of low-grade DCIS (detection rate, 0.25 percent). Detection rate for types of DCIS combined increased significantly across age groups (50–54 years, detection rate of 1.15 percent [254 of 220,985 women]; 55–59 years, detection rate of 1.23 percent [218 of 177,782 women]; 60–64 years, detection rate of 1.34 percent [201 of 150,415 women]; and 65–69 years, detection rate of 1.71 percent [316 of 184,723 women]; $P < .001$).

Of note, the detection rate for high-grade DCIS showed a significant increase with age (odds ratio, 1.18 per 5-year age group; $P < .0001$). The increase was lower for intermediate-grade DCIS (odds ratio, 1.11; $P = .016$) and not significant for low-grade DCIS ($P = .10$).

"The potential benefit of preventing aggressive invasive breast cancer through the diagnosis of a non-low-grade in situ lesion by means of digital mammography screening and subsequent treatment appears to apply significantly more frequently to older women than to younger women who are eligible for mammography screening. High-grade lesions are more likely than low-grade lesions to lead to symptoms during a patient's remaining lifetime, even in older population groups," the authors write.



Plot of detection rates (per 1,000 women screened) for total DCIS and for low-, intermediate-, and high-grade DCIS according to age group.

Media Coverage of RSNA

In September, 442 RSNA-related news stories were tracked in the media. These stories reached an estimated 626 million people.

Coverage included *U.S. News & World Report*, *Reuters*, *Toronto Star*, *Yahoo! Finance*, *Philly.com*, *Bloomberg News*, *CNNMoney.com*, *HealthDay*, *Health.com*, *CNBC.com*, *ScienceDaily*, *Medical News Today*, *Radiology Today*, *DOTmed Business News*, *Auntminnie.com* and *Health Imaging & IT*.

JANUARY PUBLIC INFORMATION OUTREACH ACTIVITIES FOCUS ON CT AND MRI

In January, RSNA's 60-Second Checkup audio program, distributed to nearly 100 radio stations across the country, will focus on the use of CT and MRI for better treatment of patients with Chronic Obstructive Pulmonary Disease (COPD).

Value of Membership

SAM Credit Deadline Approaches for *Radiology* Select Volume 3

Those who have purchased *Radiology* Select Volume 3: Coronary Artery Disease should be aware of two important deadlines. On Jan. 29, the opportunity to earn self-assessment module (SAM) credits associated with *Radiology* Select Volume 3 will expire. Those who have previously purchased access to the Volume 3 online tests will need to complete the tests by Jan. 28 to earn credit. After this date, access to the online tests expires.

The online educational edition of Volume 3 will be available at a 50 percent discount off the standard price until Jan. 28. This offer applies to the online educational edition only and does not apply to print or tablet editions.

Radiology Select is a continuing series of selected *Radiology* articles that highlight developments in imaging science, techniques and clinical practice. For more information, go to *RSNA.org/RadiologySelect*.

Education and Funding Opportunities

Writing a Competitive Grant Proposal

February 5-6, 2016
RSNA Headquarters
Oak Brook, Ill.

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, M.D., M.P.H., of Massachusetts General Hospital in Boston; Ruth Carlos, M.D., of the University of Michigan Health System in Ann Arbor, Mich.; Martin Pomper, M.D., Ph.D., of Johns Hopkins School of Medicine in Baltimore; David Shuster, M.D., of Emory University in Atlanta, and Antonio Sastre, Ph.D. of the National Institute of Biomedical Imaging and Bioengineering, Bethesda., Md.

The course fee is $225. Register online at *RSNA.org/CGP*. Contact Rachel Nelson at 630-368-3742 or *rnelson@rsna.org* for additional information.

Thank You to RSNA 2015 Faculty

Each year RSNA records several courses to be posted in a tablet-accessible online format, including side-by-side transcript and audiovisual presentation.

RSNA thanks the faculty members who participated in recording their courses at RSNA 2015, as well as those who presented self-assessment modules (SAMs) at the annual meeting. As part of presenting a SAM course, faculty must write questions for their presentation and provide references. With the help of SAM faculty, RSNA was able to provide 48 SAMs courses at RSNA 2015.

If you missed the RSNA Store at RSNA 2015, visit *RSNA.org/library* to view our current educational products. Contact *ed-ctr@rsna.org* or 1-800-272-2920 with questions.

For Your Calendar

FEBRUARY 5–6
Writing a Competitive Grant Proposal
RSNA Headquarters, Oak Brook, Ill.
• *RSNA.org/CGP*

FEBRUARY 17–20
Mexican Society of Radiology and Imaging (SMRI) Mexico City, Mexico
Visit the RSNA Booth
• *SMRI.org*

MARCH 2-6
European Society of Radiology
Visit the RSNA Booth
• *MyESR.org*

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

Annual Meeting Watch

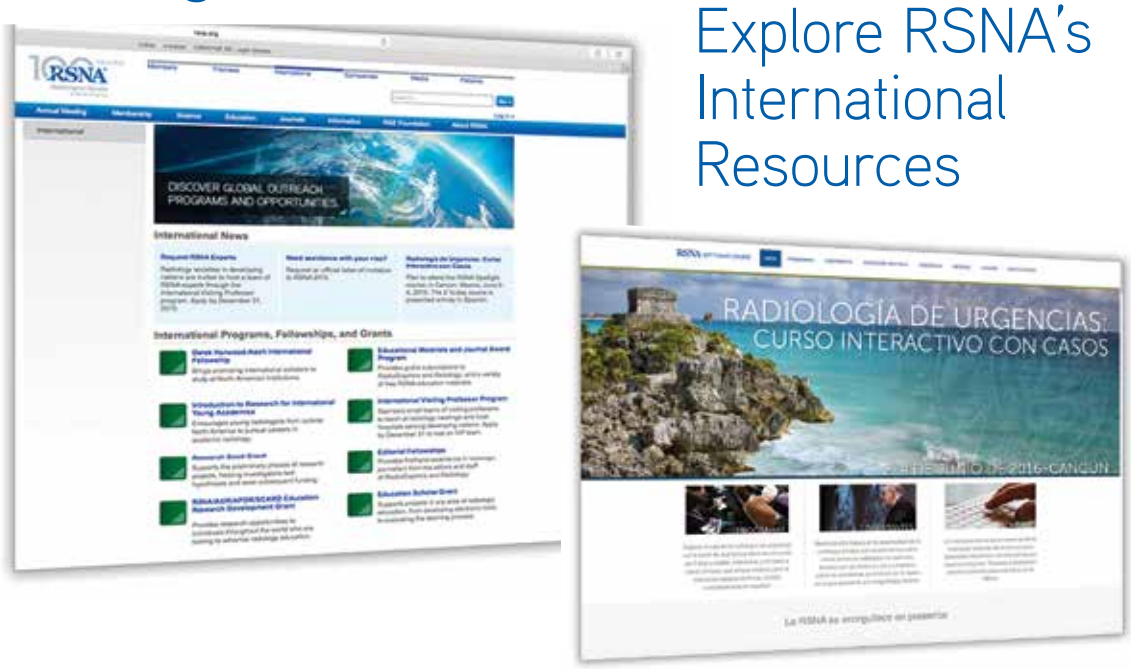
RSNA 2016 Online Abstract Submission Opens Late January

The online system to submit abstracts for RSNA 2016 will be activated in late January. The submission deadline is noon Central Time (CT) on Wednesday, April 13, 2016. Abstracts are required for scientific presentations, education exhibits, applied science, quality storyboards and quantitative imaging reading room showcases.

To submit an abstract online, go to *RSNA.org/Abstracts*. The easy-to-use online system helps the Scientific Program Committee and Education Exhibits Committee evaluate submissions efficiently. For more information about abstract submissions, contact the RSNA Program Services Department at 1-877-776-2227 within the U.S. or 1-630-590-7774 outside the U.S.

Students, clinical trainees and post-doctoral trainees are eligible to receive $500 travel awards for top-rated abstracts accepted for presentation at RSNA 2016. Full eligibility requirements will be available with the 2016 Call for Abstracts in late January.

RSNA.org



Explore RSNA's International Resources

RSNA Introduces First Spotlight Course in Cancun

RSNA's international offerings include a Spotlight Course, "Radiología de Urgencias: Curso Interactivo con Casos" ("Emergency Radiology: Interactive Courses with Cases"), from June 2 to 4, 2016, in Cancun, Mexico. Presented entirely in Spanish, renowned emergency radiology leaders will explore the use of emergency radiology as part of daily practice. This 2½ day course is available for CME credit and offers interactive sessions using Diagnosis Live™ and practical cases featuring diagnoses that you cannot miss. Learn more about the course at *RSNA.org/Spotlight*.

RSNA SPOTLIGHT COURSE

To access the full scope of RSNA programs and opportunities, non-North American members—who comprise approximately 29 percent of RSNA's more than 54,000 members — are invited to explore the International page on *RSNA.org* from the top menu above the search field.

Access resources and programs that impact developing or newly developed countries, including the RSNA International Visiting Professor Program (IVP), the RSNA Derek Harwood-Nash International Fellowship and RSNA Introduction to Research for International Young Academics (IRIYA).

Current members are encouraged to alert fellow colleagues about the benefits of RSNA membership including free advance registration to the RSNA annual meeting and subscriptions to the RSNA journals, *RadioGraphics* and *Radiology*. Membership is free for residents and fellows and includes all the same benefits.

Watch *RSNA News* for a feature article on the annual "International Trends" session presented at RSNA 2015, and check the site regularly for updated news and information throughout the year.

COMING NEXT MONTH

A panel of experts from around the globe discuss radiology imaging education in our coverage of RSNA's International Trends session at RSNA 2015.

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