Innovation, Patient Focus Will Help Radiology Thrive for Next 100 Years

After 100 years of discovery, innovation and research, radiology has proven to be one of the most impactful disciplines in medicine, but radiologists need to do even more to push the boundaries of scientific inquiry, said RSNA President N. Reed Dunnick, M.D., during his President's Address on Sunday.

Dr. Dunnick recalled the inspiration he felt attending his first RSNA Annual Meeting as a first-year resident in 1975. Body CT was being presented for the first time, and the rooms were packed due to the excitement surrounding that new modality.

“Whether you’re in academics or whether you are in private practice, everyone benefits from the work of our grantees,” Dr. Borgstede recalled. He credited the excitement for inspiring him to pursue a career in radiology that has rewarded him in many ways.

As was inspired so many years ago in

R&E Foundation Launches Fundraising Campaign

By Paul LaTour

With a goal to raise $17.5 million to fund grants in radiologic research and education, the R&E Foundation officially launched its “Inspire-Innovate-Invest: The Campaign for Funding Radiology’s Future” on Sunday. The campaign looks to bridge the gaps in funding available to promising investigators and educators.

“The time is now and our goal is clear—raise $17.5 million to keep pace with the demands of our specialty,” said James P. Borgstede, M.D., chair of the R&E Foundation Board of Trustees.

SPECIAL LECTURE

Reinvigorating Biomedical Research Will Fuel Future of Healthcare

By Richard S. Durkan

With National Institutes of Health (NIH) support for imaging-based research, healthcare is poised for major breakthroughs even as the pace of discovery is threatened by budgetary constraints, according to NIH Director Francis S. Collins M.D., Ph.D., presenter of an RSNA 2014 Special Lecture.

In his presentation, “Exceptional Opportunities in Biomedical Research,” Dr. Collins helped RSNA celebrate its centennial meeting by enlightening attendees on some of the issues most important to their future, including the critical need to reinvigorate biomedical research.

NIH’s Brain Research through Advancing Innovative Neurotechnologies (BRAIN) Initiative is an opportunity for “teams of the best and brightest minds,” Dr. Collins said. In September, the NIH awarded $46 million to more than 100 researchers in 15 states and three nations to develop innovative tools, technologies and approaches that will serve as a foundation for the entire multiyear BRAIN endeavor.

The first five years of the initiative will focus on the development of methods to map the brain, improve minimally invasive imaging techniques and complete a census of neuronal and glial cell types in animals. A noted physician-geneticist who previously led the international Human Genome Project, Dr. Collins highlighted the interdependence of imaging and genomics throughout his address.

For example, researchers recently found a gene variant that affects brain wiring and may play a role in Alzheimer’s disease. The Cancer Imaging Archive, meanwhile, is an open resource of cancer-specific medical images with links between the imaging archive and genome data.

CONTINUED ON PAGE 14A

Radiation Safety

Tip of the Day

If you use automatic exposure control, be sure there is nothing, such as hip replacement hardware, attenuating in the beam path that could impact the energy received by the detector.

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Radiologists from Across the Globe Offer Imaging Insights on Cancer

The need for a national database for breast cancer screening, a push to expand MR imaging in pelvic oncology and the increasing role of functional and molecular imaging in cancer were some of the topics discussed by presenters of “Global Cancer Imaging—Insights From Overseas” on Sunday.

By Felicia Dechter

P RESENTERS from Ireland, Korea, England and Australia stressed a shared commitment to better understanding, treating and improving survival rates for cancer.

In her presentation, “Lessons Learned from the National Irish Breast Screening Program: The first 12 years-One Million Mammograms On,” Michelle McNicholas M.D., reported that the program has made considerable progress in a relatively short span of time. “It’s early in the program to detect a reduction in mortality, but surrogate parameters such as the numbers of small cancers we are detecting would suggest that we will meet and exceed our target of 20 percent reduction in mortality,” Dr. McNicholas said.

Under the program, women ages 50-64 receive free breast X-rays on a two yearly cycle. Dr. McNicholas said cancer detection rates have well exceeded targets for first screen (around nine per 1,000) and subsequent screen (six per 1,000).

One of the biggest difficulties facing the program was the lack of a population database to identify the target population, Dr. McNicholas said. The database had to be created from scratch by combining information from various sources, such as health insurers, various government agencies and self-registration. “Maintenance of an accurate population database is an ongoing challenge,” she said.

Australia Seeks to Bolster MRI Access

In Australia, access to MR imaging varies depending on location and is offered mainly in larger cities, said Clair Shadbolt, M.D., M.B.Ch.B., consultant radiologist/director of training, Royal Women’s Hospital, and lead radiologist for the Breast MRI Service at the Peter MacCallum Cancer Centre, Melbourne.

In addition, government-funded MR imaging for pelvic oncology is extremely limited, she said.

“In Australia, only the first staging of MRI for cervical and rectal cancer can be claimed, while all other pelvic oncology is non-funded and follow-up/post-treatment studies are also not funded,” Dr. Shadbolt noted in her presentation, “MRI of Pelvic Malignancy—The View from Down Under.”

To that end, in 2012 the Australian government announced a $104.4 million Diagnostic Imaging Review Reform Package to increase access to MR imaging and increase cancer services.

Contrast-enhanced Ultrasound Adds HCC in Korea

Contrast-enhanced ultrasound—particularly with the new contrast agent Sonazoid—and dynamic contrast-enhanced MR imaging—particularly with the Gadolinium EOB-DTPA contrast agent—are especially effective techniques for detecting and diagnosing hepatocellular carcinoma, said Byung Iln Choi, M.D., professor of radiology, Seoul National University Hospital, College of Medicine, Seoul National University in Seoul, South Korea.

“At those new techniques, we can diagnose HCC’s in an early stage, with better outcome of treatment and prognosis,” said Dr. Choi, who presented, “Imaging of HCC: A Korean Perspective.” In addition, new contrast agents are helpful for better results with overall survival rate, he said.

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Clair Shadbolt, M.D., M.B.Ch.B.

Michelle McNicholas, M.D.

R&E Foundation Launches Fundraising Campaign

CONTINUED FROM PAGE 1A

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Dr. Borgstede later recalled attending a meeting when the R&E Foundation was a fledgling organization. He remembered seeing an oak leaf and acorn logo on some attendees’ badges, so he asked somebody what it meant. The person told him it was for the R&E Foundation before asking, “Don’t you contribute?”

Dr. Borgstede said he began investing before asking, “Don’t you contribute?”

“I knew then, and I know now that my investment pays off,” he said. “Even as support from outside sources dwindles and competition for grants intensifies we are increasing our funding levels.”

For 30 years of R&E’s 100 years, the R&E Foundation has played a significant role in advancing the R&E mission to promote excellence in patient care and healthcare delivery through education, research and technologic innovation.

This year, the Foundation will fund 94 grants totaling $3.6 million. This means the R&E is funding 25 percent of our ever-increasing number of excellent grant applications.

“The Foundation’s goal is twofold,” Dr. Borgstede said. “First, jump-start careers in radiology. And second, keep the pipeline of innovation alive and robust. We are meeting that two-fold goal.”

Visit the R&E Foundation Booth, located on level 3 of Lakeside Center, to learn more about how you can be a part of the campaign and support the R&E Foundation and the future of our specialty.

English Trials Focus on Functional, Molecular Imaging

In England, functional and molecular imaging in cancer treatment are the focus of a number of trials at Churchill Hospital in Oxford, said presenter Fergus Gleeson M.D., M.B.B.S., consultant radiologist at Oxford University Hospitals NHS Trust.

Among them: investigating the role of hyperpolarized xenon in chronic obstructive pulmonary disease, pre-surgical resection or radiotherapy for lung cancer, the role of perfusion in assessing lung structure and function and is more accurate than currently available techniques,” Dr. Gleeson said.

“Perfusion CT appears to be a useful technique in determining whether the ablation has been complete.”

INTERNATIONAL TRENDS MEETING FOCUSES ON RADIATION SAFETY REGULATIONS

Tuesday’s Daily Bulletin will feature coverage of a meeting of international radiology leaders who will discuss radiation safety regulations in various countries and their impact on patient care.

2014 RSNA Outstanding Educator and Researcher

During the RSNA 2014 Opening Session on Sunday, President N. Reed Dunnick, M.D. (center), honored Theodore S. Lawrence, M.D., Ph.D. (left), of the University of Michigan as the 2014 RSNA Outstanding Educator. Researcher Paula J. Woodward, M.D., of the University of Utah, was honored as the 2014 RSNA Outstanding Researcher.

Read about Dr. Lawrence’s achievements in an upcoming issue of Radiographics. An article about the career of Dr. Woodward will appear in an upcoming issue of Radiographics. See a list of past recipients at RSNA.org/awards.aspx.

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Diffusion-weighted MR of the Cervix Aids in Managing Preterm Labor

Diffusion-weighted MR (DWMR) imaging of the uterine cervix is highly predictive of impending preterm delivery in asymptomatic patients with premature shortening of the cervix, according to research presented Sunday.

By Mary Henderson

The cervix is normally between 35 and 48 mm in length at 24 weeks gestation. A sonographic very short cervix (SCX) of less than 15 mm is a predictor of spontaneous preterm birth in late pregnancy.

“The clinical management of a sonographic short cervix in the mid-trimester of pregnancy is a major obstetrical challenge,” presenter Gabriele Masselli, M.D., explained. “Impending delivery is a severe condition that prompts admission to centers with neonatal intensive care units and an immediate administration of corticosteroids to induce fetal lung maturation. However, most patients with SCX will not deliver within one week.”

To better manage patients with symptoms of preterm labor, Dr. Masselli and a team of radiologists and gynecologists from Sapienza University of Rome investigated the use of MR imaging for cervical insufficiency. “To improve upon current methods of evaluating women for impending delivery, it is necessary to use parameters that are independent of cervical length and that reflect the process of fast cervical remodeling that occurs in the few days preceding labor,” he said.

The prospective study included 30 pregnant women (mean age 29) with a mean gestational age of 24 weeks who were diagnosed with SCX of less than 15 mm and positive fetal fibronectin (FN). The researchers performed sagittal diffusion-weighted imaging studies and created an apparent diffusion coefficient (ADC) map targeted to the subglandular area of the uterine cervix for each patient and calculated ADC subglandular, ADC stromal and ADC subglandular-ADC stromal values.

Eight of the 30 patients (the impending delivery group) ultimately delivered within seven days of admission to the hospital while 22 patients (late delivery group) delivered seven or more days after being hospitalized (mean of 32 days). The ADC subglandular and ADC subglandular-ADC stromal values were significantly higher in patients within the impending delivery group than in the late delivery group. The ADCs of the cervical stroma did not help to discriminate the two groups.

The researchers’ statistical analysis showed that subglandular ADC was an extremely accurate parameter for predicting impending delivery with an overall sensitivity of 95 percent and a specificity of 95 percent.

“High ADC intensity of the subglandular area of the cervix accurately predicted impending delivery within seven days in patients presenting with a very short cervix,” said Dr. Masselli.

Dr. Masselli also noted that high intensity subglandular ADC values were poorly correlated to cervical length, suggesting that they result from mechanisms independent from those involved in cervical shortening.

“When considering a diagnosis of impending preterm delivery, ADC maps targeted to the subglandular area of the uterine cervix greatly increase the positive predictive value of SCX and positive FN,” said Dr. Masselli.

Dr. Masselli said multicenter studies are needed to definitively assess the potential role of subglandular ADC as an imaging biomarker and to provide cost/benefit analyses. “We think the additional costs related to the MRI studies may be counterbalanced by a change in hospital admission policies for these patients who are typically hospitalized until delivery,” he said.

New Horizons Lecture Presented Today

Unique Applications Spark Future of Ultrasound

Quantitative Methods Nearly Unique to Ultrasound

Dr. Rubin says rapidly expanding applications of elasticity imaging are poised to have a major impact—for example, shear wave speed imaging will likely replace liver biopsies for fibrosis/cirrhosis assessment.

Volume flow estimation, meanwhile, has the potential to significantly affect transplant evaluations, fetal evaluation through umbilical cord blood flow measurements, carotid artery flow and cerebral perfusion. And there are myriad new applications for contrast agents, using the bubbles that comprise the agents not only for contrast but also delivery. Dr. Rubin serves as director of the Division of Ultrasound in the Department of Radiology at the University of Michigan Hospitals in Ann Arbor. Throughout his career, he has exploited the basic characteristics of ultrasound and other modalities to offer real-time imaging in neurosurgery, assess thrombus age in deep vein thrombosis, discriminate between edema and fibrosis in Crohn’s disease and improve gating methods for registering cardiac CT scans. His original paper on Power Doppler ultrasound has been referenced more than 800 times and he was among the first to describe volume flow. He has served as principal investigator on more than 30 funded projects and holds 10 patents for ultrasound technology.

Honorary Memberships Presented Today

Honorary Membership is presented for significant achievements in the field of radiology. Today, at the beginning of the Monday Plenary Session, RSNA will award three honorary memberships.

An internationally renowned leader and educator, Zheng Yu Jin, M.D., is widely credited with advancing the popularization and application of cardiac interventional therapy techniques throughout his native China. A professor of interventional radiology and diagnostic radiology and radiology chair at Peking Union Medical College Hospital, Dr. Jin has become well known as a national and international advocate of multidetector CT techniques over the past two decades. As vice-chair of the Chinese Society of Radiology, his priority is MR technique generalization nationwide.

Markus Schwaiger, M.D., director of the Department of Nuclear Medicine at the Technische Universität of Munich, Germany, is an internationally known researcher, educator, author and editor whose work has shaped the development of multimodal molecular imaging. Dr. Schwaiger’s research portfolio reflects the development of PET from a research tool in cardiology to a worldwide-accepted clinical standard procedure in oncology. His recent articles address integrated whole-body PET/MR imaging and the use of PET to assess metabolic response and guide treatment of cancer.

With pioneering work that included very early studies of body MR imaging, Kaori Togashi, M.D., Ph.D., has spent more than 30 years expanding the horizon for MR in gynecology. She is a professor and chair in the Department of Diagnostic Imaging and Nuclear Medicine at Kyoto University Graduate School of Medicine. When promoted to the position in 2004, Dr. Togashi became the first woman to chair a department at the medical school of Kyoto University and the first woman to chair a department at a national university in Japan.
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South Hall, Booth 4119
Radiology History Comes Alive at Centennial Showcase

By Evonne Acevedo Johnson

From first-timers to veterans of multiple decades, RSNA 2014 attendees are viewing RSNA’s Centennial Showcase experience as a way to connect with their community by reviewing a century of radiology history in a once-in-a-lifetime forum.

“I’m here at the meeting for the tenth time, and the Centennial Showcase has really given me a feel of the last 100 years of radiology,” said Tineke Willems, M.D., Ph.D., of Groningen, The Netherlands. “The booths, the science, the industry, your colleagues—it all adds to the environment.”

The Centennial Showcase, located near RSNA Services in Lakeside Center, Hall D, is a museum-style exhibit giving attendees the freedom to explore the displays at their own pace. Particularly popular visitor stops include the Cases of the Century and several historic pieces of imaging equipment.

CONTINUED ON PAGE 10A

By Elizabeth Gardner

For the past hundred years, RSNA annual meetings have dazzled attendees with detail. Hundreds of sessions and exhibits have delved into the specifics of an ever increasing number of technologies, techniques and treatments.

Opportunities to escape the trees and get birds-eye views of the forest are what the meeting’s plenary sessions are about. For decades, these invited talks have provided a glimpse at the future of radiology: new diagnostic techniques and technologies, new treatments and new ways that the field fits into the larger medical world.

“The plenary sessions are some of the best attended sessions at the RSNA meeting,” says George S. Blissel III, M.D., radiologist-in-chief at Texas Children’s Hospital and 2012 RSNA President. “The selection process has changed over the years, but the focus has always been on picking the best speakers and the most up-to-date topics.”

While the two annual orations in diagnostic radiology and radiation oncology usually look at state-of-the-art techniques in specific subspecialties or for particular diseases, the “New Horizons” lecture focuses on larger developments that will shape the future of the field.

Diagnostic Radiology Oration has Covered Diverse Range

The Annual Oration in Diagnostic Radiology (originally the Carman Lecture) has been given every year since 1934. The inaugural lecture was given by the Mayo Clinic’s Byrl Kirklin, M.D., a founding member of the American Board of Radiology, who spoke on “Some Phases of the Roentgenologic Diagnosis of Gastric Cancer.”

Dr. Kirklin selected the topic to honor the lecture’s namesake, Mayo physician Russell Carman, M.D., 1923 RSNA president and a leading gastric radiologist who was given by the Mayo Clinic’s Byrl Kirklin, M.D., a founding member of the American Board of Radiology, who spoke on “Some Phases of the Roentgenologic Diagnosis of Gastric Cancer.”

Kirklin selected the topic to honor the lecture’s namesake, Mayo physician Russell Carman, M.D., 1923 RSNA president and a leading gastric radiologist who diagnosed himself with the gastric cancer that killed him.

“That half or more of the gastric cancers are inoperable when discovered is deplorable,” he said in the conclusion to his lecture. “That they are so often inoperable is due primarily to the fact that early cancer, unless obstructive, often gives rise to few and petty symptoms or none at all, and the patient has no substantial reason for seeking medical aid. The only way by which such cancers can be revealed is by periodic health examinations, including radiologic investigation of the stomachs of all adults.”

While that particular recommendation has not come to pass, screening colonoscopies, mammograms today routinely uncover other types of cancers with “few and petty symptoms, or none at all.”

Other diagnostic radiology oration topics have ranged far and wide, including radiology education (1961), federal regulation of radiology practice (1979) and the role of genetics in cancer (a frequent topic). In this year’s address, David C. Levin, M.D., will speak about health system changes affecting every radiologist currently in practice, with “Transitioning From Volume-Based to Value-Based Practice: A Meaningful Goal for All Radiologists or a Meaningless Platitude?”

New Horizons Lecture Examines the Cutting-edge

The New Horizons Lecture (formerly the Memorial Fund Lecture) typically spotlights advanced experimental techniques and treatments. It began in 1956 with “Proton Irradiation of the Pituitary and Its Metabolic Effects,” which described an early use of proton beam therapy using the then-new cyclotron at the University of California at Berkeley. Speaker Rollin McCombs, M.D., a self-described “physicist turned doctor” at Berkeley, closed his remarks by saying, “[I] suggest that the technic and accelerating machines which have ushered in the nuclear era may, in a less cumbersome and less expensive form, become part of the radiologist’s therapeutic armamentarium, providing him with an agent of precision and penetrating power far exceeding any he now has.”

CONTINUED ON PAGE 12A

Cutting-edge, Captivating, Contemporary: Plenary Lectures Have Told Radiology’s Story

By Evonne Acevedo Johnson

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The Sunday afternoon plenary session at RSNA 2013 included the “Power of Partnership” president’s address by Sarah S. Donaldson, M.D., and the Annual Oration in Diagnostic Radiology.
25, 50, 75: RSNA’s Milestone Anniversaries Have Prompted Reflection and Recognition

By Felicia Dechter

The year was 1939. To kick off his presidential address at the 25th RSNA annual meeting in December at the Biltmore Hotel in Atlanta, President Raymond G. Taylor, M.D., said he was waiting at the airport. “I was waiting at the airport.”

Dr. Rice said. When approving the concept of a special advertisement to the journal Radiology. “It is impossible, in so short a review, to describe in detail the multitudinous activities of fifty years,” he wrote. “The growth of the Society must be attributed to the successive groups of members in the larger centers of population,” Dr. Taylor said in his address. “In the short time these problems have been recognized and approached with any organized and more or less unanimous effort or intention, great progress has been made; and it seems probable that a fair solution is possible, if not actually in sight.”

Because there was no niche in medical practice provided for radiology, and, therefore, no recognized or established place for radiologists, “we have grown into one,” Dr. Taylor concluded.

Golden Anniversary Lauded Society’s Strong Foundation

Twenty five years later, the 50th RSNA annual meeting, otherwise known as the “Golden” meeting, was held at the Palmer House in Chicago. Total registration was just under 4,500, which was an increase of 500 over the year before and made the gathering the largest ever held by the Society. The number of scientific exhibits at the meeting—71—was also a record-breaker.

Howard P. Doub, M.D., RSNA president in 1938, called the Society’s attainment of a golden anniversary a “proud event in the history” of RSNA. “The strength of the Society after half a century rests on the solid foundation laid by its pioneer builders,” Dr. Doub wrote in an article titled, “The Radiological Society of North America: Fifty Years of Progress,” published in the November 1964 issue of Radiology. “It is the result literally of the fervor and the indomitable perseverance of these men.”

Membership had boomed by the mid-1960s, growing from 62 charter members in 1915 to 4,159 members in the various categories “RSNA is believed to be the largest scientific radiological society in the world,” Dr. Doub wrote. “The growth of the Society must be given over to solving the problem of the conscientious work of the pioneer members and their wisdom in incorporating broad educational principles into the permanent framework of the Society. Much credit must be given also to the successive groups of younger members, who have introduced a spirit of scientific progressiveness and of buoyancy into the meetings.”

Dr. Doub would go on to describe the many ways in which those younger members, along with their elders, moved RSNA and the radiologic profession forward. Dozens of members served in the military during World War I and World War II. Meanwhile, back at home, many women trained as radiologic technologists to replace the men who went overseas to fight. By the 1950s, some of these women had completed training to become radiologists, according to the RSNA historical records.

In the Society’s first half century, RSNA members also completed important work via research, manufacturers and standardization committees, established an official publication and celebrated the achievements of radiologists and radiologists through the presentation of historical lectures and awarding of gold medals, Dr. Doub noted. “It is obviously impossible, in so short a review, to describe in detail the multitudinous activities of fifty years,” he wrote.

As he nears retirement, Dr. Rice said his main focus during the annual meeting is CME. He has welcomed new RSNA technologies that offer access the highest quality education in a convenient format. “Having a combination of an onsite experience and a virtual experience is very nice—in fact, I did my first session this year via the Virtual Meeting, while I was waiting at the airport.”

But in addition to the educational offerings, there is a sense of community at RSNA that can’t be simulated, Dr. Rice said. “I came from New Orleans, and since Katrina many of my colleagues have scattered throughout the country. Here at the RSNA meeting, I get to see my friends. It’s been a joy to come to Chicago.”

Radiotherapy History Comes Alive at Centennial Showcase

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“I’ve been coming for the last 25 years, and this one has been spectacular,” said Edgardo Gimenez, M.D., a radiologist at Mayo Clinic in Rochester, Minn. Dr. Gimenez gestured to the EMI CT unit loaned to RSNA by Mayo, saying, “This is the first CT scanner in the U.S., and I’m proud it sits just outside my office.”

The unit isn’t the only piece of vintage technology featured in the Showcase. Attendees can see equipment including historic ultrasound systems, X-ray tubes and tables and an early model remote-controlled X-ray rfrequency system, loaned by exhibitors and partners who have rich histories with RSNA. Visitors can view the technology from all sides and read how the history captures their significance in the evolution of radiology.

The Cases of the Century area gives visitors a chance to try their hand at identifying anatomical structures and making diagnoses based solely on vintage images. Cases that “The strength of the Society after half a century rests on the solid foundation laid by its pioneer builders,” Dr. Doub wrote in an article titled, “The Radiological Society of North America: Fifty Years of Progress,” published in the November 1964 issue of Radiology. “It is the result literally of the fervor and the indomitable perseverance of these men.”

Membership had boomed by the mid-1960s, growing from 62 charter members in 1915 to 4,159 members in the various categories “RSNA is believed to be the largest scientific radiological society in the world,” Dr. Doub wrote. “The growth of the Society must be given over to solving the problem of the conscientious work of the pioneer members and their wisdom in incorporating broad educational principles into the permanent framework of the Society. Much credit must be given also to the successive groups of younger members, who have introduced a spirit of scientific progressiveness and of buoyancy into the meetings.”

Dr. Doub would go on to describe the many ways in which those younger members, along with their elders, moved RSNA and the radiologic profession forward. Dozens of members served in the military during World War I and World War II. Meanwhile, back at home, many women trained as radiologic technologists to replace the men who went overseas to fight. By the 1950s, some of these women had completed training to become radiologists, according to the RSNA historical records.

In the Society’s first half century, RSNA members also completed important work via research, manufacturers and standardization committees, established an official publication and celebrated the achievements of radiologists and radiologists through the presentation of historical lectures and awarding of gold medals, Dr. Doub noted. “It is obviously impossible, in so short a review, to describe in detail the multitudinous activities of fifty years,” he wrote.

As he nears retirement, Dr. Rice said his main focus during the annual meeting is CME. He has welcomed new RSNA technologies that offer access the highest quality education in a convenient format. “Having a combination of an onsite experience and a virtual experience is very nice—in fact, I did my first session this year via the Virtual Meeting, while I was waiting at the airport.”

But in addition to the educational offerings, there is a sense of community at RSNA that can’t be simulated, Dr. Rice said. “I came from New Orleans, and since Katrina many of my colleagues have scattered throughout the country. Here at the RSNA meeting, I get to see my friends. It’s been a joy to come to Chicago.”

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Histories of RSNA and Radiology “Intertwined”

By Paul LaTour

N. Reed Dunnick, M.D., said it was a distinct honor to formally open the 100th annual meeting of RSNA and kick off the Centennial celebration with his President’s Address on Sunday.

“One of the fun parts of preparing for this speech was reading speeches by former RSNA presidents and looking at material from the RSNA archives,” Dr. Dunnick said. “From the very beginning, the histories of the RSNA and radiology have been intertwined.”

During his speech, Dr. Dunnick quoted addresses from RSNA past-presidents Hedvig Hricak, M.D., Ph.D., Dr. h.c. (2010), C. Douglas Maynard, M.D. (2000), Michael A. Sullivan, M.D. (1997), Eugene P. Pendergrass, M.D. (1954) and Howard P. Dubb, M.D. (1938). Dr. Dunnick noted that changing the organization’s name in 1919 to RSNA, from its original name of the Western Roentgen Society, was prompted in part by growth in membership that came to include members from Canada. Today, he said, RSNA has more than 54,000 members from 140 countries, making it a truly international organization.

While devoting the majority of his address to radiology’s future, Dr. Dunnick also examined the history of the specialty, which he called one of the most impactful disciplines in medicine. “From the stunning discovery that radiation could be used to actually treat disease to the remarkable development of imaging modalities such as CT, ultrasound and MR, our profession has changed medicine,” he said.

Among the pioneering innovations during radiology’s evolution, Dr. Dunnick said, were improvements in radiography and fluoroscopy that enabled radiologists to image patients with less radiation. Then there were the contrast media that allowed radiologists to image not only vessels, but also organs such as the kidneys, ureters and bladder—air, carbon dioxide and water were recognized as useful contrast agents.

So very much has changed since the first RSNA annual meeting, held in Chicago in 1915, Dr. Dunnick said. “Our medical grandfathers and great-grandfathers scribbled their research notes with pencils in leather-bound notebooks—and some were still traveling by horse and carriage when the RSNA was founded,” he said. “Today, we use tablets and laptops and can instantly share our ideas electronically with colleagues all over the globe. It’s a radically different world.”

RSNA Technical Exhibits Open with a Bang

RSNA President N. Reed Dunnick and the RSNA Board of Directors led a technical exhibits grand opening ceremony Sunday celebrating 100 years of advancement. Following the introduction of representatives of the technical exhibits anchor companies—Agfa Healthcare, Bard Biopsy, Bayer Healthcare, Canon, Carestream, Fujifilm, GE Healthcare, Hitachi, Hologic, McKesson, Philips, Samsung, Shimadzu, Siemens and Toshiba—commemorative flags dropped and cannons fired streamers to shower the crowd gathered between the North and South halls.

“Our corporate colleagues have done much of the heavy lifting in technical innovation in radiology, and we radiologists could not care for patients without their contributions,” Dr. Dunnick said.

Attendees and exhibitors in the audience spoke of the relationships and advancements they have built and witnessed over their years of experience with RSNA. “From the early adoption of PACS to RSNA’s movement to become a truly international society, this convention is considered the world congress of radiology,” said Eberhard Hagel, M.D., of Hospital Grabs in Grabs, Switzerland.

Trevor Mitchell, an exhibitor with Faxitron who has worked the RSNA annual meeting for seven years, said, “It’s the one place where the clinicians and decision makers are going to be, where you can have worthwhile, constructive meetings in one go. The more you come to Chicago, the more you love it.”

RSNA Acknowledges Role of Press in Promoting Radiology

At a reception Sunday night, members of the RSNA Public Information Committee (PIC) thanked members of the press for representing the face of radiology over the last century.

“As we look back over the last 100 years, we know how important it has been to have you as our partners,” said Mary C. Mahoney M.D., RSNA Board Liaison for Publications and Communications. “Journalists have been invaluable in conveying the value of radiology.

“It is because of you that the public knows who we are and how we contribute to patients’ well-being,” Dr. Mahoney concluded. “You are the ones who get our message out.”
RSNA Honorary Members Have Hailed From Around The World

Today at RSNA 2014, the Society will present RSNA Honorary Membership to three individuals. They follow in the footsteps of 112 others who also have been recognized for “significant achievements in the field of radiology.” Honorary members are nominated by the RSNA president and elected by the Board of Directors. The first Honorary Membership was bestowed in 1970 on Marguerite Hogan Henry, the Society’s first executive director. Since then, RSNA Honorary Members have hailed from around the globe:

Cutting-edge, Captivating, Contemporary: Plenary Lectures Have Told Radiology’s Story

CONTINUED FROM PAGE 9A

In 1986, the New Horizons Lecture explored “Lymphoma, Melanoma, Colon Cancer: Diagnosis and Treatment with Radiolabeled Monoclonal Antibodies.” Ten years later, the New Horizons audience was learning about “Image-Guided Procedures and the Operating Room of the Future.” This year’s lecture is “Future of Ultrasound,” by Jonathan M. Rubin, M.D., Ph.D., from the University of Michigan, who will examine ways to dramatically expand the applications and usefulness of ultrasound through elasticity imaging, volume flow estimation and the use of new contrast agents.

Radiation Oncology Oration is Newest Addition

The youngest of the regular plenary lectures, the Annual Oration in Radiation Oncology (formerly the Erskine Memorial Lecture) began in 1976, when Henry S. Kaplan, M.D., of Stanford University spoke on “Hodgkin’s Disease: Multidisciplinary Contributions to the Conquest of Neoplasms.” Dr. Kaplan pioneered the use of radiation in the treatment of Hodgkin’s, which had previously been a death sentence but was well on the way to being curable by the mid-1970s with a combination of radiation and chemotherapy. In his talk, Dr. Kaplan noted that many of the patients from his first clinical study at Stanford (1953 to 1962) were still alive and relapse-free, and those who died of other causes were free of Hodgkin’s. “Thus, it is now possible to state with conviction that Hodgkin’s disease can indeed be permanently cured,” he said in his conclusion.

Other presenters of the radiation oncology oration have looked at varied topics, such as chemotheradion (1991), linking diagnostic imaging, radiation therapy and nuclear medicine to fight cancer at the molecular level (2002), and managing carcinoma of the prostate under impending healthcare reform (or at least, what seemed to be impending in 1994). This year’s radiation oncology lecture will be “Error Bars in Medical Imaging: Stealth and Treacherous,” a discussion of the ways that 3D imaging (CT, PET and MRI) can both help and hinder effective radiation therapy. Speaker Lawrence B. Marks, M.D., chair of radiation oncology at the University of North Carolina, will discuss the inherent limitations of medical images when applied to radiation therapy and the danger of introducing errors by the way imaging findings are reported.

“Every radiologist who can possibly do so should plan to attend,” Manly J. Sandborn, M.D., said recently. “[Every] every session and every exhibit and the banquet. [A radiologist’s] clientele will appreciate their physician’s time and money necessary to attend this meeting, for they know that it means better service for them on his return.” While Dr. Sandborn’s remarks were published a few years before the establishment of the annual lectures, they immediately became part of the vital annual meeting content he described.

25, 50, 75: RSNA’s Milestone Anniversaries Have Prompted Reflection and Recognition

CONTINUED FROM PAGE 10A

...foundation, the RSNA Board of Directors hoped that in time the return on investment would be significant. As evidence of success, for every $1 the Foundation has awarded, grantees subsequently have obtained $40 of funding from other foundations and agencies, Dr. Campbell said. “An unanticipated, but most gratifying, dividend from the Foundation has been the recent appointment of many former grantees as chairmen and section chiefs of academic radiology departments.

Now, as he did 25 years ago, Dr. Campbell emphasized how RSNA has wisely shifted the focus of its annual meeting from a concentration of presentations from North America to more international involvement to encourage wide dissemination of important radiological information yearly at an easily accessible location. Continued development of respected relationships with technical exhibitors, whom he deemed “colleagues in commerce,” has also been vital, Dr. Campbell said.

Also important to remember—in 1939, 1964, 1989 and 2014, and every year in between—has been the power of a small, voluntary, apolitical, elected RSNA Board of Directors. Dr. Campbell noted. Throughout history these boards, which have attracted the leaders in radiology who support and enhance the goals of RSNA, paved the way for years to come, he said.

“For the future leaders of RSNA, the legacy of commitment fostered by former leaders should give you strength to face the responsibilities ahead,” Dr. Campbell said in his president’s address. “The future of your Society is bright; the horizons for growth and progress appear unlimited.”

To commemorate RSNA’s 50th, or “golden,” anniversary meeting in 1964, the November issue of Radiology featured a special metallic cover.
Business Analytics: the Next Big Imaging Modality?

By Elizabeth Gardner

Radiologists are used to analyzing massive amounts of imaging data to produce a diagnosis but they often ignore the equally large amounts of data available to help run their practices more effectively. A crash course on Sunday afternoon demonstrated how to use basic tools and analytic processes to begin to reap the benefits of “big data,” as well as to identify patterns that can lead to more effective patient care.

The session, “The Use of Business Analytics for Improving Radiology Operations, Quality, and Clinical Performance,” was held in association with the Society for Imaging Informatics in Medicine.

“People need to use these tools to help identify where there may be a bottleneck or a resource that isn’t fully utilized or is being over-utilized,” said session moderator Katherine Andriole, Ph.D., of the Center for Evidence-Based Imaging at Brigham and Women’s Hospital.

Dr. Andriole demonstrated a simple open-source tool that can take in data from multiple sources, such as a PACS, an electronic health record system, and imaging modalities, and use it to analyze metrics like equipment utilization and radiation dose information. Before that analytic step can happen, though, the data needs to be integrated, or normalized so that one set of data can be compared with another. The process, “extract-transform-load (ETL),” has been thoroughly developed for years in other industries, but has only been applied to healthcare relatively recently.

Something as simple as a date—expressed as 11/14/2013 or 11-14-2013—can start another—can create gibberish rather than usable information if the two sets of data aren’t made consistent with each other.

“The quality of the data is the piece that makes this a useful process or not,” Dr. Andriole said. “If the data integrity is not what it should be, the results won’t be what you want.”

Key Performance Indicators Critical
Another challenge for many practices is to figure out exactly what they need to measure, or what their key performance indicators (KPI) should be. For example, one practice looked at the number of exams done with each of its scanners. While one scanner was used for substantially fewer exams than the others, it turned out on closer inspection that it was actually overbooked because its hours of operation were shorter. Dr. Andriole recommended a more sophisticated KPI that looked at each scanner’s hours of use as a percentage of the number of hours available.

Analytics Reveals “Invisible World of Patient Flow
Presenter Paul Nagy, Ph.D., director of the Medical Technology Innovation Center at Johns Hopkins University, recommended that analytic programs be regarded as a new imaging modality—one that reveals the previously invisible world of patient flow.

“The next big imaging modality won’t be a PET/CT scanner, but Big Data, and it’s going to cost as much as other imaging modalities if you do it right,” he said. Even in the current environment, advanced analytics can pinpoint operational problems and help identify explanations and solutions. For example, an analytics program can present a visual representation of how a CT scanner is used during a single day. “If it looks like a comb—if there’s consistently too much space between procedures—it identifies inefficient scheduling,” perhaps a new machine that doesn’t take as long to do exams, Dr. Nagy said. “That’s hard to see if you’re just looking at the data, but the human brain is such a good detection system that if we visualize the data, we can easily see bizarre patterns.”

Dr. Nagy also demonstrated how to analyze the cause of gaps in the comb—whether it was no-show patients, lack of demand for the scanner or some other cause. Sometimes delays from earlier in the day or elsewhere in the organization can have ripple effects. “You have to understand the flow of the system and not punish physicians for a systemic delay,” he said.

Tessa Cook, M.D., assistant professor of radiology at the University of Pennsylvania Medical School, demonstrated several applications of analytics, including a program to track radiation dose, a program for tracking physician follow-up on incidental findings, and a program that helps residents track what they’ve read and determine the accuracy of their readings. While quality and safety aren’t at the forefront of analytics, Dr. Cook said the right tools can enable dramatic improvements.

While dose information from scanners isn’t a perfect representation of how much radiation a patient receives, it can serve as a proxy to start re-evaluating imaging protocols, Dr. Cook said. The biggest challenge is standardizing the data. “Some of it appears as pixels on an image, rather than as structured data,” Dr. Cook said.

Upcoming RSNA 2014 Sessions Will Cover the Analytics Efforts Mentioned by Dr. Cook:

• RCC-22—Monitoring Radiation Exposure: Standards, Tools and HIE REM
• QSE 104—Structured Reporting of Focal Masses in the Abdomen: A Focus on Consistent Communication and Monitoring of Follow-up Recommendations
Tuesday, 2:15 to 2:50 p.m.
• QSE 124—The More You See—Effect of First Year Residents’ Interpretation Volume on Independent Call as Second Year Residents
Tuesday, 3:40 to 3:50 p.m.
• QSE 13A—The Future of Federal Health Information Technology Incentive Programs: Expert Panel,” in Room S104A.

Informatics Experts Discuss HIT Incentive Programs

Radiologists hoping to take advantage of federal health information technology (HIT) incentive programs must first understand how the programs work and how they can affect their practice revenue and operations.

A panel of experts will offer insight into recent and upcoming regulatory changes to programs during the Wednesday session, “The Future of Federal Health Information Technology Incentive Programs and Policies: Expert Panel,” in Room S104A.

Moderated by Curtis P. Langlotz, M.D., Ph.D., advisor to the RSNA Informatics Committee, the course will cover programs including Meaningful Use, which pays an incentive for “meaningful use” of electronic health records, and the Physician Quality Reporting System, which offers financial incentives to physicians who report data on quality measures related to covered services.

Attendees will hear the views of experts involved in the regulatory process to understand intent and context, gain insight into recent and upcoming changes, and decide how their practice should respond to these programs.

Contrast-enhanced CT in Pregnancy Associated with Lower Birth Weight

By Richard S. Dargan

Babies born to women who undergo contrast-enhanced CT during pregnancy appear to have a lower birth weight than those born to women who received CT without contrast, according to research presented Sunday. Researchers said their findings, although preliminary, may validate concerns over the use of iodinated contrast in pregnant women.

CT with iodinated contrast media is relied upon to diagnose potentially life-threatening conditions like pulmonary embolism or appendicitis. However, there are risks associated with iodinated contrast media, and standard guidelines recommend it be avoided during the first trimester of pregnancy based on laboratory and animal studies. Few reports have assessed its use clinically.

For the new study, Jason B. Hartman, B.A., a fourth-year medical student at Case Western Reserve University School of Medicine in Cleveland, and colleagues reviewed charts of 336 pregnant women who underwent CT between February 2005 and December 2013 at University Hospitals of Cleveland. The patients had been examined for headaches, abdominal pain, difficulty breathing and other indications.

After excluding patients with positive CT results or poor follow-up, the researchers were able to compare 128 patients who received contrast with abdominal, pelvic or chest CT with 91 women who underwent non-contrast head CT.

They found that the mean birth weight in the contrast administered group was 2,679 grams, or about 5.9 pounds—significantly lower than the control group’s average birth weight of 3,035 grams, or 6.7 pounds.

Birth weights were 376 grams lower in the group that received iodinated contrast. It’s very surprising that this finding was so clinically measurable.

Jason B. Hartman, B.A.

There were no statistically significant differences between groups regarding mean age of the mother at the time of delivery or mean gestational age at delivery. APOGEP scores, a measure of a newborn’s baby’s health, were similar for both groups at one and five minutes.

Though further studies are indicated to validate and understand the association between birth weight and CT with contrast during pregnancy, Hartman said the findings underscore the importance of using safer modalities such as ultrasound and MRI whenever possible in pregnant women. “Results from this preliminary study provide the impetus for future studies and are an important step in leading to improved clinical outcomes,” he said.

Study co-authors include Alok Harwani, B.S.; Nicholas Bhowmik, M.D.; Bahar Mansoori, M.D.; Kelly Kuo, M.D.; Robert Morgan, B.A.; Akshay Paspulati, B.S.; Pablo R. Ros, M.D., Ph.D., M.P.H.; and Karin A. Herrmann, M.D., Ph.D.
Reinvigorating Biomedical Research Will Fuel Future of Healthcare

CONTINUED FROM PAGE 1A

“...we have arrived as big data providers, and we have a big data challenge,” Dr. Collins said. A six-year initiative, Big Data to Knowledge (BD2K), is expected to ease that transition.

Closing the Gap Between Diagnosis and Treatment

Translating basic science into treatment is also vital, Dr. Collins said. Disorders with a known molecular basis have climbed from less than 500 in the early 1990s to more than 5,000 today. “There is a huge gap between what we can diagnose and what we can treat,” Dr. Collins said. The NIH is working with 10 biopharmaceutical companies on the Accelerating Medicines Partnership, an effort to transform the current model for developing new diagnostics and treatments. As part of this effort, they intend to learn more about Alzheimer’s disease by studying people before disease onset. They also hope to speed up the therapeutic development pipeline—currently an average of about 14 years from the discovery of a drug to its clinical use—by encouraging and enabling the sharing of data. Dr. Collins profiled MR elastography as an example of improving healthcare through science, a key NIH theme. Elastography, an imaging technique that allows researchers to assess stiffness in tissue, recently found a new application in surgical planning for radiologists, who must decide what findings are important enough to report to a referring physician.

The jury deliberated for about 30 minutes before rendering its verdict. Following the dismissal of the case, audience members were encouraged to participate in a question-and-answer discussion with the participants, including Chicago trial attorneys Keith A. Hebeisen (plaintiff lawyer) and Timothy G. Nickels (defendant lawyer).

Despite the jury’s findings, audience members remained concerned about potential lawsuits based on decisions made in practice about incidentalomas, especially if the radiologist recommends no further action, as was the case in the mock trial. That incidental finding turned out to be an early carcinoma, and the patient later died.

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Innovation, Patient Focus Will Help Radiology Thrive for Next 100 Years

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scientific achievements and innovations that have improved patients’ lives.

Advances in ultrasound, CT and MR imaging illustrate the point, Dr. Dunnick said. Ultrasound has virtually replaced liver biopsies for patients with cirrhosis in Europe; CT has eliminated exploratory laparotomies because it is so accurate in identifying abdominal pathology; and MRI has made it possible to acquire a vast array of information about structure in the body.

“The cumulative effect of all of these modalities—ultrasound, CT, MRI, and others—has been nothing short of transformational for medicine,” Dr. Dunnick said. “Just think of it, today an imaging study is obtained at almost every medical encounter.”

Dr. Dunnick kept his focus on the future, but also included the intertwined histories of radiology and RSNA. (See story in the Daily Bulletin Commemorative Centennial Edition, Page 11A.)

“I am convinced that we will conduct the research needed to advance our field, and that this new, exciting approach to radiology will prevail,” Dr. Dunnick said. “I am personally committed to it and I hope all of you will be as well—it’s a golden opportunity to truly shape the future of our profession.”

RSNA. “It’s good to have one voice singing out loud, but it’s even better if we all get together and take one voice and turn it into a whole symphony,” he said. “Then perhaps, the music will be compelling. I think we can get there.”

“A medically and legally, the whole discussion was very good,” said Leonard Berlin, M.D., who served as the event’s moderator. “It really worked out very well.”

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The power of innovation has transformed our healthcare industry from the days of Roentgen’s tube to the robust wireless digital technology of the Konica Minolta AeroDR XE flat panel detector. The new AeroDR XE is for extreme environments and meets the demanding needs of the ER/Trauma, ICU/CCU and all portable applications.

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Cost is Barrier to CT Lung Cancer Screening Programs

Although more and more of the country’s leading academic medical centers are offering CT lung cancer screening, many still aren’t screening large numbers of patients, according to a survey presented Monday.

By Mike Bassett

Conducted in March 2014, the survey was emailed to thoracic radiologists at 21 academic medical centers identified from the 2012-2013 U.S. News and World Report listings of top hospitals, cancer centers and pulmonary medicine centers. The survey follows up on one conducted in March 2013. Of the 20 survey respondents, 95 percent (19) have an active screening program, an increase from 79 percent in 2013. However, just five or fewer patients are scanned per week at 14 of the 19 sites, while only one site scans more than 20 patients per week, said presenter Phillip Boiselle, M.D., of Beth Israel Deaconess Medical Center in Boston.

“We expected that more programs would be screening, but it was a surprise that so few patients were being screened at individual sites,” Dr. Boiselle said. “While we didn’t address the question of why centers are reaching so few patients, I think a barrier to this test,” said Dr. Boiselle, stressing that financial barriers might change now that the Centers for Medicare and Medicaid Services has issued a preliminary decision to cover low-dose CT lung cancer screening for eligible patients. “If, as anticipated, this proposal is approved, it will remove the important barrier of cost for seniors who meet eligibility requirements for screening,” Dr. Boiselle continued. “When you couple that with forthcoming coverage from private insurers as mandated by the Affordable Care Act, we anticipate seeing a much larger number of patients being screened, not only at these sites, but also at other sites across the country.”

Study Shows Value of CT Lung Cancer Screening

At the same session Brady McKee, M.D., a radiologist at Lahey Hospital & Medical Center in Burlington, Mass., presented a study suggesting that expanding the eligibility requirements for CT lung cancer screening could save thousands of additional lives.

When Lahey began its low-dose screening program in 2012, only one set of guidelines was available — those of the National Comprehensive Cancer Network (NCCN) — which recommend CT lung screening for patients in two high-risk groups.

“CT screening is younger and smoked less — 50 years or older with a 20-pack-year history of smoking. Group 2, however, is also defined as having one additional risk factor such as other lung disease or a family history of lung cancer. Lahey chose to screen both groups. In their study, Dr. McKee and his colleagues retrospectively reviewed the results of all CT lung-screening exams from January through December 2012 and compared the demographic characteristics of and screening results for the 1,302 patients in Group 1 and 458 patients in Group 2.

“There were significant [demographic] differences between Group 2 and Group 1,” Dr. McKee said, pointing out that the average patient in Group 2 was younger, smoked less, was less likely to be a current smoker, and if a former smoker, had gone a longer time without smoking than his or her Group 1 counterpart.

Despite these demographic differences, the screening results for the two groups were similar. For example, 28 percent of individuals in Group 1 had positive exams compared to 25 percent in Group 2; 6.1 percent in both groups had at least one clinically significant incidental finding; and 0.6 percent in Group 1 and 0.1 percent in Group 2 had findings suspicious for pulmonary infection. Six cases (1.8 percent) of lung cancer were diagnosed in Group 2 and 17 (1.6 percent) cases were diagnosed in Group 1.

Since the screening results were similar for both groups, opening up screening programs to individuals from Group 2 could save thousands of additional lives, Dr. McKee said. At Lahey, a little more than a quarter of the individuals screened for lung cancer came from Group 2. “If we know there are something like 7 to 9 million people in the U.S. who meet the Group 1 criteria, it could mean there are 2 to 3 million who meet the Group 2 criteria,” he said. “This at least provides a ballpark estimate about how many additional lives can be saved.”

More on Lung Cancer Screening This Week

Other RSNA 2014 offerings address the rapidly evolving issue of lung cancer screening:

Lung Cancer Screening: Update on Policies and Procedures

Not Topic Session SPSHS2

THURSDAY, DEC. 4 • 3:00–4:00 P.M. — ROOM 5406B

While guidelines for who should be screened for lung cancer with CT have been developed by many organizations, policies and procedures for performing lung cancer screening have not been fully developed. The radiology community, governmental officials, and patient advocacy groups have been influential in affecting standards, policies and procedures for lung cancer screening. This session will review and update these actions.

Build It Right: Tools and Instructions for Assembling a Lung Cancer Screening Program

Education Exhibit CHE012-b

This electronic exhibit available for viewing in the Learning Center addresses such issues as identifying institutional stakeholders and key personnel, defining the screening population, determining screening timing and duration, program rollout and results notification and tracking.

Today’s Press Conferences

RSNA invites members of the medical news media to attend its annual meeting each year so that, through stories in print, broadcast and Internet media, the public gains a greater understanding of radiology and its role in their healthcare.

Four press conferences will be held today:

• High School Football Players Show Brain Changes after One Season
• Imaging Shows Brain Connection Breakdown in Early Alzheimer’s Disease
• PET/CT Shows Pituitary Abnormalities in Veterans with PTSD
• Researchers Use 3-D Printing to Guide Human Face Transplants

RSNA 2014 press releases are available online at RSNA.org/press14.
Breast Arterial Calcification Predicts High Calcium Scores in Women with Coronal Artery Disease

By Felicia Dechter

BREAST ARTERIAL CALCIFICATION (BAC) predicts high coronary calcium scores (CAC) and coronary artery disease (CAD) in coronary CT angiography (CCTA), independent of age and risk factors, according to an RSNA 2014 presenter. BAC identified in routinely performed mammograms could potentially be used to direct further testing to detect CAD in women.

The findings were the findings of the study, “Relationship of Breast Arterial Calcification with Coronary Calcium Score and Coronary CT Angiography,” presented Sunday by Mariana Diaz-Zamudio, M.D., a radiologist at Instituto Nacional de Cardiologia in Mexico City.

Conducted at Cedars Sinai Medical Center in Los Angeles from September 2013 to January 2014, the retrospective study consisted of 204 women, all over 45 years of age who underwent screening or diagnostic mammography and CCTA. The time between mammography and CCTA ranged from 0 days to 24 months; median time was seven months.

Mammography studies were reviewed by an experienced reader blinded to CT results. BAC was assessed using a semi-quantitative scale (none/mild/moderate/severe). CAC was categorized as 0, 1-99, 100-399 and greater than 400 and CCTA as 0, less than 50 percent, 50-69 percent, and greater than 70 percent stenosis grade.

“Our study shows that the presence of breast arterial calcification is associated with high coronary calcium scores, greater than 400, and CCTA greater than 50 percent, independent of age and risk factors,” Dr. Diaz-Zamudio said.

Results of the study are good news for women with CCTA, she added. Since mammography is done routinely for screening, incidental BACs could raise the question about the presence of CAD and increase detection for women.

For example, Dr. Kopans pointed out that while mammograms are “free” with no co-pays or deductibles under the Affordable Care Act, a patient called back for a diagnostic test “will have to pay however the deductible is, and with more and more patients moving into higher deductible plans, that can be quite a burden for some of the our patients,” Dr. Kopans said. “Patients aren’t going to consider that to be great care.”

A patient who needs to take a day off for a call-back and will have to pay hundreds of dollars out-of-pocket for the procedure could begin to think about foregoing a mammogram on an annual basis, Dr. McIntyre said.

“We want to make sure patients have every reason to comply with screening guidelines,” Dr. McIntyre said. “Mammography is a life-saving examination, so we have to start thinking about payment models that ensure radiologists are reimbursed enough to provide those services, and we have to make sure that patients have an incentive to comply with screening guidelines.”

Mammography Controversy Continues

“Mammography screening has been one of the major medical advances of the last 20 years,” said presenter Daniel Kopans, M.D., department of radiology, Harvard Medical School and director of breast imaging, Massachusetts General Hospital, in his session on current breast imaging controversies. “What is interesting is that the opposition to mammography screening has been going on as long.”

This is despite the fact that there is more and more evidence that screening saves lives, he said. Yet, there continues to be what he calls “the continued use of misinformation” to try and deny women access to mammography.

“This has been going on way too long,” he said, and called out a number of major medical journals for refusing to publish work supporting screening while publishing work opposing it—particularly as it related to women between ages 40-49.

For example, Dr. Kopans referred to a 2010 study published in the New England Journal of Medicine “that purported to show that screening women in Norway had very little effect on mortality.” But, Dr. Kopans explained, one of the problems with that study was that it had an average follow-up time of 2.2 years even though evidence has shown that benefits from screening don’t appear until 3-5 years after it has been instituted.

“This is misinformation a peer reviewer should pick up, and didn’t,” he said. Dr. Kopans was also harshly critical of more recent studies, such as one published in the November 2012 edition of the New England Journal of Medicine in which the authors estimated that more than 30 percent of all of breast cancers diagnosed by screening were overdiagnosed, was based on “assumptions” and “estimates.”

Despite such research, the salient point, he concluded, is that “the data clearly support annual mammography beginning at the age of 40.”

From Screening Guidelines to Mammography Controversies, Experts Assess the State of Breast Imaging


By Mike Basset

I N TERMS OF BREAST CANCER screening, Carol Lee, M.D., a radiologist at Memorial Sloan-Kettering Cancer Center, said the recent push to notify women of their breast density has led to an increased demand for supplemental screening, “because we know that mammography can be limited for women with dense breasts.”

Dr. Lee focused on MRI and ultrasound—the two supplemental screening modalities for which a fair amount of data is known about the risks and benefits associated with each.

While ultrasound and MRI began as diagnostic modalities in breast imaging, Dr. Lee explained that as these modalities evolved, it became clear they had some advantages over mammography and could be used in a screening setting.

“We have more and more data about how these modalities perform in screening,” she said, adding that while researchers “don’t have all the answers,” what we do have can provide radiologists with a rational approach on how to address the question of what to use, when to use it, and for whom.

Ultrasound has several advantages: it doesn’t involve any compression or radiation, it is non-invasive and is relatively inexpensive and widely available. Studies have also shown that ultrasound provides a cancer detection rate that is better than mammography, Dr. Lee said. In terms of disadvantages, ultrasound is operator-dependent and studies have shown that the positive predictive value of screening ultrasound is low.

While MRI also has disadvantages. For example, not all women can tolerate the modality, it requires intravenous contrast, it requires intravenous contrast, and the imaging time is long.

However, the ACS recommends against MRI as first-line screening, but that tomosynthesis is reasonable, depending on the patient’s breast density, age, and risk factors, and that MRI is the appropriate modality for those who have a lifetime risk of cancer of between 20 to 30 percent.

“In terms of breast cancer screening, I think the best we can do is use the best modality,” Dr. Lee said. “But we still need a rational approach on how to address the question of what to use, when to use it, and for whom.”

Looking to the future, Dr. Lee said that “we have more and more data about how these modalities perform in screening.”

“The best we can do is use the best modality,” Dr. Lee said. “But we still need a rational approach on how to address the question of what to use, when to use it, and for whom.”

Daniel Kopans, M.D., Geraldine McGinty, M.D., and Carol Lee, M.D., discussed issues impacting breast imaging on Sunday.

We have more and more data about how these modalities perform in screening.

Carol H. Lee, M.D., Memorial Sloan-Kettering Cancer Cen-

Tomosynthesis Surges in 2015

In terms of the economics of breast imaging going into 2015, Geraldine McGinty, M.D., chair of the American College of Radiology’s Economic Commission, said, “I think there is a huge appetite to understand what is happening with tomosynthesis.”

The good news, Dr. McGinty said, is the Centers for Medicare and Medicaid Services said it will cover tomosynthesis starting January 1, 2015. However, one problem is that many private payers are “still holding on to the idea that tomosynthesis is still experimental” and will not pay for the procedure, she said.

On the bad news side, however, is the fact that CMS wants the Relative Value Scale Update Committee (RUC) to review the entire breast imaging code family, which could be a problem, Dr. McGinty said, because the RUC has been known “unfriendly” to radiology.

The ACR is also working ways to align payment policies with good care.
MDCT Shows Promise as Alternative Technique in Rectal Cancer Staging

By Elizabeth Gardner

Multidetector CT (MDCT) and multiplanar image reconstruction (MPR) might be as accurate as MRI—the current gold standard for determining whether rectal cancer has invaded the mesorectal fascia (MRF)—according to a study presented Sunday.

“MRF involvement is the most important point for determining the extent of disease, the appropriate course of treatment and the patient’s prognosis,” said presenter Silvia Girolama Drago, M.D., with the Department of Diagnostic Radiology, San Gerardo Hospital, Monza, Italy, which is affiliated with the University of Milan-Bicocca.

Accurate pre-operative staging is essential for assessing resection margin and identifying MRF tumors. While many researchers have compared MRI and CT for predicting the depth of bowel wall involvement and lymph node invasion, few have addressed the problem of MRF infiltration, Dr. Drago said.

The team’s study had two objectives: to evaluate the accuracy of MDCT and MPR compared with conventional MRI, and to assess whether MPR images are more accurate than axial CT images alone. The study may lay the groundwork for replacing follow-up MRI studies with MDCT for patients with confirmed rectal cancer who can’t undergo MR or don’t have access to MR facilities. MDCT can also be performed at lower cost than MRI, co-investigator Davide Ippolito, M.D., said.

The elimination of MRI could potentially increase convenience for both patients and physicians. “In one step we can get information about loco-regional tumor staging and information about distant metastases,” Dr. Drago added.

The prospective study comprised 79 patients (55 male), with a mean age of 69, who had biopsy-confirmed primary adenocarcinoma of the rectum and had been referred for thoracic and abdominal CT staging before starting treatment with surgery and neoadjuvant radio-chemotherapy. Researchers performed multiplanar CT reconstructions and reviewed imaging data as axial images and then as MPR images. Each patient was also assessed with an MR study performed at 1.5 T with a dedicated phased array multicoil, including multiplanar T2 weighted sequences and axial T1 weighted sequences. Axial CT and MPR CT images were then compared to MRI imaging in order to assess the involvement of MRF.

In the T2-weighted MR images, rectal cancer appeared as hyperintense compared to the muscles and MRF was a hypointense line surrounding the mesorectal fat. In the axial and MDCT images, rectal cancer was seen as an intraluminal mass or as a mural thickening (greater than 6 mm). MRF was a thin, curvilinear structure surrounding the mesorectal fat with similar density to the muscles.

The MPR images increased the accuracy of the CT scan from 77 percent to 86 percent compared with axial images alone. The MPR images also showed MRF invasion as accurately as the MR images. Dr. Drago said the team continues to collect data on new patients, and may expand the research to compare the performance of the two modalities in other areas where MRI is routinely used.

Assuming equal accuracy, MDCT has some flexibility advantages over MRI, she noted. While MRI offers more options for orienting the machine during the exam to get the best angle on the site being imaged, the resulting images can’t be changed.

“With CT, you just get one orientation of acquisition, but you can perform multiplanar reconstructions at any angle,” she said. “The computer gives you more freedom.”
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