RSNA News™

June 2013 Volume 23, Number 6

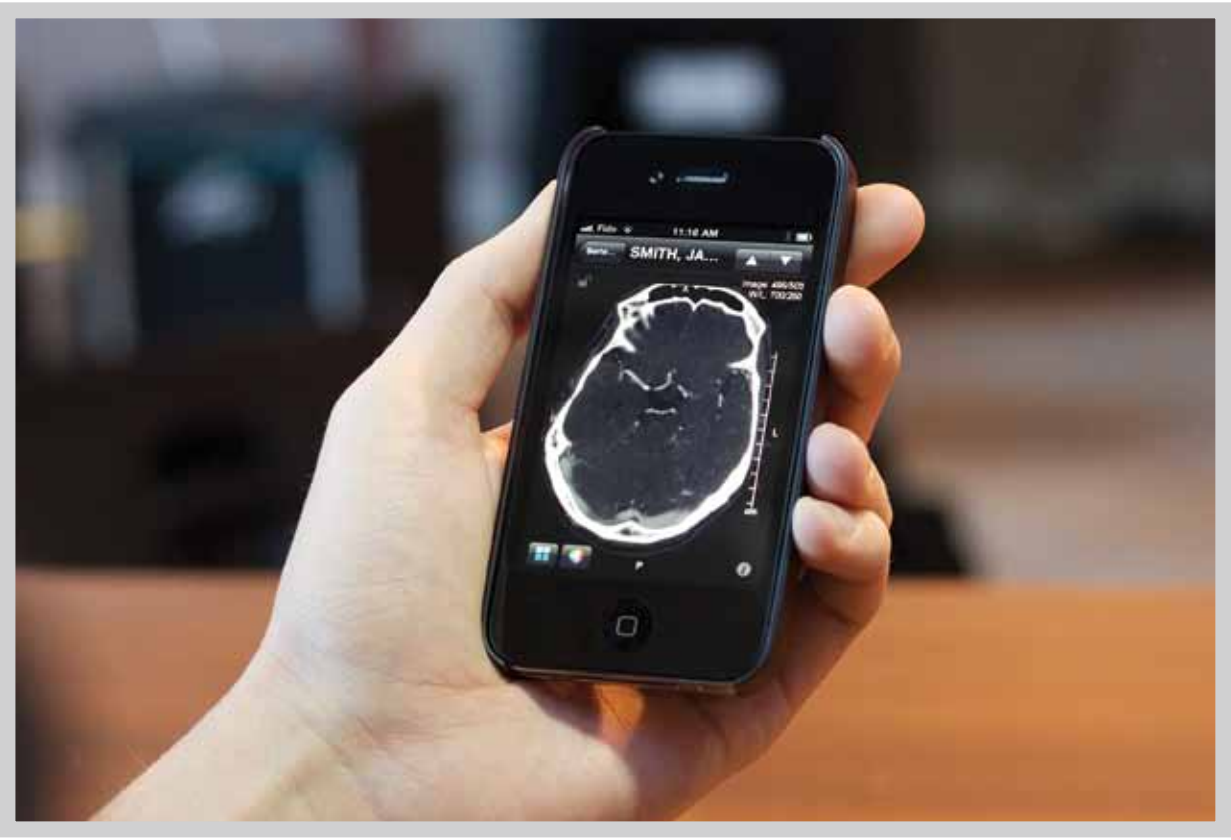


Image courtesy of Calgary Scientific

Smartphone App Successful in Telestroke Evaluation

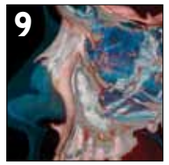
ALSO INSIDE:

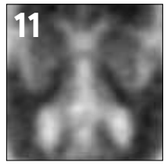
JUNE 2013 • VOLUME 23, NUMBER 6

RSNA News™

RSNA MISSION

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





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UP FRONT

FEATURES

RADIOLOGY'S FUTURE

NEWS YOU CAN USE

DISTINGUISHED HONOREES AND LECTURERS

The RSNA Board of Directors has announced the distinguished award recipients to whom the Society will pay tribute at the 99th Scientific Assembly and Annual Meeting. They are:

GOLD MEDALISTS

Theresa C. McLoud, M.D.
Boston

Harvey L. Neiman, M.D.
Reston, Va.

J. Frank Wilson, M.D.
Milwaukee


McLoud


Neiman


Wilson

HONORARY MEMBERS

Gabriel P. Krestin, M.D., Ph.D.
Rotterdam, Netherlands

Anne W. Lee, M.D.
Shenzhen, China

Malgorzata Szczerbo-Trojanowska, M.D.
Lublin, Poland

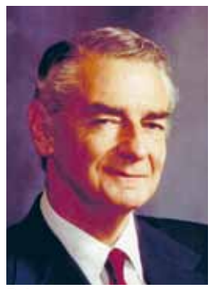

Krestin


Lee


Szczerbo-Trojanowska

PROGRAM DEDICATION

RSNA will dedicate its 2013 annual meeting program to the memory of **Philip E.S. Palmer, M.D.**


Palmer

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December 1–6 | McCormick Place | Chicago

Numbers in the News

7

Percentage of adult Americans who could be affected by obstructive sleep apnea syndrome (OSAS). See Page 9 to find out how advancements in dynamic CT and MR imaging are proving successful in diagnosing and treating OSAS.

50

Percent chance a radiologist has of being a defendant in at least one malpractice lawsuit by age 60, according to a recent study. Turn to Page 5 to learn about this study and another, both published in the February issue of *Radiology*, that examined the frequency with which radiologists are sued, and the reasons why.

53

Patients with acute stroke whose CT brain scans were simultaneously interpreted by radiologists at the hospital and by telestroke doctors with smartphones, for a recent study. The level of agreement between reviewers was 92 to 100 percent. Learn more about the smartphone app used in the study and the implications of the results on Page 7.

60

Three-year survival rate for patients with inoperable lung cancer treated with stereotactic body radiation therapy (SBRT), according to a recent study. Learn more about the potential for SBRT to become the standard treatment for early stage, medically inoperable non-small cell lung cancer on Page 13.


2012 RSNA President George S. Bisset III, M.D. (*center*), received honorary membership in the European Society of Radiology (ESR) from 2013 European Congress of Radiology President José Ignacio Bilbao, M.D., Ph.D. (*left*), and 2013 ESR President Gabriel P. Krestin, M.D., Ph.D.

ESR Honors Dignitaries at Annual Meeting

2012 RSNA President **George S. Bisset III, M.D.**, was named an honorary member of the European Society of Radiology (ESR) at the European Congress of Radiology (ECR) in Vienna, Austria, in March. Dr. Bisset is chief of pediatric radiology at Texas Children's Hospital and Edward B. Singleton Professor of Radiology at Baylor College of Medicine in Houston.

Also receiving honorary ESR membership were Tarek A. El-Diasty, M.D., a professor of radiology and chair of the radiology department at the Urology and Nephrology Centre, Mansoura University, Egypt, and Gary M. Glazer, M.D., who served as chair of the Department of Radiology and the Emma Pfeiffer Merner Professor of the Medical Sciencesat Stanford University School of Medicine, California, for more than 20 years. RSNA awarded Dr. Glazer its Gold Medal in 2009. He passed away in 2011.

Gold Medals were also bestowed at ECR 2013:

- **José Cáceres, M.D.**, a professor and former head of diagnostic radiology at H.G.U. Vall d'Hebron Universidad Autonoma, Barcelona, Spain.
- **Johannes Lammer, M.D.**, vice-chair of the Department of Radiology and director of cardiovascular and interventional radiology at the Medical University of Vienna.
- **Maximilian F. Reiser, M.D.**, a professor of radiology, chair of the Department of Clinical Radiology and dean of medicine at Ludwig Maximilians University of Munich. RSNA awarded Honorary Membership to Dr. Reiser in 2008. He is a member of RSNA's Public Information Advisors Network.

IN MEMORIAM

John M. Dennis, M.D.

John M. Dennis, M.D., a nationally renowned radiologist and former dean of the University of Maryland School of Medicine (UMSM), Baltimore, passed away January 17, 2013. He was 90.

Dr. Dennis began his career in 1951 at UMSM as an instructor in the radiology department. Two years later, he was named professor and the first full-time chair of the department, a position he held until 1973 when he was appointed acting dean of the medical school. He was named dean in 1974, vice-chancellor for health affairs in 1975 and vice-president for academic affairs in 1983. Dr. Dennis was named dean emeritus in 1990 and professor emeritus in diagnostic radiology in 1995.

Dr. Dennis earned his medical degree from UMSM in 1945. He served in the Air Force from 1946 to 1948 as chief of radiology at the Station Hospital, Langley Air Force Base in Virginia.

Dr. Dennis served as president of the American College of Radiology (ACR) and chair of its Board of Chancellors. His many honors include gold medals from ACR and the American Roentgen Ray Society.

RSNA Board of Directors Report

At meetings in January and March, the RSNA Board of Directors updated the Society's 2013-18 Strategic Plan, looked ahead to the 2013 International Day of Radiology and approved more plans for RSNA 2013.

Strategic Plan

The updated RSNA Strategic Plan refines the Society's goals to advance the radiological sciences, foster the development of new technologies, offer education in a variety of media, facilitate informatics strategies to improve the efficiency and effectiveness of healthcare and serve as a worldwide leader in radiology. Read the plan at *RSNA.org/RSNA_Strategic_Plan.aspx.*

Ronald L. Arenson, M.D.
Chairman, 2013 RSNA Board of Directors

Collaborations

Plans are underway for the next International Day of Radiology, a collaborative effort of RSNA, the European Society of Radiology and American College of Radiology (ACR) launched in 2012. Activities on this year's International Day of Radiology, scheduled for November 8, will focus on lung imaging. The event's Facebook page, *facebook.com/internationaldayofradiol ogy*, will feature updates throughout the year.

The Board extended an invitation to the ACR Resident and Fellow Section (RFS) to appoint a liaison to RSNA's Resident and Fellow Committee. An RSNA liaison will also serve on the ACR RFS and this reciprocal relationship will facilitate cooperation between the two groups to more effectively serve the interests of radiology residents.

RSNA 2013

The Board of Directors selected the Special Interest and Controversies Sessions for this year's annual meeting. These sessions enable meeting attendees to discover radiology-related topics that present point-counterpoint on a controversy in imaging (Controversies), or programs the RSNA Board deemed of particular importance (Special Interest). This year's sessions are:

Special Interest

- Update on Image Wisely
- Quality: Getting Radiologist Peer Review Right
- Workforce Planning in Radiology: Are We Training the Right Number of Radiologists?
- Diagnosis Live Games

Controversy

- MRI Contrast Use: Have Quality and Safety Collided?
- Imaging of Inflammatory Bowel Disease: If There was Only One Choice—What Would it be? CT or MR Enterography?
- Fibroid Therapy: UAE vs. Focused US
- Radiology Reporting: Is Structured Reporting the Answer?
- Lung Cancer Screening: Conflict of "Dollars and Sense?"
- CT Radiation and Risk: How Certain Are We of the Uncertainties?
- The Evolving Role of Image-Guided Pulmonary, Hepatic and Renal Mass Biopsy: Current Indications and Controversies
- Controversies in Radiology: Stroke Penumbral Imaging
- The Heart of the Matter: Nuclear Stress Test vs. CTA for Low to Intermediate Risk Cardiac Patients with Chest Pain
- Controversies in Imaging Strategies for HCC in Cirrhosis

Hot Topic Sessions that enable meeting attendees to discover radiology-related topics that are late-breaking will be announced at a later date.

In other news, the Pediatrics and Nuclear Medicine/Molecular Imaging campuses will be offered once again at RSNA 2013. The separate campuses feature many components—including refresher and series courses, scientific presentations, and education exhibits—of these subspecialties, to facilitate focused study during the week.

Advance registration for RSNA 2013, with its theme of The Power of Partnership, is underway for members. General registration opens June 5 and course enrollment begins July 10. I look forward to seeing you in Chicago as we experience together the science, education and technology that no one else can offer quite like RSNA.

Ronald L. Arenson, M.D.
Chairman, 2013 RSNA Board of Directors

An update on the Image Wisely campaign (*above*, promoted at RSNA 2012), is one of the Special Interest Sessions planned for RSNA 2013.

My Turn

Amyloid Imaging Offers Opportunities, Requires Caution

Amyloid beta is the most widely recognized marker of Alzheimer Disease (AD), and many even believe it is a causal factor. Amyloid plaques are associated with neuronal damage that can eventually lead to profound dementia in a subset of patients. For patients with dementia, the standard imaging work-up has been MR and FDG-PET imaging of the brain. These diagnostic studies often help to establish the diagnosis of AD by distinguishing it from other conditions such as fronto-temporal dementia. However, these studies are less useful early on in the disease, at a time when treatment modifications may still be effective.

Clinical guidelines require the presence of dementia to make the diagnosis of AD. However, by then, it may be too late to halt or even delay the progression with treatments aimed at reducing amyloid deposition. The recent FDA approval of F18-Florbetapir, an amyloid tracer and imaging biomarker, is a giant leap forward.

As with any diagnostic test, amyloid imaging carries with it the expectation of increased diagnostic certainty, or at least the potential to alter medication choices and regimens, and/or improve patient understanding and motivation. The strength of amyloid imaging lies in its high negative predictive value. Its best use is when the presentation is atypical or when someone has an early-onset and objectively verified cognitive decline. This is where MR imaging and FDG-PET fall short. Amyloid scanning should neither be the front-line imaging study for elderly patients with cognitive decline nor a screening test for AD.

It is important to emphasize that amyloid deposits in the brain do not automatically equate to Alzheimer disease. With the appropriateness criteria and indications for amyloid scanning now established, CMS should work swiftly to approve reimbursement. Research can then be appropriately directed at drug development strategies for amyloid removal or perhaps even methods for preventing amyloid deposition in the first place.

Laurie A. Loevner, M.D., is a professor of radiology at the University of Pennsylvania. She serves on the *RSNA News* Editorial Board and is a past-recipient of an RSNA Research & Education Foundation Research Scholar Grant.

Read "Amyloid PET Imaging Plays Pivotal Role in Alzheimer's Care" starting on Page 11.

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.

June features a video of Bart Demaerschalk, M.D., demonstrating the ResolutionMD™ Mobile smartphone app for successfully evaluating medical images during a telestroke evaluation as well as a video interview with Mark Wagshul, Ph.D., discussing the latest advancements in dynamic CT and MR imaging technology in diagnosing and treating patients with obstructive sleep apnea.

Access the *RSNA News* tablet edition on the App Store at *itunes.apple.com/us/app/rsna-news/id444083170?mt=8* and Google Play at *https://play.google.com/store/apps/details?id=air.org.rsna.rsnanews&hl=en*.

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

SUBSCRIPTIONS
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REPRINTS AND PERMISSIONS
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Failure to Order Imaging Tests Not a Major Driver of Malpractice

According to recent research showing that diagnostic errors far outpaced any other source of malpractice lawsuits, radiologists are highly unlikely to be sued for failing to recommend imaging tests.

In a separate study, those researchers also determined that the likelihood of a radiologist being the defendant in at least one malpractice lawsuit is 50 percent by age 60, yet the difference in frequency and average number of lawsuits accrued varies widely by sex and state of residence.

Appearing in the February 2013 issue of *Radiology*, both studies were based on data acquired from the Parsippany, N.J.,-based company One-Call Medical, which compiles malpractice histories of radiologists for credentialing purposes in workers' compensation cases.

Studies have shown that malpractice is still a major concern for radiologists. Despite comprising only 3.6 percent of U.S. physicians, radiologists rank sixth overall in the number of malpractice claims, according to the Physicians Insurers Association of America. Fear of being sued is often cited as a reason for ordering additional imaging—a phenomenon known as defensive medicine.

While not in line with frequently held notions about radiology malpractice, this new data could assuage the fears many radiologists have to some degree.

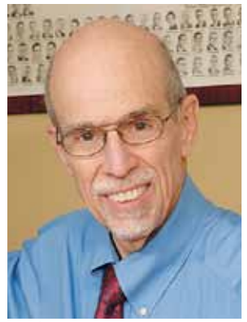
Conducted at the University of Medicine and Dentistry of New Jersey in Newark, the study of 4,793 cases filed against 2,680 radiologists in 47 states found as the primary allegation that failure to order additional imaging represented only 0.41 malpractice claims per 1,000 person-years. By contrast, errors in diagnosis accounted for 14.83 claims per 1,000 person-years. Breast cancer was the most frequently cited missed diagnosis, with 3.57 claims cited per 1,000 person-years.

"The prevalent notion is that a radiologist who does not recommend tests will be sued," said Stephen R. Baker, M.D., study co-author and chair of the university's Department of Radiology. "Data show that this rarely happens."

In fact, Dr. Baker suggested that additional imaging may have less to do with fear of lawsuits than with dollars and cents. "Defensive medicine is profitable," he said. "When value is accorded to quantity, the remuneration increases with the quantity of work. That's why the new value system is trying to reward improved quality as opposed to quantity."

Another often-cited reason for malpractice—communication errors—made up only 0.4 claims per 1,000 person-years. "Communication is considered an important factor in malpractice suits, but it's not the pre-eminent factor because most radiologists don't communicate directly with patients," Dr. Baker said.

Baker



Berlin

ACR Survey Shows Communication Failure is Common Source of Lawsuits

While concurring that the leading cause of malpractice lawsuits filed against radiologists continues to be allegations of errors in radiologic diagnosis, one radiology malpractice expert contends that failure to communicate results of radiologic examinations is a significant source of lawsuits filed against radiologists.

"While the number of malpractice lawsuits alleging failed radiologic communication has not yet reached epidemic proportions, nonetheless they are indeed increasing in number," said Leonard Berlin, a radiologist at Skokie Hospital and a professor of radiology at Rush University and the University of Illinois College of Medicine.

> "The prevalent notion is that a radiologist who does not recommend tests will be sued. Data show that this rarely happens."
>
> **Stephen R. Baker, M.D.**

In fact, failure to communicate results of radiologic examinations is the second most common cause of malpractice litigation filed against radiologists, said Dr. Berlin, who delivered an Annual Oration in Diagnostic Radiology, "To Disclose or Not To Disclose Radiologic Errors—Should "Patient First" Supersede Radiologist Self-Interest?, at RSNA 2012.

An American College of Radiology (ACR) survey conducted earlier this year found that 23 percent of the 3,400 radiologists responding admitted having been sued for failing to communicate findings; 49 percent said they have not and 28 percent declined to respond. Sixty percent of failed communication malpractice lawsuits were resolved in favor of the plaintiff, either through settlement or trial verdict; 29 percent were resolved without payment to the plaintiff and no information was given regarding the remaining 11 percent.

Dr. Berlin says the problem is exacerbated by the disparity between how radiologists communicate urgent versus significant, unexpected findings. While malpractice lawsuits rarely allege failure of communication of an urgent finding such as a hemorrhage or tension pneumothorax, virtually all of the failed communication lawsuits deal with failure to directly communicate significant unexpected findings.

"Nevertheless, from the courts' perspective, all radiologic findings that could be adverse to a patient's health fall into the same category: they require direct communication," Dr. Berlin said.

While he agrees that malpractice lawsuits alleging radiologist negligence for failing to recommend additional imaging examinations have been, and remain, extremely rare, lawsuits alleging failure to order imaging tests filed against non-radiologic physicians are not rare. Data from Cook County (greater Chicago area), Illinois indicate that failure to order allegations comprise approximately 5 percent of all medical malpractice lawsuits filed against physicians, Dr. Berlin said.

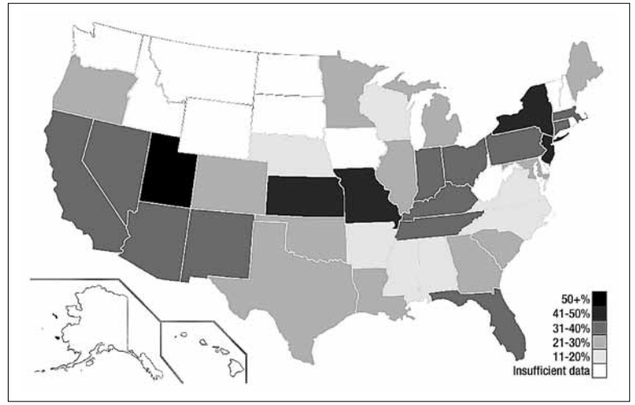
"The fact that radiologists themselves are not commonly sued for "failure to order" an imaging test should not lull them into a false sense of security," Dr. Berlin said.

Both Drs. Berlin and Baker urge radiologists to follow the ACR Practice Guidelines for Communication of Diagnostic Imaging Findings, which are often invoked by plaintiff lawyers making cases that a particular defendant radiologist failed to meet such an obligation.

One Company Offers Significant Database

While numerous studies have examined malpractice trends in radiology, the One-Call Medical database offered a much larger pool of data, said Dr. Baker, whose research grew out of his longtime work as a consultant for the company.

"As the company grew and grew, I thought, this is a huge data source that can give us insights into malpractice cases," Dr. Baker recalled. "This study group is 10 times bigger than those of previous studies, and the radiologists enrolled represent more than 25 percent of the radiologists in the country."



The likelihood of a radiologist being the defendant in at least one suit is 50 percent by age 60, yet the difference in frequency and average number of suits accrued varies widely by state of residence and sex, according to research by Stephen R. Baker, M.D., and colleagues. *Above*: A map of the U.S. depicting the percentage of radiologists in each state who have ever been sued. The District of Columbia and 14 states had fewer than 50 radiologists enrolled with One-Call Medical at the time of the study and were therefore excluded from this analysis. Though individual states varied greatly in the likelihood for a radiologist to have been sued, malpractice actions against radiologists were not concentrated in any region of the country.

Of the 4,793 cases filed against radiologists in the study, Dr. Baker and colleagues were able to derive an alleged cause of the lawsuit in 4,043.

After breast cancer, non-vertebral fractures and spinal fractures, lung cancer and vascular disease were the most frequently missed diagnoses. Procedural complications represented the second most common category of malpractice suits after errors in diagnosis, with 1.78 claims per person-years.

The same research team mined this data for a separate study examining demographic characteristics of malpractice claims against the same group of radiologists. Researchers found radiologists had a 50 percent likelihood of being the defendant in at least one suit by age 60.

Information on settlements and jury verdicts were available for 2,758 cases. Claims were settled before trial in the vast majority of cases, with only 99 listed claims ending in a court-directed judgment. The majority of completed claims were settled in favor of the plaintiff, with an average award of $411,112 paid on behalf of radiologists in court-directed cases. For claims settled out of court, the mean payment was $295,993.

"The chances of a radiologist getting sued are not huge," said Dr. Baker. "However, the chance of losing is well above 50 percent, because we can't hide our mistakes."

Data showed that male radiologists were about 1.37 times more likely than women to be sued during their careers. "I have a hunch that in the case of breast imaging, women are less likely to sue women," Dr. Baker said. "It's also possible that while younger women are working in the same areas as men, the older ones are being segregated into areas less likely to be subject to malpractice."

The outcome of cases and average award amounts differed markedly by state. Median payment awards ranged from a low of $24,105 in Colorado to a high of $350,000 in Maine. Mean payments varied from $74,373 in Nebraska to $715,707 in Oregon. The higher mean payments reflect the disproportionate effect of a few very large awards.

Continued on Page 16

Smartphone App Successful in Telestroke Evaluation

The phrase "time is brain" represents the recognition that a stroke is a time sensitive neurological emergency.

But many patients, particularly those who live in remote and medically underserved areas, have limited access to neurologists. Although telemedicine is a possible solution in those situations, neurologists are still tied to a desktop or laptop computer that require a reliable Internet connection.

A recent study by Bart Demaerschalk, M.D., and colleagues from the Mayo Clinic in Phoenix, has determined that telemedicine can, as Dr. Demaerschalk puts it, "fit in our pockets." The study, published in the September 2012 issue of *Stroke*, found that the U.S. Food and Drug Administration (FDA)-approved ResolutionMD™ Mobile smartphone app, from Calgary Scientific, can be used successfully to evaluate medical images during the course of a complete telestroke evaluation.

"Every second that elapses between the onset of stroke and diagnosis, management and institution of treatment means that more neurons die and patients have a greater possibility of neurological deficit, disability or death," said Dr. Demaerschalk, a professor of neurology and medical director of Mayo Clinic Telestroke, a network connecting the Mayo Clinic Hospital in Phoenix to a dozen rural hospitals, most of which are in Arizona. "But with existing technology, as sophisticated as it is, there are still instances when there can be delays."

Smartphones, however, give neurologists immediate access to patients' brain imaging. Dr. Demaerschalk and colleagues evaluated 53 patients who presented at Yuma Regional Medical Center with acute stroke and underwent a CT brain scan. Each scan was simultaneously interpreted by radiologists in Yuma and telestroke doctors with smartphones, and then by an independent adjudication panel of stroke neurologists whose determinations were considered to be the gold standard.

Researchers determined that smartphones were "not perfect" when it came to evaluating the more subtle features of CT brain scans. "In some cases, it wasn't as good as the traditional radiologist interpretation at a PACS workstation," Dr. Demaerschalk said.

ON THE COVER

Mayo Clinic researchers demonstrated that the ResolutionMD™ Mobile smartphone app from Calgary Scientific can be used successfully to evaluate medical images during the course of a complete telestroke evaluation.

But as far as the most important aspects of the CT scan interpretation for purposes of this study—its usefulness in making treatment recommendations for patients with acute stroke—the smartphone worked quite well. "In excluding hemorrhage in the brain, tumor, and any other contraindications to recommendations for clot-busting medications, it was very good," Dr. Demaerschalk said, pointing out that the level of agreement among reviewers was 92 to 100 percent.

Demaerschalk

Telemedicine Benefits Underserved Areas

Results show that telemedicine can be used anywhere and at any-time, which is particularly important in a state like Arizona where a substantial part of the population doesn't have immediate access to neurological care.

"We've also learned that it's not just remote rural hospitals that are underserved," Dr. Demaerschalk said. "There are a number of urban hospitals that are underserved as well." He pointed out that his own institution in Phoenix provides telestroke care to the Maricopa Medical Center, a busy urban hospital that has neurologists on staff but is still challenged when it comes to finding emergency neurological care.

Dr. Demaerschalk and colleagues also conducted a companion study, published in *Stroke*, in which they determined that high-quality video teleconferencing using smartphones to conduct neurological exams for stroke are "reliable, easy to use, affordable...and [yield] high physician satisfaction."

Ultimately, Dr. Demaerschalk would like to test the validity of the two studies in one combined study, to determine whether smartphones remain a reliable and safe tool, before the technology is adopted for routine clinical practice. □

> "Telemedicine can fit in our pockets."
>
> **Bart Demaerschalk, M.D.**

WEB EXTRAS

To view an abstract of the study, "Smartphone Teleradiology Application Is Successfully Incorporated Into a Telestroke Network Environment," go to *stroke.ahajournals.org/content/43/11/3098.*

To view an abstract of the study, "A New Support System Using a Mobile Device (Smartphone) for Diagnostic Image Display and Treatment of Stroke," go to *stroke.ahajournals.org/content/43/1/236.abstract.*

To access SYNAPSE ERm at the Apple store in iTunes, go to *www.apple.com/itunes/affiliates/download/.*

To view a video of Bart Demaerschalk, M.D., demonstrating the ResolutionMD smartphone application, go to *http://youtu.be/trxsCPOkfN4.*

Smartphones like ResolutionMD™ by Calgary Scientific, *right*, offer the considerable advantage of giving physicians immediate access to patients and providing telemedicine benefits to patients in remote, rural hospitals that are often underserved.
Image courtesy of Calgary Scientific

SYSTEM USES SMARTPHONE TO EXCHANGE STROKE IMAGES

Smartphones were used by neurologists at Jikei University School of Medicine (JUSM) in Tokyo to develop a system for exchanging diagnostic images and clinical and management information to rapidly diagnose and treat stroke victims.

In their pilot study, co-inventors and authors Hiroyuki Takao, M.D., an instructor at JUSM, and Yuichi Murayama, M.D., director for the Center of Endovascular Surgery at JUSM, developed the "i-Stroke" system to transfer hospital-generated patient, clinical and imaging information from a hospital "stroke server" to a physician's smartphone. The system, since renamed SYNAPSE ERm, is able to transfer clinical data, CT, MR, angiographic, intraoperative images and expert opinion in real time. The consultation occurs via Twitter direct messages seen only by the recipient.

The study was published in the October 2011 issue *Stroke* and presented at the 2012 Society of Neuro-Interventional Surgery annual meeting.

Dr. Takao sees smartphones as part of the solution in continuing efforts to rapidly diagnose and treat stroke victims. "We can't use a personal computer anytime and anywhere, but we can use smartphone devices for stroke on anyone, anytime anywhere."

In addition to delivering images, the system can alert hospital staff to the imminent arrival of stroke patients and the amount of time elapsed after the stroke and patient's condition on arrival. By allowing physicians to view imaging results and other tests in real time, SYNAPSE ERm encourages swift reaction and saves precious time.

The system also allows neurologists outside the hospital to view surgical and other procedures in real time, making them available for guidance and expert assessment of treatment progress.

"The system may become useful for acute patient management in neurology and neurosurgery," said Dr. Takao, adding that the system can improve the outcome in many patients by facilitating diagnosis and treatment of stroke. He also believes SYNAPSE ERm can help cut healthcare costs by improving physician efficiency and reducing misdiagnosis and the unnecessary transfer of patients.

SYNAPSE ERm is available for free download at the Apple store in Japan. Licensed by FUJIFILM Corp., the system is now in place in approximately 25 hospitals in Japan, Dr. Takao said. Trials are underway in the U.S. and Europe to evaluate the technology and pave the way for possible regulatory approval.

Imaging Advancements Aid in Sleep Apnea Therapy, Detection

Advancements in dynamic CT and MR imaging technology are proving successful in diagnosing and treating patients with obstructive sleep apnea syndrome (OSAS), new research shows.

Cine MR imaging provides the 3D isotropic resolution necessary to obtain very high spatial and temporal imaging of the entire upper airway and surrounding soft tissue, allowing for high-quality computerized reconstruction of the entire airway, according to researcher Mark Wagshul, Ph.D., who introduced the technique at RSNA 2011 and presented his most recent findings at RSNA 2012.

"Cine MR imaging offers complete coverage of the entire upper airway with isotropic resolution, allowing image reformatting in any plane you desire," said Dr. Wagshul, an associate professor at the Gruss Magnetic Resonance Research Center at the Albert Einstein College of Medicine, New York. "Also, the entire airway is collected under identical respiratory conditions. Finally, the technique provides retrospective gating which can be used to limit imaging to specific physiological conditions such as normal tidal breathing versus an apneic event."

Wagshul

OSAS affects 3 to 7 percent of the adult population, more than half of whom are overweight. Other risk factors for OSAS include a narrowed airway, family history, being older (OSAS occurs significantly more in those over 60), and use of alcohol, sedatives or tranquilizers. Untreated, OSAS can lead to heart attacks, strokes, impotence, irregular heartbeat, high blood pressure and heart disease and can cause daytime sleepiness resulting in accidents, work-related problems and interpersonal problems, among other issues.

OSAS is also present in 2 to 4 percent of children, but the incidence increases by as much as 50 percent for obese children. "It's becoming especially important given the increasing prevalence of obesity in children in the U.S.," Dr. Wagshul said. "Obstructive sleep apnea syndrome is associated with fatigue and poor school performance."

Very detailed computational models of the airway and surrounding tissues can be created using the dynamic information available, providing the physicians with information about flow, pressure and airway motion unique to OSAS patients. The technology will also allow simulation of surgical procedures, allowing physicians to see the impact a procedure such as tonsil removal would have on airway flow.

"This is critical for allowing surgeons to practice a more focused and physiology-based approach to resection with better outcomes," Dr. Wagshul said.

In their latest study, Dr. Wagshul and colleagues examined 20 females between 13 and 18 years old who being were evaluated for polycystic ovary syndrome (PCOS), a disorder affecting 5 to 10 percent of girls and women of reproductive age which leads to obesity and has been associated with OSAS. OSAS is 30 times more prevalent in females with PCOS than in the general population, Dr. Wagshul said.

> "Cine MR imaging offers complete coverage of the entire upper airway with isotropic resolution, allowing image reformatting in any plane you desire."
>
> **Mark Wagshul, Ph.D.**

Multislice craniofacial CT imaging can aid otorhinolaryngologists and maxillofacial surgeons in detecting soft tissue and skeletal factors that can alter the mechanical properties of the upper airway and its tendency to collapse during sleep, according to researchers.
Images courtesy of Natalia Sabaneeff, M.D.

Researchers detected three patients with severe OSAS and four with mild OSAS and imaged the computerized models of the girls' upper airways while they were awake. Images of the severe cases revealed the upper portions of the airway constricting during one part of the breathing cycle and at the same time expanding lower down in the airway. Cases of mild OSAS revealed more synchronous motion of the entire airway.

"In the more severe patients, we can see an abrupt change in the timing of the airway motion going from the velopharynx into the oropharynx, precisely at the site of restriction in the severe cases," Dr. Wagshul said. "Other studies in the group have shown that such motion may be due to activation of the muscles surrounding the airway, likely compensation for change in airflow due to the airway constriction.

Dr. Wagshul continues to examine data from the study.

Multislice CT Aids in OSAS Detection, Treatment

Although the standard diagnostic test for OSAS is a polysomnogram, Brazilian researchers contend that multislice craniofacial CT imaging can aid ENT physicians and maxillofacial surgeons in detecting soft tissue and skeletal factors that can alter the mechanical properties of the upper airway and its tendency to collapse during sleep.

A number of anatomical features can predispose a person to OSAS, many of them potentially treated with surgery, said Natalia Sabaneeff, M.D., a radiologist at Centro De Diagnostico Por Imagem in Rio de Janeiro who presented, "3D CT Cephalometric Analysis and Sleep Apnea: How Can We Help the Otorhinolaryngologist?" at RSNA 2012.

"Retrognathia and maxillary deficiency, low positioned hyoid bone, enlarged soft palate and tongue and tonsillar hypertrophy are some of the conditions that can increase the incidence of sleep disorders," Dr. Sabaneeff said. "MDCT and cephalometric analysis can help diagnose anatomical causes of sleep apnea, affecting the management of such patients."

Cephalometric analysis—the study of dental and skeletal relationships in the head—can be performed by radiograph, CT and even MR imaging, Dr. Sabaneeff said. "However, MDCT is the best single imaging method to study patients with sleep apnea," she added. "It provides great spatial resolution in a short acquisition time and allows tridimensional reconstructions for studying skeletal abnormalities and soft tissue/airway analysis."

MDCT can further aid ENT physicians by providing information to determine a course of treatment potentially more helpful than continuous positive airway pressure (CPAP), the standard OSAS treatment. This is especially true when patients using oral appliances such as tongue-retaining devices present with anatomic factors that could result in OSAS. In addition, MDCT can help physicians decide whether to perform surgical treatments such as nasal surgery, uvulopalatopharyngoplasty, genioglossus advancement, adenotonsillectomy and maxillomandibular advancement.

"In order to decide the best treatment option, it is essential to perform cephalometric studies in those patients," Dr. Sabaneeff said. □

WEB EXTRAS

To view a video of Mark Wagshul, Ph.D., discussing his RSNA 2012 research on imaging advancements in diagnosing and treating patients with obstructive sleep apnea syndrome (OSAS), go to *RSNA.org/NewsLandingPage.aspx*.

To access an abstract of the research, "Novel Retrospective, Respiratory-Gating Method Enables 3D, High Resolution, Dynamic Imaging of the Upper Airway During Tidal Breathing," by Dr. Wagshul and colleagues, go to *www.ncbi.nlm.nih.gov/pubmed/23401041*.

Amyloid PET Imaging Plays Pivotal Role in Alzheimer's Care

Often referred to as the next frontier in Alzheimer disease (AD), amyloid PET imaging holds tremendous promise as a tool to aid in the early detection of AD or cognitive impairment—potentially even before the onset of dementia.

Nevertheless, the modality faces a number of barriers to widespread use. Medicare does not yet cover brain amyloid imaging with PET, and out-of-pocket fees for the test can cost several thousand dollars. Other limiting factors include patients' access to dementia experts who can effectively use amyloid PET imaging information as a part of their diagnostic workup and radiologists who can accurately interpret the scans.

Although wider clinical use will take time, the wheels are already in motion. Used in Alzheimer's research for more than a decade, amyloid PET imaging has been clinically available only since April 2012, when the U.S. Food and Drug Administration (FDA) approved the first radiopharmaceutical for brain amyloid PET imaging (Amyvid by Eli Lilly and Company), opening the door for approval of similar PET tracers. And patients are already beginning to ask physicians about the benefits of the new modality.

"The test is not in general use yet, but there are going to be a lot of questions about amyloid PET imaging and physicians need to be prepared," said Dean M. Hartley, Ph.D., director of science initiatives, Medical and Scientific Relations Division, at the Alzheimer's Association.

To offer guidance to physicians, patients affected by AD and the public, the Society of Nuclear Medicine and Molecular Imaging (SNMMI) and the Alzheimer's Association jointly published the first criteria for the appropriate use of amyloid PET imaging to aid in the diagnosis of those with suspected AD. The criteria appeared in the January 2013 online editions of *The Journal of Nuclear Medicine and Alzheimer's & Dementia*: *The Journal of the Alzheimer's Association.*

"Our primary goal is to provide healthcare practitioners with the information and options available to provide patients with the best possible diagnosis and care in a cost effective manner," said Maria Carrillo, Ph.D., Alzheimer's Association vice-president of medical and scientific relations.

Drafted by SNMMI and the Alzheimer's Association's Amyloid Imaging Taskforce, consisting of dementia and imaging experts from across the globe, the criteria are designed to help physicians determine who is—and is not—an appropriate candidate for amyloid PET imaging.

Task force members stress that amyloid PET imaging is not the equivalent of clinical diagnosis of Alzheimer disease or dementia and is only one tool that clinicians should use to judiciously manage patients. "Currently, amyloid PET imaging can aid in the determination of someone having Alzheimer disease but cannot replace a full clinical evaluation," Dr. Hartley said.

Criteria Determine Appropriate Use for Amyloid PET Imaging

In amyloid PET imaging, the radiopharmaceutical is introduced into the body by injection into a vein and binds specifically to the amyloid protein, enabling visualization of areas in the brain where amyloid has clumped together into plaques—one of the defining pathologic features of AD.

However, patients with normal cognition can also have elevated levels of these plaques, as do people with conditions other than AD. Therefore, the potential clinical use of amyloid PET imaging requires careful consideration so that its proper role may be identified, according to criteria authors.

Because definitive research on health outcomes of amyloid PET imaging isn't yet available, task force members analyzed peer-reviewed, published literature to develop a consensus of expert opinion. "Basically, the task force researched 10 indications for use of amyloid PET imaging," Dr. Hartley said. "Three were determined as appropriate; seven were not."

Minoshima

Hartley

> "One of the critical indications of PET amyloid imaging will be to aid in the diagnosis of Alzheimer's in patients whose clinical presentations are atypical or unexplained"
>
> **Satoshi Minoshima, M.D., Ph.D.**

According to the task force, amyloid PET imaging should be limited to the following:

- Patients with persistent or progressive unexplained mild cognitive impairment who have had a confirmed assessment of impairment
- Patients who may have Alzheimer disease but lack a clear clinical presentation (either an atypical clinical course or an etiologically mixed presentation)
- Patients with progressive dementia who are aged 65 or younger, which may indicate early onset.

The task force determined that amyloid PET imaging is inappropriate in the following situations: Patients age 65 or older who meet standard definitions for Alzheimer disease; to determine dementia severity; based solely on family history of dementia or presence of the apolipoprotein E, type 4 (APOE 4); patients with a cognitive complaint that is unconfirmed on clinical examination; in lieu of genotyping for suspected autosomal mutation carriers; in asymptomatic individuals; non-medical use (health insurance coverage, legal decisions, or employment screening).

"One of the critical indications of PET amyloid imaging will be to aid in the diagnosis of Alzheimer's in patients whose clinical presentations are atypical or unexplained," said Satoshi Minoshima, M.D., Ph.D., co-chair of the task force and professor and vice-chair of radiology at the University of Washington, Seattle. "Examples include atypical symptoms, atypical age of onset and presence of comorbidities. If anti-amyloid treatments are determined effective in the future, amyloid PET imaging could be used for better therapeutic evaluations."

Although Dr. Minoshima says the PET amyloid imaging procedure itself is relatively straightforward, the interpretation can be challenging if physicians are not familiar with the scan. For that reason, the task force recommends that the scans be read by physicians certified in nuclear medicine or nuclear radiology who have adequate specific training in amyloid PET imaging interpretation, and that imaging procedures be performed by a qualified nuclear medicine technologist with appropriate training and certification.

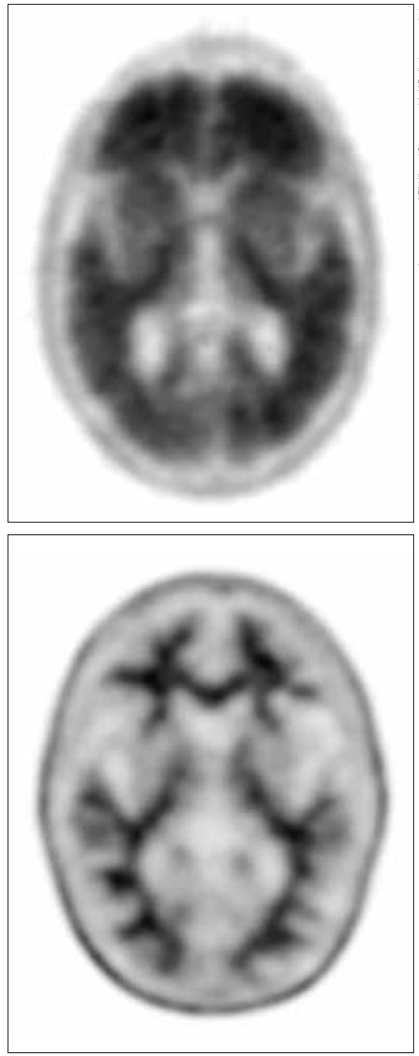
New training resources are available or in the works. When the FDA approved Amyvid, the agency mandated that Eli Lilly provide specific training in amyloid PET interpretation. (See sidebar.) SNMMI will soon be releasing an education program for those referring patients and reading the scans along with technical procedure guidelines for ensuring performance quality. Use of beta amyloid imaging and computer-aided analysis software for amyloid PET imaging is also in development, according to the task force.

CMS to Rule on Amyloid PET Imaging Coverage

Although insurance coverage is critical to use of amyloid PET imaging, the Medicare Evidence Development and Coverage Advisory Committee (MEDCAC) ruled in late January that adequate evidence does not exist to determine whether amyloid PET imaging changes health outcomes in suspected cases of AD. Committee members also expressed concern about possible inappropriate use of the test and the possibility of false-positive results.

SNMMI and the Alzheimer's Association issued statements expressing disappointment in the opinion, stressing that those concerns had been addressed by the task force criteria and recommending that the Centers for Medicare & Medicaid Services (CMS) cover brain amyloid PET imaging according to those criteria. CMS, which is expected to vote on the issue this summer, generally follows committee recommendations; private payers tend to follow CMS' lead.

Whatever the CMS decision, Dr. Hartley stressed that the task force will continue to update the criteria to reflect changes in the evolving issue. "This is a working document and it will be modified and updated to reflect any new information we receive. We are still convening and still discussing this issue." □



Images courtesy of Eli Lilly and Company and Avid Radiopharmaceuticals

In amyloid PET imaging, the radiopharmaceutical is introduced into the body by injection into a vein and binds specifically to the amyloid protein, enabling visualization of areas in the brain where amyloid has clumped together into plaques—one of the defining pathologic features of Alzheimer disease. *Above, top*: a positive scan with loss of gray-white contrast in multiple brain regions; *bottom*: a negative scan with preserved gray-white contrast.

WEB EXTRAS

To access an abstract of the "Appropriate Use Criteria for Amyloid PET: A report of the Amyloid Imaging Task Force, the Society of Nuclear Medicine and Molecular Imaging, and the Alzheimer's Association," go to *jnm.snmjournals.org/content/54/3/476.abstract*.

Access more information on amyloid PET imaging through the Society of Nuclear Medicine and Molecular Imaging (*www.snmmi.org*) and the Alzheimer's Association (*www.alz.org/Research*).

For more information on the Eli Lilly and Company reader training program, go to *www.amyvid.com/Pages/index.aspx*.

Stereotactic Body Radiation Therapy Highly Effective Lung Cancer Treatment

New research has added to the growing body of evidence demonstrating the potential of stereotactic body radiation therapy (SBRT) to become the standard treatment for early stage, medically inoperable non-small cell lung cancer.

Investigators who presented findings of a Phase II trial by the Japan Clinical Oncology Group (JCOG) at the 2012 American Society for Radiation Oncology (ASTRO) annual meeting determined that SBRT for early stage, medically inoperable non-small cell lung cancer doubled overall survival rates, as compared to conventional radiation treatment.

"SBRT should be the new standard replacing conventional radiotherapy for patients with early inoperable lung cancer," said Yasushi Nagata, M.D., lead author of the JCOG research and a radiation oncologist at the Department of Radiation Oncology at Hiroshima University in Hiroshima, Japan. "SBRT is not only effective but is well tolerated and has only mild toxicity, making it a suitable alternative to other therapies. SBRT is also painless and non-invasive, which are big advantages."

Surgery still holds one advantage: physicians have tissue samples to determine whether the cancer has spread to the lymph nodes. But patients are increasingly interested in less invasive treatment as the evidence for their efficacy becomes more solid, said Chance Matthiesen, M.D., assistant professor of radiation oncology at the University of Oklahoma Health Sciences Center (OUHSC) and lead author of "Stereotactic Body Radiation Therapy (SBRT) for Early Stage Medically Inoperable Non-Small Cell Lung Cancer," presented at RSNA 2012.

"In this day and age, patients are very smart and read about their options, coming to clinics more educated than ever before," Dr. Matthiesen said. "They will be asking whether they can have this type of radiation for early-stage lung cancers. If the data can be established, SBRT makes perfect sense because it's a shorter course of treatment and could be beneficial in terms of convenience and cost."

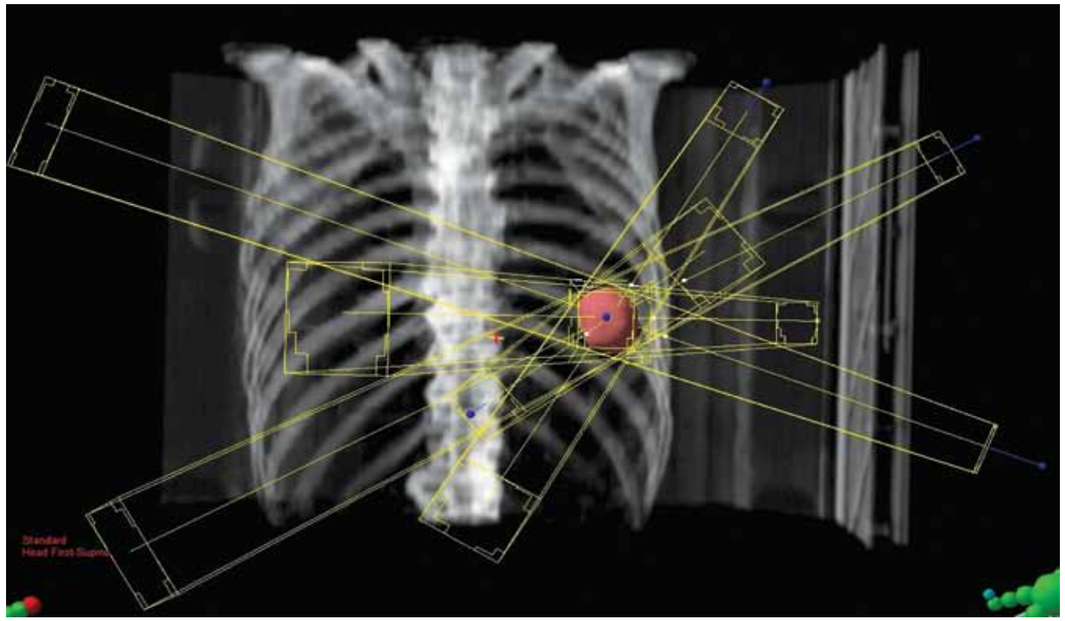
SBRT is similar to stereotactic radiosurgery (SRS), but targets areas of the body other than the brain or spine. There is a wide range of manufacturers who have products dedicated to body radiosurgery or who have adapted linear accelerators to accurately deliver radiosurgery to the body.

Nagata

Matthiesen

The devices focus radiation very tightly on the tumor, with minimal radiation exposure to surrounding normal tissue. SBRT can be accomplished in as little as a single treatment, as compared to several weeks with conventional fractionated radiation therapy.

> "SBRT should be the new standard replacing conventional radiotherapy for patients with early inoperable lung cancer."
>
> **Yasushi Nagata, M.D.**



Stereotactic body radiation therapy (SBRT) delivers very targeted beams of radiation to a small area over a few days and is less invasive than surgery. Researchers demonstrated that SBRT for early stage, medically inoperable non-small cell lung cancer doubled overall survival rates compared with conventional radiation.
Image courtesy of Yasushi Nagata, M.D.

Three-year Survival Rate Doubles over Conventional Therapy

Dr. Nagata's 2012 study, the companion to a similar study conducted previously among operable lung cancer patients, examined the safety and efficacy of SBRT for 100 inoperable lung cancer patients treated between July 2004 and November 2008.

Median patient age was 78; median tumor size was 21 mm. About half of the patients had adenocarcinomas and 40 percent had squamous cell carcinomas. Patients received an average of 48 Gy in four fractions.

Results showed patients' overall three-year survival rate was 60 percent. Earlier studies on conventional radiation in inoperable patients showed overall three-year survival rates ranging from 31 to 39 percent. Side effects for SBRT were mild and included dyspnea, hypoxia, pneumonitis chest pain and cough, Dr. Nagata said.

SBRT Exhibits Minimal Toxicity

In their research examining clinical outcomes and toxicity of SBRT, Dr. Matthiesen and colleagues retrospectively reviewed 49 patients diagnosed with early stage, medically inoperable non-small cell lung cancer treated with SBRT from 2006 to 2011.

In some cases, tumors were inoperable due to location but most patients had comorbid conditions such as impaired pulmonary function that made them ineligible for surgery. The median patient age in that study was 66.

Just over 73 percent of the group had tumors with a median maximum diameter of 2 cm, and 26.5 percent had a median maximum diameter of 4.3 cm. Approximately 53 percent of patients had squamous cell carcinomas and about 29 percent had adenocarcinomas. The median SBRT treatment was 60 Gy in three to five fractions.

At median follow-up of 16 months, 28 of the 49 patients were alive and 26 had no local recurrence or systemic cancer progression. Of those who had died, only nine patients died of recurrence or progression of lung cancer. Nine patients experienced complications from SBRT including chest wall pain and rib fractures.

"The encouraging thing about SBRT is its low toxicity," Dr. Matthiesen said. "Acute effects are minimal for the overwhelming majority of patients." Because SBRT can be accomplished in a much shorter timeframe, this treatment could offer a significant advantage to patients in rural states, he added.

"Sometimes we see patients here who live three hours away who may have a full-time job and a family depending on them," Dr. Matthiesen said. "A lung cancer diagnosis might mean stopping their life for weeks to get treatment. A week of SBRT is a stressor, but it's manageable. And it would ease the burden on treatment centers; if you can treat people in five sessions, you can see a lot more patients in a lot less time." □

WEB EXTRAS

To view a PowerPoint presentation on Stereotactic Body Radiation Therapy (SBRT) by Yasushi Nagata, M.D., presented at the 2012 ASTRO annual meeting, go to *www.rsna.org/NewsLandingPage.aspx*.

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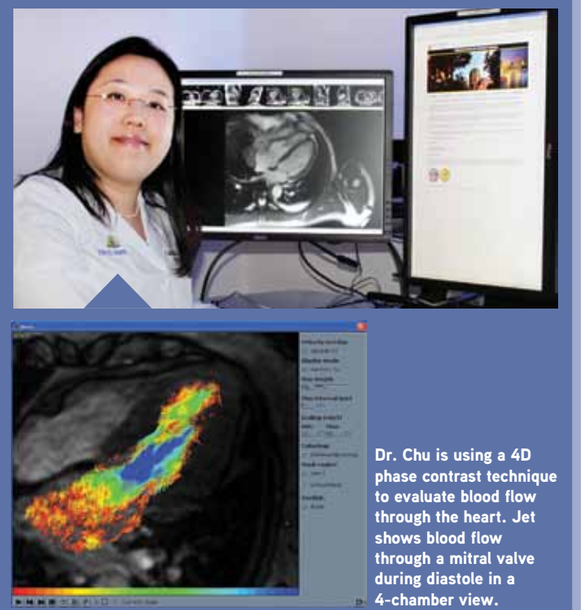
Your Donations in Action

With a grant from the RSNA Research & Education (R&E) Foundation, **Linda Chu, M.D.**, a body MR imaging Fellow at Johns Hopkins University in Baltimore, MD., is developing the project, "Cardiac MR Imaging Evaluation of Early Disease Markers of Hypertrophic Cardiomyopathy." This project is made possible through the generous support of Siemens Healthcare.

"My project will investigate the use of novel cardiac MR imaging techniques [4D phase contrast and T1 mapping] to quantify structural and functional abnormalities in patients with hypertrophic cardiomyopathy," Dr. Chu said. "We hope the quantitative measures from these techniques will improve patient risk stratification and identify patients who may benefit from early intervention."



Dr. Chu is using a 4D phase contrast technique to evaluate blood flow through the heart. Jet shows blood flow through a mitral valve during diastole in a 4-chamber view.

Failure to Order Imaging Tests Not a Major Driver of Malpractice

Continued from Page 6

Alabama radiologists experienced the lowest malpractice rate with less than one lawsuit per 100 practice-years for both men and women, while New York had the highest rate with 5.65 lawsuits per 100 practice-years for men and 4.13 for women.

Caps on Awards Impact State Malpractice Rates

One possible reason for the different malpractice rates among states is tort reform, which often caps awards for non-economic damage to plaintiffs in malpractice suits. "In states where there are limited awards for pain and suffering, plaintiffs' lawyers might be reluctant to take cases," Dr. Baker noted.

Attorney Keith Hebeisen from the Clifford Law Offices in Chicago concurs. Hebeisen, who specializes in medical malpractice and served as the plaintiff's attorney in the medical malpractice mock trial at RSNA 2012, cited Texas as an example of a state where caps on awards for pain and suffering have influenced the malpractice rate.

"The malpractice tort system has disappeared since Texas passed a $250,000 cap for non-economic damages," he said, adding that the often lengthy settlement process results in significant litigation costs and attorneys' fees. "It makes no economic sense for the attorney or the client to pursue cases in that state, even if they end up offering the full $250,000."

Caps on awards are not the only factor in malpractice rates. For instance, an Alabama cap on malpractice awards was overturned by the state Supreme Court, yet the state has the lowest lawsuit rate in the country. According to a 2008 study in the *Journal of Health & Biomedical Law*, aggressive defense of malpractice claims by insurers, positive juror attitudes toward physicians and the propensity of the state Supreme Court to overturn plaintiffs' verdicts on appeal all played a role in limiting the number of suits in Alabama.

Dr. Baker's research team continues to pore through the data on radiology malpractice, focusing on malpractice rates in spinal versus non-spinal fractures, breast imaging cases and elderly patients. □

WEB EXTRAS

To access the study, "The Causes of Medical Malpractice Suits against Radiologists in the United States," go to *radiology.rsna.org/content/early/2012/11/28/radiol.12111119.full.*

To access the study, "The Demography of Medical Malpractice Suits against Radiologists," go to *radiology.rsna.org/content/266/2/539.full.*

Journal Highlights

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

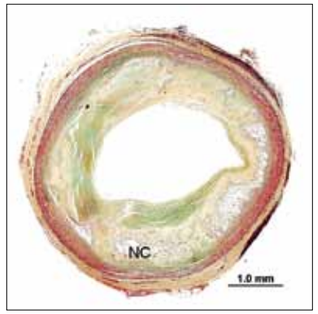
Intracranial Vasa Vasorum: Insights and Implications for Imaging

Unlike extracranial vasa vasorum, intracranial vasa vasorum are rare and develop with age, predominantly on the proximal portions of the intracranial arteries. Advanced contrast material-enhanced imaging techniques can help detect and even grade intracranial vasa vasorum, which may provide new insights into our ability to diagnose and assess the risk of intracranial vascular lesions such as atherosclerosis, aneurysms, dissections and vasculitis.

In a Review and Commentary in the June issue of *Radiology* (*RSNA.org/Radiology*), Anthony Portanova, B.S., of the University of Rochester, N.Y., and colleagues review the published literature on intracranial vasa vasorum and interpret the findings in a radiologic context. The authors offer radiologists a concise framework for analyzing diseases of the intracranial arteries on the basis of the presence or absence of vasa vasorum.

The unique structure and environment of intracranial arteries may explain their relative lack of vasa vasorum, according to the authors. This distinctive feature of intracranial arteries may serve as an important diagnostic characteristic on imaging studies, since vasa vasorum signal the presence of a variety of vascular pathologic processes and can be detected by using contrast-enhanced imaging techniques.

"Contrast-enhanced imaging modalities, including MR imaging, CT, and ultrasound, can depict vasa vasorum by showing wall enhancement, which enables the identification and characterization of intracranial vasculopathies such as atherosclerosis, aneurysms, dissections, and vasculitis that would not be achievable with conventional angiography," the authors write.



Low-power photomicrographs of severely atherosclerotic coronary artery with vasa vasorum in the adventitia. Features of this late fibroatheroma with necrotic core (NC) are highlighted. (Movat pentachrome stain.)

(*Radiology* 2013;267;3:667–679) ©RSNA, 2013. All rights reserved. Printed with permission.

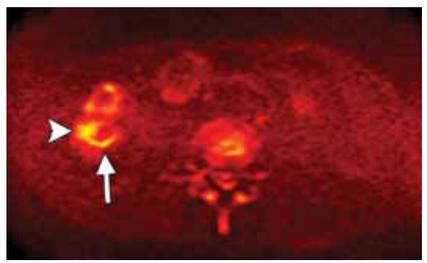
This article meets the criteria for *AMA PRA Category 1 Credit™*. CME is available online.

Diffusion-weighted MR Imaging of the Gastrointestinal Tract: Technique, Indications, and Imaging Findings

Diffusion-weighted MR imaging is emerging as an important tool in the evaluation of gastrointestinal tract tumors and inflammatory disorders and is used to depict complications and monitor tumors and inflammatory bowel disorders to assess response to treatment.

In an article in the May-June issue of *RadioGraphics* (*RSNA.org/RadioGraphics*). Rakesh Sinha, M.B.B.S., M.D., F.R.C.R., F.I.C.R., of Warwick Hospital, South Warwickshire NHS Foundation Trust, England, and colleagues review the technique, indications and imaging findings of diffusion-weighted imaging and its role in depicting disease processes that affect the gastrointestinal tract. The authors also discuss artifacts and an approach to image optimization with examples of pitfalls of interpreting diffusion-weighted images of the bowel.

"Complications, such as a malignant change, abscess, and fistula, may also be depicted, and it is particularly useful in assessing gastrointestinal tract conditions in patients with contraindications to the use of intravenous contrast material," the authors write. "Quantitative measurements of signal intensity at diffusion-weighted imaging may help differentiate actively inflamed bowel from normal bowel, and ADC values provide useful information about disease activity and response to treatment."



Crohn disease in a 35-year-old woman. Axial color-coded diffusion-weighted MR image shows an area of high signal intensity (arrows) in inflamed bowel segments and a linear area of transmural hyperintensity at the site of ulcers (arrowhead).

(*RadioGraphics* 2013;33;655–680) ©RSNA, 2013. All rights reserved. Printed with permission.

An Invited Commentary on Dr. Sinha's article by Aliya Qayyum, M.B.B.S., M.R.C.P., F.R.C.R., also appears in the issue.

CORRECTION

The Journal Highlights section in the April issue of *RSNA News* incorrectly identified the journal in the citation for the study, "Breast Reconstruction: Review of Surgical Methods and Spectrum of Imaging Findings." The journal is *RadioGraphics*.

The Radiology in Public Focus section in that issue incorrectly identified the page numbers in the citation for the study, "Body CT Scanning in Young Adults: Examination Indications, Patient Outcomes and Risk of Radiation-induced Cancer." The page numbers are 460-469.

Radiology in Public Focus

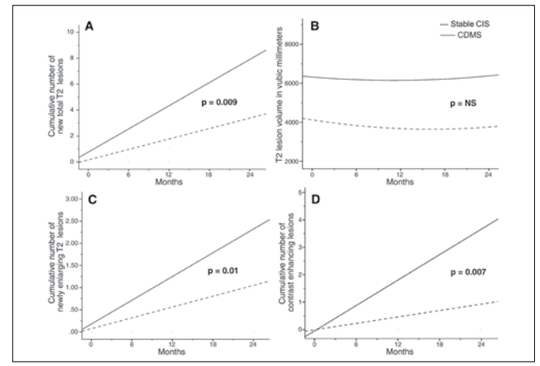
Press releases were sent to the medical news media for the following articles appearing in recent issues of *Radiology*.

Thalamic Atrophy is Associated with Development of Clinically Definite Multiple Sclerosis

Measurement of thalamic atrophy and increase in ventricular size in clinically isolated syndrome (CIS) is associated with clinically definite multiple sclerosis (CDMS) development and should be used in addition to the assessment of new T2 and contrast agent-enhanced lesions, according to new research.

Robert Zivadinov, M.D., Ph.D., of the Buffalo Neuroimaging Analysis Center, University at Buffalo, N.Y., and colleagues used contrast-enhanced MR imaging for initial assessment of 216 CIS patients. Follow-up scans were performed at six months, one year and two years. Over two years, 92 of 216 patients, or 42.6 percent, converted to clinically definite MS. Decreases in thalamic volume and increase in lateral ventricle volumes were the only MR imaging measures independently associated with the development of clinically definite MS.

Development of thalamic and central atrophy is associated with conversion to clinically definite multiple sclerosis (CDMS) over two years, and measurement should be used in addition to the assessment of new CE lesions and T2 lesions, according to the authors. "Use of these MR imaging biomarkers may be relevant for identifying patients who are at high risk for conversion to CDMS in future clinical trials involving CIS patients," the authors write.



Fitted value intercept model of changes in lesion activity and lesion volume MR imaging measures by conversion status to clinically definite MS over time. P values were adjusted by using Benjamini-Hochberg correction to minimize for false discovery rate. *A*, Cumulative number of total new T2 lesions (*P* = .009). *B*, T2 lesion volume (*P* = .320). C, Cumulative number of newly enlarged T2 lesions (*P* = .01). *D*, Cumulative number of new CE lesions (*P* = .007).

(*Radiology* 2013;268;2:InPress) ©RSNA, 2013. All rights reserved. Printed with permission.

Media Coverage of RSNA

In March, 1,175 RSNA-related news stories were tracked in the media. These stories reached an estimated 729 million people.

Print coverage included *The Wall Street Journal*, *Los Angeles Times*, *The Boston Globe*, *Milwaukee Journal Sentinel*, *The Atlanta Journal-Constitution*, *The Miami Herald* and *Orlando Sentinel*.

Broadcast coverage included Doctor Radio (Sirius XM), KFI-AM (Los Angeles), WLS-TV (Chicago), WMAQ-TV (Chicago), WHDH-TV (Boston), WXIA-TV (Atlanta), WPXI-TV (Pittsburgh) and KCBS-AM (San Francisco). Online coverage included The Wall Street Journal, The Huffington Post, *NPR.org*, Yahoo! News, WebMD, iVillage and *FOXNews.com*.

RadiologyInfo.org Wants to Connect with You

Are you missing out on the latest radiology news or informative patient-friendly content focused on radiologic procedures? Then connect with *RadiologyInfo.org* on Facebook (*Facebook.com/RadiologyInfo*) and Twitter (*Twitter.com/RadiologyInfo_*). The sites offer one-stop access to the most up-to-date information about radiology and recent posts on *RadiologyInfo.org*.

JUNE OUTREACH PUBLIC INFORMATION ACTIVITIES FOCUS ON MEN'S HEALTH

To highlight Men's Health Month in June, RSNA is distributing new public service announcements (PSAs) focusing on abdominal aortic aneurysm (triple A), one of the leading causes of death for men over 55.

In addition, the RSNA "60-Second Checkup" audio program will be distributed to nearly 100 radio stations across the U.S. June segments will focus on the use of PET/CT in the diagnosis of head and neck cancer.

Education and Funding Opportunities

RSNA/AUR/ARRS Introduction to Academic Radiology Program

Applications due **July 15**

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 during the RSNA Scientific Assembly in Chicago, December 1-6, 2013 or the ARRS Scientific Meeting in San Diego, May 4-9, 2014.

More information and the nomination form for this program are available at *rsna.org/Introduction_to_Academic_Radiology_.aspx*

Final Call to Apply for RSNA Clinical Trials Methodology Workshop

January 11-17, 2014
Scottsdale, Ariz.
Applications due **June 15**

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

Applicants will undergo a competitive selection process for course entrance. Once admitted, trainees will participate in advance preparation, didactic sessions, one-on-one mentoring, small group discussions, self-study and individual protocol development. Familiarity with basic concepts and techniques of statistics and study design is required of all applicants.

Online application and additional information can be found at *rsna.org/CT2013*.

Medical Meetings

June-August 2013

JUNE 8-11
Society of Thoracic Radiology (STR), 3rd World Congress of Thoracic Imaging, COEX Convention and Exhibition Center, Seoul, Korea
• *www.thoracicrad.org*

JUNE 8-12
Society of Nuclear Medicine and Molecular Imaging (SNMMI), Annual Meeting, Vancouver, BC, Canada
• *www.snmmi.org*

JUNE 10-12
U.K. Radiological Congress, UKRC 2013, ACC Liverpool, England
• *www.ukrc.org.uk*

JUNE 13-15
European Society of Musculoskeletal Radiology (ESSR), 20th Annual Scientific Meeting, Palace of Congresses, Marbella, Spain
• *www.essr.org*

JULY 11-12
Association of Educators in Imaging and Radiologic Sciences (AEIRS), Annual Meeting, Radisson Salt Lake City Downtown
• *www.aeirs.org*

JULY 11-14
Society of Cardiovascular Computed Tomography (SCCT), 8th Annual Scientific Meeting, Montreal
• *www.scct.org*

JULY 28-31
The Association for Medical Imaging Management (AHRA), 41st Annual Meeting and Exposition, Minneapolis Convention Center
• *www.ahraonline.org*

AUGUST 4-8
The American Association of Physicists in Medicine (AAPM), 55th Annual Meeting, Indianapolis
• *www.aapm.org*

AUGUST 16-18
Sociedad Latino Americana de Radiología Pediátrica/Latin American Society of Pediatric Radiology (SLARP), 16th Congress, Julio Cesar Turbay Ayala Convention Centre, Cartagena, Colombia
•*www.slarp.net*

SEPTEMBER 4-7
Sociedad Mexicana de Radiologia e Imagen/Mexican Society of Radiology and Imaging (SMRI), XII Curso Annual de Ultrasonido, 12th Annual Ultrasound Course, World Trade Center, Mexico City
• *www.smri.org.mx*

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

RSNA Advanced Course in Grant Writing

Applications due **July 31**

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: September 27-28, 2013; February 7-8, 2014; March 21-22, 2014; and April 25-26, 2014.

For more information and an application, go to *RSNA.org/AGW*. Questions can be directed to Fiona Miller at 1-630-590-7741 or *fmiller@rsna.org*.

2013 CORE Workshop

Registration deadline **September 26**

The 2013 Creating and Optimizing the Research Enterprise (CORE) workshop will be held Friday and Saturday, Oct. 25 and 26, 2013, in Oak Brook, Ill. The workshop will focus on strategies for developing and/or expanding research programs in radiology, radiation oncology and nuclear medicine departments. The CORE program features a combination of presentations, case studies and group discussions. More information and registration is available at *RSNA.org/ Creating_and_Optimizing_the_Research_Enterprise_Workshop.aspx.*

RSNA Derek Harwood-Nash International Fellowship

Applications due **July 1**

The Derek Harwood-Nash Fellowship program enables 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 six- to 12-week fellowship period. The application for this program is available at *RSNA.org/ Derek_Harwood-Nash_International_Fellowship.aspx*. For more information e-mail *CIRE@rsna.org*.

Annual Meeting Watch

Course Enrollment Begins July 10

RSNA® 2013 THE POWER OF PARTNERSHIP
December 1–6 | McCormick Place | Chicago

The RSNA 2013 Advance Registration, Housing and Course Enrollment brochure will be mailed in late June to all RSNA members and 2013 meeting registrants. On July 10, the brochure will be available online at *RSNA.org/Attendees.aspx*. Those registering for RSNA 2013 prior to June 15 who wish to view course enrollment information online only can "opt out" of receiving the copy by mail during online registration. Use this brochure to make the most of your RSNA 2013 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.

RSNA 2013 Registration

How to Register

There are four ways to register for RSNA 2013:

1 INTERNET (fastest way)
Go to *RSNA.org/register*

2 FAX (24 hours)
1-888-772-1888
1-301-694-5124

3 TELEPHONE
(Mon.-Fri. 8 a.m. – 5 p.m. CT)
1-800-650-7018
1-847-996-5876

4 MAIL
Experient/RSNA 2013
P.O Box 4088
Frederick, MD 21705 USA

Registration Fees

BY NOV. 8	AFTER NOV. 8	
$ 0	$100	RSNA/AAPM Member
0	0	RSNA/AAPM Member Presenter
0	0	RSNA Member-in-Training, RSNA Student Member and Non-Member Student
0	0	Non-Member Presenter
180	280	Non-Member Resident/Trainee
180	280	Radiology Support Personnel
825	925	Non-Member Radiologist, Physicist or Physician
825	925	Hospital or Facility Executive, Commercial Research and Development Personnel, Healthcare Consultant and Industry Personnel
325	325	One-day registration to view only the Technical Exhibits

Important Dates for RSNA 2013

June 5	General registration and housing opens
July 10	Course enrollment opens
October 25	International deadline to have full conference badge mailed
November 8	Final housing and discounted registration deadline
November 27	Deadline to guarantee a seat for all ticketed courses
December 1-6	RSNA 99th Scientific Assembly & Annual Meeting

Virtual Meeting

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

VIRTUAL RSNA® 2013 THE POWER OF PARTNERSHIP

Register by November 8 to receive the discounted registration fee and full conference materials mailed to you in advance. International visitors must register by October 25 to receive these materials in advance. Registrations received after November 8 will be processed at the increased fee and conference materials must be obtained at the McCormick Place Convention Center.

For more information about registering for RSNA 2013, visit *RSNA.org/Attendees.aspx*, e-mail *reginfo@rsna.org*, or call 1-800-381-6660 x7862.

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.

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/attendees.aspx.*

International Visitors

International Invitation Letters Available—Act Now for Visa!

Personalized invitation letters to RSNA 2013 are available by request during online registration. In addition, the International Visitors section of *RSNA.org/Attendees.aspx* includes important information about the visa application process. Visa applicants are advised to apply as soon as they decide to travel to the U.S. and at least three to four months in advance of their travel date. International visitors are advised to begin the visa process now.

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.

Spouse/Family Member Badges

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

To uphold the professional and educational standards of the RSNA annual meeting, children under 16 years of age are not permitted in the exhibit halls or sessions. To take advantage of Camp RSNA for childcare, visit R*SNA.org/Annual_Meeting.aspx* for registration information.

The Value of Membership

RSNA 2012 Refresher Courses Now on Sale

For a limited time, RSNA is offering discount pricing on selected refresher courses from past annual meetings. These collections are available at a 25 percent discount until October 31, 2013. The discount price is $60 for members; $90 for nonmembers. Each collection includes an audiovisual presentation, a line-by-line transcript and offers *AMA PRA Category 1 Credit™* for each successfully completed CME test.

- **Breast Imaging/New Technologies:** Two CDs, "Mammographic Interpretation" and "Computer-assisted Decision Systems in Breast and Lung Imaging" explore the effect of new technologies on breast imaging and their implications for clinical practice. The Breast Imaging/New Technologies Collection offers 3.00 *AMA PRA Category 1 Credits™*.
- **Neuroradiology:** Two CDs, "Advanced Neurovascular MR Angiography" and "Brain Perfusion Imaging: Techniques and Applications," assess patients who have, or are at risk for developing, some of the most common neurological conditions. The Neuroradiology Collection offers 2.50 *AMA PRA Category 1 Credits™*.
- **Musculoskeletal:** Three CDs, "Emerging Techniques in Musculoskeletal Imaging," "Imaging of Upper Extremity Entrapment Neuropathies" and "Osteoporosis: Clinical and Imaging Features," provide a comprehensive review of the hottest areas of musculoskeletal radiology. The Musculoskeletal Collection offers 4.50 *AMA PRA Category 1 Credits™*.

To purchase these collections at the discounted rate, go to the RSNA Education Center catalog at *RSNA.org/education/search/collections* or call 1-800-272-2920.

RSNA Staff Retirements

In March and April, RSNA said goodbye to two employees who retired after nearly 50 years' worth of combined service to the Society.

Al Simonaitis, 24 years

When Al began his employment with RSNA in September 1988 as a manuscript editor in the Publications Department, *Radiology* and *RadioGraphics* were available in print form only. As the journals evolved, so too did Al's job—he became a managing editor in August 1990 and eventually took responsibility for the journals' burgeoning online presence. From the very first articles available as text only to RSNA members via the Internet, to the podcasts, image datasets and other enhanced content that now accompany *Radiology* and *RadioGraphics* articles, Al oversaw considerable change in the way RSNA shares cutting-edge science and radiology education.

"One of the hallmarks of the many years of Al's work at RSNA was his willingness to take on new challenges," said Roberta E. Arnold, M.H.P.E., RSNA assistant executive director for publications and communications, who hired Simonaitis and served as his supervisor through his RSNA career. "He was the first managing editor of *JMRI* (*Journal of Magnetic Resonance Imaging*), when RSNA helped the Society of Magnetic Resonance Imaging to develop that journal, and he was the managing editor of the ahead-of-its-time, totally online journal, *RSNA EJ*, founded and edited by Dr. Laurens Ackerman. These journals could not have moved forward without Al's skill and enthusiasm."

Ken Schulze, 24 years

Ken also played a significant role in developing RSNA's online presence. Like Al, Ken began his employment with the RSNA as a manuscript editor when he was hired in May 1989. After a promotion to Managing Editor: Electronic Information, Ken ultimately became RSNA's first Webmaster. Ken's experience ranges from the very first announcements shared via RSNA Link to the recent redesign of the *RSNA.org* website. Ken was also instrumental in making *RSNA News* available online.

"Ken is one of the most professionally eclectic individuals I have ever met," said Schulze's supervisor, John W. Basco, M.S., RSNA managing director of web operations. "He knows a little bit about everything. One day Ken could be building HTML forms for *RSNA.org*. The next he could be teaching a class on the proper way to use a semi-colon. In our department, the rule of thumb is 'If you don't know something—anything—ask Ken Schulze.' After 24 years, we'll really feel his absence."

Residents & Fellows Corner

New York Times Examines Change in Outlook for Radiology Residents

Declining salaries and dwindling job opportunities for radiology residents have attracted the attention of the *New York Times*, which explored the issues in a March 27 article.

"Job Prospects are Dimming for Radiology Trainees" looks at why residents are finding it increasingly difficult to find jobs, let alone those well-compensated enough to cover debt accumulated during training. Medicare reimbursement cuts, teleradiology, public scrutiny of the value of some imaging tests and initiatives to emphasize primary care all were identified as factors. Read the article at *http://www.nytimes.com/2013/03/28/health/trainees-in-radiology-and-other-specialties-see-dream-jobs-disappearing.html*.

The RSNA Resident and Fellow Committee will meet this month at RSNA Headquarters in Oak Brook, Ill. One of the committee's responsibilities is to develop content for the Residents and Fellow Symposium during the annual meeting. Each year symposium sessions look at issues including career planning and legal aspects of working in radiology. Committee members also provide feedback to RSNA regarding how the Society can best meet the changing needs of radiology trainees. A report detailing the committee's latest activities will be published in the August issue of *RSNA News*. Learn more by clicking Committees at *RSNA.org/Leadership*.aspx and selecting Resident and Fellow Committee.

RSNA.org

AUR, SCARD Websites Get a Brand New Look

In addition to seeing an eye-catching new look, visitors to the redesigned Association of Radiology (AUR) and the Society of Chairs of Academic Radiology Departments (SCARD) websites will experience improved navigation and streamlined organization in a tablet-friendly format.

The websites offer visitors simpler, more direct paths to the wide array of content they have long relied on to fill their membership needs.

On the SCARD site, for example, content including past SCARD announcements, training resources, society links and more is now located under one Resources tab on the top of the page. All AUR content is now organized in colorful, easy-to-read categories anchoring the home page.

Both revamped home pages also feature new Spotlight sections highlighting important news and announcements. The SCARD site has also added a Google-powered search function.

We invite users to experience the revamped sites at *www.AUR.org* and *www.scardweb.org*.

COMING NEXT MONTH

From patient testimonials to videos of patients describing various radiologic procedures and programs, we report on some of the unique ways radiology departments and practices are using online tools to improve the patient experience.

Q: When interpreting mammography, what is the most appropriate time to use computer-aided detection (CAD)?

Find the answer and more with the

BREAST IMAGING/NEW TECHNOLOGIES CD COLLECTION

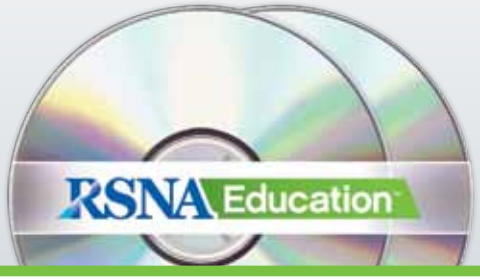
Explore new technologies in breast imaging and their implications for clinical practice, including a discussion of the advantages and controversies in computer-aided diagnosis (CAD) technology.

TWO-CD COLLECTION

BUN15

Two refresher courses from past annual meetings.

Includes visual presentation, accompanying audio, and transcripts. 3.00 *AMA PRA Category 1 Credits™*, CME test included.



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Enter **BUN15** in keyword search.

While supplies last. Sale ends 10/31/2013. CME expires 10/31/13.

For more info, contact ***ed-ctr@rsna.org***

RSNA Education™