Research Still Needed to Improve Prostate Cancer Outcomes

By Mike Bassett

Despite an impressive amount of science that has been accomplished in the area of prostate cancer, Colleen Lawton, MD, reminded her colleagues during Wednesday’s Annual Oration in Radiation Oncology, “Prostate Cancer: Improving the Flow of Research,” that a lot of research remains to be done.

According to Dr. Lawton, vice chair of the Department of Radiation Oncology at the Medical College of Wisconsin, Milwaukee, prostate cancer in many cases resembles “an ugly stepsister” when it comes to the amount of funding and research that’s been committed to the disease.

She noted, for example, that prostate cancer is diagnosed in over 200,000 men and is responsible for the deaths of 27,000 men annually in the United States. “Yet we think of it as a disease in our country that men don’t really have to worry about.”

By contrast, she pointed out, breast cancer is diagnosed in about the same number of women, kills over 40,000 women annually, and is thought of as an epidemic that must be stopped.

“We have a dichotomy here that needs to be fixed,” she said.

Screening Standards Still Lacking

She referred to what appears to be different approaches to screening breast and prostate cancer. While there has been much debate about both mammography and prostate cancer screening, there seems to be a consensus that women of a certain age should have yearly mammograms.

When it comes to prostate cancer, however, the test that was considered most appropriate — PSA screening — has been questioned over time, to the point that the United States Preventive Services Task Force now recommends against it.

“On the prostate cancer side, clearly we have much more work to do to come up with the best way to screen,” Dr. Lawton said.

Dr. Lawton went on to discuss how research into, and the treatment of prostate cancer has evolved from low-risk and intermediate-risk prostate cancer, to metastatic and post-operative disease.

She also described the significant role diagnostic radiology has played in helping radiation oncologists detect and treat prostate cancer.

Ehman is RSNA President

Richard L. Ehman, MD, is RSNA president for 2017. Dr. Ehman is professor of radiology and Blanche R. & Richard J. Erlanger Professor of Medical Research at the Mayo Clinic in Rochester, Minn.

As president, Dr. Ehman will work to emphasize RSNA’s commitment to foster continuous innovation in patient-focused radiology.

“Advances in medical imaging over the last few decades have provided amazing benefits for healthcare,” Dr. Ehman said. “We need to recognize and quantify these contributions, not just so that we can celebrate them, but also because they provide evidence of an extraordinary return-on-investment for research in our field. As the leading radiology organization in the world, RSNA can help spread awareness outside of the radiology community of the high productivity and rapid clinical impact of our science.”

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 Calgary. In 1984, he completed a year-long research fellowship 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 300 peer-reviewed scientific articles and has completed many 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 Governors from 2006 to 2014. In 2014, he was elected as an emeritus member of the Mayo Clinic Board of Trustees. He has been an active member of many medical societies and is past-president of several organizations, including the International Society for Magnetic Resonance in Medicine (ISMRM), Academy of Radiology Research, and the Society for Body Computed Tomography and Magnetic Resonance.

Jackson Named Board Chair

Valerie P. Jackson, MD, is chair of the RSNA Board of Directors for 2017. An expert in the field of breast imaging, Dr. Jackson is the executive director of the American Board of Radiology (ABR), a position she has held since 2014. She previously served on ABR’s board of trustees from 2001 to 2010.

Dr. Jackson received her medical degree in 1978 from the Indiana University School of Medicine, and completed her residency at the Indiana University Medical Center in 1982. Dr. Jackson is the Eugene C. Klatt Professor Emeritus and has had numerous academic appointments at Indiana University School of Medicine over the years, including lecturer, professor and chairman of the Department of Radiology and Imaging Sciences.

As chair of the RSNA Board, Dr. Jackson is committed to helping the Society capitalize on education and research opportunities.

“RSNA is a world leader in education and research, and my goal is to build upon the traditions of the past to move the organization and its members into the future,” Dr. Jackson said. “In these times of rapid change, I will listen to our members about their needs and wants. I feel truly honored to have the opportunity to serve this great organization as the chair of the Board of Directors.”

Dr. Jackson has published more than 100 peer-reviewed articles and 20 books and book chapters with an emphasis on breast imaging and radiologic education. She has served as principal investigator on numerous funded grants including several focused on radiologic education. Dr. Jackson has been a co-presenter of the RSNA Faculty Development Workshop and is a sought-after lecturer and educator, who has made more than 300 scientific and educational presentations at meetings worldwide. Dr. Jackson has served on the editorial boards of multiple journals, including Contemporary Diagnostic Radiology, Journal of the American College of Radiology, The Breast Journal and Seminars in Breast Diseases: Radiologic, Pathologic, and Surgical Considerations. She has served as a manuscript reviewer for numerous journals.
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Researchers may have found a way to diagnose the lymphoma in patients who live in remote, low-income areas like sub-Saharan Africa using modified smartphone technology.

The research, presented Wednesday by Aoiye Kilcoyn, MBBCh, of Massachusetts General Hospital (MGH), shows promise for empowering resource-poor communities with complex laboratory tests.

“It’s cheap, accessible, easy to do and easily replicable,” Dr. Kilcoyn said.

Employing fine-needle aspiration, a thin needle can be inserted into abnormal-appearing tissue to obtain a sample. The sample is placed in saline and immunola- beled with microbeads, then a photo can be taken with a smartphone fitted with a lens attachment that creates a hologram. The image is then sent to a remote server via the cloud.

Within as little as an hour, a diagnosis can be delivered indicating the presence (or not) of lymphoma and the likely treatment. The total cost of the procedure could eventually be less than $1.

“In Africa the physician-to-patient ratio is not that great,” said Divya Pathania, PhD, a study co-author and post-doctoral research fellow at the MGH Center for Systems Biology. “Often, by the time a patient gets screened, it is quite late.”

The team analyzed eight tissue samples obtained with the technology and compared the results with standard technology.

“Our technology was 100 percent accurate,” Dr. Kilcoyn said.

She said the team hopes to expand the clinical trial deploying the technology in Botswana within the next two years. They have already identified a hospital and tested the strength of the internet connection to assure the process won’t be hampered by insufficient technology.

If successful, the new technology could help treat patients who may live hundreds of miles from a hospital, she added.

“The ultimate goal is to develop a mechanism for diagnosing a cancer early and thus tri- aging patients into, for instance, those who may need chemotherapy and those who may need treatment for infections,” Dr. Kilcoyn said.

While the initial study involves lymphoma, she said the same technology could be used to sample other kinds of cancer as well.

Hyungsoon Im, a study co-author, said this advance in radiology would not have been possible without enhancements over the last few years in smartphone technol- ogy. “This has a great future,” Im said.


Smartphone Technology Could Enhance the Diagnosis of Lymphoma

By Michael Hart and Paul LaTour

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Continued from cover

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Dr. Ehman has served as chair of the Radiology and Nuclear Medicine Study Section of the National Institutes of Health (NIH), where he has also served terms on the Advisory Council of the National Institute of Biomedical Imaging and Bioengineering and on the Council of Councils. Dr. Ehman is an NIH-funded clinical scientist and researcher. He holds more than 70 U.S. and foreign patents, and many of these inventions are widely used in medical care. Dr. Ehman was awarded the ISMRM gold medal in 1995, the RSNA Outstanding Researcher Award in 2006, an RSNA Honored Educator Award in 2016, and the gold medal of the Asian Oceanian Society of Radiology in 2016. He was named Mayo Clinic Distinguished Investigator in 2014. He is a Fellow of the American College of Radiology. In 2010, Dr. Ehman 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 Committee, Research Development Committee, Grant Program Committee and the RSNA Research & Education Foundation Board of Trustees. In 2010, he was elected to RSNA’s board of directors and in 2011 became the liaison for science. He served as board chair from 2014 to 2015 and president-elect from 2015 to 2016.

Ehman Named Board Chair

Including American Journal of Roentgenology, Investigative Radiology, Medical Physics, Academic Medicine and Radiology, where she served as associate editor on the editorial board from 1989 to 1998, and as consultant to the editor in 1999. An RSNA member since 1982, Dr. Jackson has served the Society in numerous roles, including as chair of the Refresher Course Committee from 2009 to 2012, chair of the Breast Imaging Subcommittee of the Scientific Program Committee from 2001 to 2006, a member of the Public Information Advisors Network since 1997, and a member of the RSNA News Editorial Board from 2005 to 2008. She served RSNA as first vice president from 2008 to 2009 and was a member of the RSNA Centennial Committee. Dr. Jackson has been active on many committees of the RSNA Research & Education (R&E) Foundation and served on the R&E Foundation Board of Trustees from 2009 to 2015. Dr. Jackson has held committee or leadership positions in a number of radiologic organizations, including the Indiana Radiologic Society (IRS), American Roentgen Ray Society, Association of University Radiologists, Radiology Research Alliance, Academy of Radiology Research, Society of Breast Imaging (SBI) and the American College of Radiology (ACR). Dr. Jackson is a fellow of the ACR and has received numerous honors including the gold medals of the IRS, SBI and ACR. The Valerie P. Jackson Education Fellowship was recently established in her name by ACR. Dr. Jackson delivered the Annual Oration in Diagnostic Radiology, “Screening Mammography: Controversies and Headlines,” at RSNA 2002.
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That’s Radiological
Not So Elementary: Experts Debate the Takeover of Radiology by Machines

Radiologists could be replaced by computers in 20 years — or not, depending on who you were listening to during the Wednesday Controversy Session, “Elementary My Dear Watson: Will Machines Replace Radiologists?”

by Richard Dargan

Panelists John Eng, MD, Bradley J. Erickson, MD, PhD, and Eliot Siegel, MD, participated in the spirited debate. Dr. Erickson, of the Mayo Clinic in Rochester, Minn., said that improvements in graphic processing units (GPUs) and developments like deep learning (DL) have enabled computers to surpass humans in some cases of image recognition. He cited the potential of DL to improve radiology by identifying normal screening exams and delivering high-quality preliminary reports. In five years, DL will likely be able to create reports for mammography and chest x-rays, he said, and in 15 to 20 years for most of diagnostic imaging.

But co-presenter Dr. Siegel, of the University of Maryland Medical Center in Baltimore, argued that these image recognition improvements are not applicable to radiology. “Radiology represents a completely different challenge, with much larger and more complex information,” he said. “The information is extraordinarily more complex than picking out a dog or a cat. There are so many reasons why it is silly to think we’ll be replaced in 20 years or in our lifetimes.”

Dr. Siegel expressed concern that the hype around machine learning (ML) is becoming a major and unfounded source of anxiety among radiologists that could hurt recruitment in medical schools. He cited a story in the September 2016 Journals of the American College of Radiology that described machine learning as an “ultimate threat” that could “end radiology as a thriving specialty.” Two radiologists recently emailed him asking if they should quit the practice or risk finding jobs when they graduate.

On the contrary, Dr. Siegel predicted that there will be more radiologists in 20 years, not fewer, and that computers will be regarded as trusted friends, able to create preliminary reports, but not primary ones. The implementation of DL in radiology faces other hurdles, including the amount of time and money needed to train a machine to learn from vast databases like the National Lung Cancer Screening Trial, Dr. Siegel said. Also, the U.S. Food and Drug Administration (FDA) would be hesitant to approve technology that elevated computers to healthcare decision makers, he said, adding that medicolegal issues abound.

“Who do you sue when a computer that replaced radiologists makes a mistake, even assuming you get FDA clearance?” Dr. Siegel asked.

Dr. Erickson countered that massive investment in the DL space and its associated political power would make regulatory bodies move faster to approve new roles for computers in radiology. He also pointed to the exponentially faster computing processing power as a harbinger of a greater role for DL.

Dr. Siegel remained unimpressed, noting that processing speed is largely irrelevant if the computer is making mistakes in diagnosis.

Machines Could Make Radiology More Vibrant

Despite the good-natured ribbing, the two radiologists reached something of a consensus at the close of the session. They agreed that, in the future, computers will be performing many tasks performed by radiologists today, and that they provide a useful service in areas like quantitative imaging, biometric measures, workflow and patient safety.

“It’s a natural reaction for radiologists to think the computer is going to replace them, but this fear represents an oversimplification of what a computer can do and what the profession of radiology is,” Dr. Erickson said. “What machine learning can do is help remove the humdrum and make the profession more exciting and vibrant.”

“Radiologists judge, explain, qualify check, counsel, teach, discover, console, explore, create and do so much of things that are not computers even close to being able to do,” Dr. Siegel added.

Origins of Interventional Oncology Can Be Traced to a Chicago Pizzeria

by Paul LaTour

A strange as it sounds, the roots of interventional oncology can be traced back to a gathering at an iconic Chicago pizzeria during an RSNA annual meeting nearly 20 years ago. But it wasn’t just the pizza that brought more than 20 radiologists to Gino’s East in Chicago’s River North area on that Tuesday night in 2005. The pizza was just a bonus.

“Kidney ablation was just starting to come online when we met, so people didn’t know if that was going to be a significant area. That’s turned out to be what climbed the ladder of clinical acceptance the fastest,” Dr. Callstrom said.

Interventional oncology saw rapid growth as the image-based, minimally invasive approach became more widely accepted as an alternative to surgery. Some of the newest technologies include radioembolization, microwave ablation, tumor cryoablation, focused ultrasound, light-activated therapy and ultrasound-mediated drug delivery.

As the technologies developed, the group stayed in touch to keep current on their latest findings, allowing the field to experience a grass-roots style growth.

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“I’m emotionally attached to that meeting because that was truly the start of a new chapter of medicine. That was the core group that eventually developed this branch of interventional oncology. We shared these values and a vision,” said Ricardo A. Lencioni, MD, now one of the world’s foremost interventional oncologists and founder of the European Conference on Interventional Radiology (ECIO).

At the time of the gathering, the field of interventional oncology hadn’t yet been coined. Using radiofrequency ablation for liver tumors was in its embryonic stage, though it was used more frequently in Europe, especially in Italy where Dr. Lencioni’s mentor Luigi Solbiati, MD, practiced. Dr. Solbiati was one of the organizers of the Gino’s meeting, along with J. William Charboneau, MD, who presented the RSNA’s 2006 New Horizons Lecture about the then-emerging field of image-guided cancer treatment.

For three hours in a semi-private enclave of the restaurant, the group shared their experiences using radiofrequency ablation to target liver tumors, and to some extent, kidney tumors and bone cancers. They saw the potential for this technique, even though they didn’t know quite where it was headed.

“The specialty has gone in a few directions I didn’t anticipate back then,” said Matthew R. Callstrom, MD, PhD, a consultant in the Division of Diagnostic Radiology at Mayo Clinic and a professor of radiology at Mayo Clinic College of Medicine in Rochester, Minn.

Dr. Callstrom pointed to kidney ablation as an area in which he didn’t anticipate growth. At the start, interventional oncologists focused on liver ablation because that was where the technique was first employed.

“Kidney ablation was just starting to come online when we met, so people didn’t know if that was going to be a significant area. That’s turned out to be what climbed the ladder of clinical acceptance the fastest,” Dr. Callstrom said.

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As the technologies developed, the group stayed in touch to keep current on their latest findings, allowing the field to experience a grass-roots style growth.

“That was very useful because if somebody was doing something unique, we were able to disseminate information quickly before it was published in any peer-reviewed journal,” said Damian E. Dupuy, MD, director of tumor ablation at Rhode Island Hospital and a professor of diagnostic radiology at Brown Medical School in Providence, R.I.

Eventually, the informal meetings became more structured and led to the creation of the Society for Interventional Radiology (SIR) and the Cardiovascular and Interventional Radiological Society of Europe (CIRSE). An annual conference, the European Conference on Interventional Oncology (ECIO), was also created and is held in the United States each year, in addition to the annual ECIO held in Europe.

An interventional oncology multisession series at RSNA’s annual meeting also developed as the group continued to meet over the years. The series, which began at RSNA 2005, has blossomed to a five-day symposium that ends Thursday at RSNA 2016.

Many of the original group serve as moderators or presenters of the symposium, including Drs. Callstrom, Dupuy, Lencioni and Solbiati. They’ve earned international renown as their careers progressed as ablation gained wider clinical acceptance.

“RSNA, because of its wide-reaching international interest, was the perfect opportunity at that time to bring together experts from various countries. It allowed the meeting at Gino’s to occur. If you didn’t have the RSNA annual meeting, the growth of interventional oncology might not have happened as easily or as organically,” said Dr. Dupuy.
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Researchers Harness Big Data to Better Serve Patient Populations

A study presented Wednesday emphasized the growing need for radiologists and other healthcare professionals to develop patient-centered, socially sensitive solutions to improve patient engagement and healthcare access.

By Lynn Antonopoulos

ACCORDING TO EFREN FLORES, MD, director of radiology community health improvement at Massachusetts General Hospital (MGH), terms like “no show,” “non-compliant” and “disruptive” unfairly place all responsibility for missed appointments on the patient. He said patients and providers share responsibility and should view missed appointments as missed care opportunities (MCOs). “MCOs should not be considered an inefficiency of the system, but rather a failure of the system to engage patients into their healthcare,” he said.

Dr. Flores and his colleagues developed the Patient Engagement for Equity in Radiology (PERER) project to identify socioeconomic and demographic factors negatively affecting patient care. They obtained data from 1.1 million patient records during a 25-month period at MGH and conducted an in-depth, subset analysis of 120,000 exams to develop a predictive model to determine factors contributing to MCOs.

The analysis included 21 possible predictors such as patient age, gender, race, ethnicity, education level and more. The team also examined data from external sources, including the U.S. Census to obtain factors like weather conditions, median household income and distance to appointment among others.

Study results showed that factors like languages other than English, ethnicity—notably black and Hispanic—and lower education level were significantly associated with MCOs. In patients scheduled for breast imaging, conditions including congestive heart failure, COPD and depression were notably associated with MCOs.

Dr. Flores and his team also performed a subset analysis of pediatric patients and found that child age, height, obesity and missed clinical visit appointments were factors contributing to MCOs. He commented, “Children are more susceptible to the surrounding social environment.

We need to move beyond imaging to help these populations and decrease MCOs.

By Elizabeth Gardner

A 3-D model of an 8-year-old girl’s scoliotic spine proved so helpful in pre-surgical planning that surgeons used it in the operating room. Javin Schefflein, MD, of New York’s Mount Sinai Hospital, “contacted the neurosurgery team who were excited at the prospect of generating a precise physical model to help visualize the pathology and plan surgery.”

While routine 3-D reconstruction couldn’t adequately display all of the anomalies, Schefflein said. So far, surgery teams pay for the models generated at Mount Sinai, but finding a workable payment policy is the main challenge. Dr. Schefflein said. “More than numbers, this study represents patients. Radiology has been passive, and we need to move beyond imaging to help these populations and decrease MCOs.”

3-D Scoliotic Spine Model Aids Pre-Surgical Planning in 8-Year-Old Girl

A 3-D model of an 8-year-old girl’s scoliotic spine proved so helpful in pre-surgical planning that surgeons used it in the operating room to guide a complex — and ultimately successful — multi-stage procedure.

By Efren Flores, MD

Researchers created a 3-D anatomic model printed life-size (right).

The operation, according to Dr. Schef- flein, was a complete success. In terms of creating the model itself, the process took more than 10 hours including scanning (10 minutes), segmenting (three hours), printing (five hours) and drying/hardening time (two to three hours), and it cost about $710.

The materials and labor were cheaper than we expected, though the start-up cost for accurate modeling can be daunting,” Dr. Schefflein said. Mount Sinai’s printer alone cost about $60,000.

Finding a workable payment policy is the key to spurriing adoption, Dr. Schefflein said. So far, surgery teams pay for the models generated at Mount Sinai, but that option isn’t sustainable. Paradoxically, there are already billing codes covering models produced by outside contractors, and Dr. Schefflein urged radiologists to press for a code for in-house models. “It’s not a drastic change,” he said.
Image Perception in Radiology Remains an Important Topic

Image perception in radiology is not a new topic to the RSNA annual meeting. In fact, W. Edward Chamberlain, MD, broached the topic in his Annual Oration in Diagnostic Radiology at RSNA 1941.

By Felicia Dechter and Paul LaTour

SINCE THEN, a wide variety of tools and techniques have been developed to improve the understanding of how images are perceived, abnormalities detected and diagnostic decisions made.

There is room for improvement considering radiologists still make mistakes even using advanced image processing and analysis tools, said Elizabeth A. Krupinski, PhD, during her Wednesday presentation, “A Short History of Image Perception in Radiology.”

Improved understanding of how these image manipulations and decision support systems impact radiologists’ decision-making processes is critical to further improving their effectiveness, said Dr. Krupinski, professor and vice chairman for Research Department of Radiology and Imaging Sciences at Emory University in Atlanta.

“Determining the best ways to integrate these tools into everyday clinical workflow is critical as well, since poorly integrated systems, no matter how good they are in a stand-alone setting, will not impact performance positively,” Dr. Krupinski said.

It’s important to consider the radiologist’s perceptual and cognitive capabilities when developing new imaging technologies and tools, she said. Better training and education methods and better integration of technology into clinical workflow can impact patient care and outcomes without placing undue burdens on the radiologist.

“If we understand why errors are made, we can develop tools or processes to reduce them or we can develop better training methods,” Dr. Krupinski said.

Image analysis tools, eye-tracking, better software and hardware – there are a multitude of ways technology can be used to understand and then aid or complement the human visual system and decision making processes, she said.

The role of fatigue also needs to be understood, Dr. Krupinski said.

“Studies have demonstrated that after only eight hours of clinical work radiologists are fatigued and their diagnostic accuracy drops significantly,” Dr. Krupinski said. “We need to improve our understand-

Does Lighting Impact Performance?

In another session, Francine Jacobson, MD, MPH, said that in the early days of the specialty, radiologists used red goggles for dark adaptation to better see fluoroscopic images. Red light remained in dark rooms for film development until digital conversion was completed in the early 2000s.

Yet in 2006, after an RSNA lecture, a radiologist approached her to suggest that reading should be done in neutral gray lighting rather than the long-standing dictum to recruit darkness. Ambient lighting is also needed for non-image computer work, said Dr. Jacobson, director of lung cancer screening at Brigham and Women’s Health Care, staff radiologist at Brigham and Women’s Hospital, Division of Thoracic Imaging, and assistant professor of radiology, Harvard Medical School in Boston.

Dr. Jacobson pointed toward aviation and other industries that use blue light to improve performance as a guide for radiology. She said blue light improves alertness, attentiveness and mood. And as the use of color in imaging increases, basic color effects and color interactions also become more important.

“The most basic perceptual task is detection,” Dr. Jacobson said, adding the attribution of the finding and the company it keeps can be most important.

“Radiologists are increasingly the integrators of visual and non-visual data,” Dr. Jacobson said. “CT scans now often replace physical examination, requiring more consideration of the history that is not given to the radiologist as part of the order.”

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Women Climbing the Radiology Career Ladder Still Face Challenges, Barriers

By Felicia Dechter

Despite making progress in many areas, women in radiology still face substantial challenges and barriers in shattering the glass ceiling, according to four leading women who discussed the issue at the Wednesday session, “Women in Leadership Roles.”

Women traditionally have not asked for what they need to be successful, mainly due to cultural expectations that they should wait to be asked, said presenter Carol Rumack, MD, professor of radiology and pediatrics at the University of Colorado Medical School in Aurora.

Dr. Rumack encouraged women radiologists to ask for what they want in areas including their salary and in securing research support. She stressed that radiology leaders need to encourage women to participate in leadership roles.

“Both women radiologists and radiology leaders need to strongly support the inclusion of women at the highest levels of radiology organizations so that diversity will be a positive force for change,” said Dr. Rumack, who is a former chair of the Daily Bulletin and a past president of the American College of Radiology.

Only 25 percent of practicing radiologists are women although 50 percent of medical students are women, Dr. Rumack, who also served as the first female president of the American Association for Women Radiologists to attend.

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By Felicia Dechter

Women Climbing the Radiology Career Ladder Still Face Challenges, Barriers

By Felicia Dechter

Despite making progress in many areas, women in radiology still face substantial challenges and barriers in shattering the glass ceiling, according to four leading women who discussed the issue at the Wednesday session, “Women in Leadership Roles.”

Women traditionally have not asked for what they need to be successful, mainly due to cultural expectations that they should wait to be asked, said presenter Carol Rumack, MD, professor of radiology and pediatrics at the University of Colorado Medical School in Aurora.

Dr. Rumack encouraged women radiologists to ask for what they want in areas including their salary and in securing research support. She stressed that radiology leaders need to encourage women to participate in leadership roles.

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Survey: One-Fifth of Patients Not Getting Pre-Exam Imaging Information

By Felicia Deisher

More than 20 percent of patients are not receiving any information prior to a radiology examination and the majority of information patients are getting about imaging exams is being provided by referring physicians — and patients prefer this method.

These were among the findings of a multi-institutional U.S. survey presented during a Wednesday poster discussion by Jay K. Pahade, MD, director of radiology quality and safety at the Yale Department of Radiology and Biomedical Imaging in New Haven, Conn.

“The survey exposed that nearly one-fifth of patients/patient caregivers are not receiving information regarding their imaging exam highlighting an opportunity to improve patient engagement and awareness before the radiology encounter,” said Dr. Pahade, adding the results were somewhat surprising.

In early 2015, Dr. Pahade and co-lead investigator Andrew Trout MD, chief of nuclear medicine in the Department of Radiology/Medical Imaging at the Cincinnati Children’s Hospital, led a team who conducted a 24-item survey to assess what information patients find useful before their imaging exam. The survey comprising 1,542 patients, half of respondents said the referring physician was the preferred source for getting exam information.

Other significant results showed that 52 percent of respondents independently tried to find information about their radiology exam with most (43 percent) utilizing multiple sources and the fewest number (5 percent) using radiology specific-web sites, Dr. Pahade said. The findings were surprising to researchers, he said.

“We were surprised by the proportion of patients who reported receiving no information on their radiology exam,” Dr. Pahade said.

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Jay K. Pahade, MD

...and the University of Alabama at Birmingham — and at three sites primarily serving pediatric patients, Cincinnati Children’s Hospital Medical Center, Indiana University, Riley Children’s Hospital and Stanford University Lucile Packard Children’s Hospital. Results included responses from all facilities combined.

Key findings showed that 22 percent of respondents reported receiving no information regarding their radiology exam before presenting for imaging, Dr. Pahade said. Results also showed that the ordering provider was the most common source of information (65 percent) about a patient’s radiology exam and that 72 percent of respondents said the referring physician was the preferred source for getting exam information.

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Dr. Pahade said. The study provides insight into the effectiveness of current pre-exam information delivery, patient and parent/caregiver preferences on receiving information, the importance of specific exam-related information and methods patients currently use to obtain information on their own, Dr. Pahade said.

Results also highlight the need for better awareness and marketing of radiology-specific sites such as the RSNA/ACR patient website, RadiologyInfo.org, so patients can obtain accurate pre-exam information, he added.

Dunnick is R&E Foundation Chair

N. Reed Dunnick, MD, is the chair of the RSNA Research & Education (R&E) Foundation Board of Trustees.

R. Dunnick is the Fred Jenner Hodges Professor of Radiology at the University of Michigan Health System in Ann Arbor, Mich., where he has been a faculty member since 1992.

A member of the Board of Trustees since 2013, Dr. Dunnick advocates for the Foundation’s mission to improve patient care through the financial support of research and education in radiology.

Dr. Dunnick has an active RSNA member since 1987, serving on the Board of Directors from 2006 to 2014, and as president in 2014. He has also served on the Scientific Program Committee, Research Development Committee, Education Council and the Grants Program Committee.

A recognized leader in the radiology community, Dr. Dunnick is a past president of the American Roentgen Ray Society and the Society of Chairs of Academic Radiology Departments. He has served in leadership roles with a number of other medical societies and organizations, including the American Board of Radiology Foundation and the American College of Radiology, where he served as vice president from 2008 to 2009.

Dr. Dunnick supports the Foundation as a Silver Centennial Pathfinder, Presidents Circle member and Platinum Visionary donor.

The Board of Trustees also appointed Stamatis V. Destounis, MD, Rochester, NY; Umar Mahmood, MD, PhD, Charlestown, Mass.; and Vijay M. Rao, MD, Philadelphia, to the Board.

To learn more about the Foundation and its Inspire-Innovate-Invest Campaign visit the R&E Foundation booth in the Connects Center or RSNA.org/Foundation.
Dorsal Anterior Insula Connectivity - A Potential Target for Cognitive Improvement in MS Patients

A new study suggests that the dorsal anterior insula may be an attractive target for non-invasive strategies to modulate connectivity in order to improve cognitive function related to multiple sclerosis.

By Lynn Antonopoulos

“The role of the anterior insula as a critical area regulating switching between cognition and behavior is only just beginning to be investigated and understood,” said presenter Bernardo Canedo Bizzo, MD, research fellow in radiology, Harvard Medical School/Massachusetts General Hospital (MGH). He also noted that predictpos- sible cognitive deficits based on our functional neuroanatomic findings has the potential to help guide patient management and patient counseling in the future.

Cognitive impairment is estimated to occur in 40 to 60 percent of MS suf- ferers. Dr. Bizzo and his team assessed whole-brain, dorsal anterior insula intrinsic functional connectivity using resting state functional MRI (fMRI) in 28 MS patients. In addition, each patient was assessed for cognitive status, degree of disability and cognitive reserve.

They sought to relate dorsal anterior insula intrinsic functional connectivity with measures of cognitive status and reserve. The study provided support for recent findings that relate the insula to a tripartite framework of cognition, emotion and interception – the sensory system responsible for detecting the body’s inter- nal regulation responses.

The researchers performed 3T MRI using the Connectome scanner at MGH Martinsen Center for Bio- medical imaging, and that they don’t understand what they are seeing. “Techs take the pictures, process the images, and just send them on,” he said. “The problem with that is the radiologists can only see what we show them, which can limit their ability to see the images and diagnose.”

A CT technologist’s job is to show radiologists the answer to the diagnostic question, Leal pointed out. “Understanding the disease process, and understanding from an angiographic standpoint how blood flows around the body, and how we should design protocols — all of these things have to go together in order for us to properly do our job,” he said.

Updated Protocols will Lead to Improved Efficiency

One problem, Leal said, has to do with protocols. “I do a lot of cardiac imaging, and with a lot of our studies we’ve been using the same kinds of protocols we’ve been using for years.” He added that some of these protocols can be traced back to machines that no longer exist.

“Radiologists have changed significantly,” he pointed out. “So why haven’t our protocols changed?”

Leal questioned what he called a “cookbook approach to CT scanning. As a consultant, he visits various facilities and observes protocol setups. “I’ll ask why they’re using that protocol for this particular study, because it doesn’t make any sense,” Leal said. “And the answer to that will be, ‘well, that’s what’s in the book’.”

“It’s another problem we have in the tech world,” Leal said, pointing out that technologists will use protocol guides — or “cookbooks” — and training so they’re prepared to make adjustments to protocols and better handle these new CT systems.

“With education, and by working together, we can provide better — and consistent — quality studies, and greater job satisfaction,” he concluded.

First RSNA Image Share Validation Seals Awarded

RSNA and The Sequoia Project announced Wednesday the first sev- en vendors to success- fully complete the RSNA Image Share Validation program that rigorously tests the compliance of vendors’ systems to accurately and efficiently exchange medical imag- es. The approved ven- dors include Agfa Health- care, AMBIA Health (formerly Dicom Grid), GE Healthcare, Lexmark Healthcare, Lifecare, Inc., Much Technology and Novarad.

“Radiologists should insist that products they purchase have achieved the RSNA Image Share Validation Seal to ensure true interoperability. Anything less is not in the interest of our patients,” said David S. Mendelson, MD, vice chair of radiology IT at the Mount Sinai Health System in New York.
Shear Wave Elastography Via Ultrasound Offers a Painless Liver ‘Biopsy’

When it comes to assessing and staging fibrosis in chronic liver disease, histopathology is still considered to be the gold standard. But what if ultrasound (US) could do the job just as reliably without subjecting the patient to a painful and inconvenient biopsy?

By Elizabeth Gardner

The Lahey Clinic in Burlington, Mass., is using a US technique, shear wave elastography, to supplement, and in many cases replace, liver biopsy. The clinic uses the technique for about 50 cases per month.

In a poster presentation on Wednesday, radiology resident Pauley Chea, MD, said most healthcare facilities should be able to use shear wave elastography with their existing US equipment, with at most a software upgrade.

“Switching over can happen fairly quickly — it’s just a matter of deciding whether it’s what a facility needs,” he said.

Chronic liver disease, including alcoholic liver disease, fatty liver disease, hepatitis, cirrhosis, cholangitis and hemochromatosis, is responsible for 1.2 percent of deaths per year in the U.S., and cirrhosis alone accounts for 35,000 deaths.

Early detection and staging of fibrosis and inflammation is key in determining prognosis and treatment outcomes, and fibrosis can be reversed if detected and treated early.

The most common causes of fibrosis are hepatitis B and C, alcoholic liver disease and non-alcoholic fatty liver disease. Fibrosis is most commonly confirmed with a biopsy. But biopsies pose their own risks: most commonly bleeding — and may yield inconsistent specimens. The biopsied site may not represent the liver’s overall condition if the liver isn’t homogeneous. And biopsies may be contraindicated for some patients.

Shear waves are generated in tissues when a directional force (such as US) is applied and causes deformation. Shear waves produce micrometer-level tissue displacement that can be detected by the US probe.

Shear wave elastography may be indicated when liver fibrosis is suspected, as well as hepatitis, non-alcoholic steatohepatitis, primary biliary cholangitis or other liver disease. Because fat and fluid interfere with shear wave propagation, elastography may be less accurate in obese patients, and in the presence of ascites, steatosis, inflammation, acute hepatitis, and cholestasis.

Dr. Chea predicted that the “painless biopsy” will be particularly useful to measure the effectiveness of treatment over time. Rather than requiring a biopsy every three years, hepatologists can order the scans to monitor response non-invasively, and can also avoid exposing the patient to excess radiation via repeated CT scans, or incurring the greater expense of repeat MRI studies.

The technology might be used to evaluate blood vessels, focal liver lesions and lung fibrosis.

Cost Assessment Tool Improves Efficiency of MR Enterography

By Richard Dargan

USE OF A COST ASSESSMENT tool helped the Mayo Clinic reduce time and expense associated with an MRI procedure, according to research presented at RSNA 2016.

Time-Driven Activity-Based Costing (TDABC) is a cost accounting methodology developed by two professors at the Harvard Business School to help businesses better understand their costs.

Applied to a healthcare setting, TDABC measures the time and cost of providing patient care services, taking into account personnel and equipment costs per minute.

Overhead expenses and profit margins are also factored to determine the true cost.

“In this era of declining reimbursements, it’s particularly important to understand how much a procedure costs and how much you’re getting paid,” said Stacy Schultz, project manager and former quality improvement specialist at the Mayo Clinic in Rochester, Minn. “TDABC helps by taking every piece of the exam and putting a value on it.”

Schultz and her Mayo Clinic colleagues recently applied TDABC to better understand and improve their practice of MR enterography, commonly used to examine the small intestine for signs of Crohn’s disease.

Though the imaging portion of the procedure only takes about half an hour, patient preparation can be time-consuming. The exam at the Mayo Clinic once involved eight different care providers and required a patient to spend an average of three hours in the department.

“We picked MR enterography for this study because it was something we knew a lot about,” Schultz said. “It’s been a frustrating exam for all the staff, with an extensive number of process steps, and prior attempts at improving the process had been disappointing.”

Eliminating Delay in MRE Procedures

A multidisciplinary team of patient-care personnel and radiology management staff worked together to analyze the various steps in the procedure and the associated costs and develop new approaches.

For instance, MRE procedures at Mayo once required a nurse to deliver an injection of glucagon, a medication that reduces the normal contractions of the intestine that can blur the images on MRI. This step interrupted workflow and had the potential to delay the exam for as long as 25 minutes. The team shifted responsibility for the glucagon injection to the technologist, eliminating the delay.

“The nurses were frustrated at being interrupted from other duties to prepare and perform the injection, and technologists were frustrated waiting on the nurses, so this change not only cut time but really helped reduce frustration among staff members,” Schultz said.

The organization applied the TDABC methodology to MRE starting in January 2015 and ended the implementation and data collection by October of that year. They were able to gather process observation data from more than 30 exams to validate previous data from over 1,000 patient chart reviews.

Analysis showed that TDABC methodology led to improvements in the daily workflow. In more than 1,000 MRE procedures, the modifications reduced non-value-added waste and cost by 13 percent. Staff time was reduced 16 percent, from an average of 198 minutes to 165. Patient process time dropped from an average of 102 minutes to 85, a reduction of 17 percent. Surveys showed a high level of staff satisfaction.

Everybody loved it,” Schultz said. “The nurses and technologists were happy and complaints from radiologists went down.”

With the success of this initiative, Mayo Clinic teams are applying the TDABC methodology to other areas within the radiology practice, including ultrasound and MRI of the head.
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