



## Radiology Navigates Stricter HIPAA Laws

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See Page 23**

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## FEATURES



**5** | Oncologic Imaging Focus of French Research



**7** | Radiology Faces Threats, Challenges



**9** | Technology Cuts Radiation Exposure



**11** | MR Imaging Part of “Genomic Revolution”



**13** | Radiology Navigates Stricter HIPAA Laws

## UP FRONT

- 1** First Impression
- 1** Centennial Snapshots
- 4** My Turn

## RADIOLOGY’S FUTURE

- 15** R&E Foundation Donors

## NEWS YOU CAN USE

- 19** Education and Funding Opportunities
- 20** Journal Highlights
- 21** *Radiology* in Public Focus
- 23** Annual Meeting Watch
- 23** The Value of Membership
- 24** RSNA.org

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## CENTENNIAL SNAPSHOTS

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

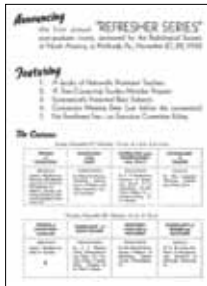
### 1919: First Technical Exhibition at Annual Meeting

RSNA realized that commercial exhibitors who rented space during the annual meeting could help introduce attendees to new technology while supporting the Society's operating budget. Nineteen companies involved in X-ray manufacturing were part of the first technical exhibition.



### 1938: Refresher Courses Held for First Time at Annual Meeting

Included in the program of courses intended to review established knowledge in the field was a "film-reading session" during the afternoon of the first day of the annual meeting. That session, the meeting's most popular, lives on today as the Image Interpretation Session.



### 1965: Scientific Program Committee Established

With those refresher courses and more, the RSNA annual meeting had evolved into an event too large for RSNA's secretary-treasurer, executive secretary and various committee chairmen to organize. **President Robert D. Moreton, M.D.**, helped consolidate development under the direction of one all-encompassing committee.



### 1970: RSNA Honorary Membership First Awarded

Marguerite H. Henry, RSNA's first executive director, was the first to receive RSNA honorary membership, which recognizes "significant achievements in the field of radiology." Serving the Society as executive director from 1933 to 1971, Henry had guided RSNA through times of tremendous growth in its annual meeting and research journal. RSNA Honorary Membership has been bestowed on 109 individuals.



### 1990: Introduction to Academic Research First Offered

This program co-sponsored by RSNA, the Association of University Radiologists and American Roentgen Ray Society introduces residents to academic radiology in the second year of their residencies. Participants learn the importance of diagnostic radiology research and meet successful clinical radiology researchers.

### 2009: RSNA Image Share Funded

With \$4.7 million grant from the National Institute of Biomedical Imaging and Bioengineering, RSNA created a secure, patient-centric medical image sharing network. RSNA received more funding in 2012 to expand the network; as of late 2013, more than 6,000 patients with nearly 25,000 total exams had enrolled.

**RSNA Image Share**

## ICR 2014 Postponed, Moved to Dubai

The International Society of Radiology (ISR) has announced that the 2014 International Congress of Radiology (ICR) will be held September 9-12 in Dubai.

The meeting had been planned for earlier in the year in Sharm El Sheikh, Egypt; however, ongoing security concerns and travel restrictions in Egypt prompted a change in venue. The ISR notes that the Egyptian character of the congress will stay the same, with some input by the local radiological society in Dubai as well. The organizing committee and program are unchanged.

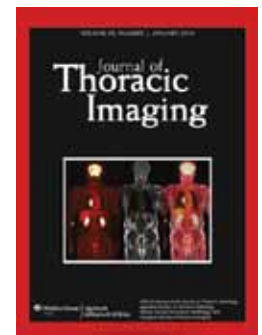


Tarek El-Diasty, M.D., president of the Egyptian Society of Radiology and Nuclear Medicine (ESRNM), said his organization fully supported the decision to relocate the congress.

## Journal of Thoracic Imaging Launches Educational CT Lung Cancer Screening Web Feature

To provide radiologists with the resources that they need to prepare for their upcoming role in lung cancer screening, the *Journal of Thoracic Imaging* recently launched a new Lung Cancer Screening Corner section in its online journal at [www.thoracicimaging.com](http://www.thoracicimaging.com).

The new Web feature contains links to a variety of open-access resources, including review articles, online lectures, and perspectives from leading experts on screening. The site also includes important practice guidelines, recommendations and statements from the American Cancer Society, the United States Preventive Services Task Force, the American College of Radiology and the Society of Thoracic Radiology, among other organizations.



# APPLY NOW FOR RSNA EDITORIAL FELLOWSHIPS

Applications are being accepted for the RSNA William R. Eyer Editorial Fellowship and the RSNA William W. Olmsted Editorial Fellowship for Trainees.

Both fellowships offer the opportunity to work with *Radiology* Editor Herbert Y. Kressel, M.D., in Boston and *RadioGraphics* Editor Jeffrey S. Klein, M.D., in Burlington, Vt. The Eyer fellowship lasts one month and the Olmsted fellowship lasts one week.

Each fellow will also visit the RSNA Publications and Communications Division at RSNA Headquarters in Oak Brook, Ill. The Eyer Fellow will work with the *RadioGraphics* editorial team at RSNA 2014.

The application deadline for the Olmsted fellowship is April 1. The Eyer fellowship application deadline is May 1. Learn more at [RSNA.org/Publications/editorial\\_fellowships.cfm](http://RSNA.org/Publications/editorial_fellowships.cfm).

**Radiology**  
**RadioGraphics**

## Hudgins Awarded ASHNR Gold Medal



**Hudgins**

Hudgins is a professor of radiology at Emory University School of Medicine, Atlanta, where she is director of head and neck radiology and program director of the Neuroradiology Fellowship Program. She has served as president of both the American Society of Neuroradiology and ASHNR.

The American Society of Head and Neck Radiology (ASHNR) awarded its 2013 Gold Medal to **Patricia A. Hudgins, M.D.**, during the society's recent annual meeting in Milwaukee. Dr.

## Berlin Honored at Special Ceremony in Italy

**Leonard Berlin, M.D.**, was recently presented a new, one-of-a-kind award for his work in radiology during a formal ceremony at the Municipal Hall in the city of Montecatini Terme, Italy, by the mayor of the city, **Giuseppe Bellandi, M.D.**, the only radiologist in the world known to have been elected as mayor of a city. Dr. Berlin is a radiologist with Skokie Hospital, Ill., formerly Rush North Shore Medical Center, where he chaired the Department of Radiology for 31 years, and a professor of radiology at Rush Medical College and the University of Illinois College of Medicine.

Over the past eight years, Dr. Berlin has been invited to Montecatini Terme to speak as the principal lecturer on topics related to risk management in radiology at a CME course sponsored by the Italian Society of Medical Radiology. While Dr. Bellandi took a leave of absence from radiology to serve as mayor in 2010, "Giuseppe still considers himself a radiologist," Dr. Berlin said.

Dr. Berlin presented the Annual Oration in Diagnostic Radiology at RSNA 2012 and has served as chairman of the RSNA Professionalism Committee and is a member of the Public Information Advisors Network (PIAN).



**Leonard Berlin, M.D., (left)** was presented a special award in Italy for his work in radiology by **Giuseppe Bellandi, M.D., (right)** a radiologist who is also the mayor of the city of Montecatini Terme.

## Thousands Support NIH Research at RSNA 2013

More than 3,000 meeting attendees visited the Academy of Radiology Research (ARR) booth at RSNA 2013 to send critical emails to members of Congress about the importance of preserving the future of National Institutes of Health (NIH) research.

In 2013, government sequestration cuts reduced the NIH budget by 5.3 percent. In 2014, cuts will increase to 7.2 percent unless Congress ends the sequestration, according to ARR, an alliance of 28 professional imaging societies, 37 academic radiology departments, 80 patient advocacy groups and nine industry partners.

Attendees were invited to stop by the ARR booth and use a laptop, iPad or their own mobile device to email members of Congress in support of NIH imaging research as part of ARR's virtual grassroots advocacy campaign to support medical imaging research as Congress debates imaging funding and ending sequestration. Supporters can visit the ARR website at <http://action.imagingcoalition.org>.



## RANZCR Honors Mendelson



**Mendelson**

The Royal Australian and New Zealand College of Radiologists (RANZCR) presented the Roentgen Medal to **Richard M. Mendelson, M.D.**, at its 64th Annual Scientific Meeting in Auckland, New Zealand.

Dr. Mendelson is a consultant gastrointestinal radiologist at Royal Perth Hospital and clinical professor at the University of Western Australia and the University of Notre Dame.

# SFR Honors Kressel, Krestin, Ghossain, Honda

**Herbert Y. Kressel, M.D., Gabriel P. Krestin, M.D., Ph.D., Michel Ghossain, M.D., and Hiroshi Honda, M.D.**, were awarded honorary memberships by the Société Française de Radiologie (SFR) at its recent Journées Françaises de Radiologie in Paris.

*Radiology* editor since January 2008, Dr. Kressel is radiologist-in-chief emeritus of the Department of Radiology at Beth Israel Hospital in Boston and the Miriam H. Stoneman Professor of Radiology at Harvard Medical School. Dr. Kressel received the RSNA Gold Medal in 2011.

Dr. Krestin is a professor of radiology and chair of the Department of Radiology at Erasmus University Medical Center Rotterdam, the Netherlands. He is a past-president of the European Society of Radiology (ESR) and received RSNA honorary membership in 2013. Dr. Ghossain is professor of radiology at the Hotel-Dieu de France, St. Joseph University of Beirut. Dr. Honda is the head of the Department of Radiology at Kyushu University and serves as treasurer and 2013 congress president of the Japan Radiological Society.



Kressel



Krestin



Ghossain



Honda



## Roentgen Award Nominations Being Accepted

Nominations are being accepted now for the RSNA Roentgen Research Award, recognizing residents and fellows who have made significant contributions to their departments' research efforts as evidenced by presentations and publications of scientific papers, receipt of research grants or other contributions.

Only one resident or fellow per program can be nominated by the program director or department chair.

The RSNA Research & Education (R&E) Foundation provides an award plaque for the department to display and a personalized award to present to the selected resident or fellow. The nomination deadline is April 1. Learn about the nomination process and see a list of past recipients at [RSNA.org/Roentgen\\_Research\\_Award.aspx](http://RSNA.org/Roentgen_Research_Award.aspx)



## Hologic Commits \$100,000 to R&E Foundation

Hologic has committed to donating \$100,000 over five years to support the mission of the RSNA Research & Education (R&E) Foundation. A longtime supporter of the Foundation, the move makes Hologic the newest company to join the Vanguard program.

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Every life is extraordinary

“At Hologic we care about these things: Great science; meaningful innovation; early detection; and continuous improvement,” said Pam Cumming, vice-president of corporate marketing. “We know that identifying and supporting the researchers and scientists of tomorrow is critical to our long-term success.”

Hologic is a leading developer, manufacturer and supplier of premium diagnostic products, medical imaging systems and surgical products, focusing on women's healthcare needs.

“As a Vanguard supporter of the RSNA R&E Foundation, our contributions help support investigators whose work will lead to major discoveries in the field of radiology,” Cumming said. “It's a win-win situation. The investigators get a start in their healthcare careers and all of us benefit from their discoveries.”

As partners in the pipeline of innovative research and education, Vanguard companies provide seed money to investigators whose work could lead to major discoveries. A variety of grants and funding levels are offered that can be tailored to meet a participating corporation's giving preferences. Vanguard companies receive recognition for their contribution throughout the endowment period in RSNA publications, on the Foundation's website ([RSNA.org/Foundation.aspx](http://RSNA.org/Foundation.aspx)) and during the RSNA annual meeting.

## My Turn

# The Cost of Security

In this issue of *RSNA News*, I draw your attention to the feature article describing some of the challenges radiologists face as a result of new HIPAA (The Health Insurance Portability and Accountability Act) rules that came into effect in fall 2013.

I think that everyone would agree that our campaign of always “keeping patients first” means protecting them. Their fundamental safety, of course, is the primary concern, but patients first also means respecting their privacy. When HIPAA became law in April 2003, most of us understood the concept if not exactly the letter of the law.

As an academic radiologist, I knew enough to make sure that patients’ names were blacked out on images being collected for didactic presentations and that we should refrain from discussing patients in the hospital elevators or cafeteria. But the restrictions imposed by HIPAA have farther reaching implications for handling Protected Health Information, or PHI, than most of us ever imagined.

With HITECH, the Health Information Technology for Economic and Clinical Health Act, which further spells out some serious consequences of mishandling PHI, things have become even more complicated.



David M. Hovsepian, M.D., is the editor of *RSNA News*. He is a professor of radiology in the Department of Radiology at Stanford University in California. He also serves on the RSNA Public Information Committee and the Public Information Advisors Network.

Read “Basics Steps Aid Compliance with Stricter HIPAA Regulations,” on Page 13

The issues with HIPAA and HITECH underscore a general problem we’re facing today in America, namely how to maintain data security in what is rapidly becoming an exclusively digital society—where our economic transactions, communications and many services are available only online. We increasingly find ourselves targets of cyberattacks, whether on our personal identity or businesses. When we conduct transactions on “secure servers,” we rely on them to be secure knowing that no such thing truly exists.

For those of us who conduct our daily patient-related activities with the aid of our desktop computers, tablets and smartphones, our parent organizations require us to be protected by firewalls and load software onto our devices to manage and encrypt our data. These tactics absolve us of personal liability in the event of a data breach, but they come at a cost. Others now have access to what was once “our” data—including our own personal information stored on those devices—floating around in a cloud somewhere.

On the one hand, individuals need to be assured of their personal security, whatever aspect of it we might be discussing. The judicious use of technology can help with that security, but it’s easy to cross the fine line between watchfulness and invasion of privacy. In the era of big data, that balance point is increasingly less clear and the law of unintended consequences often brings us quickly from the cloud back down to earth.

## THIS MONTH IN THE *RSNA NEWS* TABLET

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

As part of this month’s story on challenges facing radiology, we feature video interviews with RSNA Board Member Vijay M. Rao, M.D., David C. Levin, M.D., and Jonathan W. Berlin, M.D., discussing their RSNA 2013 presentation, “The Future of Radiology: What are the Threats and How to Respond to Them.”

Access the *RSNA News* tablet edition on the App Store at [itunes.apple.com/us/app/rsna-news/id444083170?mt=8](https://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.rsna-news&hl=en>.



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# Oncologic Imaging the Focus of “France Presents”

*From molecular imaging biopsy guidance to intra-arterial therapy for hepatocellular carcinoma, the “France Presents” session delivered a full spectrum of cutting-edge research in oncologic imaging at RSNA 2013.*

THE SOCIÉTÉ FRANÇAISE DE RADIOLOGIE chose to focus the “Presents” session on diagnostic and interventional oncologic imaging and the role of radiologists in managing cancer patients, said presenter Valerie Vilgrain, M.D., chair of the Department of Radiology at the University Beaujon Hospital in Clichy, France.

Both anatomic evaluation and routine functional tumor imaging are increasingly combined to provide optimal tumor staging and response, said Alain Luciani, M.D., Ph.D., a professor of radiology at the University Paris Est Creteil and a radiologist at the University Hospital CHU Henri Mondor, who presented “Whole-body Diffusion in Hematology Malignancies.”

“Current MR developments, including respiratory triggering, phased array coils and parallel imaging, bring whole-body MR imaging to clinical practice, especially in oncology patients,” Dr. Luciani said.

Ongoing national and international protocols led by French academic imaging teams are currently underway for the assessment of multiple myeloma and lymphoma, Dr. Luciani said. In a France/Taiwan research program supported by French public funding, investigators are exploring whole-body diffusion-weighted imaging as a standalone method compared to PET-CT for lymphoma staging with novel instrumental developments dealing with diffusion in hematologic malignancies.



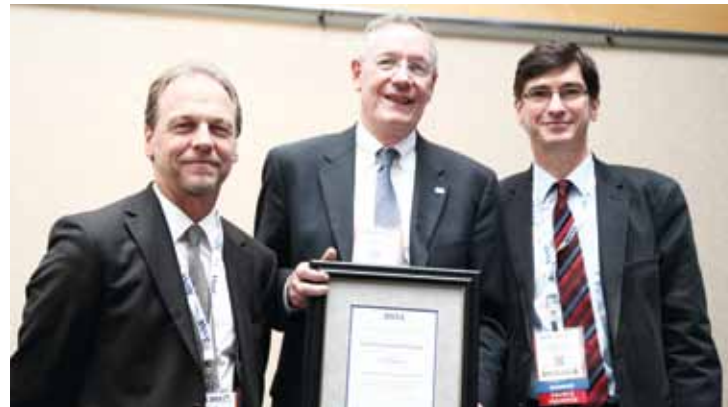
## Radiologist Plays Key Role in Oncologic Imaging

Dr. Vilgrain’s presentation focused on the role of the radiologist on a multidisciplinary team in the treatment of colorectal liver metastases. “In recent years there has been significant growth in multidisciplinary teams, working as a result of increasing specialization, advances in medical technologies and recommendations by national agencies, especially in oncology,” she said.

The radiologist’s role on these teams is key, Dr. Vilgrain said. “In colorectal liver metastases, based on an extensive imaging workup and patient clinical status, radiologists and hepatobiliary surgeons discuss whether the patient is resectable, unresectable or borderline. In unresectable or borderline patients, radiologists evaluate tumor response to choose optimal treatment.”

Radiologists also have a critical role in addressing chemotherapy-induced liver toxicity and in potentially avoiding radical hepatectomy by isolating lesions with advanced imaging, she said. These teams are vital for optimal patient care, Dr. Vilgrain said, citing a 2012 study in the *British Journal of Radiology* demonstrating that patients who did not benefit from a multidisciplinary team were denied potentially curative treatments.

Established in 2003, the French National Cancer Plan was developed to reduce the number of cancer cases and deaths and improve quality of life. The plan also aimed to establish multidisciplinary team meetings for every patient. “Radiologists have become important contributors to these teams and their presence is mandatory when discussing oncologic cases,” Dr. Vilgrain said.



Closing remarks were given by (from left) Nicolas Grenier, M.D., professor of radiology at the University of Bordeaux, RSNA Board Liaison for International Affairs Richard L. Baron, M.D., and Jean-Pierre Pruvo, M.D., Ph.D., professor of neurosurgery, Hospital Roger Salengro, Lille, France.

The story of cancer begins with biopsy, said Eric De Kerviler, M.D., a professor of radiology at Hôpital Saint-Louis in Paris, whose presentation focused on molecular imaging techniques for biopsy guidance. “The standard imaging modalities used for needle guidance are often adequate to identify the lesion or determine the needle trajectory, but cannot overcome the variable expression of molecular targets within tumors,” Dr. De Kerviler said.

Molecular imaging enables the visualization of cellular function, and therefore offers better insight into a tumor’s biology, demonstrating areas of increased metabolism or cellularity, abnormal perfusion or tissue stiffness, Dr. De Kerviler explained. Molecular imaging can create a clearer map of the optimal biopsy route, Dr. De Kerviler said. “What if we could dispose from a molecular GPS?” he asked.

“Current MR developments, including respiratory triggering, phased array coils and parallel imaging, bring whole-body MR imaging to clinical practice, especially in oncology patients.”

**Alain Luciani, M.D.**





Valerie Vilgrain, M.D.



Dr. Pruvo and 2013 RSNA President Sarah S. Donaldson, M.D.

Techniques for intra-arterial therapy of liver malignancies were presented by Thierry J. De Baere, M.D., director of the Department of Interventional Radiology at the Institut Gustave Roussy in Villejuif, France.

“For hepatocellular carcinoma (HCC), 3D angiography image guidance with computer image analysis improves outcomes of chemoembolization because 3D imaging allows us to better depict tumors in the

Daily Bulletin coverage of RSNA 2013 is available at [RSNA.org/bulletin](http://RSNA.org/bulletin).

liver,” Dr. De Baere said. “Tumor feeding vessels can be depicted with a sensitivity of 99 percent, with limitations in vessels below one millimeter when patients have been already treated.”

“We need research in drug and delivery platforms dedicated to intra-arterial therapy,” Dr. De Baere said. “In the future, we could have one syringe for HCC, one for liver metastases, and so on.” □

## Partnerships Promote Global Dose Reduction

**Radiologists, technologists and other stakeholders are working together to successfully implement dose reduction strategies worldwide, according to presenters of an RSNA 2013 session.**

IN THE EUROPEAN UNION (EU), projects such as Clinical Audit Guidelines, a tool developed to facilitate the implementation of clinical audit programs in medical imaging and radiation therapy departments, and other programs that collect dose distributions and provide education and training are key to promoting a radiation safety culture, said Graciano N. Paulo, M.Sc., R.T., vice-president of the European Federation of Radiographer Societies.

“All these EU projects were made on a multi-stakeholders model, based on the contribution of organizations representing EU regulators, radiologists, radiographers, medical physicists and research centers, among others,” Paulo said.

Paulo emphasized the need for more guidelines covering the entire EU, including radiation dose information and specific advice for imaging children and pregnant women. Also needed are clearer and stronger measures to encourage the availability and the use of referral guidelines, he said.

“Radiographers, being the final point of contact for the patient, have the responsibility to guarantee the correct procedure to the right patient, while ensuring maximum optimization and effective use of equipment,” Paulo said.

Partnerships have also helped another major organization, the International Society of Radiographers and Radiologic Technologists (ISRRT), make great strides



Graciano N. Paulo, M.Sc., R.T.

in bringing radiation safety to developing countries, according to Donna E. Newman, B.A., R.T., director of professional practice at the ISRRT.

The ISRRT works with the World Health Organization (WHO) and others to promote best radiography practices, education and standards throughout the world. Society programs like the donor-enabled Travel Support Fund help bring technologists from developing countries to the organization’s World Congress.

As an example, Newman cited Boniface Yao, a technologist from Ivory Coast in Africa whose trip to the ISRRT World Congress in Toronto was made possible through the fund. Yao returned home

after the congress and presented several workshops in his native country and at a national conference in Cameroon.

“He said that this opportunity allowed him to put himself in a bigger world,” Newman recalled.

### Dosewise Competition Yields Best Practices

The ISRRT also offers the Dosewise Competition, a contest in which radiographers across the world send in examples of their best practices to protect patients from excess radiation. The winner gets a trip to the ISRRT international conference or the RSNA annual meeting.

Other ISRRT workshops send instructors to developing countries to provide education and training to colleagues who can’t go to the conferences.

Session moderator Michael D. Ward, Ph.D., vice-dean of the Goldfarb School of Nursing at Barnes-Jewish College in St. Louis, echoed the RSNA 2013 theme—the Power of Partnership—when he discussed the importance of disseminating the latest information on dose optimization.

“These events bring together physicians, radiographers, physicists and other staff members and regulators to share best practices,” he said. “Then we go back and spread the word through our organizations.” □

# Shifting Healthcare Landscape Creates Threats, Challenges

With the implementation of the Affordable Care Act, the introduction of new payment models, and a shift from volume- to value-based radiology, radiologists are facing a number of challenges as they head into the foreseeable future.

BUT THERE ARE SEVERAL STEPS radiologists can take to deal with these challenges going forward, according to Vijay M. Rao, M.D., David C. Levin, M.D., and Jonathan W. Berlin, M.D., who presented “The Future of Radiology: What are the Threats and How to Respond to Them,” at RSNA 2013.

While all three radiologists addressed the same topic just one year ago at RSNA 2012, some circumstances have changed since then, said Dr. Rao, RSNA Board Liaison for Information Technology and Annual Meeting. “People were still wondering about the Affordable Care Act and whether that really meant a change from volume- to value-based radiology,” she said. “That has become a reality and now we are focusing on quality metrics. It’s important for us to become champions of quality in our institutions.”

Dr. Rao urged radiologists to become more visible within the hospital environment, particularly with the evolution and adoption of new payment models. “One thing that clearly needs to happen is that radiologists need to build bridges to hospital administrations,” she said. “As we evolve into bundled payments or the formation of ACOs (accountable care organizations), we’re no longer talking about fee-for-service, so radiologists may be in an unfavorable position unless the hospital recognizes their value.”

Radiologists also need to increase their visibility by becoming more involved in areas like hospital strategic planning, attending medical executive committee meetings, and/or working to reduce overall costs.

In the meantime, many of the challenges that have afflicted radiology over the last several years continue to do so. Dr. Levin pointed out that it’s clear the perception of radiology as a com-



Jonathan W. Berlin, M.D.



David C. Levin, M.D.

modity continues to dog the specialty. He pointed to a recent article in the *New England Journal of Medicine* that called for Medicare to “extend competitive bidding to medical devices, lab tests, radiology diagnostic services and all other commodities.”

“There we are identified as a commodity like broccoli and toilet paper,” Dr. Levin said. “That’s the way we are being perceived by a lot of intelligent people.”

A “culture change” is needed, Dr. Levin said. Radiologists must act like true consulting physicians by screening imaging exams for appropriateness, supervising advanced imaging exams, giving patients access to their test results, and being available to consult with referring physicians.

## Code Bundling Among Factors Driving Decrease in Utilization

*Utilization rates for CT, MR imaging and nuclear medicine have leveled off since experiencing rapid growth in the early part of the 2000s when they drew concern due to cost, potential overuse and, in the case of CT, the cancer risk associated with radiation dose.*

DAVID C. LEVIN, M.D., who also presented “Nationwide Medicare Data Show the End of Growth in Utilization Rates of Advanced Imaging” at RSNA 2013, led a team in using the Medicare Part B Physician/Supplier Procedure Summary Master Files for 2000-2011 to examine utilization rates.

According to the study, the CT utilization rate per 1,000 beneficiaries skyrocketed from 325 in 2000 to its peak of 637 in 2009, a 96 percent increase. The nuclear medicine rate per 1,000 rose from 193 in 2000 to 320 in 2006, a 66 percent increase.



A study led by David C. Levin, M.D., found that utilization rates for CT, MR imaging and nuclear medicine have leveled off since experiencing rapid growth in the early 2000s. Image courtesy of David C. Levin, M.D.

In order to do these things, radiologists will have to change the way they look at productivity, Dr. Levin said. Co-presenter Dr. Berlin pointed out that in order to deal with declining reimbursements, radiologists have focused on increasing productivity while cutting expenses and reducing hiring.

This is problematic on several levels, Dr. Berlin said. It's a problem when radiologists fail to pick up the phone or reach out to other clinicians or residents because these activities won't increase RVUs, he said.

"Radiologists should behave more like consulting physicians," Dr. Levin said, "even if it means we have to sacrifice some income to do it."

Dr. Levin also urged radiologists to "take back the nights and weekends" from teleradiology companies; consider consolidating into larger groups in order to better cover those times as well as provide subspecialty expertise and achieve more market power and economies of scale; do more to publicize American College of Radiology (ACR) appropriateness criteria; and build bridges to primary care physicians who will be increasingly influential under new payment models.

### Radiologists as Utilization Gatekeepers

In terms of utilization management, radiologists need to take on a larger role, Dr. Rao said. In the past radiologists have shied away from becoming utilization gatekeepers, she said, partly due to financial interests, as well as the possibility of alienating their colleagues by rejecting imaging tests as unnecessary.

"This is where radiologists have to take a leadership role in reducing unnecessary imaging," she said.

Taking on that role can be accomplished in several ways, including educating medical students, staff and referring physi-



Vijay M. Rao, M.D.

cians about appropriate imaging and working with hospitals to install decision support systems linked to order entry.

Another major concern is that a bigger segment of the radiology job market is contracting. And a poor job market means "less clout and prestige for the specialty," as well as less added-value as perceived by referring physicians and patients, Dr. Berlin said.

Groups should be prepared to hire more young radiologists, even if it means sacrificing income, Dr. Rao said. "We don't want to send the message to medical students that there aren't any jobs available in radiology. Radiology has always attracted the best and the brightest and we don't want to see them shy away from entering the specialty." □

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“Radiologists should behave more like consulting physicians, even if it means we have to sacrifice some income to do it.”

David C. Levin, M.D.

Meanwhile, the MR rate per 1,000 jumped from 95 in 2000 to 185 in 2006, a 95 percent increase.

"Imaging was the most rapidly growing of all physician services," said Dr. Levin, professor and chairman emeritus of the Department of Radiology at Thomas Jefferson University, Philadelphia. "That led to a lot of concern, and that was partially responsible for the reimbursement cuts that have followed since then."

The results of Dr. Levin's study, however, showed that the rates began leveling off from 2009 until 2011, the most recent year with available data. CT dropped a small amount to 626 in 2010, and took a dramatic plunge to 500 in 2011, mostly the result of code bundling for CT of the abdomen and pelvis. Nuclear medicine also saw a gradual decline to 303 by 2009, then a sharp decline to 135 in 2010, again largely due to code bundling for primary myocardial perfusion imaging and its two add-on codes for left ventricle wall motion and ejection fraction. In 2011, the number fell again, to 128.

MR imaging rates remained steady since 2006, hitting 184 in 2011. MR imaging experienced no code bundling.

Despite code bundling appearing to have a dramatic effect on the trend lines for utilization rates, Dr. Levin said even without that development the growth had ended. He attributed the drop-off to a variety of factors beyond code bundling, including higher co-pays for patients and the growth of radiology benefits management companies (RBMs). Among other factors are reimbursement cuts, physician concerns about costs and radiation, and appropriateness criteria. The recession was also a factor, though the slowdown began before the recession hit.

All factors contributed to the leveling off, but Dr. Levin said RBMs played a major role. "RBMs have basically changed the way a lot of the ordering physicians think about ordering imaging," Dr. Levin said. "They know they're going to have to go through this preauthorization process. That has probably discouraged a lot of inappropriate use."

Dr. Levin said it's too soon to predict what the 2012 data will show, but he doesn't believe the rates will increase. "There might be a little bit of growth, but it's not going to be near the rate we saw in the early 2000s," he said. "In fact, there may be no further growth." □

# Spectral CT Improves Image Quality, Reduces Radiation Exposure

*Recent technological advances have contributed to the development of photon-counting detectors (PCD), which are now able to discriminate between photons based on energy level, providing information about the composition of an object in a single scan.*

"PCDs ARE THE NEXT BIG THING IN CT," said Radin A. Nasirudin, Dipl.-Ing, of the Department of Diagnostic and Interventional Radiology, Technische Universität München, Munich, Germany, in an RSNA 2013 presentation.

Incorporating photon-counting detector technology into CT—a technique called spectral CT—not only relays this additional information in a single scan, but due to quantum efficiency, noise can be drastically reduced. This means that better image quality can be achieved with lower radiation dose, Nasirudin said. "Current estimates on dose reduction suggest a decrease by a factor of two or more," he said.

In his study, "Application of Photon-counting CT: Metal Artifact Reduction," Nasirudin and colleagues investigated the advantages this technique provides in reducing metal artifacts.

"Artifacts caused by metal objects are common and can significantly reduce the diagnostic quality in daily clinical practice," Nasirudin said. "Although there are many well-established methods for metal artifact reduction, most involve segmentation and thresholding for detection of the metal object, which is prone to reintroduce new artifacts."

With this in mind, Nasirudin and colleagues developed an algorithm—spectral-driven iterative reconstruction (SPIR)—that utilizes spectral information to reduce metal artifact in CT.

Researchers used a Monte Carlo simulator to simulate spectral CT projection data of a jaw phantom consisting of bone, soft tissue, teeth and gold implants. The resulting spectral projection data were decomposed to determine the spatial location and density of the gold. That information was then incorporated into a penalized maximum likelihood iterative reconstruction algorithm.

"The results from our investigation into the reduction of metal artifacts are promising," Nasirudin said. "The material decomposition technique is able to detect the metal implant from other components of the phantom."

When compared to a known shape, the error from detecting the implant by material decomposition is less than 2 pixels, he said, which "strongly suggests" the technique is able to accurately detect the spatial location and density of any dental implant.

Use of the technique resulted in a reduction of streaking artifacts without compromising any other anatomical information, Nasirudin said. When visually compared to other techniques like filtered-back projection or standard penalized maximum likelihood iterative reconstruction, "our method delivers superior image quality while preserving the details around the metal implant," he said.

It's significant that this technique seems to work well with any shape of dental implant, he said. For example, researchers first used the technique with a jaw phantom that had a circle-shaped metal implant, but later tested the algorithm with more realistic dental implants that produced images with high diagnostic quality.

In addition, he said the parameters for the iterative reconstruction (such as number of iterations and the strength of the penalty) didn't change from one shape to another, indicating that "our method can be extended to other parts of the body such as the lower extremity or the spine."

The study demonstrates that information provided by spectral CT "will be a central key to overcoming image quality issues in current clinical CT," Nasirudin said. "We foresee that the clinical introduction of spectral CT will lead to more clinically relevant applications while possibly reducing radiation exposure to the general population." □



**Radin A. Nasirudin, Dipl.-Ing**

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“We foresee that the clinical introduction of spectral CT will lead to more clinically relevant applications while possibly reducing radiation exposure to the general population.”

**Radin A. Nasirudin, Dipl.-Ing**

# New Angiography Platform Reduces Dose, Maintains Quality

**A new angiographic imaging platform can reduce radiation dose by 83 percent without compromising image quality, according to RSNA 2013 presenters.**

“OVER THE PAST 10 YEARS we have seen a large increase in the use of radiation for medical imaging,” said Marco J. Van Strijen, M.D., of the Department of Radiology, St. Antonius Ziekenhuis in Nieuwegein, the Netherlands. “Minimal invasive innovative therapies in interventional radiology and cardiology rely on high-quality imaging, but also lead to longer procedure times and often in younger patient groups.”

A further hindrance, Dr. Van Strijen said, is the fact that many patients undergoing interventional procedures are obese, which “poses an additional problem to the dose we are using for getting optimal image quality,” and that procedures are getting more complex and at closer range, which also contributes to larger dose exposure.

Therefore research in this area has been necessary to find new techniques to reduce dose for both individual patients and staff during these procedures, and to verify claims of particular vendors regarding the ability of their devices to reduce dose, he said.

According to Dr. Van Strijen, the availability of increased computer power has led to the development of real-time imaging reconstruction algorithms that—combined with technical improvements in imaging equipment—are capable of reducing the needed radiation dose while maintaining image quality.

The platform his group studied—a system from Philips Healthcare called AlluraClarity—can adjust more than 500 system parameters in real time, thereby reducing the radiation dose necessary for adequate imaging during interventional procedures.

“The important part of the system is the flexible digital imaging pipeline,” Dr. Van Strijen said, adding that it enables the operator to make adjustments in functions such as pixel shifting, image enhancement or noise correction depending on the anatomical area of interest, and all in real time.

In this study, the researchers acquired two angiographic runs for each of 50 patients scheduled for iliac interventions. One run was acquired using a conventional imaging platform while the other was acquired using the new platform. Air kerma (kinetic energy released per unit mass) and dose area product values were recorded in all acquisitions and at the end of the procedure.

“As the definition of ‘adequate imaging’ is difficult to describe, we asked several non-affiliated experienced interventional radiologists



**Marco J. Van Strijen, M.D.**

across Europe to compare the results in a blinded way,” Dr. Van Strijen said.

The researchers found that the radiation dose in all procedures showed a mean reduction of radiation dose of 83 percent. The imaging technology was used in the entire procedure for all 50 patients since the image quality was considered to be sufficient for performing the intervention.

In addition, the qualitative image assessment by the non-affiliated interventional radiologists found that the run using the low-dose platform was usually of equivalent or better image quality as compared to the conventional imaging platform. According to Dr. Van Strijen, the blinded review comparison found that the lower dose technique provided better image quality in 14 cases, similar image quality in 32 cases, and worse image quality in two cases.

“Results suggest that the technology will provide ‘enormous’ future radiation dose reduction benefits for both patients and staff during interventional procedures,” Dr. Van Strijen said. □

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“Results suggest that the technology will provide ‘enormous’ future radiation dose reduction benefits for both patients and staff during interventional procedures.”

**Marco J. Van Strijen, M.D.**

# MR Imaging Part of “Genomic Revolution” in Brain Cancer Treatment

**An imaging genomic map that links MR imaging traits with gene and microRNA (miRNA) expression profiles in patients with glioblastoma multiforme (GBM) was presented at RSNA 2013.**

RESEARCHERS SOUGHT TO IDENTIFY genomic correlates of an MR perfusion radiophenotype in order to find new genomic targets for treatment of GBM, the most common malignant brain tumor. GBM accounts for 52 percent of all brain tumor cases affecting functional tissue and 20 percent of all intracranial tumors. Between 12,000 and 14,000 new GBM cases are diagnosed annually, and the five-year survival rate for GBM is among the worst for human cancers.

“It’s a quite terrible diagnosis,” said Rivka Colen, M.D., of The MD Anderson Cancer Center in Houston. She noted that despite ongoing efforts, there has been little significant progress in GBM therapy over the years.

But the relatively new field of imaging genomics, which links specific imaging traits (radiophenotypes) to genomic profiles, has the potential to effect changes in the way GBM is diagnosed and treated, Dr. Colen said. Her question has been, “How can MR imaging help in the so-called genomics revolution?”

Dr. Colen and colleagues identified 30 patients from the Cancer Genome Atlas (a publicly available genomic data site) who had both a genetic-expression profile and neuroimaging. Morphological image analysis was performed using Slicer 3.6, a free,

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Rivka Colen, M.D.

open-source package for visualization and image analysis, while the perfusion maps were created with NordiciCE, an image processing and analysis software application.

## MR T2-mapping Aids in Follow-up of Osteoarthritis Therapy

*Arthritic knees may be successfully treated with stem cell therapy, and the success of the treatment can be measured with MR T2-mapping, according to a pilot study presented at RSNA 2013.*

THE RESULTS SUGGEST that treatment with mesenchymal stromal cells (MSCs) decreases pain, improves function and quality of life, and in some cases delays or even reverses cartilage damage. MSCs can differentiate into chondrocytes after injection.

Osteoarthritis is the most prevalent chronic joint disease, responsible for 2 percent of direct public health expenditures with much larger indirect costs due to disability and loss of productivity. Short of replacing the joint, no treatment today has succeeded in restoring cartilage. Typical treatments include anti-inflammatory drugs, analgesics and local corticosteroid injections.

The study represents a proof of concept for both stem cell therapy and the correlation of T2-mapping with clinical assessments.

“We wanted to find out if MR T2-mapping could be a useful technique for the follow-up of stem cell treatment,” said Joan C. Vilanova, M.D., Ph.D., associate professor of medicine at the University of Girona, Spain, who presented the results. He noted that most newer MR equipment is capable of performing T2-mapping, which can detect changes in water content in cartilage, as well as other biochemical and biophysical changes.

Twelve patients with clinical and radiologic diagnosis of osteoarthritis of the knee were treated with autologous mesenchymal stromal cells (MSCs) by intra-articular injection. There was an equal number of male and female patients and left and right knees. The average patient age was 49 and all 12 patients had failed to respond to conventional treatments.

After an initial clinical and MR assessment, patients had MSCs harvested from their bone marrow, cultured and injected into their knees. There were no serious adverse events from the injections, and post-implantation pain, reported by half the patients, responded well to ibuprofen and resolved within one to six days.

Clinical outcomes, including assessments of pain, disability and quality of life were followed for a year. Cartilage assessment was performed using MR T2-mapping at 88 pre-determined anatomical regions before treatment and at 6 months and 12 months after treatment. T2 relaxation values were determined in each region of the knee. T2 relaxation

**Daily Bulletin coverage of RSNA 2013 is available at [RSNA.org/bulletin](http://RSNA.org/bulletin).**

“We included patients with high versus low perfusion and we looked at—and were able to obtain—the micro RNAs and genes that were intimately and closely associated with high versus low perfusion,” Dr. Colen said. “Given that patients with high perfusion are said to have a more aggressive phenotype—to have increased angiogenesis, and usually have a greater propensity to recur and even have an increased amount of invasion and decreased survival rates—we identified the top gene hits that were associated with these glioblastoma and glioblastoma patients.”

The whole purpose is using MR—specifically MR perfusion—to screen for genomic targets that would be novel, clinically relevant and clinically meaningful, which can go on to commercialization to develop a genomic-based therapeutic,” Dr. Colen added.

Currently genomic targets are identified for commercialization through computer algorithms, but these algorithms do not necessarily provide biological information, Dr. Colen said. “MR imaging reflects the underlying composition of the tumor, as well as the tumor environment,” she said. “The changes on MR imaging reflect the underlying histological, physiological, functional, metabolic and genomic composition of the tumor and of the tumor microenvironment.”

Studies like the October 2011 *PLoS One* article, “Radiogenomic Mapping of Edema/Cellular Invasion MRI-Phenotypes in Glioblastoma Multiforme,” authored by Dr. Colen and colleagues, have validated the use of MR as a tool to discover novel and new genomic targets, she said. Now, instead of using conventional MR imaging characteristics, Dr. Colen and colleagues are using perfusion—a more advanced imaging modality.

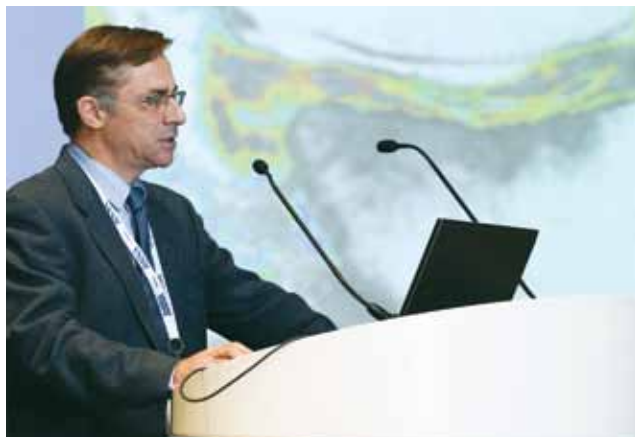
Next, researchers need to determine how MR can play a role in genomic-based drug development, Dr. Colen said. “How can we play a role in imaging genomic biomarkers so that we can begin stratifying patients using MR, or stratify patients into clinical trials, and develop imaging-based endpoints in clinical trials that are reflective of the histological and genomic composition of the tumor?” Dr. Colen added. “Those are the next questions.” □

“The changes on MR imaging reflect the underlying histological, physiological, functional, metabolic and genomic composition of the tumor and of the tumor microenvironment.”

**Rivka Colen, M.D.**

**WEB EXTRAS**

Access an abstract of the study, “Radiogenomic Mapping of Edema/Cellular Invasion MRI-Phenotypes in Glioblastoma Multiforme,” by Rivka Colen, M.D., and colleagues, at [plosone.org/article/info%3Adoi%2F10.1371%2Fjournal.pone.0025451](https://doi.org/10.1371/journal.pone.0025451)



**Joan C. Vilanova, M.D., Ph.D.**

time is sensitive to both changes in cartilage hydration and orientation of collagen fibrils. T2 relaxation time increases with osteoarthritis.

Participating patients had a 65 to 78 percent reduction in their level of pain, and smaller but still significant improvements in knee function and quality of life. Pain reduction during sports activity was even greater than pain reduction at rest. Analysis of the T2-mapped images showed consistent decreases in T-2 relaxation values.

The study is ongoing and has expanded to 70 patients, Dr. Vilanova said. He expects additional results to be available sometime this year. He cited two areas that need further study: the standardization of MR T2-mapping techniques and exactly how the MSCs work once they're injected.

“We have not proved the mechanism of the benefit,” he said. “We need to study more joints over a longer follow-up period.” □

“We wanted to find out if MR T2-mapping could be a useful technique for the follow-up of stem cell treatment.”

**Joan C. Vilanova, M.D., Ph.D.**

# Basic Steps Aid Compliance with Stricter HIPAA Regulations

*Encrypting laptop computers and securing email are among the basic precautions radiologists can take to avoid hefty fines associated with stricter regulations modifying the Health Insurance Portability and Accountability Act (HIPAA). The regulations became mandatory in fall 2013.*

KNOWN AS THE OMNIBUS RULE or Mega Rule, the new legislation took effect in March 2013, with compliance mandated in September 2013. The law represents the third phase of a process begun in 1996 with the enactment of HIPAA and extended in 2009 with the Health Information Technology for Economic and Clinical Health (HITECH) Act. The rule was issued by the Office for Civil Rights (OCR)—the entity that enforces HIPAA—of the U.S. Department of Health & Human Services (HHS).

Enacted amid concerns that patient privacy might be endangered by the growing use of electronic health records (EHRs), the Omnibus Rule was motivated in part by a perception of lax enforcement, informatics experts say. “This new rule intensifies issues first raised by HIPAA,” said David E. Avrin, M.D., Ph.D., vice-chair of informatics, the Department of Radiology and Biomedical Imaging, the University of California, San Francisco. “It turns up the heat on a problem that already existed.”

Under the rule, OCR will increase investigations and penalties for groups that demonstrate security lapses in the storage and exchange of patients’ protected health information (PHI). Civil penalties for noncompliance have been increased based on the level of violation. Any breach of PHI, whether intentional or accidental, can potentially set violators back by as much as \$1.5 million. The maximum penalty ultimately is at the discretion of HHS. As recent settlements show (see sidebar), those penalties can reach seven figures.

“Privacy compliance is a big deal for radiology groups; you can’t just dismiss it,” said J. Raymond Geis, M.D., a member of the RSNA Radiology Informatics Committee (RIC).

“It’s like a car accident,” Dr. Avrin added. “You don’t think about the costs until it happens to you.”

Among other changes, the Omnibus Rule makes business associates, including storage facilities and cloud computing/data storage vendors, and sub-



Avrin



Geis

contractors liable for compliance. The rule restricts use of PHI for marketing and fundraising purposes and prohibits the sale of PHI without individual authorization. Patients who have personally paid for any treatments have the right to prevent disclosure of records if they choose.

## Encrypted Laptops are “Low-hanging Fruit”

For radiologists, the new rule has less to do with the practice of radiology than it does with group leadership administrative responsibilities, according to Dr. Avrin, former chairman of the RIC. Under HIPAA, PHI that is linked based on 18 identifiers must be treated with special care. (See sidebar)

“In terms of privacy data violation, the issue is not necessarily about the images, but about the reports and diagnostic information therein,” Dr. Avrin said. “From a private radiology group perspective, you have to be aware of your administrative responsibilities and make sure you have oversight and authority commensurate with those responsibilities to ensure the confidentiality of what you oversee.”

Though the 563-page Omnibus Rule covers a wide range of subjects, recent history suggests that the majority of breaches could be avoided with some routine updates to PHI storage. For instance, approximately half of the HIPAA violations added to the HHS website in November 2013 involve the loss or theft of unencrypted laptops—what Dr. Avrin described as the “low-hanging fruit” of privacy adherence.

A 2012 Healthcare Information and Management Systems Society (HIMSS) survey underscores the prevalence of the problem: the society found that only 64 percent of healthcare organizations use encryption when transmitting healthcare information. “Everyone in the department should have an encrypted laptop,” Dr. Avrin said. “It’s reckless to carry around a laptop without encryption.”

Laptop encryption—specifically, whole disk encryption—requires the user to enter a password before using the computer and also protects data from unauthorized access by converting it into unread-

**ON THE COVER**  
Stricter HIPAA regulations make securing patients’ protected health information more critical than ever.





able code. Whole disk encryption offers a much stronger level of protection than typical security features, such as logging into an operating system or protecting individual files with a password. For radiology groups, providing encrypted laptops to all staff members, along with enforcing strict rules for use, may be the most cost-effective approach.

“You can’t be penny wise and pound foolish,” Dr. Avrin said. “Staff laptops—whether PC or Mac—should be locked down and the healthcare system should establish group policies for encryption.”

Data encrypted in accordance with the standards of the National Institute of Standards and Technology (NIST) are generally not considered breached even when devices containing such data are lost or stolen.

Improper or unauthorized access by employees is another common source of privacy breaches. In one recent case, a community college instructor in Connecticut used patients’ X-rays as teaching tools without patients’ permission. Many of the images contained patient names, dates of birth and physician notes. The teacher had used his computer password to access the data at the hospital where he worked part-time as a radiologic technologist.

“When you’re dealing with potential fines of this magnitude, you need to exercise quality in hiring so that you limit the risk at the front end,” Dr. Avrin said. “You have to make it clear that any person who misuses the data or gives the password to someone is subject to termination.”

Unauthorized release of images to others can also be a problem, especially when privacy rules run up against a patient’s desire for convenience. “A lot of patients say they want to release their images to others, but they don’t have all the documentation,” Dr. Geis said. “We have to explain to them that we can’t release images to whomever they send to the office to pick up the CD, because we don’t have a written release form.”

Patients also often want PHI sent to their email accounts, not realizing that common accounts like Gmail are not secure.

## Security Solutions on the Rise

Fortunately, resources for avoiding potential security violations are becoming more plentiful. For example, vendors are developing and refining new products that will make adherence to the laws easier, Dr. Geis said.

“More and more we see reasonably priced IT solutions implemented like secure email, where physicians and patients can communicate in an encrypted, HIPAA-compliant manner,” Dr. Geis said. “We also see better HIPAA compliance plans being actively implemented and enforced by radiology groups as well as hospitals.”

While not widespread now, new authentication solutions like fingerprint and eye scanning are likely to become more prevalent in the future, along with tools to make auditing easier, Dr. Geis said. “There is a strong need for easy access along with security and verification, which is providing an opportunity for vendors to develop solutions,” he said.

There are other measures radiologists can take to avoid HIPAA violations. Along with reviewing security policies—especially those concerning mobile devices—radiology groups should update agreements with business associates and review and revise Notice of Privacy Practices and Breach Notification Policies. Consultation with HIPAA experts is also advisable.

“A radiology group should have its own compliance officer, and that person has to have strong support from the senior management,” Dr. Geis said.

Ultimately, the stricter regulations require more due diligence on the part of radiology, experts say.

“All radiologists need to ramp up efforts to explore new IT tools available and remain efficient while still abiding by the law,” Dr. Geis said. □

### WEB EXTRAS

☑ Access a list of the 18 protected patient identifiers covered under HIPAA’s privacy rule here: [privacyruleandresearch.nih.gov/pr\\_08.asp](http://privacyruleandresearch.nih.gov/pr_08.asp).

## HEALTHCARE NAVIGATES HIPAA VIOLATIONS

Healthcare providers—including radiologists—have experienced a number of notable breaches and settlements, according to the U.S. Department of Health & Human Services (HHS).

### Breaches include:

- More than 4 million people were potentially affected when four laptops were stolen from an Advocate Health and Hospitals Corporation Illinois administrative office. A class action suit has been filed by affected patients. (7/2013)
- Two unencrypted laptops were stolen from an office of AHMC Healthcare, a six-hospital system in California, potentially affecting the records of 729,000 people. (10/2013)
- Missouri-based Litton & Giddings Radiological Associates, P.C., said its janitorial service inadvertently sent paper billing records with public health information (PHI) to a recycling company without first shredding the documents. (10/2012)
- Online gamers looking for more bandwidth hacked into servers belonging to Seacoast Radiology in New Hampshire. Those servers contained patient data and billing information, affecting 231,000 people. (11/2010)

Read “The Cost of Security,” in My Turn on Page 4

### Settlements include:

- Affinity Health Plan, Inc., settled potential HIPAA violations for \$1.2 million after multiple photocopiers were returned to leasing agents with data still on the hard drives. Up to 344,579 individuals may have been affected. (8/2013)
- WellPoint, a managed care company, agreed to pay HHS \$1.7 million after security weaknesses in an online application database left the PHI of 612,402 individuals accessible to unauthorized users over the Internet. (7/2013)
- Blue Cross Blue Shield of Tennessee (BCBST) agreed to pay HHS \$1.5 million for a 2009 breach involving the theft of 57 unencrypted computer hard drives from a leased facility in Tennessee. The drives contained the PHI of more than 1 million people. (3/2012)

For more information, go to [hhs.gov/ocr/privacy/hipaa/administrative/breachnotificationrule/breachtool.html](http://hhs.gov/ocr/privacy/hipaa/administrative/breachnotificationrule/breachtool.html).

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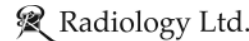
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**YOUR DONATIONS IN ACTION – HYBRID MOLECULAR IMAGING AND EVIDENCE-BASED CLINICAL PRACTICE**

Molecular imaging with FDG PET/CT is the fastest growing imaging modality in the last decade. Despite this trend, there is a serious need for educational programs for radiology residents and training for practicing radiologists in PET/SPECT/CT/MRI, radiopharmaceuticals, instrumentation and its use for evidence-based clinical practice in oncology, neurology and cardiology.

With a GE Healthcare/RSNA Education Scholar Grant of \$150,000 over two years, **Rathan M. Subramaniam, M.D., Ph.D., M.P.H.**, of The Johns Hopkins University, Baltimore, plans to fill the educational gap through his project, “Developing a Curriculum for Hybrid Molecular Imaging and Evidence-Based Clinical Practice.” The broad scholarship will be distilled through a series of video-recorded lectures, supportive reading materials for evidence-based practice and assessment modules available on a website for residents and practicing radiologists throughout the world. The emphasis will be on evidence-based clinical practice and value for patient management and outcome. Dr. Subramaniam is enthusiastic about the potential impact of this project. “I believe the curriculum will inspire young minds of trainees and educate the experienced mind of practicing radiologists in this evolving new paradigm of integration of functional and structural imaging in the context of evidence-based clinical practice.”



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Continued on Page 22

## Education and Funding Opportunities

### RSNA 2013 Cases of the Day Now Online

ANYONE WHO MISSED RSNA 2013 still has the chance to earn SA-CME credit for completing online Cases of the Day with the easy-to-use online format. Cases of the Day—image-based case scenarios spanning 15 subspecialties—are presented each day at the RSNA annual meeting. Participants review each case, submit a diagnosis and check the correct answer released the following morning.

In the online format, participants who view the cases and submit diagnoses not only immediately see the correct answer but also receive instant feedback and explanation for the correct diagnosis.

Each case includes images and clinical details to assist in diagnosis. After reviewing the case history, users can choose from a list of multiple choice answers. Each case includes the correct answer along with the most submitted incorrect answers from RSNA 2013.



**Users can explore challenging case histories to make the best diagnosis.**

In order to earn SA-CME credit for online Cases of the Day, four out of five cases must be answered correctly. If an incorrect answer is submitted, the retry button at the end of the activity allows users to repeat each case from the beginning.

Browse the newest online Cases of the Day at [RSNA.org/cod](http://RSNA.org/cod).

### RSNA Introduction to Research for IRIYA Program

Deadline for nominations  
**April 15, 2014**

THE RSNA COMMITTEE ON INTERNATIONAL RADIOLOGY EDUCATION (CIRE) seeks nominations for the RSNA Introduction to Research for International Young Academics (IRIYA) program that encourages young radiologists from countries outside North America to pursue careers in academic radiology by:

- Introducing residents and fellows to research early in their training
- Demonstrating the importance of research to the practice and future of radiology
- Sharing the excitement and satisfaction of research careers in radiology
- Introducing residents to successful radiology researchers, future colleagues and potential mentors

This special four-day seminar will be held during the 2014 RSNA Annual Meeting. The CIRE recommends 15 young academics for consideration by the RSNA Board of Directors each year.

Eligible candidates are residents and fellows currently in radiology training programs or radiologists not more than two years out of training from outside North America, who are beginning or considering an academic career. Nominations must be made by the candidate's department chairperson or training director. Fluency in English is required. Nomination forms are available at [RSNA.org/IRIYA](http://RSNA.org/IRIYA).

### Register for Writing a Competitive Grant Proposal Workshop

Last chance to register for the RSNA Writing a Competitive Grant Proposal Workshop to be held March 7-8, 2014. Limited space is available. Register at [RSNA.org/CGP](http://RSNA.org/CGP).

## Medical Meetings

### February-April 2014

#### FEBRUARY 20-22

American Society for Radiation Oncology (ASTRO) Multidisciplinary Head and Neck Cancer Symposium, JW Marriott Camelback Inn Resort and Spa, Scottsdale, Ariz.

- [www.headandnecksymposium.org](http://www.headandnecksymposium.org)

#### FEBRUARY 23-27

Healthcare Information and Management Systems Society (HIMSS), Annual Conference and Exhibition, Orlando, Fla.

- [www.himssconference.org](http://www.himssconference.org)

#### MARCH 3-7

American Physical Society (APS), March Meeting, Denver Convention Center

- [www.aps.org](http://www.aps.org)

#### MARCH 6-10

The European Society of Radiology (ESR), European Congress of Radiology (ECR), Austria Center Vienna

- [www.ecr.org](http://www.ecr.org)
- \* Visit RSNA at Booth 611

#### MARCH 22-27

Society of Interventional Radiology (SIR), 39th Annual Scientific Meeting, San Diego

- [www.sirweb.org](http://www.sirweb.org)
- \* Visit RSNA at Booth 301

#### MARCH 23-28

Society of Abdominal Radiology (SAR) and the European Society of Urogenital Radiology (ESUR), joint Annual Scientific Meeting and Educational Course, Boca Raton Resort and Club, Fla.

- [www.esur.org](http://www.esur.org)

#### MARCH 29-APRIL 2

American Institute of Ultrasound in Medicine (AIUM), Annual Convention, Caesars Palace, Las Vegas

- [www.aium.org](http://www.aium.org)

#### MARCH 30-APRIL 4

International Diagnostic Course Davos (IDKD), 46th IDKD, Diseases of the Abdomen and Pelvis, Convention Center Davos, Switzerland

- [www.idkd.org](http://www.idkd.org)

#### APRIL 1-4

RSNA and Association of University Radiologists (AUR), Joint Sponsored 62nd Annual Meeting, in conjunction with SCARD, APDR, A3CR2, ACER, AMSER, RAHSR, RRA, APCR and SNMMI, Baltimore Marriott Waterfront

- [www.aur.org](http://www.aur.org)

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## Journal Highlights

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

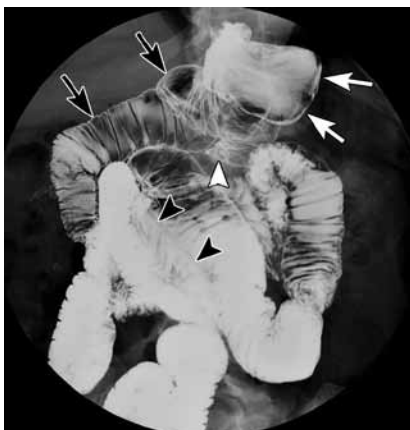
### Imaging of Bariatric Surgery: Normal Anatomy and Postoperative Complications

In treating morbid obesity, the most common bariatric procedures performed include laparoscopic Roux-en-Y gastric bypass, laparoscopic adjustable gastric banding and laparoscopic sleeve gastrectomy.

Fluoroscopic upper gastrointestinal examinations and abdominal CT are the major imaging tests used to evaluate

patients after these various forms of bariatric surgery, according to a State-of-the-Art article in the February issue of *Radiology* (RSNA.org/Radiology) by Marc S. Levine, M.D., of the Hospital of the University of Pennsylvania, and colleagues. Researchers review the most commonly performed bariatric procedures, the normal imaging findings on fluoroscopic upper GI and CT studies, and the role of imaging studies in detecting complications associated with these procedures.

Among other findings, the authors determined that upper GI barium studies are useful for showing postoperative complications, such as stomal stenosis, band slippage and gastric volvulus after laparoscopic adjustable gastric banding, and for assessing routine band adjustments. "Radiologists should be familiar with the surgical anatomy and normal imaging findings for major bariatric procedures," the authors write.



**Normal imaging findings after Roux-en-Y gastric bypass.** Supine spot image from single-contrast upper GI barium study shows opacified gastric pouch (white arrows), with barium entering Roux limb (black arrows) and blind-ending jejunal stump (white arrowhead). Note widely patent side-to-side jejunojejunostomy (black arrowheads) visualized in profile. Gaseous distention of small bowel loops resulted from aerophagia (not administration of effervescent agent).

(*Radiology* 2014;270;2:327-341)  
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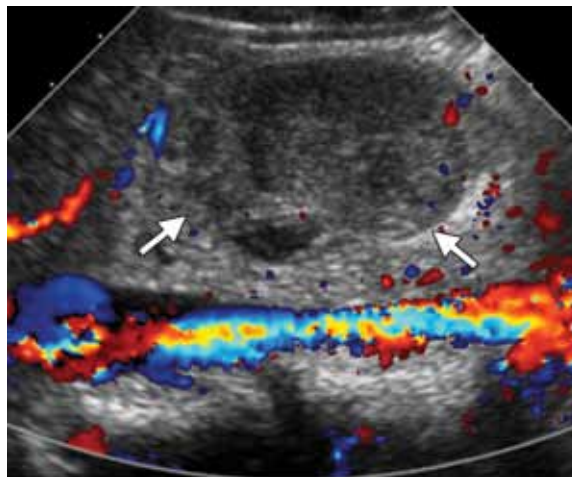
### Pediatric Nonaccidental Abdominal Trauma: What the Radiologist Should Know

Abdominal injury in nonaccidental trauma (NAT) is an increasingly recognized cause of hospitalization in abused children. Certain imaging findings in the pediatric abdomen, most notably bowel perforation and pancreatic injury, should alert the radiologist to possible abuse and incite close interrogation concerning the reported mechanism of injury.

In an article in the January-February issue of *RadioGraphics* (RSNA.org/RadioGraphics), Elizabeth F. Sheybani, M.D., of the Mallinckrodt Institute of Radiology, Washington University School of Medicine, St. Louis, and colleagues review abdominal imaging findings and their evaluation in cases of known or suspected NAT and discuss imaging findings that should raise concern in the absence of an appropriate clinical history. Specifically, the authors discuss:

- Injury detection
- Hollow viscus injury
- Duodenal injury
- Solid organ injury
- Hypoperfusion complex

Given the disproportionately high rates of hollow viscus injury in NAT, detection of hollow viscus injury should raise suspicion for NAT, especially when there is concurrent solid organ injury, according to the authors. "When abdominal injury in abuse has been identified, the radiologist must closely examine the radiologic images for evidence of additional sites of injury because of the high rate of multiple injuries in these patients," they write.



**Duodenal hematoma in a 15-year-old boy who denied a history of trauma.** Longitudinal color Doppler ultrasound image through the right upper quadrant shows a lesion with mixed echogenicity and no internal vascularity (arrows). Because the cause of the lesion remained unclear, contrast-enhanced MR imaging was performed for further evaluation. The patient denied abuse. He returned three months later with neurological devastation after an assault by his older brother.

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## Radiology in Public Focus

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

### High-signal Intensity in the Dentate Nucleus and Globus Pallidus on Unenhanced T1-weighted MRI: Relationship with Increasing Cumulative Dose of a Gadolinium-based Contrast Material

HIGH-SIGNAL INTENSITY in the dentate nucleus (DN) and globus pallidus (GP) on unenhanced T1-weighted images may be a consequence of the number of previous gadolinium-based contrast material administrations, according to new research.

In the study, Tomonori Kanda, M.D., Ph.D., of the Hyogo Cancer Center, Akashi, Japan, and colleagues compared unenhanced T1-weighted MR images (T1WI) of 19 patients who had undergone six or more contrast-enhanced brain scans with 16 patients who had received six or fewer unenhanced scans. The hyperintensity of both the DN and the GP correlated with the number of gadolinium-based contrast material administrations.

Results showed high-signal intensity of both the dentate nucleus and globus pallidus on unenhanced T1-weighted MR images correlates with the number of previous gadolinium-based contrast medium administrations (dentate nucleus:  $P < .001$ , regression coefficient = 0.010, 95 percent confidence interval [CI]: 0.009, 0.011; globus pallidus:  $P < .001$ , regression coefficient = 0.004, 95 percent CI: 0.002, 0.006).



MR images in 45-year-old woman with glioblastoma treated with surgery, chemotherapy and radiation therapy. Unenhanced T1-weighted image shows high-signal-intensity globus pallidus. Standard ROIs were placed around globus pallidus and thalamus.

(*Radiology* 2014;271:InPress) ©RSNA, 2014.

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“Gadolinium deposition, or high-signal intensity material deposition related to cumulative gadolinium load, occurs in the human brain independent of renal function,” the authors write.

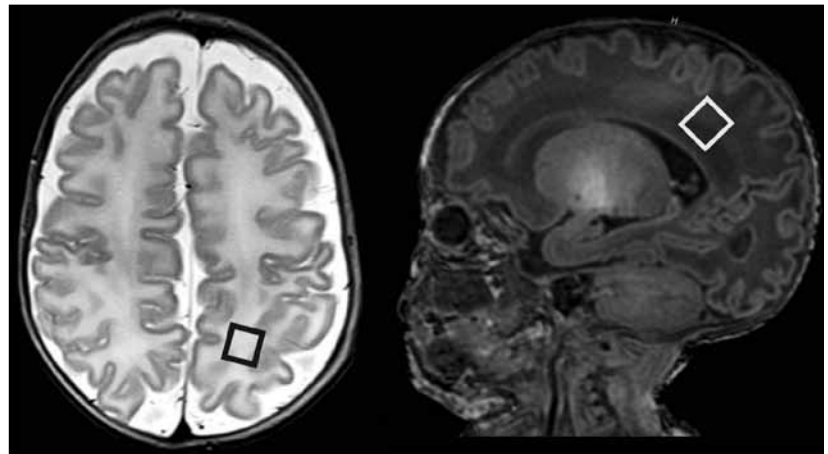
### White Matter NAA/Cho and Cho/Cr Ratios at MR Spectroscopy Are Predictive of Motor Outcome in Preterm Infants

THE COMBINATION of choline/creatine (Cho/Cr) and N-acetylaspartate (NAA) ratios measured in the posterior periventricular white matter at term-equivalent age is predictive of motor outcome at 1 year in infants born at less than 32 weeks gestation, new research shows.

Giles S. Kendall, M.R.C.P.H., Ph.D., of the University College London, and colleagues examined 43 infants (24 boys) born at less than 32 weeks gestation and admitted for neonatal intensive care. Researchers performed single-voxel point-resolved proton (hydrogen 1) MR spectroscopy from a 2-cm<sup>3</sup> voxel centered in the posterior periventricular white matter.

Abnormal motor outcome at 1 year can be predicted with a cerebral white matter N-acetylaspartate (NAA)-to-choline (Cho) ratio of less than 0.725 and a Cho-to-creatine (Cr) ratio of more than 2.425 at proton MR spectroscopy performed at term-corrected age, results showed. An increased Cho/Cr ratio and a decreased NAA/Cho ratio can predict impaired motor outcome at a corrected age of 1 year, with a sensitivity of 0.80 (95 percent confidence interval [CI]: 0.57, 0.94) and specificity of 0.80 (95 percent CI: 0.66, 0.88).

“Cho/Cr and NAA/Cho ratios have the potential to be used as surrogate endpoints in neuroprotection trials in preterm babies; in addition, they may indicate at an early stage those babies who may benefit from ongoing intervention in infancy,” the authors concluded.



Axial T2-weighted (left) and sagittal T1-weighted (right) MR images show position and orientation of posterior white matter point-resolved spectroscopy voxel.

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# Media Coverage of RSNA

In November, 3,592 RSNA-related news stories were tracked in the media. These stories reached an estimated 1 billion people.

Coverage included *The Huffington Post*, *U.S. News & World Report – Online*, *The Wall Street Journal – Online*, *Chicago Tribune – Online*, *The Virginian-Pilot*, *Science*, *NBCNews.com*, *MSN Health*, *Reuters.com*, *ABC-News.com* and *Yahoo! Finance*.



# New on *RadiologyInfo.org*

Visit *RadiologyInfo.org*, the public information website produced by the RSNA and ACR, to read the recently posted content on anemia. For more information, go to: [www.radiologyinfo.org/en/info.cfm?pg=anemia](http://www.radiologyinfo.org/en/info.cfm?pg=anemia).

## FEBRUARY PUBLIC INFORMATION OUTREACH ACTIVITIES FOCUS ON HEART HEALTH

February is American Heart Month and the RSNA “60-Second Checkup” radio program, distributed to nearly 100 radio stations across the country, will focus on the use of coronary CTA to reveal similarities of heart disease in men and women.

# RSNA Wins MarCom Awards

RSNA received five 2013 MarCom Awards from the Association of Marketing & Communication Professionals, an international awards competition that recognizes outstanding creative achievement.

### Platinum Awards:

- RSNA 2012 Press Kit
- A television segment about an RSNA 2012 study on the “chemo brain” phenomenon that appeared on the NBC Nightly News.

### Gold Awards:

- *RSNA News*— the July 2013 issue highlighting the role of radiology in aiding victims of the 2013 Boston bombing
- RSNA Employee Intranet

### Honorable Mention:

- The mobile site for *RadiologyInfo.org*, the RSNA-ACR public information website.

For more information, go to [www.marcomawards.com](http://www.marcomawards.com).

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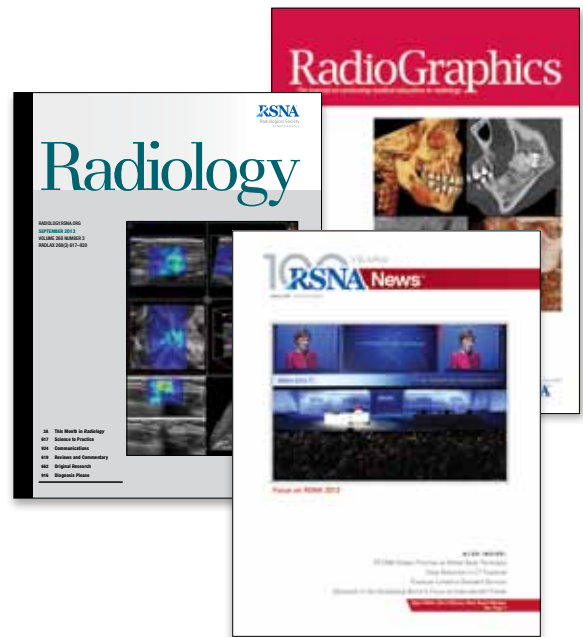
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## Annual Meeting Watch

### RSNA 2014 Online Abstract Submission Opens mid-January

The online system to submit abstracts for RSNA 2014 will be activated in mid-January. The submission deadline is 12 noon Central Time on Wednesday, April 9, 2014. Abstracts are required for scientific presentations, education exhibits, applied science, quality storyboards and quantitative imaging reading room showcase.

**To submit an abstract online, go to [RSNA.org/abstracts](http://RSNA.org/abstracts).**

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

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## RSNA 2013 Attendance Stays Strong

Despite a slow economy, attendance for RSNA 2013 remained very strong, setting a new record for the number of member and international attendees. More than 13,000 members attended RSNA 2013, an 8 percent increase from the previous year, while the nearly 9,800 international attendees at the meeting set an all-time record. Overall attendance at RSNA 2013 totaled more than 54,000.

### Other Important Dates for RSNA 2014

- May 7:** Member registration and housing open
- June 4:** General registration and housing opens
- July 9:** Course enrollment opens
- October 24:** International deadline to have full conference badge mailed
- November 7:** Final housing and discounted registration deadline
- November 26:** Deadline to guarantee a seat for all ticketed courses
- Nov 30-Dec 5:** 100th Scientific Assembly & Annual Meeting

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## COMING NEXT MONTH

Read our report on RSNA 2013 research focusing on the effectiveness of recent breast imaging technology including digital breast tomosynthesis.

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