Imaging Innovations are Paving Way Toward Healthcare Reform

Medical imaging innovations are paving a substantial part of the pathway toward achieving healthcare reform, James H. Thrall, M.D., said during the Annual Oration in Diagnostic Radiology on Tuesday.

The second trend is further development of special purpose devices, such as a portable MR imaging device that is currently under development.

“We’ve always made the patient go to the technology,” Dr. Thrall said. “Moving technology to the patient allows more coordination of care.”

The third trend involves the development of more complex devices for multi-purpose use, such as hybrid imaging devices. As an example, Dr. Thrall pointed to positron emission tomography/MR (PET/MR) imaging.

“For the first time in the history of the practice of medicine, we have an objective way of demonstrating that a patient is truly experiencing pain,” Dr. Thrall said, referring to a study that used brain PET/MR imaging to diagnose chronic low back pain.

“The ability to simultaneously correlate molecular and functional events with whole organ anatomy is unique to imaging,” he added. “No one else can do this.”

A final trend is the development of entirely new imaging methods. As examples, he mentioned non-contact laser ultrasonic (LCUS) and phase-contrast X-ray imaging.

Beyond the trends, another leg in radiology’s journey is the introduction and continued value of informatics.

“We live in the era of ‘Big Data,’” Dr. Thrall said. “We now have millions of reports in our RIS and billions of reports in our PACS. This offers the opportunity for data mining, which I think of as turning ‘dumb data’ into knowledge.”

CONTINUED ON PAGE 13A

Embracing Patient-Centered Care

By Cindy Lenart

THE CALL FOR PATIENT-CENTERED CARE is one of the primary drivers of change within radiology today and stands to transform the way the specialty is practiced, according to one of the foremost experts on the topic. Radiologists who heed that call are advised to embrace a new mindset about patient care, said Mary C. Mahoney, M.D., in the Monday session, “A New Model of Patient Care: Value over Volume.” She discussed tactics and resources that can help radiologists put the concepts of patient-centeredness and value vs. volume into practice.

Mahoney, the Liaison for Publications and Communications on the RSNA Board of Directors.

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

One patient presented a first-hand account of the value of patient-centered care. Christine Zars, M.S., R.D., was diagnosed with a grade 4 glioblastoma on her brain when she was just 19 years old. Now, 11 years later, she credits her medical team with not only saving her life, but also helping her and her support group through the trying ordeal. “A smile and a genuine interest in their personal life makes the patient feel like the doctor cares about them as a person, rather than just another patient,” she said.

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

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

CONTINUED ON PAGE 4A

Mauro Named to RSNA Board

MATTHEW A. MAURO, M.D., an accomplished vascular intervention- al radiologist, is the newest member of the RSNA Board of Directors. Dr. Mauro will assume the position of Board Liaison for Information Technology and Annual Meeting as Vijay M. Rao, M.D., becomes chairman of the Board of Directors.

“The RSNA is the world’s largest and most influential society that represents diagnostic radiology, interventional radiology, radiation oncology and medical physics,” Dr. Mauro said. “Appointment to the RSNA’s Board of Directors is a distinct honor, and I am privileged to have this opportunity to serve our specialty in this capacity.”

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

A prolific researcher, his interests include interventional oncology, venous access, embolotherapy, the management of vascular malformations and stent grafts. He has contributed extensively to the scientific literature, in particular publishing research in dialysis access, venous intervention, stenting and the evolving field of interventional oncology.

CONTINUED ON PAGE 4A

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Giving out a phone number and what a radiologist does and initiative.

In a patient-centered practice, resources for physicians build a scary maze for our patients and the RSNA Radiology Cares® initiative.

By Mike Bassett

Evaluating socioeconomic factors impacting access to imaging services could help identify at-risk patients and devise interventions to mitigate socioeconomic disparities associated with that lack of access, according to study presented Tuesday.

The motivation behind the study, said presenter Efren J. Flores, M.D., of the Department of Radiology at Massachusetts General Hospital (MGH), was a realization at Massachusetts General Hospital (MGH) that a large number of imaging patients “are getting lost in the system” because of cultural differences, language barriers, mobility issues, and other socioeconomic factors.

“I had one patient who had missed a couple of appointments and finally made it in for a third appointment for an MRI,” Dr. Flores said. “As patients may not be forthright with their opinions or views, this physician-initiated discussion may be beneficial,” she said.

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

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

The good news, however, is that despite a low level of knowledge about radiation exposure, the majority of patients in the study indicated a high level of trust in the appropriate use of ionizing radiation by their physicians, Dr. Mostafavi reported. For example, 73 percent agreed that the associated radiation risk is acceptable when their health benefits outweigh it, and 79 percent believed that the benefits of an exam outweigh the risks associated with radiation.

Non-radiologist Physicians May be Uninformed

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

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

Explaining, Discussing Medical Imaging is Key to Patient Understanding

By Ed Bannos

Given the overall lack of awareness people have about the risks versus benefits of imaging exams, physicians should make deliberate efforts to hold discussions with their patients about the types of imaging procedures, according to a Tuesday session.

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

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

CT patients were more likely to know that CT utilized radiation (85 percent) as compared to those receiving other imaging procedures (43 percent). Most patients (84 percent) correctly identified X-ray imaging as a technique that required radiation.

Overall, patients lack a general understanding of how much radiation they receive from cardiac CT and MRI. In the study, for example, most patients incorrectly said MRI had a higher radiation dose than CT.

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

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

Also, explaining radiation doses with common relatable measurements can reduce patient confusion. For example, the estimated exposure from a coronary CTA is 12 millisevens (mSv), could be explained as an equivalent to four years of exposure to background radiation. Other relatable standards Dr. Mostafavi presented included the 0.3 mSv from the food we eat every year and the 50 mSv annual worker limit.

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Patients are “Getting Lost in the System” Due to Socioeconomic Factors

By Mike Bassett

Evaluating socioeconomic factors impacting access to imaging services could help identify at-risk patients and devise interventions to mitigate socioeconomic disparities associated with that lack of access, according to study presented Tuesday.

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Embracing Patient-Centered Care

Continued from Cover

Patient-centered Radiology Subcommittee that oversees the RSNA Radiology Cares® initiative, said, “Radiology can be a scary maze for our patients and we have the power to make the patient experience a little bit easier.”

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

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

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

Dr. James Rawson, M.D., chair of the ACR Commission on Patient Experience that is part of the Imaging 3.0 campaign, advocated the involvement of patient-focused care committees that include patients and focus on collaboration, flexibility, and empowerment.

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

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

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

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

Visit the Radiology Cares Booth at RSNA 2015 in RSNA Services in the Lakeside Center for more information, and go to RSNA.org/Radiology_Cares.

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South Hall Exhibit #4111
As NSF Incidence Drops, Other Concerns Remain for Gadolinium-based MRI Contrast

Even though the risk of nephrogenic systemic fibrosis (NSF) from gadolinium-based contrast agents (GBCA) used in MRI has largely been mitigated, radiologists still need to be aware of other potential issues with these commonly used agents, according to experts who spoke at a Tuesday Controversy Session.

By Richard Dargan

N

SF, a disease that involves progressive, severe fibrosis of the skin and other organs, was first linked to GBCA in 2006. Since then, various measures such as lower doses of GBCA and pre-screening for kidney function have virtually eliminated the disease, said presenter Martin R. Prince, M.D., Ph.D., professor of radiology at Weill Cornell Medical College and Columbia University.

“The number of new cases has almost completely disappeared,” he said. This change should not cause radiologists to become complacent about GBCA administration, according to Richard H. Cohan, M.D., from the University of Michigan Health System. Dr. Cohan discussed acute adverse reactions, a rare but potentially serious issue associated with GBCA that can include rashes, hives, and nausea. For reasons unknown, some of the agents more likely to be associated with NSF are less likely to be associated with acute reactions, and GBCA package inserts are “confusing at best,” Dr. Cohan said.

“We shouldn’t forget that acute reactions occur and if they occur we have to be able to treat them,” Dr. Cohan said. Dr. Cohan recommended that radiologists review treatment algorithms for acute reactions at least once every six to nine months. Steroid pre-medication can reduce the likelihood of a reaction, he said, and may be useful in some patients with a history of reactions to GBCA.

The long-term effects of GBCA are under scrutiny in the wake of research from Japan earlier this year that found post-mortem evidence of gadolinium deposition in the brains of patients who had received multiple GBCA administrations. “We’ve also found gadolinium in the bone and in skin samples,” said presenter Emanuel Kanal, M.D., from the University of Pittsburgh Medical Center. “There are a bunch of studies going on in different countries on the clinical significance of this, and we should know more in the future.”

While NSF only occurs in patients with impaired kidney function, gadolinium deposition has been found in people with normally functioning kidneys—a much larger group, considering the number of GBCA administrations worldwide every year. “Now instead of a few hundred people we’re talking about dozens of millions,” Dr. Kanal said.

Dr. Kanal pointed out that the risk of gadolinium retention varies among the nine U.S. Food and Drug Administration-approved GBCAs. Radiologists should be aware of the differences and use the low-risk agents whenever possible—especially in pediatric patients.

NSF Draws Parallels with Contrast-induced Nephropathy

The evolution in understanding the risk of contrast-induced nephropathy (CIN), or decline in kidney function, in patients who receive iodinated contrast media for CT imaging, said presenter Matthew S. Davenport, M.D., from the University of Michigan Health System. Dr. Davenport discussed how fears of CIN were initially overstated because a good working definition of the disorder was lacking. A renaissance in understanding took place through several large studies in the past 10 years. “These studies showed that CIN is much less common than once believed,” he said. “The vast majority of patients have little or no risk.”

In cases where contrast is deemed necessary in patients with significantly impaired kidney function and MRI and CT are considered diagnostically equivalent, Dr. Davenport recommended CT for patients receiving chronic dialysis and a single dose of low-risk GBCA for those not on chronic dialysis.

“We considered informed consent if the patient is on chronic dialysis, regardless of contrast type,” Dr. Davenport said.

Reduced Dose Scans Not Ready to Detect Liver Lesions

By Elizabeth Gardner

S

Sinogram-affirmed iterative reconstruction (SAFIRE) and other image reconstruction techniques aren’t quite ready to perform reduced-dose abdominal scans that are diagnostically equivalent to standard-dose scans, according to research presented Tuesday.

A head-to-head comparison of standard CT scans and reduced dose scans with SAFIRE showed that while the reduced-dose (RD) scans were adequate for detecting some types of lesions, they could miss others, including a liver mass, according to a prospective study of 20 patients at Massachusetts General Hospital.

However, RD scans may be equivalent, or in some cases superior, to standard-dose (SD) scans in detecting kidney stones, gallstones and diverticulosis. “Further innovations in CT data acquisition or image reconstruction are needed to reduce abdominal CT doses to submillivertex levels,” the research team concluded in the study, “Assessment of Sinogram-affirmed Iterative Reconstruction Techniques for Reduced Dose Abdomen CT.”

The study compared RD images using radiation doses of less than 2 mGy, as compared to 9 mGy with SD CT. Increasing the dose slightly could yield significant improvement in the images, said presenter Atul Padole, M.D., a radiology research fellow at MGH. He plans a follow-up study with a dose of 2.6 to 3 mGy. “We need to find the dose level where we won’t miss these lesions,” he said.

The patients, 11 men and nine women with a mean age of 68 and a mean body mass index of 25, received both SD and RD 128-slice MDCT scans in succession. The RD images were reconstructed with SAFIRE at settings S1, S3, and S5, yielding a total of 80 studies (20 at standard dose and 20 at each of the three SAFIRE settings). The settings for the two scans were identical except for the tube current. The standard scans had a mean dose of 9 mGy (±3) and the RD scans had a mean dose of 1.4 mGy (±0.1). The mean effective dose for the standard scans was 6 mSv (±1.6), and the mean effective dose for the reduced scans was 0.9 mSv (±0.02).

Radiologists performed independent, random, and blinded comparison for lesion detection, lesion conspicuity, and visibility of abdominal structures, first for all patients on RD images and subsequently on SD images. Out of 72 true lesions detected with standard scans, five were missed on the reduced-dose scans regardless of the SAFIRE settings and BMI of the patients. All the missed lesions were in the liver. The RD scans also picked up one false positive liver lesion on all settings. Some lesion types, such as renal calculi, gallstones, and diverticulosis, could be accurately assessed on the RD images.

Dr. Padole showed one kidney stone image that was deemed to be optimal on the RD scans at all SAFIRE settings, compared with the SD scan. Visibility of abdominal structures was also adequate with the RD images at all SAFIRE settings. Setting S3 yielded the best RD image quality for lesion conspicuity, liver parenchyma, and renal parenchyma.

SAFIRE, which is proprietary to Siemens, is not the only image reconstruction technique to show these limitations, Dr. Padole said. He has worked with systems from other manufacturers—Phillips, GE, and Toshiba—and has seen missed or suboptimal abdominal findings with all of them.
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Bariatric Embolization is a Potential Weapon Against Morbid Obesity

Bariatric embolization shows “tremendous” promise as a safe, less-invasive weight-loss technique for morbidly obese patients, according to preliminary results of a pilot study presented by Mubin I. Syed, M.D.

"We can say that so far we have not had any adverse effects." Mubin I. Syed, M.D.

By Ed Hanson

I n an RSNA press conference on Tuesday, Dr. Syed said the study could pave the way to a minimally invasive treatment for obesity that could be performed as an outpatient procedure.

“The patients weren’t even in a hospital. It’s that safe,” Dr. Syed said. “And they leave with a little Band-Aid.”

Of the four patients who have undergone the procedure, one lost 48 pounds in a year, which was almost half of her excess body weight, Dr. Syed said. “That is equal to results from bariatric surgery, so that’s tremendous,” he said.

Another patient, who is diabetic, lost 26 pounds in three months, Dr. Syed said.

In addition, the patient’s hemoglobin A1C levels dropped to normal.

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“Another patient, who is diabetic, lost 26 pounds in three months, Dr. Syed said. In addition, the patient’s hemoglobin A1C levels dropped to normal.”

Two patients reported significant weight loss, Dr. Syed believes the procedure is promising because the two patients who did not lose weight withheld parts of their medical history that would have excluded them from the study. Dr. Syed said the experience taught him how to refine his screening procedure.

More conclusively, “we can say that so far we have not had any adverse effects,” Dr. Syed said. Some patients experience nausea and stomach pain, but no symptomatic hospitalization. Also, superficial ulcerations occur in the embolization area but they heal within 30 days and are an expected part of the procedure, Dr. Syed said.

Emboli- for Obesity a New Procedure

Interventional radiologists have performed gastric artery embolization for decades as a way to stop bleeding in emergency situations, but the idea of performing the procedure as a means of treating obesity is new.

The embolization technique suppresses the production of ghrelin, which is a hormone that stimulates appetite, by limiting blood flow to the area. This technique is less invasive and less traumatic than laparoscopic sleeve gastrectomy, Dr. Syed said.

As opposed to surgically removing part of the stomach, the embolization technique only requires access via the radial artery. “That’s a very safe access site even in a very obese patient,” he said.

Dr. Syed said he accessed the left gastric artery through the arm instead of the groin because the patients’ fatty tissue makes these arteries difficult to locate in the first place and to later put pressure on to stop any bleeding.

The pilot study used Beadblock 300-500 micron particles for the embolization. Dr. Syed said smaller beads, which were used in previous studies on animals, might be more effective but the sizes used in this study were as small as the FDA would approve.

The trial did not show significant reduc- tion in ghrelin levels, but Dr. Syed did not draw any conclusions on that data because of the small sample size.

Images courtesy of Mubin I. Syed, M.D.

Quality of the Peer Reviewer Impacts Quality of Journal

The quality of manuscripts published in a scientific journal relies heavily on peer review for assessing the strengths and limitations of the material and providing a nonjudgmental, objective critique of the submission, according to presenters of a Tuesday session.

By Felicia Dechter

W e rely on the expertise of the reviewers to identify the best science and to help improve the quality of the work,” said Radiology Editor, Herbert V. Kressel M.D. “The quality of a peer reviewed scientific journal like Radiology is a direct reflection of the quality of the paper reviewers.”

Dr. Kressel and Jeffrey S. Klein, M.D., editor of RadioGraphics, discussed peer review for their respective publications during the RSNA’s Communications Council-sponsored session, “Reviewing Manuscripts for the RSNA Journals.”

Radiology has a research focus, while RadioGraphics has an educational focus. Both journals gave insight on the important roles served by peer reviewers and the types of information they should consider when given manuscripts. Peer reviewers are asked for their input as experts in the subspecialty and on the specific topic of the submission. A peer reviewer makes suggestions to the editor and author on methods to improve the paper.

“These comments provide a rationale for rendering decisions on the paper,” said Dr. Klein, a professor of radiology at the University of Vermont College of Medicine. “Reviewers also indicate if the paper covers material recently published in Radiology or other imaging journals, as ideally we would like our papers to add to our readers’ existing fund of knowledge and practice.”

Most of the material for RadioGraphics comes from RSNA Annual Meeting education exhibits, Dr. Klein said. Reviewers are typically experienced clinicians and have reviewed for the journal for many years. Many of the publication’s reviewers are also authors and understand the important components of a high quality submission, he said.

Continued on Page 10A

CMS Mandate Delayed, But Implementation Should Move Forward

From left: Jeffrey B. Weilburg, M.B., Jennifer K. Coleman, Mark A. Hiatt, Joseph Hutter

By Paul LaTour

D espite the postponement of a key mandate in the Protecting Access to Medicare Act (PAMA) of 2014, stakeholders should not delay in their preparation, according to a panel of experts speaking Tuesday.

The Centers for Medicare & Medicaid Services (CMS) announced in October that approved mechanisms for the implementa- tion of clinical decision support (CDS) software would not be in place by the Jan. 1, 2017, deadline. The provision was included in PAMA to mandate that ordering providers consult appropriate use criteria (AUC) via electronic CDS for outpatient advanced imaging exams for Medicare patients.

“We’re not even sure when the new mandate deadline will come to pass, but now is the time to prepare,” said panelist Mark D. Hiatt, executive medical director of Regence BlueCross BlueShield of Utah.

Creating and implementing AUC is a complicated and time-consuming process. Panelist Joseph Hutter, lieutenant commander, U.S. Public Health Service, said it can take 12 to 18 months just to upload AUC into the CDS tools that will be used at a particular institution.

Dr. Hiatt said for a CDS to be successful, the user interface must be efficient, intuitive and accurate. The platform must be fast and efficient in mining content.

Clinical content must be comprehensive and editable. And it must be able to analyze and act on data.

Although the mandate is government-generated, Dr. Hutter said he sees it as a partnership between public and private entities rather than a government program.

“This program will fail if it becomes just another government compliance checklist,” he said.

Despite the difficulty in establishing CDS, it is a positive improvement over the pre-authorization process, which can be fraught with complications and unintended consequences. Jennifer K. Coleman experienced that in Michigan when a regional health plan implemented the process in the early 2000s.

Continued on Page 14A
More than 475 participants got up early for the RSNA 2015 5k Fun Run along Lake Michigan on Tuesday, raising $28,000 for the RSNA Research & Education (R&E) Foundation. Bronze Medal winners (Elodie Lechartre and Romain Labas, both of France) are pictured at left. The run started at 6:30 a.m. in Arvey Field at Chicago’s South Grant Park.

Fun Run Draws 475 Runners Along Lake Michigan

Congratulations to the top finishers:

**MALE**
- Gold Medalist: Manuel Salvador Jr., Spain (16:36)
- Silver Medalist: Anthony Michelot, France (17:19)
- Bronze Medalist: Romain Labas, France (17:34)

**FEMALE**
- Gold Medalist: Maria Del Socorro Ros, Mexico (19:49)
- Bronze Medalist: Elodie Lechartre, France (22:23)

Annual Oration in Radiation Oncology Presented Today


In 2014, after several years of extensive consultation and coordination with many stakeholders, the National Cancer Institute (NCI) transformed its longstanding cooperative group program into the new National Clinical Trials Network (NCTN). NCTN then created five new groups including NRG Oncology, a non-profit research organization formed to conduct oncologic clinical research and to broadly disseminate study results for informing clinical decision making and healthcare policy, according to Dr. Curran, chair of NRG Oncology. NRG Oncology brings together the National Surgical Adjuvant Breast and Bowel Project, the Radiation Therapy Oncology Group and the Gynecologic Oncology Group—each recognized internationally as a research leader. The organization focuses its clinical and translational research efforts on patients afflicted with malignant brain tumors, head and neck cancers, lung cancers, breast cancers, gastrointestinal cancers, genitourinary cancers and gynecologic cancers, Dr. Curran says. He will discuss the means by which NRG Oncology develops and executes practice-defining research for these patients on a global basis.

Dr. Curran is the executive director of Winship Cancer Institute of Emory University, Atlanta, and the Georgia Research Alliance Scholar and Chair in Cancer Research. Dr. Curran also serves as the Lawrence W. David Professor and Chairman of the Department of Radiation Oncology at Emory School of Medicine. He served as chairman and principal investigator of the Radiation Therapy Oncology Group, an NCI-funded cooperative group.

R&E Foundation Auction Open Until Friday

Excitement is building for the virtual auction benefiting the Inspire-Innovate-Invest Campaign® of the Research & Education (R&E) Foundation. Visit the R&E booths in RSNA Services (Lakeside Center, Level 3) or go online to RSNA.org/Foundation-Virtual-Auction to bid on unique packages while supporting the Foundation. Up for auction are a trip to the 2016 Tony Awards Show, a Chicago Helicopter Experience, and a Sip & Soar Adventure in Napa. Visit the website to see all the packages and place your bid. Bidding closes Friday, Dec. 4 at 12:30 p.m.

Excitement is building for the virtual auction benefiting the Inspire-Innovate-Invest Campaign® of the Research & Education (R&E) Foundation. Visit the R&E booths in RSNA Services (Lakeside Center, Level 3) or go online to RSNA.org/Foundation-Virtual-Auction to bid on unique packages while supporting the Foundation. Up for auction are a trip to the 2016 Tony Awards Show, a Chicago Helicopter Experience, and a Sip & Soar Adventure in Napa. Visit the website to see all the packages and place your bid. Bidding closes Friday, Dec. 4 at 12:30 p.m.
Quality of the Peer Reviewer Impacts Quality of Journal

CONTINUED FROM PAGE 8A

“Given their expertise and knowledge of the quality of submission we typically publish, their assessment is the most important component of maintaining the high quality of our published material,” said Dr. Klein.

Annually, Radiology receives nearly 3,000 submissions and publishes 360 to 380 manuscripts, said Dr. Kressel. Its active reviewer pool consists of approximately 1,000 experts from around the world. Submissions are pre-screened by one of the editors before peer review for suitability. In addition to scientific peer review, accepted research submissions undergo a separate statistical review, Dr. Kressel said.

Dr. Kressel asks reviewers to evaluate the quality of the science and the educational value of a manuscript, as well as the validity of its claims and conclusions. “We ask Radiology reviewers to summarize the study, identify strengths and weaknesses as well as specific comments to improve the quality of the manuscript,” Dr. Kressel said. “We also ask them to make sure that the criticism is constructive in nature and not harsh or insulting.”

RadioGraphics reviews about 220 manuscripts annually, Dr. Klein said. The journal publishes about 180 educational papers annually and has approximately 750 reviewers; many review for both journals, he said.

Both journals can earn the reviewer credit. Radiology reviewers can request CME for their reviews at the time they are submitted. If the quality of the review is satisfactory the reviewer can receive three hours of Category 1 CME credit for a reviewed manuscript, Dr. Kressel said. RadioGraphics offers three hours of AMA PRA Category 1 CME credit for a review of adequate quality as assessed by the editor.

Imaging Takes on Predictive Role in Gynecological Cancer

When it comes to gynecological cancers, imaging is transitioning from a position in which it is descriptive and morphologic, to one in which it is predictive and molecular.

By Mike Bassett

That was the message during a Tuesday session on imaging gynecological malignancies. “Imaging is going to be a predictive tool,” said Susanna Lee, M.D., Ph.D., chief of Women’s Imaging at Massachusetts General Hospital and the session’s keynote speaker. “It’s going to tell us how the therapy is going to work, how the patient is going to do during therapy over the long term, and what that patient’s survival chances are going to be.”

“It’s really a biomarker, which is a really important role that imaging has taken in cancer therapy,” she added.

Gynecologic imaging is also becoming more molecular, she said. “The current chemotherapeutic agents are targeted to specific molecules in specific cellular pathways and we need to be able to image in this order in order to help them treat their patients.”

DWI has Potential as Novel Imaging Biomarker

In one such session, Jung Jae Park, M.D., Samsung Medical Center, Sungkyunkwan University School of Medicine in Seoul, Republic of Korea, described a study in which he and his colleagues compared the prognostic value of diffusion weighted MRI (DWI) and PET/CT during concurrent chemotherapy (CCRT) of cervical cancer for predicting disease progression.

Among its advantages, DWI is fast and non-invasive and imaging findings can be quantified using the apparent diffusion coefficient (ADC). Thus, the potential of DWI as a novel imaging biomarker reflecting tumor aggressiveness has grown markedly.

And while PET/CT is certainly a key imaging technique, it does involve extensive pre-imaging preparation and exposes patients to ionizing radiation, he said. “Therefore, we wanted to compare the predictive value of an imaging marker derived from DWI (ADC value) and PET/CT (SUV value) to determine that these imaging techniques could be potentially interchangeable for predicting patients’ outcomes.”

Dr. Park and his colleagues studied 67 patients who underwent CCRT for locally advanced cervical cancer and underwent both diffusion-weighted MRI and PET/CT before and during treatment.

They found that the degree of change in the ADC value of cervical cancer during one month of CCRT had a predictive value for estimating patients’ prognosis after treatment, and that the degree of change in tumor ADC (mean ADC) and SUV (maximum SUV) were correlated. “The most important and original finding of this study was that the degrees of change in tumor ADC and SUV are similar,” Dr. Park said. “And they revealed similar prognostic performance for predicting patient prognosis regarding disease progression after CCRT of cervical cancer.”

Dr. Park said that the findings suggest that these imaging biomarkers are feasible for developing predictive models for estimating treatment outcome.

In another presentation Yanchun Wang, of the Department of Radiology, Tongji Hospital, Wuhan, China, discussed her study showing that intravoxel incoherent motion (IVIM) diffusion weighted MRI could help predict and monitor the effectiveness of neoadjuvant chemotherapy (NACT) for cervical cancer.

Wang and her colleague at Tongji Hospital, Daxin Wu, M.D., recruited 42 patients with primary cervical cancer. IVIM diffusion weighted MRI was performed at three points during the administration of NACT—prior to NACT, three weeks after the first administration of NACT and three weeks after the second administration of NACT.

Treatment response was assessed according to RECIST criteria three weeks after the second administration of NACT and the patients were then divided into responders and non-responders.

Before treatment the diffusion coefficient (D) and standard ADC values were significantly higher in responders than non-responders. A receiver operating characteristic curve analysis yielded area under curve values of 0.804 and 0.678 respectively and, according to Wang, could be used to differentiate responders from non-responders.

D and Standard ADC values in responders remained significantly higher than non-responders three weeks after both the first and second NACT treatments. “IVIM may be useful for predicting and monitoring the efficacy of NACT in cervical cancer,” Wang concluded. “And D and ADC values could represent reliable early predictors of NACT response.”
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Richard L. Ehman, M.D., is RSNA president-elect for 2016. Dr. Ehman is professor of radiology and Blanche R. & Richard J. Erlanger Professor of Medical Research at the Mayo Clinic in Rochester, Minn.

A s President-elect, Dr. Ehman will continue to emphasize RSNA’s commitment to advancing medical imaging through its annual meeting programming and the efforts of the Research and Education Foundation.

“Fostering research and new technologies is a key component of RSNA’s mission,” Dr. Ehman said. “As RSNA wraps up its Centennial celebration and looks toward the future, I will work with the Board to maintain the Society’s legacy of promoting excellence in patient care through relentless innovation.”

Dr. Ehman earned his medical degree in 1979 from the University of Saskatchewan in Saskatoon, Canada. His internship at Foothills Hospital in Calgary, Alberta, was followed by a residency in diagnostic radiology at the University of California, San Francisco. This was followed by a clinical fellowship and his appointment to the staff of the Mayo Clinic in 1985.

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

Dr. Ehman served on the Mayo Clinic Board of Trustees. In 2010, he was elected as a member of the Institute of Medicine of the National Academies of Science, which is one of the highest honors in medicine in the U.S. As an RSNA member, Dr. Ehman has served on the Refresher Course Committee, Scientific Program Committee, Radiology Editorial Board, Research Development Committee, Grant Program Committee and the Research and Education Foundation Board of Trustees. In 2010, he was elected to the RSNA Board of Directors and in 2011 became the liaison for science. He served as Board chair from 2014 to 2015.

Radiation Exposure Answer

He can go back to work immediately as long as he wears gloves. The radioactive iodine may be excreted in sweat on his hands, and it is important not to prepare foods for others without a barrier (the gloves) in place for the first several days after treatment.

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Today’s Press Conferences

RSNA invites members of the medical news media to attend its annual meeting each year in order to help the public gain a greater understanding of radiology and its role in personal healthcare. Research developments presented at the meeting are shared with the public through print, broadcast and internet media stories.

Four press conferences will be held today:
• Imaging Yields Evidence of Heart Disease in Archeological Find
• Researchers Find Link Between Early-Stage Brain and Heart Disease
• Study Suggests Breast Density Alone Not a Risk Factor for Cancer
• CT and 3-D Printing Aid Surgical Separation of Conjoined Twins

RSNA 2015 press releases are available at RSNA.org/press15
Getting Out of the Reading Room May Be Better for Your Health

By Felicia Dechter

**MULTIPLE STUDIES** have linked sedentary behavior to diseases including obesity, diabetes, hypertension and heart disease. For that reason, radiologists who spend the vast majority of their workday in a seated position may be at increased risk, particularly if they do not have a routine exercise program outside of work.

While working with radiation might be considered an occupational hazard, the sedentary nature of image interpretation can pose its own very real and potentially dangerous health risks, said Jason Hoffmann, M.D., assistant professor of radiology at the Winthrop-University Hospital in Mineola, NY, who presented a storyboard exhibit on the topic Tuesday.

“While fluoroscopy and sonography can have components of image acquisition and interpretation that may be a bit more active, the majority of image interpretation performed by diagnostic radiologists involves the sedentary process of image review on a computer workstation while in the seated position,” Dr. Hoffmann said.

He cites a recent meta-analysis performed by Biswas, et al., associated sedentary behavior with all-cause mortality, cardiovascular disease mortality, cardiovascular disease incidence, cancer mortality, cancer incidence and Type 2 Diabetes incidence, Dr. Hoffmann said.

“Even for those who exercise regularly, spending increased time sitting can negate the healthy effects of exercise,” Dr. Hoffmann said. “Moreover, prolonged periods of time spent in the seated position lead to a slowing of one’s metabolism.”

It is important for radiologists to address the health risks of sedentary behavior and to understand the three basic components of human daily energy expenditure: the thermic effect of food, the basal metabolic rate, and activity thermogenesis (both exercise-associated thermogenesis (EAT) or non-exercise activity thermogenesis), Dr. Hoffmann said.

Activity thermogenesis is approximately 30 percent of daily energy expenditure, and is subdivided as exercise-associated thermogenesis (EAT) or as non-exercise activity thermogenesis (NEAT). NEAT refers to the energy expended during normal activities of daily living.

With relatively simple changes in work environment and work habits, radiologists can implement NEAT-related behavior modifications, Dr. Hoffmann said. A number of basic exercises can be incorporated into the radiologists’ work routine, including leg lifts, seated spinal twists, side stretches and neck rolls, Dr. Hoffmann said.

The radiologist can intermittently stand while dictating, incorporate fidgeting, tap foot, drink water (out of a smaller container to force walking to the water cooler), walk and park further away, take the stairs, and aim for 10,000 steps per day.

All of these improvements can be made progressively, as this will likely lead to increased adoption of improved and overall compliance with the regimen, Dr. Hoffmann said.

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**Participants Reap Benefits from Quality Improvement Program**

By Richard S. Dargan

**MULTIDISCIPLINARY QUALITY IMPROVEMENT** program developed through an academic radiology department improved participants’ self-assessed skills and facilitated the execution of multiple department improvement projects, according to a presentation Tuesday.

Radiologist David Larson, M.D., associate chair of performance improvement in the Department of Radiology at Stanford Medicine, began to develop the program more than a year ago after the radiology department was tasked with 55 major improvement initiatives covering everything from efficiency to patient safety.

“At the time, the department had no structured mechanism to accomplish these goals,” he recalled.

Dr. Larson enlisted the help of his Stanford associates Jake Mickelsen, B.S., quality improvement education manager, and Kandice Garcia, R.N., M.S., radiology quality manager, in developing what would become the Realizing Improvement through Team Empowerment (RITE) program, a 10-session, 20-week project-based course.

Teams were assembled—each including a leader, three to seven project participants, a sponsor and a quality improvement coach—for eight different projects. The program leaders made short videos on relevant topics available online prior to each session and each team was expected to share an update of the project at the two-hour sessions receive feedback on their approach, and provide feedback to others.

The course was led by Dr. Larson and the two quality improvement managers, who also served as team coaches. Forty-one individuals participated in the first cohort of the course, including physicians, administrators, technologists and nurses. Six of the participants were from outside the radiology department.

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**Imaging Innovations are Paving Way toward Healthcare Reform**

**Continued from cover**

As more knowledge is generated, knowledge management becomes the logical next step. This means developing utility programs for the delivery of knowledge at the point of care.

Dr. Thrall said this has already been done for referring physicians through direct decision support for order entry. To transfer that to radiology it is necessary to develop more evidence-based best practice standards, improve adherence to them, reduce confusing variation between reports, and integrate decision support programs seamlessly into the radiologist’s workflow.

Another aspect of working in the digital age is image analysis, which lends itself to deep learning.

“Every set of image data that we obtain has a risk and a cost to a patient,” Dr. Thrall said.

I believe it is imperative that we extract as much information as possible to justify that risk and cost,” Dr. Thrall said.

Deep learning involves using mathematical tools to extract data from images that would not be apparent via standard imaging reports. That information can then lead to more precise medicine through imaging biomarkers, imaging phenotypes and radiogenomics.

A radiologist allows patients to be sorted into different prognostic or therapeutic categories rather than making recommendations based on an “average patient.”

“We use this for more precise diagnosis and prognosis, better selection of therapy, better selection of patients for clinical trials and the assessment of therapeutic efficacy,” Dr. Thrall said.

**Oration Dedicated to Brogdon**

**THE 2015 ANNUAL ORATION in Diagnostic Radiology is dedicated to the memory of Byron Gilliam Brogdon, M.D., an internationally recognized authority on forensic radiology.**

Dr. Brogdon was a leader of academic radiology, serving as chairman of the departments of radiology at the University of New Mexico and the University of South Alabama. He was an enthusiastic advocate for collaboration between radiology and forensic sciences, and adeptly spanned both fields in his work.

During his distinguished career, Dr. Brogdon published 360 articles, wrote six books and 65 chapters. He was a past-president of the American College of Radiology (ACR), a distinguished fellow of the American Academy of Forensic Sciences, a member of the American Roentgen Ray Society (ARRS), and an emeritus member of the RSNA. He was awarded gold medals of the ACR, the Association of University Radiologists, and the ARRS.

Dr. Brogdon earned his medical degree at the University of Arkansas, Little Rock, where he also began a residency. He completed the residency at the Bowman Gray School of Medicine at Wake Forest University, Winston-Salem, N.C., in 1956. Following brief service in the U.S. Air Force, Dr. Brogdon began his medical career as an assistant professor of radiology at the University of Florida, Gainesville.

Dr. Brogdon died March 28, 2014, at 85.
CMS Mandate Delayed, But Implementation Should Move Forward

CONTINUED FROM PAGE 8A

She found the process negatively impacted the workflow and encouraged “work-arounds” such as not ordering appropriate imaging only to avoid the hassle. To Coleman, the process also puts the emphasis on the cost of utilization rather than quality.

“How wonderful would it be to say, ‘Regardless of the cost, we’re going to do what’s right for the patient,’” said Coleman, executive director of Grand Traverse Radiologists, PC, and president of the Radiology Business Managers of Michigan. “That’s a great measure to go after.”

According to Coleman, CMS addresses that shortcoming.

“At the end of the day, CDS provides appropriate imaging that is patient specific, provider endorsed and results in appropriate costs,” Coleman said.

Staff at Massachusetts General Hospital (MGH) report a similar experience. MGH implemented its own CDS within its radiology order entry (ROE) prior to the mandate.

The MGH system created suite reports that generated appropriateness scores for each physician. The reports were shared among the physicians so they could learn if they were requesting too many imaging tests compared to their colleagues.

MGH is currently working on adding total cost and clinical outcomes to the suites report to help further explain why one physician may have a higher use rate than another.

“The goal of this was not simply to reduce utilization,” said Jeffrey B. Weilburg, M.D., associate medical director, Massachusetts General Physicians Organization. “The goal was to implement optimal utilization.”

MR-ultrasound Fusion May Improve Prostate Biopsy Results

Prostate biopsies could become significantly more accurate if guided by MR-ultrasound fusion, according to a retrospective analysis of more than 600 patients conducted at the Hospital Israelita Albert Einstein in Sao Paulo, Brazil, and presented on Tuesday.

By Elizabeth Gardner

The study showed that targeted prostate biopsies using MR-ultrasound fusion can detect more clinically significant lesions than random sextant biopsy, the current standard of care, and can increase the accuracy of the procedure, particularly in cases where clinical or laboratory findings establish a high suspicion of cancer.

Random sextant biopsies are performed about a million times a year in the U.S., and detect between 27 and 40 percent of cancers, said presenter Guilherme Mariotti, M.D. The procedure misses about 35 percent of cancers, and also detects a large number of low-risk cancers.

“Prostate cancer demands better tools to prevent over-detection of low-risk cancers and to improve identification of high-risk patients, and that’s where targeted prostate biopsy using MRI-ultrasound fusion can play a role,” he said.

The research team conducted a retrospective analysis of 286 patients who underwent targeted prostate biopsies using MR-ultrasound fusion from August 2013 to January 2015. The analysis included all patients with suspected prostatic cancer based on clinical or laboratory findings (for example, positive digital rectal examination or high PSA) who underwent multiparametric MRI and US-MRI fusion prostate biopsy. Their mean age was 61.8 years and their prostate weight was 53.4 grams.

Results for the study group were compared with 331 patients in the same period who underwent ultrasound-guided random biopsies with an average of 14 fragments.

The comparison group had a mean age of 62.2 and prostate weight of 53.3 grams.

In the test group, the targeted biopsy with MRI-ultrasound fusion found significant cancer, requiring surgery, in 47 percent of patients, and low-risk cancer in another 11 percent, with one stromal tumor of uncertain malignant potential. In the subgroup with the highest risk (142 patients with Likert scores of 4 or 5), the technique detected cancer requiring surgery in 69 percent of cases in the test group. An additional 7 percent of the biopsies detected low-risk cancers.

In comparison, random ultrasound-guided prostate biopsies performed on a sextant basis in a comparison group had only a 40 percent incidence of true positives requiring surgery. An additional 12 percent of the studies detected low-risk cancers.

The patients in the study will be followed for a number of years to determine whether there are differences in death rate or metastases, Mariotti said. The researchers also plan a prospective study that will compare the two techniques used in the same patient.

Guilherme Mariotti, M.D.
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