The Greening of Radiology: Simple Changes Reduce Energy Use, Carbon Footprint

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NIBIB Appoints New Advisory Council Members

Three new members have been appointed to the National Advisory Council for Biomedical Imaging and Bioengineering (NIBIB) of the National Institute of Biomedical Imaging and Bioengineering (NIBIB): John C. Gore, Ph.D., is the Hertha Ramsey Cress chair in medicine, university professor and director of the Institute of Imaging Science at Vanderbilt University Medical Center in Nashville. Dr. Gore is a member of RSNA’s Molecular Imaging Committee. Cato T. Laurencin, M.D., Ph.D., is director of the Institute for Regenerative Engineering and the chief executive officer of the Connecticut Institute for Clinical and Translational Science, Farmington. He is also the Albert and Wilda Van Dyk Distinguished Professor of Orthopaedic Surgery and a professor of chemical, materials and biomolecular engineering at the University of Connecticut, Storrs. Mark A. Mosen, M.D., Ph.D., is head of the Stanford Center for Biomedical Informatics Research and professor of medicine and computer science at Stanford University.

NIBIB, a component of the National Institutes of Health, implements a wide variety of biomedical imaging and bioengineering programs to foster the development of innovative medical technologies to improve healthcare.

Brant-Zawadzki Named to R&E Board of Trustees

A renowned MR imaging expert, Michael Brant-Zawadzki, M.D., has been named the newest member of the RSNA Research & Education (R&E) Foundation Board of Trustees. Dr. Brant-Zawadzki, succeeds Vijay M. Rao, M.D., who has served on the R&E Board of Trustees since 2008. Dr. Brant-Zawadzki is the executive medical director of the Neuroscience Center of Excellence, Haag Memorial Hospital, Newport Beach, Calif., and an adjunct clinical professor of diagnostic radiology at Stanford University. Along with serving as the current vice-chair of the R&E Public Relations Committee, Dr. Brant-Zawadzki has served on the R&E Fund Development Committee and R&E Visionaries in Practice Subcommittee. He is a Gold Visionary donor to the Foundation. Dr. Brant-Zawadzki is a member of the RSNA Public Information Advisors Network (PIAN), past chair of the Public Information Committee and has served as an associate editor and reviewer for Radiology.

TELL A COLLEAGUE—RENEW NOW

RSNA members who did not renew their membership by Dec. 31, 2021, ceased receiving their RSNA publications, including RSNA News. Know someone who hasn’t renewed? Encourage them to retain all the benefits of their RSNA membership by renewing today at RSNA.org/renew.

In addition to subscriptions to RSNA News, RadioGraphics and Radiology, RSNA benefits include:

- Free advance registration to the annual meeting
- Free education tools to maximize learning and earn CME
- Networking opportunities with radiology professionals from across the globe
- mRSNA®, which lets you build your own personal online workspace

Members who are transitioning into practice from training pay reduced rates their first and second years. For more information on RSNA membership, contact membership@rsna.org, 1-877-RSNA-MEM (776-2636) or 1-630-571-7873 (outside the U.S. or Canada).

Not too Early to Set Up Group Billing for 2012

Practices and academic institutions with large numbers of RSNA members can take advantage of group billing to receive just one invoice during the next membership renewal cycle. To set up this option, contact the RSNA Membership Department at membership@rsna.org or 1-877-776-2636 (630-571-7873 outside the U.S. and Canada).

Only Qualified RTs Should Perform Coal Miner Scans, Agency Says

The U.S. Department of Health and Human Services’ (HHS) has proposed a new rule allowing only qualified radiologic technologists to produce radiographs of lungs of coal miners under the Coal Workers’ Health Surveillance Program. The “Specifications for Medical Examinations of Underground Coal Miners” outlines the specifications for providing, interpreting, classifying and submitting chest X-rays of underground coal miners for the surveillance of coal workers’ pneumoconiosis. The program is administered by the National Institute for Occupational Safety and Health. Current standards do not require that qualified RTs perform the radiography. The American Society of Radiologic Technologists supports the proposal and recommends that HHS use the same definition of radiologic technologists used in the Consistency, Accuracy, Responsibility, Excellence in Excellence ( CARE) in Medical Imaging and Radiation Therapy bill.

The proposed amendments would also add a set of standards permitting the use of digital radiography systems, as the current standards pertain to film-based radiography systems only.

1 RSNA News | April 2012
2 RSNA News | April 2012
Technology is Best Way to Address Self-referral Abuses

Self-referral is rampant in the healthcare system in the U.S. and is one of the factors most responsible for avoidable costs and unnecessary patient risk through unnecessary exposure to ionizing radiation. Financially motivated self-referral siphons money from the health system to no benefit of patients and must be much more effectively addressed by CMS and the private insurance industry.

How we got to where we are today is a painful and sobering story of unthought-of incentives in the healthcare legislation. The so-called Stark Laws provide legal safe harbors with loopholes large enough to drive an MRI device or CT scanner through, let alone radiation therapy devices. What is more disheartening than the failure of CMS and Congress to take action is the rapacious behavior of so many physicians across our country. Ironically, the financial pressures facing the U.S. may provide the best opportunity to address self-referral. Policymakers are beginning to understand the2 appropriate conflicts of interest from developing. The first reporting deadline for data collected in 2012 will be March 31, 2013, according to CMS. Under the proposal, applicable manufacturers and group purchasing organizations are subject to civil monetary penalties for failing to comply with the reporting requirements of the statute. The Medical Imaging & Technology Alliance (MITA) offers a list of resources on the Sunshine Act on its website, www.medicalimaging.org, under Policies and Positions. To access the U.S. Department of Health and Human Services Centers for Medicaid and Medicare Services proposed rules, go to www.cms.gov.

My Turn

James H. Thrall, M.D., is radiologist-in-chief at Massachusetts General Hospital and the Juan M. Taveras Professor of Radiology at Harvard Medical School in Boston. Dr. Thrall has served as a Perspectives Editor for Radiology and received the RSNA Gold Medal in 2007. He is the RSNA Research & Education Foundation Board of Trustees from 2002 to 2008.

While the final details must be ironed out, the Medical Imaging & Technology Alliance (MITA) and U.S. Food and Drug Administration (FDA) have agreed in principle on the FDA’s medical device user fee program. This agreement proposes to reauthorize the medical device user fee program and includes commitments from the FDA to improve the device review process. The user fee, including additional transparency and predictability.

An important component of this agreement is that it also enhances premarket review by putting in place mechanisms for earlier, more effective communications between manufacturers and the FDA and improvements to both the pre-submission and post-submission processes. The agreement also includes an independent, three-party audit of the premarket review process. Under this agreement the FDA is expected to sue up to $250 million over five years to hire more than 200 full-time employees including 140 new device reviewers. MITA was one of three industry associations that negotiated the agreement. In a time of tremendous advances in imaging and radiation therapy technologies, the agreement enables the industry to develop innovative, life-saving technologies to market faster, so that patients receive the care they need, said Lindsay Morris, MITA acting executive director. “The increase in resources for the medical device program under this agreement corresponds to a more timely approval process, which will benefit patients and the manufacturers who develop these innovative technologies.”

African Society of Radiology Holds Second Congress

After holding its first meeting in 2011, the African Society of Radiology (ASoR) will hold its 2nd ASoR Congress in Bibliotheca Alexandrina, Egypt, from April 3-6. The Congress was organized by ASoR and the Egyptian Society of Radiology and Nuclear Medicine. The 2011 Congress was attended by more than 120 radiologists from 19 countries in Africa, Europe, Australia and North America. Pictured at the 2011 Congress, from left: Congress President Professor Mohamed Daffia, head of the radiology department at National Cancer Research Institute, Alexandria, Egypt; Professor Jim Drew, Director of Advertisin.

New Agreement Reached on FDA Medical Device User Fees

While the final details must be ironed out, the Medical Imaging & Technology Alliance (MITA) and U.S. Food and Drug Administration (FDA) have agreed in principle on the FDA’s medical device user fee program. This agreement proposes to reauthorize the medical device user fee program and includes commitments from the FDA to improve the device review process. The user fee, including addi-
MR Imaging Provides New Keys to Psychiatric Disease

MR imaging is helping researchers correlate psychiatric disorders with structural and chemical abnormalities in the brain and could one day provide a valuable diagnostic and treatment-monitoring tool for patients, according to some experts.

Psychiatric disorders like schizophrenia, bipolar disorder and attention deficit/hyperactivity disorder (ADHD) exact an enormous toll on society. One in two Americans has a diagnosable mental disorder each year, according to the Centers for Disease Control and Prevention, including 44 million adults and 11.7 million children. The Institute of Medicine recently named depression and schizophrenia as two of the “big nine” chronic conditions that dominate the U.S. medical landscape.

The complexity of human behavior and lack of quantitative objective measures for psychiatric diseases make accurate diagnosis challenging. For instance, bipolar disorder is often misdiagnosed as clinical depression, resulting in misguided treatment approaches. MR-based tools such as MR morphometry, diffusion-tensor imaging (DTI), functional MR (fMRI) imaging and MR spectroscopy have shown promise as diagnostic tests for psychiatric conditions.

In research presented at RSNA 2011, Xiaobo Li, Ph.D., an assistant professor of radiology at Albert Einstein College of Medicine in New York, and colleagues used fMRI to compare the brains of 20 children with ADHD and 15 healthy children as they performed a visual attention working memory task. The fMRI scans showed disturbances in functional connectivity between the visual sensory cortex and the prefrontal cortex in the ADHD group, suggesting that fMRI could be useful for the initial evaluation of patients.

Dr. Li, who has researched psychiatric disorders with MR since 2004, is working on new research using DTI to show white matter impairment in the corticospinal tract in children with ADHD. Advances in MR technology helped fuel her findings, she said. “Researchers have been working actively on developing new MR and data processing techniques,” she noted. “For example, in our research, parallel MR imaging data acquisition techniques significantly shortened the scan time and high resolution DTI techniques made it possible to assess the very small white matter branches in the human brain.”

“In the coming decade or so, we should be able to know better about the neuronal substrates associated with ADHD and find better diagnostic and treatment strategies,” Dr. Li added.

Dr. Li’s research represents just part of the spectrum of recent MR-based research on psychiatric disorders. At RSNA 2011, researchers from the Capital Medical University in Beijing presented research that used evidence from voxel-based morphometry to determine that detection in changes of gray and white concentrations may be helpful for the early diagnosis and evaluation of patients with Tourette Syndrome. In the last year alone, researchers using MR imaging have discovered:

- Low iron levels in the thalamus may contribute to ADHD pathophysiology.
- DTI images and measurements of white matter nerve fibers in regions of the brain critical to language, emotion, and social cognition provide a promising diagnostic test for autism.
- Quantifying the loss of gray matter in the brain can help diagnose serious cases of childhood-onset schizophrenia, bipolar disorder and other psychoses.
- The gray matter in a network of brain regions known to affect social communication and self-related thoughts has a distinct organization in people with autism.
- MR can help predict future bipolar disorder in young people who haven’t shown any symptoms.

Technology Detects Neurobiology Differences

Despite the wealth of recent findings, a wider role for the MR imaging in diagnosing psychiatric disease is still years away, according to Perry F. Renshaw, M.D., Ph.D., M.B.A., a professor of psychiatry at the Neuroscience Program at the University of Utah in Salt Lake City. “The good news is that the new technologies are showing differences in the neurobiology among patients with psychiatric diseases,” he said. “The bad news is that, at a clinical level, we haven’t learned much that helps.”

“We’ve developed good technical tools to tell the difference between groups of people with bipolar disorders and those without,” added John Port, M.D., Ph.D., a radiologist at the Mayo Clinic in Rochester, Minn. “But the tests aren’t strong enough to find the condition in an individual.”

That recent development of 7.0 T MR—currently approved for research purposes only—could have promise in the field, especially for researchers like Drs. Renshaw and Port who specialize in MR spectroscopy. Dr. Port received a 2001 Research & Education (R&E) Foundation seed grant for his study of iron levels in the thalamus using 7.0 T MR imaging. “We’re using it to look for abnormal biochemistry,” Dr. Renshaw said. “However, it has a low signal-to-noise ratio. The higher field strength of 7.0 T is an exciting development for MR spectroscopy because it boosts the signal-to-noise ratio.”

Nevertheless, the economics of psychiatric medicine is a factor. Treatment non-adherence is a major problem and the nature of some psychiatric diseases makes patients unreliable—a problem for busy practices that rely on the MR suite to generate income, Dr. Renshaw said. “With trends like cuts in reimbursement, operations have to be very efficient,” Dr. Renshaw said. “Someone with a knee injury is likely to show up for an MR, but someone with depression-dependent may make an appointment and you never hear from them again.”

Regardless of how MR imaging evolves in psychiatry, ongoing and future research—including studies of biomarkers and the link between imaging findings and genetic profiles—will continue to improve our understanding of the structure and chemistry behind these conditions. “There is an imaging test for most disease processes, but in the psychiatric field we don’t have that yet,” Dr. Port said. “I thought I had one in 2005—I made a presentation at RSNA about it—but it turned out it wasn’t strong enough. I hope in my career we will develop something. It won’t be tomorrow and it won’t be next year, but hopefully we’ll have something in the next decade.”

Dr. Renshaw and Dr. Port are shown above. Dr. Li’s research presented at RSNA 2011: Left: Locations of the 16 brain regions for functional connectivity analysis that were determined based on the activation maps of both groups. Right: Within-group averages and between-group comparisons of the pair-wise functional correlation coefficients. The two images at left show the within-group averages; the two images at right show the pairs that had significantly increased and decreased functional connectivities in ADHD, compared to controls.
The Greening of Radiology: Simple Changes Reduce Energy Use, Carbon Footprint

While CT scanners, MR imaging machines, interventional suites and PACS reporting stations make radiology one of the most power-hungry departments in a hospital, facilities can significantly reduce energy consumption by implementing some fairly simple measures.

“AS A GROUP, I feel radiologists often overlook our impact on the environment,” said Colin McCarthy, M.D., who presented a quality storyboard, “EcoRadiology: Pulling the Plug on Wasted Energy in the Radiology Department,” at RSNA 2011. “Implementing changes such as turning off computers and air conditioning when not in use represent very simple but effective ways to play our part in reducing the carbon footprint of the department,” Dr. McCarthy said.

Because radiology has long been at the forefront of adopting technology to aid in patient care, radiologists should strive to be role models of energy efficiency in their own institutions, said Eliot Siegel, M.D., a professor and vice-chair of imaging informatics at the University of Maryland School of Medicine in Baltimore and presenter of the scientific paper “Greening Radiology” at RSNA 2011. “As more facilities turn to electronic medical records for their clinical workflow, energy needs mount,” Dr. Siegel said. “As radiologists, we should help our fellow doctors roll out their own electronic medical records.

Both physicians worked with colleagues to implement energy-saving models in their own facilities.

Computers, Air Conditioning Needlessly Devour Energy

Dr. McCarthy, a third-year radiology resident at St. Vincent’s University Hospital, Dublin, Ireland, and colleagues used readily available and inexpensive energy monitors to analyze usage of various appliances during normal use and in standby mode. After auditing the number of PACS reporting stations, desktop computers, air conditioners, lights, printers and general office equipment left on after hours, the team measured energy consumption for the entire year.

Researchers found that 29 of 43 desktop computers were left on unnecessarily overnight and weekend in the radiology department, wasting 25,000 kilowatt hours (kwh) annually. In addition, 25 of 27 PACS reporting stations were routinely left on overnight and on weekends, wasting 47,000 kwh annually. “This equates to almost $5,000 in electrical running costs, equivalent to the carbon emissions of six passenger vehicles each year,” Dr. McCarthy said.

Air conditioning is another needless energy drain. In just two reporting rooms, air conditioning wasted 37,000 kwh annually, totaling $4,800 in electrical running costs, researchers found.

Shutting Off Computers Saves $3,300 a Year

Simply shutting down workstations and monitors at the end of the day leads to institution-wide cost savings, according to Dr. Siegel and colleagues, whose findings were published in the November 2011 issue of the Journal of the American College of Radiology.

At the University of Maryland, Dr. Siegel and Amy Kunce, A.R.R.T., plugged their department’s computer workstations into a Kill-a-Watt electricity meter to monitor energy usage during active and standby states. Results showed that computers and monitors left on 24-7 department-wide would use at least 40,189.97 kwh and cost $4,420. If computers were shut down at the end of the day, the department would use at least 10,261.68 kwh, costing only $1,128, thereby saving the 29,928.29 kwh and $3,292, researchers concluded.

“In an age where cost reduction and energy savings are necessary, reducing power consumption in radiology with the simple step of turning machines off at the end of the day, if implemented hospital wide, will lead to cost savings institution wide,” Dr. Siegel said.

Experts say the “greening of radiology” is more critical than ever as radiology departments transition to electronic health records and rely more heavily on power-hungry technology like CT scanners and PACS. Ahrens: Energy-saving measures ranging from turning off computers to purchasing energy-saving light bulbs were discussed by RSNA 2011 presenter Colin McCarthy, M.D., (right) who presented “EcoRadiology: Pulling the Plug on Wasted Energy in the Radiology Department” at RSNA 2011.
MR Microscopy Holds Promise for Brain Tumor Research

A novel technique using 3D MR microscopy, allowing researchers to image vessel architecture in exquisite detail, has the potential to characterize the vascular phenotype of preclinical brain tumor models and hold promise for other areas of research.

The novel imaging method developed by Dr. Pathak and colleagues, published in the July 2011 issue of *PLoS ONE*, which simultaneously examined tumor brain invasion and angiogenesis, has shown promise for many areas of research, said Jiangyang Zhang, Ph.D., an assistant professor in the Department of Biology at Johns Hopkins, who oversees Dr. Pathak’s research.

“The high-resolution 3D images of the murine brain tumor model have a wide array of applications ranging from bioengineering to tumor biology,” Dr. Zhang said. “That is why this exciting research was featured on the cover of one of the premier biology journals.”

This RSNA-funded research has also led to a subsequent study by Dr. Pathak and colleagues, published in the August 2011 issue of *Journal of Cerebral Blood Flow & Metabolism*.

These results unequivocally show the feasibility of using MR microscopy to characterize the vascular phenotype of a mouse brain tumor model. “Regions of interest analysis showed significant differences in the vascular phenotype between the tumor and the contralateral brain,” Dr. Pathak said.

“There are protocols in place that provide a readout on the angiogenic status of an MR scan but understanding how tumors grow and spread, high-resolution studies that simultaneously visualize brain tumor invasion and vascularization are rare,” Dr. Pathak said. “That was our goal with this research.”

The study has also led to new research projects for Dr. Pathak and his team. First, they plan to take information gleaned from the high-resolution MR images to develop in vivo analogues of these biomarkers.

“There are protocols in place that provide a readout on the angiogenic status of an MR scan but the relationship between the readout and underlying biology is not clear,” he said. “These preclinical studies help inform that.”

The team also plans to conduct more computational studies and work toward better understanding of the basic biology of brain tumors.

**CLINICAL IMPLICATIONS:** From biology and imaging perspectives, knowledge of the 3D architecture of the tumor and the contralateral brain, Dr. Pathak said, would represent a truly innovative approach for investigating tumor angiogenesis at spatial resolutions intermediate to those of in vivo MR imaging and optical microscopy techniques.

**CAREER IMPACT:** Due to the current challenges obtaining research funding in an economically difficult period, the RSNA Seed Grant provided Dr. Pathak with the resources to generate high-quality preliminary data for larger extramural grants from the National Institutes of Health.

**Acknowledgments:** The authors thank the RSNA Research & Education Foundation, the International Biomedical Research Alliance, the National Institutes of Health, and the National Science Foundation for their generous support of this work.

**For more information on all R&E Foundation grant programs, go to www.rsna.org/grants.”**

**Image 469x409 to 595x585**

“Vascular Phenotyping of Brain Tumors Using Magnetic Resonance Microscopy,” go to www.ncbi.nlm.nih.gov/pmc/articles/PMC3148133/


**Image 630x574 to 1116x711**


**WEB EXTRA:** To access an abstract of the study, “Vascular Phenotyping of Brain Tumors Using Magnetic Resonance Microscopy,” in the *Journal of Cerebral Blood Flow & Metabolism*, go to www.nature.com/jcbfm/

**WEB EXTRA:** To access a free copy of the full study, “Three-Dimensional Imaging of the Mouse Neurovasculature with Magnetic Resonance Microscopy,” go to www.pbsearch.org/article/10.1002/hed.21990

**Image 1029x18**


**Image 1029x18**


RSNA-funded Research has Wide Reach

Along with helping to establish Dr. Pathak’s national and international reputation for his work on imaging the tumor microenvironment, the initial RSNA-funded research has led to advancements for other members of his team.

Graduate student Eugene Kim served as the lead author on the Journal of Cerebral Blood Flow & Metabolism article and—based on that research—received the Young Investigator Award from the International Bill Negendank Society for Magnetic Resonance in Medicine.

And the research has had an even wider ripple effect, Dr. Pathak said. “People are being trained on these new methods that were not available before and we are being approached for a variety of disease models—not just brain tumors, but Alzheimer’s disease and other neurodegenerative disorders,” Dr. Pathak said. Although he suspected its potential, Dr. Pathak said he had no idea the research would have such an immediate impact.

“The RSNA grant was indispensable in moving forward with what has been a truly groundbreaking project,” Dr. Pathak said. “Although he suspected its potential, Dr. Pathak said he had no idea the research would have such an immediate impact.”

“The RSNA grant was indispensable in moving forward with what has been a truly groundbreaking project.”

Arvind P. Pathak, Ph.D.
Real-time Dose Technology Measures Staff Exposure, Minimizes Risk

Technology will soon hit the market that provides real-time feedback about radiation exposure to interventional radiologists during fluoroscopy procedures and offers the promises of helping reduce radiation risks for both patients and staff.

Two studies—one in North America, the other in Europe—demonstrated the groundbreaking potential of technology featuring a real-time radiation dose display screen and individual wireless dosimeters worn by healthcare staff. Current technologies measure the radiation exposure for an entire month, which makes it difficult to pinpoint the precise time of a high-dose exposure.

“All of us work in radiation all day, so we’re always looking to reduce our risk of exposure,” said James Benenati, M.D., an interventional radiologist at Baptist Cardiac & Vascular Institute in Miami, Fla., and co-author of “New Device for Interventional Radiology Team Dose Reduction Using Real-time Feedback,” presented at RSNA 2011. “This technology allows us to see how much radiation we’re getting every time we step on the fluoroscopy pedal.”

During the 22-week study at Baptist Cardiac & Vascular Institute, researchers using the technology discovered a downward trend in total accumulated weekly team dose per fluoroscopic minute (PFM). The attending, fellow, nurse, technician and anesthesiologist wore a dosimeter for every procedure. The mean team PFM during the final 10 weeks—the open period of the study—was statistically less than the team dose during the closed phase (42.79 microSieverts (µSv) per minute vs. 19.81 µSv per minute).

Seeing the real-time radiation exposure allows team members to adjust their behavior during procedures, Dr. Benenati said. “With this technology, we’re watching every time you touch the pedal,” he said. “We’re able to act on it immediately. Everybody in the room is involved, so we can see who is getting the most or least exposure. You can look and say, ‘OK, I’m getting too much here. I’m going to move the shield or step back.’ It changes the behavior of the whole group.”

Researchers used the Philips DoseAware System (DAS), which resulted from a collaboration between Philips Healthcare and Unfors Instruments. Real-Time Dose Display Measures Scatter Rates

A European study focusing on scatter dose also demonstrated the potential of real-time dosimeters in improving personal safety for healthcare staff.

Researchers in Spain evaluated the Philips DAS showing staff radiation doses in real time in several angiography rooms at Hospital Clínico San Carlos in Madrid.

“When specialists know the dose rate received at any time during their work, they can adopt protection strategies easily without compromising the success of the procedure,” said Roberto M. Sanchez, M.D., a medical physicist at Hospital Clínico San Carlos and lead author of the study, “Staff Radiation Doses in a Real-Time Display Inside the Angiography Room,” published in December 2010 issue of Cardiovascular and Interventional Radiology.

Researchers concluded that real-time dose display to staff members warns interventionalists whenever the scatter dose rates are too high or the radiation protection tools are not being properly used, providing an opportunity to improve personal protection accordingly.

Researchers used a DAS prototype that utilized dosimeters placed at shoulder level over the protective lead apron of the radiologist. Dosimeters wirelessly track radiation levels every second and relay them to a base-station screen mounted close to the diagnostic monitors. Another dosimeter was placed on the C-arm to measure scatter radiation.

An easy transfer of the values to a data sheet permitted further analysis of the scatter dose profile measured during the procedure.

The cumulative occupational doses measured per procedure ranged from 0.6 to 350 µSv, Dr. Sanchez said. The dose rates recorded ranged from 1 to 5 milliSieverts (mSv)/h during fluoroscopy and from 12 to 235 mSv/h during digital subtraction acquisitions (DSA).

The mean cumulative dose measured at the C-arm during the trial was 1.04 mSv—10 times higher than the dose received by the radiologist (0.11 mSv per procedure). This difference was attributed in large part to radiologists stepping back or leaving the angiography room during DSA.

Researchers concluded that real-time dose display to staff members warns interventionalists whenever the scatter dose rates are too high or the radiation protection tools are not being properly used, providing an opportunity to improve personal protection accordingly.

“Patients and physicians both benefit from this new tool,” Dr. Sanchez said. “For the radiation protection specialist, you can now monitor every second that a dose is received, which can also be valuable for researching dose reduction strategies.”

Although the mainstream media is currently focused on patient exposure to radiation, physicians have been concerned about their own exposure for decades, Dr. Benenati said.

“We’ve been looking for something like this for a long time,” he said. “Patients are the top priority, but the reality is that the vast majority of them will receive only minimal exposure to radiation throughout their lifetime. The physicians who are in the room every day are at a much greater risk from exposure to radiation.”

“This technology allows us to see how much radiation we’re getting every time we step on the fluoroscopy pedal.”

James Benenati, M.D.
The most important take-home point from our research is that a high percentage of women can be seen within 16 days following an abnormal mammogram screening. This benchmark is achievable.

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Osteoporosis Imaging—State of the Art and Advanced Imaging

While dual-energy X-ray absorptiometry (DXA) is currently the state-of-the-art technique to measure bone mineral density and help physicians diagnose osteoporosis, new research is focusing on assessing bone quality using other advanced imaging techniques.

In an article in the April issue of Radiology (RSNA.org/Radiology), Thomas M. Link, M.D., of the University of California at San Francisco, and colleagues assess novel techniques to measure bone mineral density and discuss how imaging techniques should be used to diagnose prevalent osteoporotic fractures. Specifically, the authors discuss:

- High-resolution peripheral CT
- MR imaging
- MR spectroscopy and perfusion
- Quantitative ultrasound

Correctly diagnosing and interpreting fragility fractures with all available imaging modalities is one of the major responsibilities of radiologists, according to the authors. "Radiologists need to be sensitized to the fact that the presence of fragility fractures will alter patient management and these fractures need to be described in the report."

Impact of Mammography Detection on the Course of Breast Cancer in Women Aged 40–49 Years

Increased mammography-detected breast cancer over time coincides with lower—stage disease detection resulting in reduced treatment and lower rates of recurrence, adding factors to consider when evaluating the benefits of mammography screening.

Judith A. Malmgren, Ph.D., president of HealthStat Consulting, Inc., Seattle, and colleagues conducted a follow-up analysis of data from the National CT Colonography Trial, in which 49 who were treated between 1990 and 2008 went both virtual and optical colonoscopies at 15 centers around the country.

Researchers analyzed trial data from 477 patients over the age of 65 and 2,054 patients between the ages of 50 and 65 who were screened with the two procedures for polyps. Patients in the study were both men and women at predominantly an average risk for colorectal cancer.

Cancerous lesions 1 centimeter or larger were found in 6.9 percent of patients in the 65 and older group and in 3.7 percent of the younger patients.

Researchers showed no significant difference in the accuracy of CT colonography for the detection of large and intermediate-sized cancers in the older patients compared to the younger participants. Sensitivity and specificity among the older and younger groups were 0.82 and 0.83 and 0.92 and 0.86, respectively, according to researchers.

"For most measures of diagnostic performance and in most subsets, the difference between senior-aged participants and those younger than 65 years was not statistically significant," the authors write.

Increased mammography-detected breast cancer during the period, with fewer patient-detected cases in a large and carefully followed up breast cancer patient data from a dedicated community institution.

The shift to mammography-detected breast cancer cases was accompanied by a shift to diagnosis at a lower stage of disease (diagnosis at stage 0 increased 66 percent and diagnosis at stage III decreased 66 percent) and disease that requires less treatment.

The decision to undergo screening mammography by women aged 40–49 years is multifactorial, according to the authors.

"The decision should be made by patients who are informed that screening mammography can help reduce morbidity and mortality associated with a more advanced—stage breast cancer diagnosis and treatment."
Media Coverage of RSNA

From mid-December to mid-January, media outlets carried 6,292 RSNA-related news stories reaching an estimated 4.2 billion people.

Print coverage included: Boston Globe, The Orlando Sentinel, Arizona Daily Star, Sarasota Herald-Tribune and The Wichita Eagle. Broadcast coverage included: The Dr. Oz Show, CNN, NBC4-AM (New York), KABC-TV (Los Angeles), KTLA-TV (Los Angeles), WLS-AM (Chicago), WGN-TV (Chicago), WFLD-TV (Chicago), WVEC-TV (Norfolk), WPVI-TV (Philadelphia), KYW-TV (Philadelphia), WBBM-TV (Chicago), KDFW-TV (Dallas), WTVT-TV (Tampa), WFTV-TV (Orlando) and WBMM-TV (Chicago).


RSNA 2011 ANNUAL MEETING COVERAGE

Total media coverage of the RSNA annual meeting from November 2011 through January 2012, has resulted in a record 14,735 tracked media placements, yielding an estimated potential audience circulation of nearly 8 billion. Both in placements and impressions, media coverage of RSNA 2011 has already exceeded total for RSNA 2010, which garnered 7,894 placements with 5.3 billion audience impressions for the entire year.


April Outreach Activities

In April, RSNA distributed the “60-Second Checkup” audio program to more than 100 radio stations across the U.S. The segments focused on patient privacy.

The Value of Membership

A popular attraction at RSNA annual meetings, the 2011 Cases of the Day are now available online.

Cases of the Day—image-based case scenarios spanning 14 radiology subspecialties—are presented each day at the annual meeting. Participants review each case, submit a diagnosis and check the correct answer that is released the following morning. In the online format, participants who view the RSNA 2011 cases and submit diagnoses not only immediately see the correct answer but also receive instant feedback and can discuss the case with others.

Each Case of the Day is worth 100 AMA PRA Category 1 Credits®, which will be automatically transferred to the RSNA CME Credit Repository upon completion.

Cases of the Day are free to RSNA members. Non-members may access online Cases of the Day for a fee of $15 per case.

Expanding Features Deepen Radiology’s Reader Impact

Whether you prefer the print, online or tablet edition, free access to the continually evolving scientific journal Radiology is a premier benefit of RSNA membership.

Each month, Radiology publishes approximately 300 pages of peer-reviewed original research, authoritative reviews, well-balanced commentary on significant articles and expert opinion on new techniques and technologies. Radiology’s current 6.069 impact factor is the highest of all general diagnostic imaging journals.

The journal continues to expand its online presence with interactive features including podcasts, videos, a monthly reader poll and the popular Diagnosis. Please invite readers to submit the most likely diagnosis for a particular case. Users can also earn online CME credit for an activity associated with selected Review and State of the Art articles.

Readers also are invited to explore full-content Radiology apps for the iPhone®, iPad touch® or iPad® and mobile-optimized sites now available for mobile devices.

A new feature, Radiology Select, is a continuing series of selected Radiology articles that highlight developments in imaging science, techniques and clinical practice.

For more information on these and other Radiology features—and to view a video introduction of Radiology Select by Radiology Senior Deputy Editor Deborah Levine, M.D.—go to Radiology.RSNA.org.
ICR 2012

May 3-6, 2012 
São Paulo Brazil

RSNA will sponsor a session on pediatric cardiovascular imaging and additional speakers at the 27th International Congress of Radiology (ICR), to be held in conjunction with the 42nd São Paulo Radiological Meeting, May 3-6, in São Paulo Brazil. The International Society of Radiology (ISR) presents ICR every two years in a different location around the world. The ICR meeting offers educational activities including oral and digital scientific presentations, discussions on health policies and a technical exhibition. Previous ICR meetings took place in Mexico (2004), South Africa (2006), Morocco (2008) and China (2010). Enroll online at www.irc2012.org.

Medical Meetings 
April-May 2012

| April 16-20 | Society for Pediatric Radiology (SPR), 50th Annual Meeting, Fairmont Hotel, San Francisco, Calif. | www.prdrad.org |
| April 19-21 | ASNR, with cosponsors including RSNA, 3rd Multidisciplinary Cardiovascular Molecular Imaging Symposium, National Institutes of Health, Bethesda, Md. | www.asnr.org |
| April 20-22 | Australian Society of Radiologists (ASOR), 9th Annual Scientific Meeting of Medical Imaging and Radiation Therapy, Sydney Convention and Exhibition Centre | www.asor.org.au/mm2012 |
| April 21-23 | American College of Radiology (ACR), 89th Annual Meeting and Chapter Leadership Conference, Washington Hilton Hotel, Wash., D.C. | aacr.org |
| April 21-23 | Canadian Association of Radiologists (CAR), 75th Annual Scientific Meeting, Le Centre Sheraton, Montreal, Quebec | www.car.ca/en.aspx |
| April 27-30 | Australian and New Zealand Society of Nuclear Medicine (ANZSNM), 42nd Annual Scientific Meeting, Melbourne Convention Centre, Australia | www.anzsnm2012.com.au |
| April 29-29 | Canadian Nuclear Medicine Society (CNMS), 40th Annual Meeting, Harrogate Conference Centre, United Kingdom | www.cnms.ca |
| April 29-May 2 | British Nuclear Medicine Society (BNMS), 40th Annual Meeting, Harrogate Conference Centre, United Kingdom | www.bnms.org.uk |
| May 11-12 | Medical Imaging Informatics and Teleradiology, 8th Annual Conference, Novotel Toronto Centre, Toronto, Canada | www.mii.ca |

RSNA Introduction to Research for International Young Academics

The RSNA Committee on International Relations and Education (CIRE) seeks nominations for this 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

The program consists of a special four-day seminar held during the RSNA Scientific Assembly and Annual Fellowship. CIRE recommends 15 international young academics for consideration by the RSNA Committee on International Relations and Education (CIRE). Eligible candidates are residents and fellows currently in radiology training programs or radiology education programs in other countries—

Deadline for nominations—April 15

• Enrolling online at RSNA.org/IRIYA.

RSNA Clinical Trials Methodology Workshop

January 12-13, 2013

Shedd Animal Hospital
Applications due June 4

This conference leverages a combination of state-of-the-art lectures, panel discussions, invited papers, and selected abstracts of basic, translational, and clinical research to promote meaningful dialogue on available and emerging therapies in radiology, medical oncology, surgical oncology, interventional oncology, hematology and radiation oncology.

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. Applications must be submitted electronically and are available at clinicaltrials.rsna.org. For more information, contact Fiona Miller at 1-630-590-7741 or fmiller@rsna.org.
Optimize Your RSNA Journals Experience

Exploring the finest peer-reviewed journals in radiology is now faster and easier than ever with the newly redesigned journals page on the all-new RSNA.org.

All Radiology and RadioGraphics related content is consolidated into intuitive categories that quickly direct you to your desired destination. Once you’ve explored online content and perused the latest online editions or utilized any of the other journal resources, click the new feedback button to offer your thoughts on the site.

Highlights of the redesigned page include:

- **Feedback:** Click here to leave comments and suggestions for improving your RSNA Web experience.
- **Things to Know:** Order a non-member subscription or apply for RSNA membership, which includes free journal subscriptions and access to the Radiology Legacy collection. Opt for online-only journals, explore exclusive content, and earn instant CME.
- **Explore the Finest Journals in the Field:** Access direct links to Radiology, RadioGraphics, and the Radiology Legacy collection.
- **Mobile Options:** Access full content Radiology and RadioGraphics apps and mobile-optimized sites for your mobile device.
- **Resources:** Subscriber help and services are accessible at this central hub.
- **Extras:** Additional icons at the bottom of the page direct you to essential tools and content relevant to your online experience.
- **Social Media:** Follow Radiology and RadioGraphics on Facebook, Twitter, and other social media sites.

**COMING NEXT MONTH**

While a radiologist might have an idea in mind, he or she might not be familiar with the process for developing, patenting and licensing inventions that could become critical to daily practice. In next month’s RSNA News, we explain how physician-entrepreneurs can take the next step with their intellectual property.
Unlimited
Clarity

You need high quality images fast, but patients cannot always hold still. The solution is Hitachi’s RADAR™ for high-field Oasis and Echelon. Use RADAR with any coil and in any plane to keep your patients’ images still, even when they aren’t. Choose Hitachi high-field MR and be unlimited.

To find out more about how Hitachi’s high-field RADAR motion compensating technology can benefit you, visit www.OasisMRI.com