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Bohdan Pomahac, M.D.
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The Future of Imaging Informatics—Meaningful Use and Beyond
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The Story Behind the Image
Radiation Oncology and Radiology—Annual Oral Tinteresting Theme
Leonard Berlin, M.D.
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ANNUAL ORATION IN DIAGNOSTIC RADIOLoGY
Radiation Oncology and Radiology—Should We Get Married Again?
Anioby L. Zieman, M.D.
Boston

AAPM SYMPOSIUM
Breaking Angiographic Speed Limits: Accelerated 4D MRA and 4D DSA Using Undersampled Acquisition and Constrained Reconstruction
Charles A. Mistretta, Ph.D.
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Ultrasound Goes Supersonic: Very-High-Speed Plane Wave Transmission Imaging for New Morphological and Functional Imaging of Mmodes
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Chang
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Tanter
Mistretta

Gore
Sandler
Lichtenstein
Barentsz

SAR Bestows Honors
The Society of Abdominal Radiology (SAR) awarded its 2012 Walter B. Cannon Medal to Richard M. Gore, M.D., at its recent annual meeting. Dr. Gore is a clinical professor of diagnostic radiology at the North Shore University Health System in Evanston, Ill. A manuscript reviewer for Radiology, Dr. Gore has served on the RSNA Refresher Course Committee and as chair of the Scientific Program Committee’s Gastrointestinal Subcommittee. Carl M. Sandler, M.D., a professor at the University of Texas MD Anderson Cancer Center in Houston, was awarded the 2012 Howard M. Pollack Medal. Dr. Sandler has served as a manuscript reviewer for Radiology and on RSNA’s Scientific Program Committee’s Genitourinary and Breast Imaging Subcommittees.

Joel E. Lichtenstein, M.D., a professor of radiology at the University of Washington in Seattle, and Jelle O. Barentsz, M.D., a professor of radiology and vice-chair for research at the Radboud University Medical Center Nijmegen, The Netherlands, were respectively awarded the GI and GU Lifetime Achievement Awards. Dr. Lichtenstein has served as a manuscript reviewer for Radiology and RadioGraphics. Dr. Barentsz is an associate editor of Radiology and served on the RSNA Oncologic Imaging and Therapies Task Force. The Society of Gastrointestinal Radiologists and the Society of Uro-radiology recently merged to form the Society of Abdominal Radiology. The 2012 year marked the last year in which the awards would be given under the individual societies, as future awardees will receive the awards under the new society.

Alektiar Named ABR Trustee
The American Board of Radiology (ABR) has appointed Kater M. Alektiar, M.D., a member of the Department of Radiation Oncology at the Memorial Sloan-Kettering Cancer Center in New York, as a new trustee for radiation oncology. Dr. Alektiar has served as an ABR oral examiner since 2004 and as ABR gynecology oral section chair since 2007. He replaces Kim Ang, M.D., chair of the Division of Radiation Oncology for The University of Texas MD Anderson Cancer Center in Houston, who served as an ABR trustee for eight years.

More Quantitative Imaging Projects Funded
RSNA, through its Quantitative Imaging Biomarkers Alliance (QIBA), has funded another 10 studies that explore quantitative imaging with CT, MR and nuclear medicine. Funding for the projects is supported by a $2.4 million contract awarded to RSNA by the National Institute of Biomedical Imaging and Bioengineering (NIBIB) in 2010. Twenty-six projects were funded in the first round of grants last year. Topics range from “Assessing Measurement Variability of Lung Lesions in Patient Data Sets” to “Impact of Dose Saving Protocols on Quantitative CT Biomarkers of COPD and Asthma.”

The Quantitative Imaging Biomarkers Alliance (QIBA) was organized by RSNA in 2007 to unite researchers, healthcare professionals and industry stakeholders in advancing quantitative imaging and the use of biomarkers in clinical trials and practice. Quantitative imaging is defined as the acquisition, extraction and characterization of relevant quantifiable features from medical images for use in research and patient care. RSNA views this work as a step toward the ultimate goal of enhancing the use of quantitative imaging methods in clinical practice. For more information, go to RSNA.org/QIBA.aspx.

IN MEMORIAM
John R. Hodgson, M.D.
RSNA Past president John R. Hodgson, M.D., died May 14, 2012. He was 97. Dr. Hodgson joined the staff at the Mayo Clinic in Rochester, Minnesota, in 1947, where he served as chair of the Department of Diagnostic Radiology and was appointed to the Board of Governors and elected president of the staff. He is recognized as a pioneer in the Mayo Clinic’s outreach program, resulting in many regional satellite clinics and major facilities in Scottsdale, Ariz., and Jacksonville, Fla. Noted for his work in gastrointestinal disease and improving resident education, Dr. Hodgson supervised the development of a straight diagnostic radiology residency program and frequently invited outside lecturers to speak at the institution. During his tenure, Mayo Clinic’s Department of Radiology developed a strong cross-sectional imaging program and several new subspecialty areas. Dr. Hodgson was a dedicated and active participant in the scientific and organizational aspects of local and state medical organizations, serving as president of the Minnesota Radiological Society. Dr. Hodgson served as RSNA president in 1970 and received the RSNA Gold Medal in 1975.
AIUM Bestows Honors

The American Institute of Ultrasound in Medicine (AIUM) presented its Joseph H. Holmes Pioneer Award to Stephanie Wilson, M.D., and Charles Church, Ph.D., at its recent annual meeting in New York. Dr. Wilson is a professor of radiology at the University of California and a member of the Department of Diagnostic Imaging at Foot Hills Medical Centre in Calgary, both in Alberta, Canada. Dr. Church is an associate research professor at the University of Mississippi, Oxford, and a senior research scientist at the university’s National Center for Physical Acoustics.

Joshua Copel, M.D., an internationally known expert in maternal and fetal medicine and high-risk pregnancy, received the 2011 William J. Fry Memorial Lecture Award. A past-AIUM president, Dr. Copel is a professor of obstetrics, gynecology and reproductive sciences, professor of pediatrics and vice-chair of obstetrics at Yale University School of Medicine in New Haven, Conn.

J. Oscar Barahona, B.S., R.D.M.S., president of Greenwich Ultrasound Associates, PC, Connecticut, for the past 25 years, received the Distinguished Sonographer Award. Dr. Evans, Ph.D., and Brian Trudinger, M.D., received AIUM Honorary Fellowships. Dr. Evans is an emeritus professor at the University of Leicester in Great Britain. Dr. Trudinger is professor of obstetrics and gynecology at the University of Sydney and director of fetal medicine at Westmead Hospital, both in Australia.

AIUM also presented its Memorial Hall of Fame awards posthumously to Charles Kleinman, M.D., whose work led to the birth of fetal echocardiography; Wexly Nyborg, Ph.D., who helped establish a basis for much of the current knowledge of nonthermal mechanisms by which ultrasound interacts with biological materials; David Robinson, D.Sc., who holds eight patents, helped produce exceptional fetal imaging and invented several techniques for the measurement of sound speed; and Michael Wainstock, M.D., an influential pioneer in the use of ultrasound in ophthalmology.

My Turn

New Radiology Select Illustrates Road from Research to Patient Care

RSNA publishes many of our specialty’s outstanding research and review articles. For several years we have been wondering how we might showcase the cream of the crop. How could we take the best quality research and bundle it in a way that is of value and interest to our readership and our authors?

One consideration was to develop a print-on-demand product that would allow radiologists to receive articles selectively in their subspecialty. Unfortunately, this turned out to be prohibitively expensive. But it gave us the idea that we could create specialty compilations ourselves. We are pleased to unveil a new publication called Radiology Select. Volume I, Pulmonary Nodules, was introduced this winter. Each issue spans a time period of up to seven years. We intentionally chose articles that showed how new knowledge progressively built upon the work of previous investigators, with early experiments leading to clinical studies, and ultimately to illustrate how radiology research can lead to improved patient care.

Volume II, Stroke, will be released this summer. Volumes on Screening for Breast Cancer and Cardiac CT are planned for 2013. Wanting to stay current with the growing number of readers who prefer an online product, we also developed a tablet version as well as an online version. The online version includes the opportunity to earn CME/SAM credits. By adding podcasts, we offer users a chance to hear how researchers foresee future research and how this compilation of research has changed clinical care at their institutions.

For me, it has been a real pleasure to work with so many groups in RSNA, including experts from the publications, information technology and education departments. But the project could not have been completed without our guest editors and the many authors who performed the original research, and then devoted additional time to writing CME/SAM questions. I hope our members find this useful, and I welcome any comments to dlevine@rsna.org.

Rosen Named Radiology Chair at UMass

Max P. Rosen, M.D., M.P.H., has been appointed chair of the Department of Radiology at University of Massachusetts (UMass) Medical School and UMass Memorial Medical Center in Worcester. Dr. Rosen, who will join UMass in September, is currently associate vice-chair of radiology, associate chief of radiology for community network services and interim chief of breast imaging at Beth Israel Deaconess Medical Center in Boston.

Vadlamudi Recipient of AMA Leadership Award

The American Medical Association (AMA) awarded its 2012 Leadership Award to Venu Vadlamudi, M.D., at its recent annual Excellence in Medicine Awards ceremony. Dr. Vadlamudi is a radiology resident at Hurley Medical Center in Flint, Mich., and plans to begin his fellowship in vascular and interventional radiology at William Beaumont Hospital. Dr. Vadlamudi was recognized for demonstrating outstanding non-clinical leadership skills in advocacy, community service and education.

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President’s Editorial

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Letters to the Editor

Letters to the Editor can be submitted online at rsna.org.
Rising Obesity Rate Presents Imaging Obstacles

Experienced radiologic technologist Maureen Seluta, R.T., (R), has never gotten used to the unpleasant task of telling a bariatric patient that he or she simply won’t fit in the fluoroscopy machine.

While fluoroscopy is routinely used to perform a gastrografin swallow study in post-gastric bypass patients, standard fluoroscopy equipment allows just 20 inches between the imaging device and the table, which has a 350-pound limit. “Some patients could not fit into the machine, and they were truly embarrassed,” said Seluta, operations manager in the Department of Radiology at Massachusetts General Hospital (MGH) in Boston.

About five years ago, the staff was thrilled when a new GE Precision X-ray (XRA) accommodates up to 550 pounds and has an aperture opening of 48 inches.

Despite the sizeable price tag, Seluta says the equipment worth its weight in gold, especially considering the growing number of bariatric patients at MGH. “Patients aren’t even aware the machine is there,” she said. “We treat about two bariatric patients a day — numbers that are expected to keep rising. We are getting more than enough use out of it.”

Radiology Playing Catch-up on Obesity Epidemic

Along with the increasing popularity of bariatric surgery, the rising prevalence of obesity in the U.S. and around the world is making such specially designed equipment and other solutions more necessary in radiology departments that rarely faced such issues in the not-too-distant past.

While radiology is making inroads, the medical imaging industry is still playing catch-up on a problem that has literally become an epidemic almost overnight, said Raul N. Uppot, M.D., an assistant professor of radiology at Harvard Medical School and an interventional radiologist at MGH, who will present, “Challenges in Imaging and Performing Image-Guided Procedures in the Obese Patient,” at RSNA 2012. (See sidebar) Dr. Uppot says radiologists must be cognizant of the limitations of their imaging equipment and be able to make the necessary technical and equipment adjustments to obtain quality imaging in obese patients.

Though his presentation is part of ASRT@RSNA 2012, an education program for radiologic technologists, Dr. Uppot said the talk will also be geared toward radiologists and manufacturers. Along with discussing the prevalence of obesity, Dr. Uppot will outline overall challenges in imaging obese patients, discuss the difficulties specific to each imaging modality and offer potential solutions.

“Increasingly, obesity is becoming an issue for radiologists and radiology departments,” said Dr. Uppot. “Radiologists must be cognizant of the limitations of their imaging equipment and be able to make the necessary technical and equipment adjustments to obtain quality imaging in obese patients.”

Challenges are Specific to Each Imaging Modality

From patient transport and positioning issues to the financial and clinical impact resulting from cancelled imaging procedures when a patient is too large for the machine, obesity has created challenges for radiology on a number of fronts.

Even when the equipment is large enough, radiology departments are increasingly unable to adequately image and assess obese patients due to other limitations. While obesity affects each imaging modality differently, ultrasound is most directly limited by excessive fatty tissue, Dr. Uppot said.

“Although ultrasound has the advantage of being performed portably and therefore is not limited by table weight or aperture diameter, it is compromised by fat attenuation, a small footprint and difficulties in patient positioning,” he said.

Plain radiography and nuclear medicine are also limited by fat attenuation, while CT, MR imaging and fluoroscopy are also limited by the patient’s size relative to the imaging equipment. “If a patient can fit on CT equipment, then CT is the preferred imaging modality in the obese patient,” Dr. Uppot said.

While increased radiation dosage required for the overweight and obese is also an issue, researchers are working to determine acceptable dosage for those patients, Dr. Uppot said. “That is an issue that will evolve in coming years based on research,” he said.

Patient-centered Focus Could Speed Changes

While such challenges won’t be addressed overnight, the medical imaging industry is making strides on a number of important fronts.

Manufacturers are responding with advances in CT and MR imaging equipment offering larger apertures and table weight limits. At the same time, technological advances including harmonics in ultrasound, dual-source CT and increased gradient strengths and matrix coils in MR imaging are poised to address the issues of limited image quality in obese patients.

Requirements of obesity, Dr. Uppot will outline overall challenges in imaging obese patients, discuss the difficulties specific to each imaging modality and offer potential solutions.

“Increasingly, obesity is becoming an issue for radiologists and radiology departments,” said Raul N. Uppot, M.D. Continued on Page 8

RSNA 2012 Patients First

IMAGING AND OBESITY, THE “OZ EFFECT” AMONG ASRT@RSNA 2012 SESSIONS

The 1½-day education program for radiologic technologists at this year’s annual meeting, ASRT@RSNA 2012, will feature discussions of such wide-ranging topics as digital radiography, image processing and the “Oz effect” — Commercial, Social, and Government Media Driven Health Information on Medical Imaging.

Technologists may earn continuing education credit through ASRT@RSNA 2012. Sessions are:

Wednesday, November 28
• Challenges in Imaging the Obese Patient
• Musculoskeletal Radiology: More Than Radiography
• Radiation-conscious Imaging in CT of the Pediatric and Adult Patient
• The Oz Effect—Understanding and Mitigating the Impact of Commercial, Social, and Government Media Driven Health Information on Medical Imaging

Thursday, November 29
• The Team Approach to Breast Imaging: A Model for All of Radiology
• ACR Standard of Ethics: Overview
• The Roles and Contributions of Radiographers to Effective Gastronomic Medicine
• Digital Radiography Image Processing: What Every Technologist Needs to Know
• PACS as a Profession: Qualifications for Success
• A Simple Solution to a Complex Problem - How to Predict Future Health Care Workforce Staffing Levels

For more information about ASRT@RSNA 2012, go to RSNA2012.RSNA.org
Radiologists Not the Drivers of High-cost Imaging

While the data have shown that nonradiologists’ self-referral contributes substantially to imaging utilization, it has been argued that radiologists also self-ref for making recommendations for additional imaging. New research, however, shows that radiologist recommendations actually account for only a small percentage of high-cost, outpatient imaging.

In a study published in the February 2011 issue of Radiology, Susanna I. Lee, M.D., Ph.D., from Massachusetts General Hospital in Boston, and colleagues set out to measure the proportion of high-cost imaging generated by recommendations from radiologists. They examined a database of approximately 200,000 radiology examinations at one institution over a six-month period to find high-cost examinations that were preceded by one which contained a radiologist’s recommendation.

“We wanted to determine if radiologist recommendations for follow-up exam were one of the major drivers of high-cost imaging,” Dr. Lee said. “Because if that were the case, we might take steps to modify their behavior and impact the volume of high-cost imaging.”

However, results showed that only 1,558 of the 29,232 high-cost examinations—about 5 percent—followed a radiologist’s recommendation.

“The bottom line was that high-cost imaging studies such as CT, MR imaging and PET only accounted for 5 percent of the volume,” Dr. Lee said. “This was a bit of a surprise, because preceding studies have shown a higher rate of radiologist recommendations in exam reports—closer to 15 percent to 30 percent.”

One reason for the discrepancy, Dr. Lee noted, is that a radiologist’s recommendation is only one of several tools used by physicians in determining how to proceed with a case. “There are many other options,” she said. “The referring physician may choose to biopsy or recommend surgery, for instance.”

“When people talk about self-referral, it’s important to understand that there’s a difference between a treating physician owning a CT scanner and referring the patient for a CT exam and a radiologist recommending an additional examination—advice that the treating physician has a choice to act upon or not,” Dr. Lee continued. “Our study indicates that modifying radiologists’ behavior would be unlikely to change the overall volume of high-cost imaging.”

In the group that owned the equipment, 42 percent of patients referred for exams had negative scans, compared with 23 percent of the group that did not own the equipment. Orthopedic surgeons with financial interest in the equipment also were much more likely to order MR imaging exams on younger patients.

“The group that owned the equipment had a lower threshold for ordering exams,” said Ramsey Kilani, M.D., an associate faculty member at Duke University Medical Center. “We don’t know whether this represents a conscious or unconscious bias. Subconsciously, if you have easy access to imaging, you may be more likely to order an exam. Secondly, physicians might be a lot less likely to opt for watchful waiting if they have the imaging equipment right there.”

Another Duke study that focused on knee MR imaging yielded similar results. Researchers reviewed 989 diagnostic knee MR imaging studies ordered over a six-month period by two separate orthopedic groups. Knee MR imaging studies referred by physicians with a financial interest in the imaging equipment statistically significantly 52 percent increase in the negative scan rate over those referred by physicians with no financial incentive.

“The ultimate outcome of self-referral is increased utilization,” said Dr. Kilani, who is working with other Duke researchers on similar studies of MR imaging patterns in other areas of the body. “Our study suggests that the fraction of increased imaging utilization due to self-referral is more likely to be unnecessary than non-incentivized utilization.”

Radiologists like Dr. Kilani are concerned that this increased utilization due to self-referral places the patient at risk for adverse consequences while failing to yield medically useful information. However, some physician groups reject the suggestion that self-referral incentivizes imaging and have lobbyied against efforts to curb the practice.

Statements from two physician groups—the American Urological Association and the American Academy of Orthopaedic Surgeons—maintain that there are benefits to self-referral, including more timely access to study findings and better patient compliance.

While solutions are specific to each modality, some leading radiol技术人员 and radiologists are also becoming better educated on the issues involved, leading to more efficient methods and protocols. While solutions are specific to each modality, some protocols apply across the board for all imaging. He recommends knowing the patient’s weight and girth, being aware of the limitations of current imaging equipment and knowing how to optimize imaging protocols and equipment settings. As healthcare becomes more patient-focused, hospitals are more likely to invest in solutions for better accommodating this segment of the patient population. “We put in the proposal for new equipment three times before it was approved,” Seluta said. “It’s really important because no patient should have to go through a potentially embarrassing experience.”

Rising Obesity Rate Presents Imaging Obstacles

Continued from Page 6

Radiologic technologists and radiologists are also becoming better educated on the issues involved, leading to more efficient methods and protocols. While solutions are specific to each modality, some protocols apply across the board for all imaging. He recommends knowing the patient’s weight and girth, being aware of the limitations of current imaging equipment and knowing how to optimize imaging protocols and equipment settings. As healthcare becomes more patient-focused, hospitals are more likely to invest in solutions for better accommodating this segment of the patient population. “We put in the proposal for new equipment three times before it was approved,” Seluta said. “It’s really important because no patient should have to go through a potentially embarrassing experience.”

WEB EXTRAS

To access an abstract of the studies, “Effect of Obesity on Imaging Quality,” by Jacquelyn C. Yanch, Ph.D., and colleagues, and “Increased Radiation Dose to Overweight and Obese Patients from Radiographic Examinations,” by Jazzyman C. Yanch, Ph.D., and colleagues, in Radiology, go to RSNA.org/radiology.

To watch a video presentation and hear Ramsey Kilani, M.D., and colleagues discussing their research, “A Case Study in Lumbar Spine MR and Physician Self-referral of Imaging,” (see video, 4:40 at RSNA 2011, go to RSNA.org/rsnanews)
Iterative Reconstruction Techniques Reduce Radiation Dose in Head, Chest CT

Techniques of iterative reconstruction of CT images, such as adaptive statistical iterative reconstruction (ASIR) and the more advanced model-based iterative reconstruction (MBIR) algorithms, reduce radiation dose while preserving image quality in head and chest CT, according to new research.

Comparing effective radiation dose and dose to the eye lens in multidetector CT (MDCT) brain examinations, lead researcher Jan Zizka, M.D., a professor of radiology at Charles University Teaching Hospital, Hradec Kralove, Czech Republic, and colleagues utilized either filtered-back projection (FBP) or iterative reconstruction to image space (IRIS). The research was presented at the European Congress of Radiology (ECR) 2012 in Vienna, Austria.

Researchers examined 400 routine adult brain CT examinations—200 performed using standard FBP and 200 using IRIS. Doses were calculated from CT dose index (CTDIvol, mGy) and dose length product (DLP, mGy.cm) values, the organ dose to the lens was derived from the actual tube current-time product value applied to the lens, according Dr. Zizka.

Results showed that consistent application of as low as reasonably achievable (ALARA) principles, combined with iterative reconstruction, reduced the effective radiation dose as well as the risk of radiation-induced cataract in MDCT scans of the head without loss of image quality by at least 50 percent compared to FBP and by at least 50 percent compared to reference standards of both the European Commission Quality Criteria and the International Commission on Radiological Protection (ICRP).

Based on the latest epidemiological studies on the threshold for absorbed dose to the lens of the eye, ICRP in 2011 issued a warning reducing the allowable dose from 2 Gy to 0.5 Gy. Dr. Zizka said. Using FBP, the dose to the lens could reach that level in as few as seven non-optimized CT head scans provided the lens is exposed to the primary beam, significantly increasing the risk for cataracts in a large population of subjects undergoing head CT, Dr. Zizka said.

By contrast, “with acquisitions using iterative reconstruction algorithms, patients can undergo as many as 20 MDCT head scans before the risk for cataracts becomes significant,” Dr. Zizka said.

MBIR Shows Greater Potential Than ASIR

While phantom experiments have shown that MBIR has the potential to reduce radiation dose without compromising image quality, a second study presented at ECR 2012 is the first to evaluate CT radiation dose reduction and image quality characteristics in the same patients using both ASIR and MBIR, said lead author Masaki Katsuura, M.D., of the Department of Radiology, Graduate School of Medicine at The University of Tokyo.

Researchers examined 100 patients who underwent reference-dose and low-dose unenhanced chest CT with 64-row multidetector CT (MDCT), according to Dr. Katsuura. Images were reconstructed with 50 percent ASIR-FBP blending (ASIR50) for reference-dose CT and with ASIR90 and MBIR for low-dose CT. Objective image noise was measured in the lung parenchyma, Dr. Katsuura said.

Results showed that “MBIR significantly improved image noise and artifacts over ASIR,” Dr. Katsuura said. “With nearly 80 percent less radiation, diagnostically acceptable chest CT images were obtained using MBIR, which also showed improvement over ASIR for providing diagnostically acceptable low-dose CT images without severely compromising image quality.”

“Our results indicate that, in order to preserve diagnostic quality in chest CT acquired with nearly 80 percent less radiation, a pure iterative reconstruction technique such as MBIR should be used for image reconstruction as opposed to a reconstruction technique that uses a blend of FBP images with iteratively reconstructed images, such as ASIR,” Dr. Katsuura said.

MBIR Holds Promise for Dose Reduction in Children

MBIR holds considerable potential for dose reductions, particularly in certain patients and settings, such as imaging of infants and young children and screening for lung cancer, Dr. Katsuura said.

Although the prolonged processing time of MBIR (about one hour per case) may currently limit its routine use in clinical practice, the technique holds great promise for the future, he said.

“The ability of MBIR to detect and localize lesions, not only in the chest but in different body regions, is still to be investigated,” Dr. Katsuura added.

WEB EXTRAS

To access the European Congress of Radiology presentation “Reduction of Effective and Organ Dose to the Eye Lens in Cerebral MDCT Scans Using Iterative Image Reconstruction,” by Jan Zizka, M.D., go to rsna.org.


With acquisitions using iterative reconstruction algorithms, patients can undergo as many as 20 MDCT head scans before the risk for cataracts becomes significant.”

Jan Zizka, M.D.
Ablative Therapies are Promising Weapon in Fighting Cancer

Irreversible electroporation (IRE) and microwave ablation are among the newest ablative therapies showing promise as targeted treatments for complicated and inoperable forms of cancer, including pancreas and lung.

IRE has been successful in treating primary and metastatic liver cancer and is now in the first stages of treatment for pancreatic cancer, said Govinda rajan Narayanan, M.D., an associate professor of clinical radiology at the University of Miami, Miller School of Medicine.

“The potential effectiveness of IRE in treating pancreatic cancer is exciting,” said Dr. Narayanan, who has worked extensively with IRE and presented an RSNA 2011 Hot Topic session on the subject. “No other ablative modality is able to go into that organ without a high level of mortality and morbidity.”

Unlike thermal ablative techniques, IRE doesn’t damage the collagen-skeleton protecting blood vessels, which means it could be particularly useful in treating cancer in organs close to major blood vessels. IRE uses an electric current, instead of heat or freezing, to permanently open cell membrane pores in the tumor. Once the cell membrane pores are opened, the tumor cells begin to die.

“We need more data and experience with IRE, but I think it will be a good complement to a busy interventional oncology practice,” Dr. Narayanan said. “IRE can serve as a niche application when you have to go next to the aorta or near critical structures, and moving forward it has the potential to be a big player in the pancreatic cancer arena.”

Potential for IRE Hinges on Research

The potential for using IRE in clinical practice will depend on continued research and overcoming reimbursement obstacles, Dr Narayanan said. The NanoKnife® System by AngioDynamics, the first medical technology to use IRE, received U.S. Food and Drug Administration (FDA) clearance in 2006. Currently, fewer than 30 U.S. hospitals offer IRE as a treatment option. In his practice, Dr. Narayanan and his colleagues have performed procedures on 20 pancreatic cancer patients with few side effects.

Microwave Ablation Targets Tumors with Heat

When treating lung cancer, microwave ablation could eventually replace radiofrequency ablation (RFA) as the thermal ablative treatment of choice, said Damian Dupuy, M.D., a professor of diagnostic imaging in the Division of Biology and Medicine at Brown University, Providence, R.I., who has published extensively about microwave ablation, most recently in the January 2012 issue of Radiology.

Because many lung cancer patients are long-time smokers who have also developed emphysema or cardiovascular disease, they are often unsuitable candidates for lobectomy. Dr. Dupuy said. “We need more data and experience with IRE, but I think it will be a good complement to a busy interventional oncology practice,” Dr. Narayanan said. “IRE can serve as a niche application when you have to go next to the aorta or near critical structures, and moving forward it has the potential to be a big player in the pancreatic cancer arena.”

“Using heat to treat tumors creates ‘heat sink,’” Dr. Narayanan said. “If a tumor is close to a blood vessel, the part closest to the vessel will not be completely treated because the flowing blood in the vessel will steal some of the heat. You don’t get that with IRE.”

The procedure is performed by placing electrodes, with CT or ultrasound guidance, in pairs around the tumor. The electrical pulses are delivered through each pair of electrodes—about as far as two or as many as six, depending on the size of the tumor—in sequence. Each pair of electrodes needs 90 pulses to be effective and each treatment should last about 90 seconds, Dr. Narayanan said.

When treating lung cancer, microwave ablation could eventually replace radiofrequency ablation (RFA) as the thermal ablative treatment of choice, said researcher Damian Dupuy, M.D. Left: an axial CT fluoroscopy image shows a microwave antenna within a large, right upper-lobe lung cancer. This 48-year-old patient had been treated with radiation and chemotherapy, but the tumor recurred causing chest wall pain from tumor growth. Microwave ablation was successful in pain palliation; right: a CT fluoroscopy image of a single microwave antenna within an early stage left, upper-lobe lung cancer.

“IRE can serve as a niche application when you have to go next to the aorta or near critical structures, and moving forward it has the potential to be a big player in the pancreatic cancer arena.”

“The combination of hotter temperatures and the ability to penetrate air make microwave ablation more suitable than radiofrequency for treating lung tumors.”

Damian Dupuy, M.D.

Microwave Ablation Ablation of Pulmonary Malignancies with Tumor Permittivity Feedback Control: Ablation and Resection

More Hospitals Moving Toward Microwave Ablation

A handful of microwave ablation manufacturers have received FDA approval, most within the last year and a half, Dr. Dupuy said. While he estimates that about three dozen facilities are now using microwave ablation and many more will be migrating in that direction, financial factors, including reimbursement, preclude widespread use in the near future. The focus now is on further researching the technology, Dr. Dupuy said.

“It is clear that patients who have lung cancer with limited treatment options are benefiting from image-guided ablation therapy, though the exact subset of patients who will benefit most and with what ablating technology remains unknown,” Dr. Dupuy said. “Therefore, additional research must be conducted.”

WEB EXTRAS

To access the study, “Intraoperative Microwave Ablation of Pulmonary Malignancies with Tumor Permittivity Feedback Control: Ablation and Resection Study in 10 Consecutive Patients,” by Damian Dupuy, M.D., and colleagues in the January 2012 issue of Radiology, go to RSNA.org/radiology.
Radiology ExamWeb™ Offers High-tech Radiology Testing Alternative

As a medical student, Matthew Devries, M.D., faced a fairly typical final examination after completing his radiology rotations: a huge stack of paper filled with photocopies of images.

Worse, he became radiology residency program director at the University of Nebraska Medical Center (UNMC) College of Medicine in Omaha, Dr. DeVries was fortunate to discover what he considers a better option for his students: Radiology ExamWeb™—a centralized, web-based quiz database and exam-taking system. After seeing Radiology ExamWeb demonstrated at the Association of University Radiologists (AUR) 2010 annual meeting, Dr. DeVries knew it would serve him well in his new position at UNMC and make a strong impression on his students.

“With iPhones and iPads, the med student of today is tech-savvy and wants technology integrated into the curriculum,” said Dr. DeVries, also an assistant professor of radiology at UNMC. “Programs grounded in technology get automatic street cred because they are in tune with how students study today.”

“Radiology ExamWeb has been a tremendous help in our department’s effort to train medical students,” Dr. DeVries added. “Having a highly structured, well-conceived test for our radiology rotation that is secure and can be easily proctored is a highly effective tool!”

That was the goal of Petra Lewis, M.D., who developed Radiology ExamWeb with her colleague Nancy McNulty, M.D., in part through a $30,000 RSNA Education Seed Grant awarded in 2009. As a longtime member and former president of the Alliance of Medical Student Educators in Radiology (AMSER), Dr. Lewis was keenly aware of the time pressures on medical student educators like Dr. DeVries.

“Radiology clerkships and electives are highly variable among medical schools, and developing fast and comprehensive tests is both time-consuming and difficult,” said Dr. Lewis, a professor of radiology and obstetrics/gynecology at The Geisel School of Medicine at Dartmouth, N.H. “Our database allows clerkship directors to contribute questions to a central bank which are then edited and use one of 200 examinations already created by other educators. Students use password access to take online examinations from any computer, and educators can analyze test results by student, class or examination.”

With a total of $49,000 awarded by the Hudson Foundation, Drs. Lewis and McNulty contracted with an experienced vendor, ExamWeb LLC, to develop the online testing software. With the RSNA grant funding and help from AMSER members, they completed Radiology ExamWeb by compiling and editing questions to National Board of Medical Examiners standard accepted format, creating a user manual and hosting workshops for radiology educators.

“AMSER members submitted an initial 800 exam questions—an issue effectively addressed by Radiology ExamWeb, Dr. Lewis said.”

Radiology ExamWeb is a national evolution of AMSER Shared Resources, which shares curricula, images and other teaching materials among members through a secure computer server, Dr. Lewis said. “AMSER promotes shared resources because it’s a highly effective tool.”

Having a highly structured, well-conceived test for our radiology rotation that is secure and can be easily proctored is a highly effective tool!”

Matthew DeVries, M.D.
GREAT GRANT FUNDING TO SUPPORT 2012 TREATS

The R&E Foundation Board of Trustees, chaired by Theresa C. McLoud, M.D., has approved $2.9 million in funding—highest in the Foundation’s history—for grant projects in 2012. “We would personally like to thank all of our generous contributors who made this possible,” said Dr. McLoud.

“With intense competition for grants we are pleased to achieve a 30 percent funding rate this year,” Dr. McLoud said. “I am certain the research and education projects undertaken with the Foundation’s support will make a significant difference in the lives and health of the patients we serve.”

Maximizing the generous support of RSNA members, friends, private practice groups and corporate supporters, more than 85 percent of Foundation expenses directly support research and education grants. Since its inception in 1984, the Foundation has awarded $37 million to nearly 1,000 young investigators. Surveys show that for every $1 granted by the Foundation, recipients have received over 30 additional dollars in subsequent funding from other sources.

Visionaries in Practice Program

A giving program for private practices and academic departments

Donors who give $1,500 or more per year qualify for the R&E Presidents circle. Their names are shown in bold face.

Individual Donors

Donors who give $1,500 or more per year qualify for the RSNA Presidents Circle. Their names are shown in bold face.

READER SERVICES

For more information on Radiology ExamWeb (www.radiologyexamweb.com) and to create an account, please contact Petra Lewis, M.D., at petra.lewis@rsna.org

Radiology ExamWeb™ Offers High-tech Radiology Testing Alternative

“Historically, we haven’t had the tools to construct a test with high-quality questions that reflected the full breadth of material we wanted students to know,” Dr. Dewitt said. “The fact that radiology is driven more and more by clinical production means academic time is harder to come by, which only compounds the problem.”

Maria Shiu, M.D., director of medical student education radiology at New York University (NYU), agrees. “Radiology ExamWeb has about 1,500 questions covering all imaging modalities and body systems, and some 2,300 medical students have taken online exams at 65 institutions including Michigan State University, the University of Chicago and NYU School of Medicine.”

With the goal of being depleting, Dr. Lewis is seeking additional funding to support the program. “Radiology ExamWeb is huge benefit to radiology,” Dr. Lewis said. “It’s not simply, ‘here is a test to use.’ It’s about facilitating the continued integration of radiology into the medical school curriculum.”

In addition to pro and post-tests for the selective, Dr. Shiu has recently administered the AMSEZ-certified standard exam through Radiology ExamWeb.

Radiology ExamWeb Off to Promising Start

Dr. Lewis’ project has expanded quickly in a few short years. To date, Radiology ExamWeb has about 1,500 questions covering all imaging modalities and body systems, and some 2,300 medical students have taken online exams at 65 institutions including Michigan State University, the University of Chicago and NYU School of Medicine.

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Radiofrequency Ablation of Lung Tumors: Imaging Features of the Postablation Zone

Although preliminary results are suggestive of a survival benefit when radiofrequency ablation (RFA) is used to treat pulmonary malignancies, local progression rates are appreciable. Because a patient can undergo repeat treatment if recurrence is detected early, reliable post-RFA imaging follow-up is critical.

In an article in the July-August issue of Radiographics (RSNA.org/Radiographics), Feredoun G. Ablin, M.D., of University of California, Los Angeles, Medical Center, and colleagues summarize the biochemical processes in this degeneration, the application of advanced disk imaging techniques and the novel biologic therapies that have the most clinical promise. Specifically, the authors discuss:

- T2 mapping
- TR time constant
- Diffusion imaging
- MR spectroscopy
- PET

“The imaging techniques that sensitively monitor biochemical and inflammatory processes have application in clinical trials of innovative therapies and ultimately in the selection of patients for treatment,” the authors write.

Pediatric Abdominal Pain: Use of Imaging in the Emergency Department in the United States from 1999 to 2007

Use of CT in pediatric patients with abdominal pain increased in U.S. emergency departments (EDs) between 1999 and 2007 despite a stable incidence of appendicitis. Ultrasound use in pediatric patients was higher in adult-focused EDs than in pediatric-focused EDs. The odds of a child receiving a CT scan increased during each year of the study period, even though there were no statistically significant changes in ultrasound usage, numbers of patients admitted to the hospital, or numbers of patients with acute appendicitis. Only 3 percent of patients ultimately diagnosed with appendicitis were imaged with both ultrasound and CT. CT use in patients with abdominal pain was higher in adult-focused EDs than in pediatric-focused EDs.

Locally Advanced Breast Cancer: MR Imaging for Prediction of Response to Neoadjuvant Chemotherapy from ACRIN 6637/I-SPY TRIAL

MR imaging findings are stronger predictors of pathologic response to neoadjuvant chemotherapy (NACT) than clinical assessment in patients with stage II or III breast cancer, with volumetric measurements of tumor response early in treatment showing the greatest advantage.

Nola M. Hylton, Ph.D., of the University of California, San Francisco, and colleagues analyzed data from ACRIN 6637, a second generation ultrasound contrast agent in the detection and classification of endoleaks at CTA, researchers concluded.

Evaluation of Abdominal Aortic Aneurysm after Endovascular Repair: Prospective Validation of Contrast-enhanced US with a Second-Generation US Contrast Agent

Contrast-enhanced ultrasoundography yields good sensitivity, specificity and accuracy in endoleak detection and might be used as monitoring tool in the follow-up of patients who undergo endovascular repair of abdominal aortic aneurysms (EVAR).

Rosa Gildert, M.D., Ph.D., of the University of Barcelona, Spain, and colleagues prospectively assessed the accuracy of contrast agent-enhanced ultrasoundography with a second generation ultrasound contrast agent in the detection and classification of endoleaks after EVAR compared with CT angiography (CTA).

Researchers evaluated the technique in 35 patients who underwent EVAR. CTA and contrast-enhanced ultrasound studies were performed on patients at one- and six-month follow-up and yearly thereafter. A total of 126 CTA and contrast-enhanced ultrasound studies were performed.

Sensitivity, specificity, positive predictive value, negative predictive value and accuracy of contrast-enhanced ultrasound in endoleak detection were 97 percent, 100 percent, 99 percent and 99 percent respectively when compared with CTA; results showed. Contrast-enhanced ultrasound could replace CTA in the follow-up of patients with stable or decreasing aneurysm sac size and no evidence of endoleak at CTA, researchers concluded.

Your Therapeutic Response with Imaging

Your Therapeutic Response with Imaging and Molecular Analysis (I-SPY TRIAL) breast cancer trial. They compared MR imaging and clinical assessment in 216 female patients ranging from 26 to 68 years of age undergoing NACT for stage II or III breast cancer. For prediction of both pathologic complete response (pCR) and residual carcinoma burden (RCB), MR imaging size measurements were superior to clinical examination at all time points, with tumor volume change showing the greatest relative benefit at the second MR imaging examination, researchers concluded. Area under the receiver operating characteristic curve (AUC) differences between MR imaging volume and clinical size predictors at early, mid- and post-treatment time points, respectively, were 0.14, 0.09 and 0.02 for prediction of pCR and 0.09, 0.07 and 0.05 for prediction of RCB.

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Media Coverage of RSNA


RSNA/AUR/ARRS Introduction to Academic Radiology Program

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

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

Successful applicants will be assigned to either a seminar held during the RSNA Scientific Assembly in Chicago, November 25-29, 2012 or the AUR Scientific Meeting in Washington, DC, April 14-19, 2013.

More information and nomination forms are available at RSNA.org/Introduction_to_Academic_Radiology.aspx. Questions can be directed to Fiona Miller at 1-630-590-7741 or fmiller@rsna.org.

Final Call to Apply for RSNA Derek Harwood-Nash International Fellowship

International radiologists three to 10 years beyond training are invited to apply for this six- to 12-week fellowship at a North American institution. One or two fellows will be selected.

The application for this program is available at RSNA.org/Derek_Harwood-Nash_International_Fellowship.aspx. Further information, contact Fiona Miller at 630-590-7741 or fmiller@rsna.org.
Course Enrollment Begins July 11

The RSNA 2012 Advance Registration, Housing and Course Enrollment brochure will be mailed in late June to all RSNA members and 2012 non-member meeting registrants and will be available online at RSNA2012.RSNA.org starting July 11. Use this brochure to make the most of your RSNA 2012 experience. With information organized to help you complete your enrollment in just a few steps, find the courses you need, build your schedule and enroll quickly and easily online or via the print form.

Guarantee Your Seat!

Tickets are required for various meeting components, including refresher and multisession courses, informatics workshops and RSNA tours and events.

All ticketed courses must be confirmed prior to November 21 to guarantee a seat. RSNA ticketed courses fill up fast, so ensure you get the courses you need by enrolling at RSNA.org/register. There is no onsite course ticketing. Registrants without tickets will be allowed entrance into a course after all ticketed registrants have been seated.

RSNA 2012 Registration

How to Register

There are four ways to register for RSNA 2012:

1 INTERNET—Fastest way to register!
   Go to RSNA.org/register

2 FAX (24 hours)
   1-888-772-3888
   1-301-694-5124

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

4 MAIL
   Experient/RSNA 2012
   P.O. Box 4088
   Frederick, MD 21705 USA

Registration Fees

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RSNA 2012 Important Dates

- July 11: Course enrollment opens
- Oct 19: Deadline for international badge mailing
- Nov 2: Deadline for housing and discounted registration
- Nov 21: Deadline for guaranteed seating to all ticketed courses
- Nov 25 – 30: RSNA 98th Scientific Assembly & Annual Meeting

RSNA Seeks NPI Exhibitor Numbers During Registration

A provision within the federal Patient Protection and Affordable Care Act (PPACA) (www.healthcare.gov/law/resources/authorities/titleii-transparency-program-integrity-act) requires healthcare companies to disclose any transfer of value to a healthcare provider to the U.S. Department of Health & Human Services beginning next year. To assist RSNA 2012 exhibitors in complying with this provision, RSNA requests its U.S. healthcare provider attendees supply their publicly available National Provider Identifier (NPI) number (www.cms.hhs.gov/NPPES/NPPESRegistryHome). The NPI number will be embedded in the bar code data on the attendee’s name badge—it will not be printed on the badge. Exhibitors will obtain this information only when a registrant voluntarily scans their badge at the exhibit booth through the lead retrieval system.

Hotel Deposits Required

A $300 deposit is required to confirm your hotel reservation. Reservations may be secured with a major credit card at the time of booking. The credit card must be valid through December 2012 and will be charged by the hotel approximately two weeks before the annual meeting. Registrants may also send a check, money order or wire transfer to register for RSNA 2012:

RSNA

P.O. Box 4088

Frederick, MD 21705 USA

For more information about registering for RSNA 2012, visit RSNA.org or call 1-800-381-6660 x7662.

RSNA tours and events.

Tickets are required for various meeting components, including refresher and multisession courses, informatics workshops and RSNA tours and events.
RSNA 2011 Refresher Courses Now Online

A great addition to your education library, 20 refresher courses recorded at RSNA 2011 are now available online and for purchase on CD-ROM. New this year, an additional 10 refresher courses have been added to our online self-assessment modules (SAMs) library.

Each year, RSNA records a limited number of annual meeting refresher courses for future interactive, online sessions. Each course is presented in an audiovisual format, including slides and audio from each presentation. A course transcript and a detailed outline are available throughout the presentation. An integrated search feature allows users to search a presentation for specific terms that redirect them to a relevant portion of the course for enhanced learning.

Although refresher courses can be viewed free online, only RSNA members have the added benefit of earning AMA PRA Category 1 Credit™ for each course. Online SAMs refresher courses are available free to all members, nonmembers pay $50 to access the course and earn CME/SAM credit.

To view the newest courses, visit RSNA.org/education/search and click on “Online Education” or call 1-800-272-2920 for more information.

Use Fellowship Connect to Find, Post Fellowship Positions

With RSNA’s online resource Fellowship Connect, residents and practicing radiologists can search for fellowship positions by specialty, location and institution. Users can read institutional profiles, find out if fellowship positions are available, get contact information and more.

Gaining access to Fellowship Connect:

RSNA members: Using their member login, RSNA members can personalize their searches by entering key words such as the name of the institution, state or specialty. Fellowship Connect provides a print feature and save option that allows members to store search results for later viewing.

Institutions: After creating an account, institutions can post company profiles, available fellowship positions, contact information and website links. Each institution is responsible for keeping fellowship information current on the website.

To access Fellowship Connect, go to fellowships.rsna.org.

Residents & Fellows Corner

Continued from page 20

Members-in-Training Offered Dues Assistance

Members-in-Training can take advantage of the Transitional Dues Programs as they transition into a paid membership. Each year, incoming residents are invited to join RSNA for free. An invitation letter and electronic application form are sent to the program director at each institution in the U.S. and Canada, as well as some programs in Mexico and overseas. This includes diagnostic radiology, radiation oncology and nuclear medicine programs. Membership begins on their first day as a radiology resident—July 1. Beginning with the first year in practice, dues for transitioning resident and fellow members are $300, and $200 in the second year, allowing them time to settle into the profession through the Transitional Dues Program. Full dues are not required until their third year.

Under these programs, transitioning members receive all the benefits of full membership, including subscriptions to Radiology, Radiographics and RSNA News, access to physics modules and other useful references and tools, free admission to the annual meeting and free access to CME credit through online education.

For more information, go to RSNA.org/Become_A_Member.aspx or contact the Membership Department at 1-877-RSNA-MEM (1-877-776-2636) or membership@rsna.org.

Trainee Portal Connects Users to Resident/Fellow Resources

Because busy members-in-training don’t have spare time to search for critical radiology tools and resources, RSNA’s all-new trainee portal on the redesigned RSNA.org consolidates essential information in one place.

From jump-starting their research careers to finding the perfect fellowship/residency positions, trainees can link directly to a host of resources designed to meet their specific needs. Highlights of the portal—accessible on the top menu above the search field—include:

• Trainee News: Need-to-know information on free trainee benefits including RSNA membership, annual meeting registration and myRSNA.

• Trainee Resources:
  - Tools for Trainees: Access peer-reviewed education materials, physics modules and useful references and tools designed with trainees in mind.

  - Get Funded with an R&E Grant: Get informational on applying for grant opportunities or making a gift to support radiologic research.

  - Career Connect: Apply for jobs and access a comprehensive set of career development resources.

  - Resident and Fellow Committee: See how residents and fellows are helping to shape the vision, goals and initiatives of the RSNA community.

  - Grant Writing and Research Development Programs: Apply for workshops, programs and courses to help you develop grant writing skills and further your career in radiologic research.

In addition, colorful icons at the bottom of the page direct users to the RSNA Annual Meeting, myRSNA and educational offerings. Social media links are your resource for starting and joining conversations.

COMING NEXT MONTH

Next month, RSNA News reports on how residents and radiologists can increase their value in a tight job market—or keep their jobs—by taking on responsibilities outside of imaging interpretation.
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