RSNA News™
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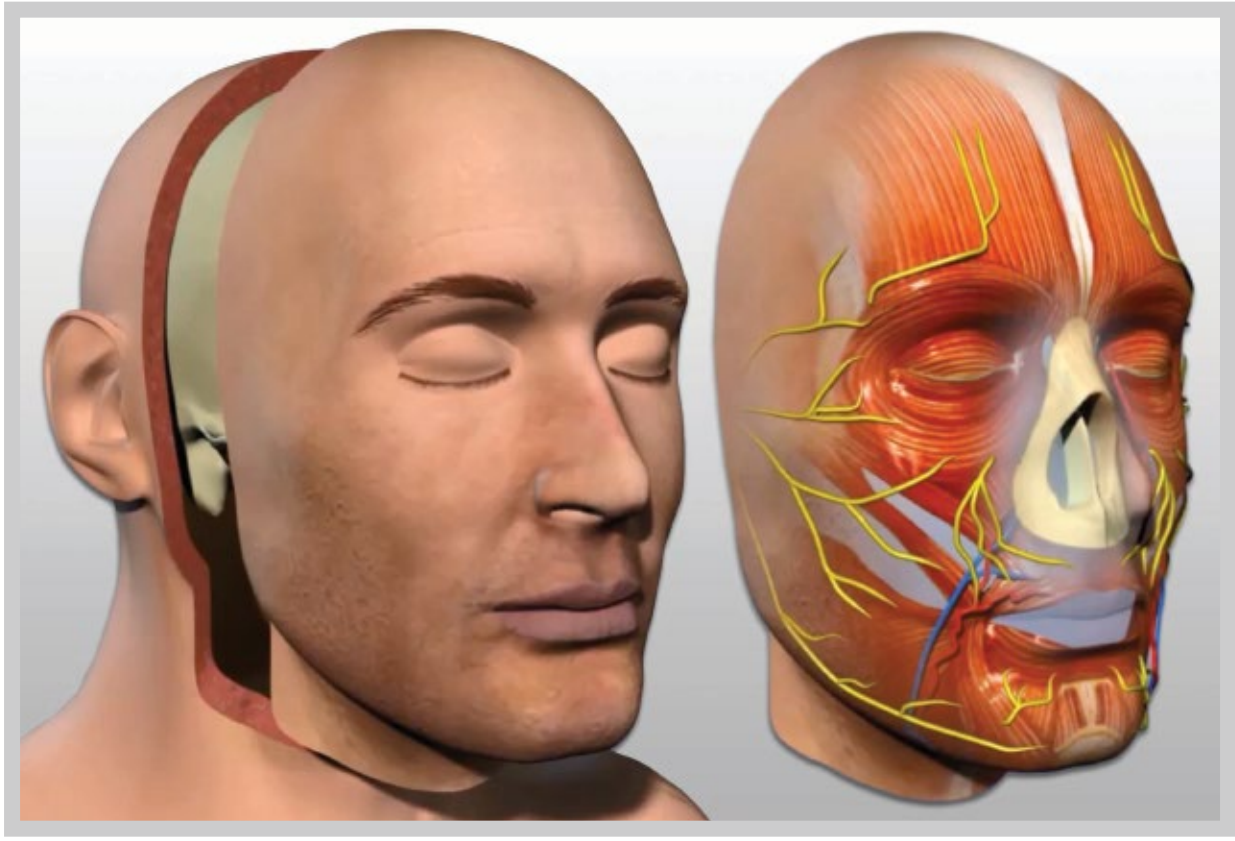

3-D Printing Changes the Face of Transplant Surgery

ALSO INSIDE:

Submit Abstracts by April 8
See Page 23

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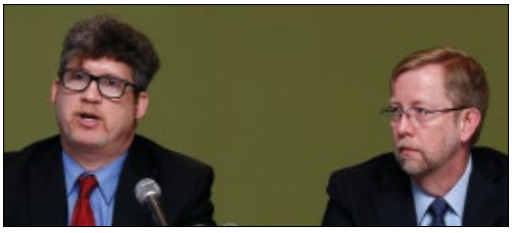
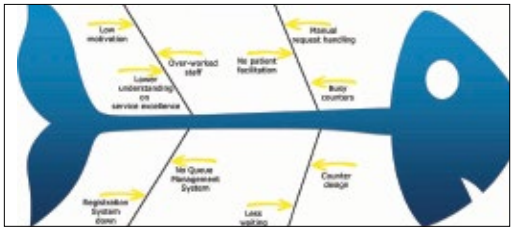
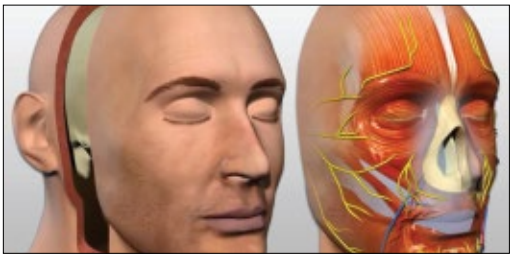
MARCH 2015 • VOLUME 25, NUMBER 3

FEATURES







100 RSNA News™

UP FRONT

RADIOLOGY'S FUTURE

NEWS YOU CAN USE

RSNA MISSION

The RSNA promotes excellence in patient care and healthcare delivery through education, research and technologic innovation.

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Stadnyk Elected President of St. Louis Metropolitan Medical Society


Stadnyk

Michael J. Stadnyk, M.D., a radiologist with St. Luke's Hospital and ProSight Radiology, Chesterfield, Missouri, has been elected 2015 president of the St. Louis Metropolitan Medical Society.

Dr. Stadnyk served as a St. Louis Metropolitan Medical Society councilor from 2009 to 2011, as secretary in 2012, as vice-president in 2013, and as president-elect in 2014. He has been a delegate to the Missouri State Medical Association since 2009.

Dr. Stadnyk earned his medical degree from the University of Missouri-Kansas City. He is a past-president of the Greater St. Louis Society of Radiologists and is an RSNA member.

NCRP Issues Statement About Fluoroscopically-Guided Interventions

The National Council on Radiation Protection and Measurements (NCRP) has released Statement No. 11, "Outline of Administrative Policies for Quality Assurance and Peer Review of Tissue Reactions Associated with Fluoroscopically-Guided Interventions (FGI)."

This statement is intended to clarify recommendations given in the NCRP Report No. 168, "Radiation Dose Management for Fluoroscopically-Guided Interventional Medical Procedures" (NCRP, 2010). It provides detailed recommendations for a facility's QA-PR process and recommendations for administrative practices for the evaluation of known or suspected FGI radiation injuries. Facilities typically investigate and characterize all unusual medical events via a QA-PR committee composed of professional peers of the involved practitioner. Evaluating those radiation management processes and practices discussed in this Statement shall be a part of an interventional service's QA-PR program.

NCRP Report No. 168 emphasizes that the safe performance of FGI procedures requires controlling radiation dose in order to prevent unexpected or avoidable tissue reactions and to minimize the severity of medically unavoidable injuries. It also provides guidance for controlling dose and for patient post-procedure follow-up. Similar guidance has been provided by professional societies and by several national and international organizations.

The statement is available at *ncrponline.org/Publications/Statements/Statement_11.pdf.*

ROENTGEN NOMINATIONS DUE BY APRIL 1

Nominations are being accepted now for the RSNA Roentgen Resident/Fellow Research Award recognizing residents and fellows who have made significant contributions to their departments' research efforts as evidenced by presentations and publications of scientific papers, receipt of research grants or other contributions.

The nomination deadline is April 1. Learn about the nomination process and see a list of past recipients at: *RSNA.org/Roentgen_Research_Award.aspx.*

Numbers in the News

4

Dimensions of service excellence—communication, attitude, responsiveness, respect and caring—that radiology personnel at Aga Khan University Hospital strove to improve with a special initiative. Read about the successful project, presented at RSNA 2014, on Page 9.

15

Number of topics, including breast imaging, pediatric radiology and ultrasound, covered in the new *RadioGraphics* ABR Diagnostic Radiology Core Exam Study Guide Article Index. Read more about this new study tool on Page 22.

100

Amount, in dollars, that RSNA members pay in dues during their first year of practice. Turn to Page 23 to learn more about reduced rates for members in transition.

426

Imaging procedure utilization rate per 1,000 beneficiaries in hospital outpatient facilities in 2012, up from 418 the year before. Learn how a shift in outpatient advanced imaging from private imaging centers to these hospital facilities is raising concerns about reduced access for patients and increased costs for payers, on Page 11.

SRU Presents Annual Awards


Gosink


Neiman


Jo

Barbara B. Gosink, M.D., received the 2014 Lawrence A. Mack Lifetime Achievement Award at the recent Society of Radiologists in Ultrasound (SRU) annual meeting in Denver. Dr. Gosink is an Emeritus Fellow of the SRU who formerly practiced at the University of California San Diego.

The late **Harvey L. Neiman, M.D.**, was honored with the 2014 Distinguished Service Award. Dr. Neiman, who died June 5, 2014, received the RSNA Gold Medal in 2013 and served as chief executive officer of the American College of Radiology, among many other accomplishments.

Patricia C. Jo, M.D., of the University of Calgary in Canada, received the 2014 Member-in-Training Award for her paper "Nodules in a Cirrhotic Liver: The Significant Contributions of Contrast Enhanced Ultrasound."


Swartz

ASHNR Honors Swartz with 2014 Gold Medal

The American Society of Head and Neck Radiology (ASHNR) awarded its 2014 Gold Medal to **Joel D. Swartz, M.D.**, during the recent ASHNR annual meeting in Seattle, Washington.

An authority in his field, Dr. Swartz co-authored the textbook "Imaging the Temporal Bone," which is in its fourth edition, and has been co-editor of "Seminars in Ultrasound, CT and MR" since 1994.

Dr. Swartz served as chair of the Department of Radiology at Germantown Hospital in Philadelphia from 1991 to 1999 and currently provides remote interpretation of MR and CT images via teleradiology from his home office.

AAWR Announces 2014 Awards

The American Association for Women Radiologists (AAWR) has announced its 2014 award recipients:


Rao


Travis


Angtuaco


Bahl


Hiniker

Vijay M. Rao, M.D., the David C. Levin Professor and chair of the department of radiology at Thomas Jefferson University and RSNA Board Liaison for Information Technology and Annual Meeting, received the Marie Skoldowska-Curie Award.

Elizabeth LaTorre Travis, Ph.D., also received a Marie Skoldowska-Curie Award. Dr. Travis is the associate vice president for women faculty programs, Mattie Allen Fair Professor in cancer research and professor in the departments of experimental radiation oncology and pulmonary medicine at The University of Texas MD Anderson Cancer Center in Austin, Texas.

Teresita L. Angtuaco, M.D., a professor of radiology at the University of Arkansas Medical School (UAMS), director of imaging in the radiology department and chief of ultrasound, received the Alice Ettinger Distinguished Achievement Award.

Manish Bahl, M.D., a fourth-year radiology resident at Duke University Hospital received the Lucy Frank Squire Distinguished Resident Award in Diagnostic Radiology.

Susan Hiniker, M.D., a fifth-year resident in the department of radiation oncology at Stanford University Medical Center, received the Eleanor Montague Distinguished Resident Award in Radiation Oncology. Dr. Hiniker was the recipient of the Varian Medical Systems/RSNA Roentgen Resident/Fellow Research Grant in 2012.

RSNA Board of Directors Report

At meetings during RSNA 2014, the RSNA Board of Directors reflected upon a successful first year of the Centennial celebration and looked ahead to the 100th anniversary of the Society's founding in 2015.

Centennial Showcase Returns for RSNA 2015

Plans are underway for RSNA 2015, with the theme, "Innovation is the Key to Our Future." As part of the Society's centennial celebration, RSNA turns its focus toward the Society's next 100 years. In an updated Centennial Showcase, attendees will be invited to ponder where the technology, innovation, and informatics that have driven our specialty thus far will take us next, and imagine how our current efforts in patient-centered care will help us to better serve our patients.

100th Annual Meeting Was a Great Success

Before contemplating the future, RSNA celebrated its history. At RSNA 2014, the Centennial Showcase featured a welcome from a virtual Wilhelm Roentgen and displays detailed how the Society's mission and programs and services have supported community, research, education, innovation, and patient care throughout the years.

The Society was pleased to welcome more than 56,000 attendees, including 11,000 international attendees from 125 countries, to its 100th annual meeting. Those attendees, as well as RSNA members who were unable to attend, are reminded that they can access RSNA 2014 electronic education exhibits—using their badge number or RSNA account number—throughout 2015 at *dps.rsna.org*.

The celebration of our history continues throughout this year on the Society's Centennial website, *RSNA.org/Centennial*. Visitors will find facts and photos from the Society's past, as well as dozens of amazing images submitted to our Centennial image contest.

Collaborations Continue

RSNA is pleased to work with other radiologic societies worldwide to further developments in medical imaging. The

Richard L. Ehman, M.D.
Chairman, 2015 RSNA Board of Directors

Board recently approved a joint International Visiting Professor (IVP) program with the Asian Oceanian Society of Radiology (AOSR) and an RSNA/AOSR Joint Symposium to be conducted at both the RSNA Annual Meeting and the Asian Oceanian Congress of Radiology (AOCR) in 2016.

RSNA is working with the Interamerican College of Radiology (CIR) to present a refresher course on body CT at the CIR course in Cancun in June.

In other ongoing collaborations, RSNA was pleased to host a meeting of 16 molecular imaging societies, with the goal of coordinating their efforts, at RSNA 2014. The work of the Quantitative Imaging Biomarkers Alliance (QIBA) also continues, with a goal of internationalization to harmonize quantification efforts throughout the world.

Journals

Last year was an exciting one for the RSNA journals. All *Radiology* and *RadioGraphics* articles accessed online are now accompanied by a list of related articles, to assist in research and deeper exploration of a topic. Nearly 100 percent of participants in the *RadioGraphics* reader survey reported that they find the journal useful or very useful in clinical practice; in addition, some 81,000 *RadioGraphics* credits were issued in 2014. *Radiology* podcasts, meanwhile, continue to be popular, with approximately 62,000 downloads in 2014.

This year, look for the *RadioGraphics* ABR Diagnostic Radiology Core Exam Study Guide Article Index (see Page 22 for more details).

Informatics

There are now more than 250 structured reporting templates offered in RSNA's library at *RSNA.org/Reporting*. Free and not subject to license restrictions on their reuse, the report templates create uniformity and improve communication with referring providers and enable practices to meet accreditation criteria and earn pay-for-performance incentives. RSNA encourages reporting vendors to use the templates to develop software products that enable radiologists to create high-quality radiology reports more efficiently.

R&E Campaign Underway

I encourage all RSNA members to contribute to "Inspire-Innovate-Invest: The Campaign for Funding Radiology's Future®," launched by the R&E Foundation at RSNA 2014. The campaign goal is to raise $17.5 million to fund grants in radiologic research and education, bridging gaps in funding for promising investigators and educators.

I am pleased to report RSNA membership now tops 54,000. The other members of the Board of Directors and I look forward to serving each and all of you throughout the coming year.

Richard L. Ehman, M.D.
Chairman, 2015 RSNA Board of Directors

Technology Forum

IHE® Connectathon Forges Path to Standard Interoperability

The 17th annual IHE® North American Connectathon, health information technology's (HIT) largest interoperability testing event, was held Jan. 28-Jan. 30, in Cleveland. The event allows a wide spectrum of healthcare vendors to test implementations of IHE Profiles and their ability to connect effectively with industry peers. More than 500 engineers gathered for five intense days of interoperability testing.

Connectathon testing helps the HIT industry achieve the level of interoperability needed to meet the demands of healthcare providers and patients for convenient, secure access to electronic health records (EHRs). The event has also become an important milestone for HIT standards bodies, emerging health information organizations (HIOs) and government agencies, whose success relies on achieving effective interoperability of HIT systems.

This was apparent as users and developers of these systems gathered at the Jan. 28 Connectathon Conference to explore challenges in realizing wider EHR usage, which has increased significantly but has yet to attain the interoperability necessary to achieve continuity of care, population health, patient management and clinical quality improvement.

C. Martin Harris, M.D., M.B.A., chief information officer of the Cleveland Clinic, presented the keynote address, "The Path Forward and How Do We Get There." Other sessions included, "The Path to Interoperability through Testing and Certification," "Connecting Across the Continuum of Care" and "IHE's Role in Mission Critical Interoperability Standards Projects."

RSNA and the Healthcare Information and Management Systems Society (HIMSS) have been sponsors of the Connectathon since its inception in 1999. Located for many years in Chicago, the 2014 Connectathon was held for the first time at the HIMSS Innovation Center in Cleveland. Connectathons are also held annually in Europe, Japan and Korea.

For more information on IHE, go to *RSNA.org/ihe.aspx*.

THIS MONTH IN THE *RSNA NEWS* ONLINE VERSION

Get more of this month's news online at *RSNA.org/News*. Enjoy interactive features including video, audio, slide presentations and more. Go online to leave us a comment and easily share stories via social media as well.

View a series of videos taken at RSNA 2014 on the role of imaging and 3-D printing in face transplant surgery, including video animation of a face transplantation surgery and an interview and press conference with researcher Frank Rybicki, M.D., Ph.D.

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Radiology Must Be Part of Discussion on POC Ultrasound

BY MARY HENDERSON AND RICHARD S. DARGAN

The rising use of bedside or point-of-care (POC) ultrasound presents both opportunities and challenges for the medical community, along with a need for increased training in the modality for medical students and practitioners.

For radiologists, the growth in POC ultrasound among non-imaging specialties causes concern about lost business and shortfalls in patient care.

Daily Bulletin* coverage of RSNA 2014 is available at *RSNA.org/bulletin.

Nevertheless, two leading authorities who presented the RSNA 2014 Controversy Session, "Point of Care Ultrasound: Is there an Owner or Do We All Just Rent?" stress that POC should not be viewed as a threat and may even present opportunities for radiologists to become more relevant in the ultrasound sphere.

"From the perspective of radiologists, there is plenty of fear and trepidation and in some cases anger about anybody but radiologists doing ultrasound," said co-presenter Brian D. Coley, M.D., a pediatric radiologist at Cincinnati Children's Hospital and treasurer of the American Institute for Ultrasound in Medicine. However, he added, much of this fear and anger is unfounded and fails to recognize the potential benefits of POC ultrasound to medicine and the opportunity radiologists have to impact the discussion on this burgeoning modality.

"What if I told you that point-of-care ultrasound could be a good thing?" he asked. "There is real, evidence-based data showing that in the right hands with the right training, it's a very powerful tool for patient care."

Evolving POC Technology Creates New Uses—and New Users

In only a few decades, ultrasound has evolved from refrigerator-sized machines on carts to relatively inexpensive devices that fit in the palm of the hand. In fact, the cost of ultrasound units has dropped from $40,000 for a cart-based machine to $7,000 for a hand-held unit in just five years, according to J. Christian Fox, M.D., a professor of clinical emergency medicine and director of instructional ultrasound at the University of California, Irvine.

Bahner, Coley at RSNA 2014

This evolution, along with concerns over radiation exposure, has launched a boom in POC ultrasound that shows no signs of slowing. In a study published in the January 2014 edition of the *Western Journal of Emergency Medicine*, Dr. Fox wrote that affordability and improved image quality could make bedside ultrasound the new figurative stethoscope. "Besides the stethoscope, since the time of Hippocrates, there has been no technology that doctors use at the bedside that's had any impact on clinical diagnosis," Dr. Fox said.

"The stethoscope is an antiquated device," said Scott D. Solomon, M.D., a professor of medicine at Harvard Medical School in Boston. "Although we can learn an enormous amount with it, the capability offered by POC ultrasound far exceeds it.

"Handheld ultrasound didn't exist until about 10 years ago," Dr. Solomon added. "There are devices now that aren't much bigger than an iPhone, with image quality as good as those produced by large machines 10 to 15 years ago."

Among the benefits is the fact that POC ultrasound has no body region or organ of interest

Fox

Blaivas

"Ultrasound is one of the few areas in imaging where not everyone is trying to divide up the same pie. Ultrasound volumes are not dropping in the radiology department, because point-of-care applications have made the pie bigger."

BRIAN D. COLEY, M.D.

limitations, said Michael Blaivas, M.D., a professor of emergency medicine at the University of South Carolina Medical School. "POC ultrasound providers can scan anything and everything that is helpful to the patient in the clinical setting," Dr. Blaivas said. "If a patient needs a biopsy, then ultrasound will be used to guide the needle. POC users
can scan the eye looking for a detached retina. There is no limitation to the focused exam anatomically as far as relevant clinical questions."

As a result, the modality is increasingly being used by emergency physicians, intensivists and anesthesiologists—among other specialties—in the U.S. and beyond.

Despite its expansion into non-radiology specialties, the prospect of radiology losing business is likely overblown, according to Dr. Coley. POC applications are for different issues, he said, such as resuscitations and other procedures where time is of the essence. "Ultrasound is one of the few areas in imaging where not everyone is trying to divide up the same pie," he said. "Ultrasound volumes are not dropping in the radiology department, because point-of-care applications have made the pie bigger."

Training Must Begin Early

Still, concerns persist over non-radiologist physicians doing ultrasound without adequate education, training and experience. Even the so-called "yes or no" questions answered in a focused ultrasound exam carry with them the possibility of false-negatives, Dr. Coley noted.

Practitioners should be well-trained in normal and abnormal sonographic findings, artifacts and proper use of the controls on the ultrasound machine to achieve good image quality, according Peter M. Doubilet, M.D., Ph.D., senior vice-chair of the Department of Radiology at Brigham and Women's Hospital, Boston, and a professor of radiology at Harvard Medical School. "Otherwise, we will see a plethora of false positive diagnoses leading to inappropriate follow-up testing and treatment, false negative diagnoses leading to delays in diagnosis and management, and misguided needles leading to patient injuries."

That training should begin in the first year of medical school, said David Bahner, M.D., director of ultrasound at the Ohio State University Department of Emergency Medicine in Columbus, who co-presented the Controversy Session on POC Ultrasound at RSNA 2014. "Ultrasound in medical education is growing," he said. "Barriers exist, including a lack of space, equipment and financial support, but they can be overcome."

Drs. Fox and Solomon advocate the integration of ultrasound into all four years of the medical school curriculum—a step 16 medical schools have already taken, Dr. Blaivas said.

WEB EXTRAS

Access the American Institute of Ultrasound in Medicine's (AIUM) Education Portal Clearinghouse of resources designed to facilitate the integration of ultrasound into medical school education at *AIUM.org*.

Training needs to occur in two different realms: medical school and continuing medical education (CME), Dr. Solomon said. But it appears that won't happen overnight. Dr. Bahner expressed concern about the slow pace of change, noting that almost a third of U.S. medical schools are lagging behind in bringing ultrasound training into the curriculum. He attributed the slow adoption to a problem common in medicine, which he described as a "cacophony of voices."

"We're all speaking with different voices when we need to speak with one, and that's why a lot of healthcare is broken," he said. As an example, Dr. Bahner noted that the POC ultrasound/ultrasound training is not yet on the agenda of the Liaison Committee on Medical Education, jointly sponsored by the Association of American Medical Colleges and the American Medical Association, as the recognized accrediting body for programs leading to medical degrees in the U.S.

With medical education struggling to catch up to the boom in ultrasound, it's more essential than ever that radiologists drive the discussion and ensure quality care, Dr. Coley said. "There has been a contentious history, but there also are many areas of collaboration," he said. "For instance, the medical executive committee often will go to the radiologist and ask what the requirements should be for non-radiologists to use ultrasound. And if you volunteer to help, 99 times out of 100 you will be welcomed with open arms and you can direct the course for a particular institution."

"Radiologists are finally coming around and saying, 'we have to be involved'," Dr. Coley said. "It's not the same field it was 30 years ago and that's OK."

But ultimately, coordination needs to occur among all specialties for POC ultrasound to realize its full potential, Dr. Bahner said. "The future of medicine needs to be built by the house of medicine rather than 'an apartment complex' of medicine with individual silos not working together in a coordinated fashion," he said.

Added Dr. Fox: "We need to join together and set criteria for each medical specialty, as well as clear indications for the use of POC ultrasound and screening protocols." □

MARY HENDERSON, is a writer based in Bloomington, Ind.
RICHARD S. DARGAN is writer based in Albuquerque, N.M.
Both specialize in health and medicine.

ACR Stresses Need for Training in POC Ultrasound

The American College of Radiology (ACR) issued a 2013 resolution on Point of Care (POC) ultrasound, stressing the need for training, credentialing and ongoing quality assurance for all healthcare providers performing and interpreting sonographic examinations.

"Targeted POC ultrasound can be useful as a limited bedside adjunct to the physical examination but is fundamentally different from comprehensive diagnostic ultrasound examinations such as those ordered by clinicians and performed in radiology departments with interpretation by radiologists," according to ACR.

POC exams without formal training, adequate standards and documentation "can be detrimental to patient care, including the risk of the patient receiving an incorrect diagnosis from an improperly performed sonographic examination," the organization stated.

Business Analytics: the Next Big Imaging Modality?

BY ELIZABETH GARDNER

While radiologists are used to analyzing massive amounts of imaging data to produce a diagnosis, they often ignore the equally large amounts of data available to help run their practices more effectively. But basic tools and analytic processes can help physicians reap the business benefits of "big data," as well as to identify patterns that can lead to more effective patient care, according to RSNA 2014 researchers.

"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 Katherine Andriole, Ph.D., of the Center for Evidence-Based Imaging at Brigham and Women's Hospital, Boston, who moderated the session, "The Use of Business Analytics for Improving Radiology Operations, Quality, and Clinical Performance," held in association with the Society for Imaging Informatics in Medicine.

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, can be used to analyze metrics like equipment utilization and radiation dose information, said Dr. Andriole, who is a member of the RSNA Radiology Informatics Committee (RIC).

But before that analytic step can happen, 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 11/30/14 in one system and 30.11.14 in 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 is figuring out exactly what needs to be measured, or what key performance indicators (KPI) should be. For example, one practice looked at the number of exams performed with each of its scanners. While one scanner was used for substantially fewer exams than the others, it turned out that scanner 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 analytics 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," such as 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."

Andriole

Nagy

Cook

Any number of causes could create gaps in the comb—no-show patients, lack of demand for the scanner or some other reason. 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.

Applications of analytics, including a program that tracks radiation dose or physician follow-up on incidental findings, and a program that helps residents track what studies they've read and determine the accuracy of their readings, were discussed by Tessa Cook, M.D., assistant professor of radiology at the University of Pennsylvania Medical School, and a member of the RIC and the RSNA Medical Imaging Resource Center (MIRC®) Subcommittee.

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 reevaluating 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. □

ELIZABETH GARDNER is a writer based in Chicago specializing in medical technology and health IT issues.

Integrating Radiology, Pathology Would Improve Diagnostics, Aid Patients

BY PAUL LATOUR

Integration between radiology and pathology would lead to an improved diagnostic system that would benefit both caregivers and patients, according to presenters of the RSNA 2014 special interest session, "Radiology and Pathology Diagnostics: Is it Time to Integrate?"

The value proposition includes speedier and more accurate diagnoses, better patient outcomes, better management of diagnostic and therapeutic resources, and lower costs, according to presenter Mitchell D. Schnall, M.D., Ph.D.

"Diagnostics really drive the clinical care path and the precision medicine agenda as we go forward," said Dr. Schnall, the Eugene P. Pendergrass professor and chair in the radiology department at the University of Pennsylvania.

He added that current diagnostics exist in individual silos (radiology, lab, molecular diagnostics, histology, etc.) with no "grain elevator" working to facilitate cooperation or sharing.


Schnall


Feldman


Langlotz

Pathologist Michael D. Feldman, M.D., Ph.D., said the disciplines need to develop a common culture, adding that one immediate opportunity exists in terms of lesion location reference. The first step is establishing a shared workflow and integrated information systems, which means upgrading from the antiquated paper requisition system most hospitals still use.

Daily Bulletin* coverage of RSNA 2014 is available at *RSNA.org/bulletin.

"It's a real boondoggle to get all the necessary data together for anatomic pathologists with paper requisitions," said Dr. Feldman, an associate professor of pathology and laboratory medicine at the Hospital of the University of Pennsylvania. "So there are opportunities with an integrated workflow for standards in imaging, ordering and reporting spaces that could go a long way."

To converge workflows, it is critical to decide what capabilities can be supported for developing information technology and informatics, according to Dr. Feldman.

Structured Reporting Template for Prostate on the Horizon

During the panel discussion later in the session, Curtis P. Langlotz, M.D., Ph.D., said that it's unfortunate most institutions don't already have a group interface between radiology and pathology, but added that it's not an informatics issue.

"The reason it hasn't been done is more about the business and resources being allocated for it," said Dr. Langlotz, radiology and biomedical informatics research professor at Stanford University Medical Center and the Informatics Advisor for RSNA's Radlex® Steering Committee. "One of the headwinds we face is trying to develop a mechanism to exchange templates."

But one such mechanism is nearing fruition with prostate reports, according to panelist Jeffrey C. Weinreb, M.D. He said radiology is moving toward creating a standard template for structured prostate reporting that will mirror what pathologists have already implemented.

"This is an obvious area for radiology and pathology to work together," said Dr. Weinreb, a professor of diagnostic radiology at the Yale School of Medicine.

Dr. Schnall said both radiology and pathology need to get together in deciding issues such as defining a disease and how it is measured. "We have to redefine some of these issues together for them to be coherent," Dr. Schnall said.

Despite the barriers that exist to full integration between radiology and pathology, experts were optimistic it can be done. The key is communication.

"You'll never get to a common culture unless you start sitting down and talking about it," Dr. Feldman said. "We're starting to hear some of that now."

The session was held jointly between RSNA and the American Society of Clinical Pathologists and followed up on a two-day workshop held in 2014 at RSNA Headquarters in Oak Brook, Ill. □

PAUL LaTOUR is an *RSNA News* staff writer .

"One of the headwinds we face is trying to develop a mechanism to exchange templates."

CURTIS P. LANGLOTZ, M.D., PH.D.

Pakistani Hospital's "Attitude" Project Improves Patient Service

BY FELICIA DECHTER

While staff in a busy multimodality radiology department is rightly focused on providing the right diagnostic and interventional services, patients expect more than that, according the presenter of an RSNA 2014 session.

"While patients come for 'care' solutions to their health problems, there is no denying that what they observe daily and usually assess and respond to in patient satisfaction surveys is the 'caring' part. They focus on whether the communication was polite, the staff, nurses and doctors exhibited positive attitudes, their needs were met timely and efficiently, and they were handled well and with respect during their hospital stay." said Muhammad Akbar Khan, M.B.A., manager of radiology at Aga Khan University Hospital (AKUH), a 650-bed philanthropic, not-for-profit, private teaching institution in Karachi, Pakistan.

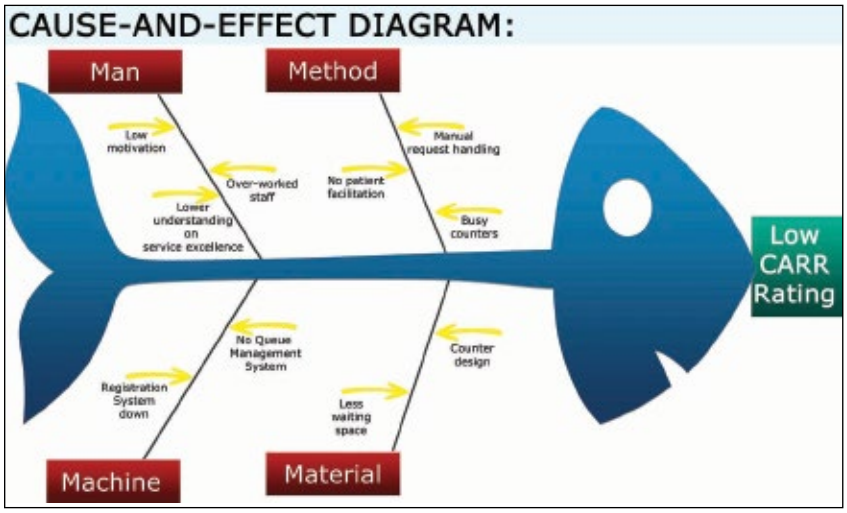
Daily Bulletin* coverage of RSNA 2014 is available at *RSNA.org/bulletin

"This makes service excellence, and hence the patient's experience, and satisfaction of utmost importance," said Khan, who presented a quality storyboard detailing AKUH's initiative to improve the patient experience by focusing on service excellence within the radiology department. "The idea was to do a measureable assessment of where we were in the eyes of those whom we serve and then act upon the assessment to improve the four dimensions of service excellence: communication, attitude, responsiveness, respect and caring," Khan said. Those modes of behavior are as important as patients' healthcare needs, he added.

While the baseline assessment identified improvement opportunity in all four categories, the Attitude rating in the radiology department was estimated at 64 percent. The hospital set a goal to bolster the Attitude rating to at least 80 percent within a 12-to16- month period by using a systematic approach to ensure a "delightful patient experience." The approach included timely guidance upon entry, complete information with courteous communication, quick processing of test formalities, positive and welcoming staff, radiographers and radiologists, and an easy-to-approach leadership for addressing their concerns.

Khan

An analysis of patient satisfaction findings and patient complaints yielded expected behaviors from staff, including radiographers. Staff training sessions incorporated role modeling and video records of actual interactions between patients and staff to identify "do's" and "don'ts." In addition, supervisors more frequently monitored interactions with patients, and a "meet-and-greet service" was created to welcome and guide patients. Special dinners, breakfast gatherings and other events served to keep staff motivated.



Muhammad Akbar Khan, M.B.A., presented a quality storyboard at RSNA 2014 detailing the initiative at Aga Khan University Hospital, Karachi, Pakistan, to improve the patient experience by focusing on service excellence within the radiology department. The goal was to improve the four dimensions of service excellence: communication, attitude, responsiveness, respect and caring, outlined in the diagram above.

"Attitude" Goal Met

The hospital's interventions were implemented in early 2013. By December of that year, the Attitude rating had improved from 64 to 82 percent.

While changing attitudes is a challenging task, small and focused actions with continuous reinforcement help create desired improvements, Khan said. "When the team started exploring why our Attitude rating was so low, the striking finding was that the staff had an emotional disconnect within the team," he said. "There was some basis for such feeling—lack of positive attitude within the team both when mistakes are used to reprimand staff without addressing the 'system' part of the cause and when good work is ignored without praise.

"With deliberate efforts to ensure that mistakes are used as learning opportunities and good work is publicly praised, we saw the most remarkable change in the Attitude rating," Khan continued. "You plant wheat to get wheat ... you give service excellence to get service excellence." □

FELICIA DECHTER is a Chicago-based freelance writer specializing in medical technology and health IT.

Entering Misleading Information to "Get Scans Faster" Puts Patients at Risk

BY EVONNE ACEVEDO JOHNSON

Research conducted in Ireland indicated that up to 45 percent of electronic radiology requests contained incorrect or misleading information about patients' biochemical or hematological status.

"The high level of erroneous clinical and laboratory information is concerning," said RSNA 2014 presenter Maria Twomey, M.B.Ch.B., a fellow of the Royal College of Surgeons in Ireland. "The primary concern is the effect this can and does have on how the radiologist protocols, prioritizes the study and reports the study."

Dr. Twomey said she and her team saw the need for a formal study when they heard anecdotal evidence of incorrect clinical information on requests. "There was some suspicion that colleagues were entering erroneous information to get scans faster," she said.

The study was performed at Cork University Hospital, a large tertiary referral hospital that receives requests via an electronic radiology information system. Information submitted by the referring physician was compared to the reported levels on their own institution's biochemical and hematology reporting system.

Of the 250 requests included in the study, researchers found that up to 45 percent contained erroneous information about creatinine, hemoglobin, white cell count and C-reactive protein levels. Fifteen percent of requests for CT pulmonary angiography, for example, reported an abnormal D-dimer result when the actual reported result was normal. Twenty-five percent had reported hypoxia when the lab-reported blood oxygen level was normal. Elevated C-reactive protein and/or white blood cell count was reported in 70 percent of acute abdominopelvic CT requests, but 20 percent of the formal results in that subgroup were normal.

"Significantly higher incidences of erroneous parameters were supplied by medical physician referrals than by surgeons," Dr. Twomey said.

Study Request Errors Can Lead to Misinterpretation of Results

Errors in an imaging request can result in selecting an inappropriate imaging procedure, Dr. Twomey said. "It may lead to the incorrect modality or study protocol being performed or inappropriate radiation dose. It could cause a delay in other patients being scanned and may lead to misinterpretation of radiological findings.

"Ideally, all biochemical and hematological results would be checked with the laboratory system," she said. Acknowledging that this could be laborious, Dr. Twomey's team instead recommends the implementation of an electronic ordering system linked directly to patients' laboratory reports and, ideally, the electronic patient chart. "The software exists and is in use, but it is not available in our and many other institutions," Dr. Twomey said. "Budgetary constraints are prevalent throughout radiology; however, these findings would support capital input into this software."

Twomey

> "The high level of erroneous clinical and laboratory information is concerning."
>
> MARIA TWOMEY, M.B.CH.B.

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Accurate clinical information is essential for radiologists to make informed judgments on patient exposure to radiation, Dr. Twomey emphasized. "Hopefully a software system connected to the lab results would make our colleagues think twice when they make that request," she said. "Solutions based on data are the most effective. Don't do a D-dimer if you're going to ignore the results." □

EVONNE ACEVEDO JOHNSON is a Goliad, Texas-based freelance writer specializing in healthcare issues.

Imaging Shift to Hospital Outpatient Facilities Concerns Radiologists

BY RICHARD S. DARGAN

Outpatient advanced imaging is shifting from private imaging centers to higher-cost hospital facilities, according to a new study, raising concerns about reduced access for patients and increased costs to payers.

In the study, first presented at RSNA 2014, researchers from Thomas Jefferson University in Philadelphia analyzed Medicare data from 2000 to 2012 and determined procedure utilization rates per 1,000 beneficiaries for each year.

Total utilization rates for advanced imaging in private offices rose 111 percent from 2000 to 2008, and then declined for three straight years—a drop attributed to code bundling in echocardiography, nuclear cardiac exams and CT of the abdomen/pelvis. Despite no further code bundling, the decline continued in 2012, while the hospital outpatient rate increased from 418 to 426 per 1,000 beneficiaries.

"Since 2011, there have been small increases in utilization rates in hospitals even as private offices continue to decline," said presenter and study author Bhavik Patel, M.D., a third-year resident at Thomas Jefferson University.

The ratio of private office to hospital outpatient advanced imaging fell from 1.67 in 2008 to 1.11 in 2012. The shift was most apparent in MRI, echocardiography and nuclear medicine, and to a lesser degree in ultrasound and CT.

"Medicare has been dropping reimbursement for mostly the technical component and to a lesser extent the professional component of advanced imaging," said David C. Levin, M.D., professor and chairman emeritus of the radiology department at Thomas Jefferson University Hospital. "As they drop reimbursements, we're seeing private offices begin to close, so the work is shifting to hospitals."

The shift appears to be an unintended consequence of measures taken by the Centers for Medicare and Medicaid Services (CMS) to reduce healthcare costs by attempting to slow the rate of imaging growth, according to the researchers.

A 2009 study by Dr. Levin and his Thomas Jefferson University colleague Vijay M. Rao, M.D., found that while total outpatient imaging rates increased by 45 percent from 1996 through 2006, the hospitals' share of the market dropped as more and more patients opted for the convenience and atmosphere of private centers.

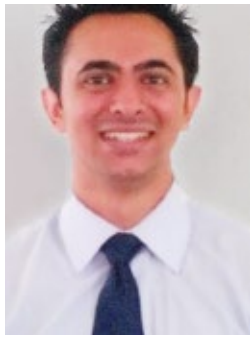
The growth in private centers positioned the facilities as prime targets for cuts, even though the actual source of much of the growth was a loophole in the Stark Law that allowed physicians to refer patients to imaging equipment that they owned. The Stark Law governs physician self-referral for Medicare and Medicaid patients.

"Physicians who own their own equipment used imaging at five to seven times the rate of physicians who did not own their own equipment and referred patients to others," said Dr. Rao, RSNA Board Liaison for Information Technology and Annual Meeting. "Because of rising costs, CMS cut reimbursement per unit rather than addressing self-referral, and the upshot of all this is that reimbursement has been slashed for offices."

The Deficit Reduction Act of 2005, which went into effect in January 2007, sowed the seeds for this recent shift by cutting reimbursements for Medicare private office outpatient imaging so that it was on par with hospital reimbursement. "Outpatient centers took a lot of the hit through things like code bundling and the utilization factor, and now we're seeing the consequences," Dr. Rao said.

Imaging Shift Impacts Patients

The consequences for imaging centers, in the form of closures, layoffs and postponed plans for equipment acquisition, are already affecting patient access, according to the researchers. "Reimbursements have been slashed so substantially that the technical revenues barely cover operating costs, so many private offices have been closing their doors," Dr. Rao said. "More and



Patel

Levin

Rao

"More and more patients are going to hospitals for advanced imaging, which ultimately will cost the payers more money because the rate of reimbursement is higher at hospitals."

VIJAY M. RAO, M.D.

The shift in advanced imaging from private imaging centers to hospitals is already affecting patient access, experts say. "Reimbursements have been slashed so substantially that the technical revenues barely cover operating costs, so many private offices have been closing their doors," said Vijay M. Rao, M.D.

more patients are going to hospitals for advanced imaging, which ultima tely will cost the payers more money because the rate of reimbursement is higher at hospitals."

Additionally, groups at imaging centers may struggle to upgrade or get new equipment, which could affect image quality and interpretation, Dr. Rao said. And patients who have opted for insurance plans with higher deductibles may put off getting necessary tests in order to save money.

"The goal of these cuts is to reduce costs, but if the hospital is paid more for patient services, then the costs may actually go up," Dr. Patel said. He likened the shift in advanced imaging to what occurred in cardiology in recent years after reimbursements for echocardiography and myocardial perfusion were cut.

"The literature suggests that many cardiology offices closed or were bought out by hospitals," he said. "Radiology is susceptible to the same macroeconomic forces."

Research Monitors Utilization Rates

The Thomas Jefferson University team expressed hope that their data would help make CMS and private insurers more aware of the importance of keeping imaging centers financially solvent.

"The Medicare program needs to stop cutting reimbursement for private imaging and equalize payments to hospital outpatient departments and private offices," Dr. Levin said. "CMS is already talking about it, but it's hard to make any changes because the hospital lobby will fight them."

In the meantime, the researchers said they will continue to monitor the annual utilization rates, although they do not expect the shift in outpatient advanced imaging utilization to change anytime soon. "We have more work to do, particularly in studying the impact of reimbursement cuts on CT, but we've painted a picture of the link between cuts and shift in imaging, and it's not unreasonable to think trends will continue," Dr. Patel said.

"I don't see anything right now that will reverse the trend, but I'm hoping that this research will bring attention to the fact that it's not advantageous to continue on this track," Dr. Rao added. □

RICHARD S. DARGAN is a writer based in Albuquerque, N.M., specializing in healthcare issues.

New CMS Data Collection Process Helps Analyze Imaging Shift

Effective January 1, 2015, CMS is using a new modifier to collect data on the shift in advanced imaging toward hospital-based physician practices. Reporting of the two-digit "PO" modifier "Services, procedures and/or surgeries furnished at off-campus provider-based outpatient departments" will be voluntary for one year before being required beginning on January 1, 2016.

CMS hopes to use the data collection to gain a better understanding of which practice expense costs typically are incurred by physician-owned imaging centers, which are incurred by the hospital, and whether there is a significant difference in resource costs given the differences in ownership arrangements. The move comes after the Medicare Payment Advisory Commission's (MedPAC) comments that CMS should set hospital outpatient payment rates at the same rate as physician offices when the office rates are the lowest.

Future of 3-D Printing is Bright, but Cost Remains an Obstacle

BY PAUL LATOUR

With advanced imaging as the cornerstone, the future of 3-D printing is bursting with possibilities for all of healthcare and holds the potential to completely reshape medicine. But barriers—primarily training opportunities and cost—prevent the technology from becoming widely implemented in everyday practice anytime soon.

Already 3-D printing is providing remarkable results in planning complex interventions in the heart, the spine and for a growing list of other procedures. At RSNA 2014, a research team led by Frank J. Rybicki, M.D., Ph.D., former director of the Applied Imaging Science Lab at Brigham and Women's Hospital (BWH) in Boston, and incoming chair and professor at the University of Ottawa, Canada, demonstrated how they utilized CT and 3-D printing to recreate life-size models of patients' skulls and soft tissues to assist in face transplantation surgery.

In 2011, Dr. Rybicki, working with the BWH surgical team led by Bohdan Pomahac, M.D., performed the first successful full-face transplantation in the U.S. and the team has since completed four more full-face procedures in addition to other partical face transplants. Dr. Rybicki explained that 3-D visualization was the precursor to 3-D printing and took place in 3-D labs. The underlying idea was that DICOM (Digital Imaging and Communications in Medicine) data sets contained more useful information than was being extracted via axial images alone, or even the rendering of a 3-D volume on a 2-D monitor (the essence of 3-D visualization). The availability of 3-D printing was the next logical step in technology and application to patient care, Dr. Rybicki said.

> *"3-D printing impacts far more routine surgeries than face transplantation, and it is here to stay."*
>
> FRANK RYBICKI, M.D. PH.D.

"There are strong parallels between 3-D printing today and early 3-D labs," Dr. Rybicki said. "Even more information can be obtained in DICOM images via a printed model in your hands, and this has borne out in many fields.

"3-D printing impacts far more routine surgeries than face transplantation, and it is here to stay," Dr. Rybicki added.

3D Printing Aids Heart, Spine Surgeons

Advancements in other areas support Dr. Rybicki's statement. The benefits of using 3-D printing to create a 3-D model of the heart were a major point of emphasis at the EuroEcho-Imaging 2014 annual meeting of the European Association of Cardiovascular Imaging (EACVI) last summer.

Specifically, in fall 2014, a 3-D heart model helped surgeons at Morgan Stanley Children's Hospital in New York repair a congenital heart defect in a 2-week-old baby. "With the advent of 3-D imaging, now we can clearly evaluate the structure of the heart in different planes," said Patrizio Lancellotti, M.D., Ph.D., EACVI president, in a written statement. "With this novel technology we will gain insights into the interactions between the valves and the ventricles, the valves and the aorta, and the valves and the left atrium."

Rybicki

Hibbeln

3-D printing itself depends on the advanced imaging modalities and protocols to generate source DICOM images amenable for printing. "For certain applications such as cardiac congenital anomalies, advanced MR protocols have proven invaluable to generate 3-D printed models," Dr. Rybicki said. "For other applications, particularly when bony structures are printed, thin section CT images will suffice."

In another breakthrough procedure in 2014, 3-D printing was used in complex spinal cord surgery. Doctors from the Peking University Third Hospital in Beijing successfully replaced a section of cancerous vertebra in a 12-year-old boy's neck with a piece created on a 3-D printer.

3-D printing was also successfully used in at least five other life-changing surgeries during 2014, including replacing an upper jaw, forming a new skull, spinal-fusion surgery, and heel and hip implants.

Training, Cost, Barriers to Widespread Use

Despite these successes, the high cost of 3-D printing hampers its implementation into everyday practice. According to an article in *Crain's Chicago Business*, high-resolution printers cost anywhere from $40,000 up to $1 million.

Other factors also run up the costs. For instance, implementing a 3-D printing laboratory is expensive, not only because the hardware and software are costly, but also because the work is very time- and labor-intensive. Funding sources, including federal resources, have become increasingly scarce, which make the funding environment extremely competitive.

ON THE COVER

Video footage showing animation of facial transplant surgery on a 3-D printed model of a male patient.

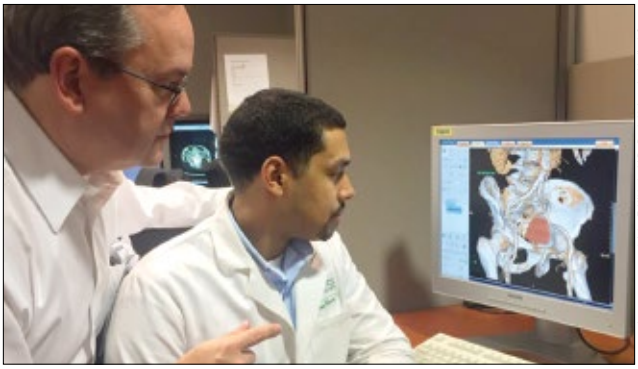


Image courtesy of John F. Hibbeln, M.D., Rush University Medical Center.

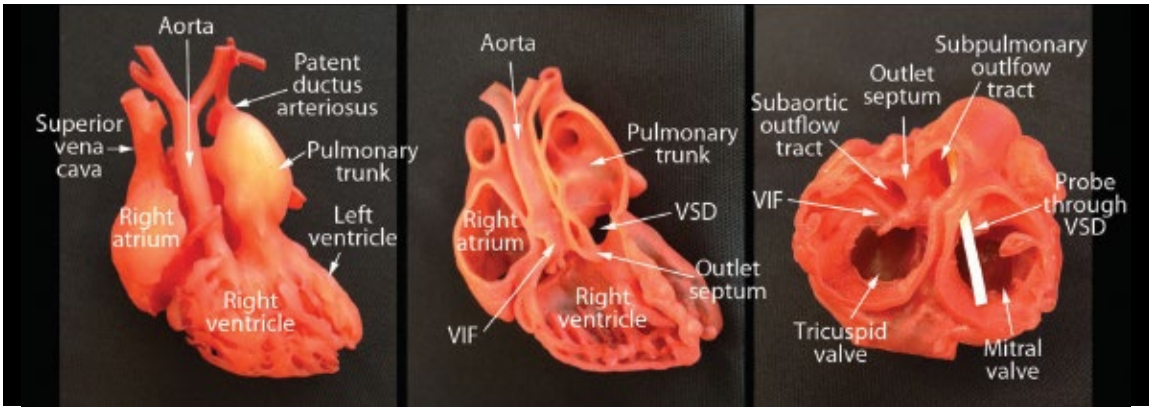


Image courtesy of Shi-Joon Yoo, M.D., Ph.D., the Hospital for Sick Children (SickKids).

3-D printing is already transforming healthcare in many revolutionary ways. *Top, from left*: 3-D printing has vast potential as an educational tool, said John F. Hibbeln, M.D., (*left*), reviewing a 3-D image of a percutaneous aortic valve replacement with fourth-year resident Michael Ralls at Rush University Medical Center, Chicago; *right*: a 3-D printed facial model created by RSNA 2014 researcher Frank J. Rybicki, M.D., Ph.D., and colleagues who used CT and 3-D printing technology to recreate life-size models of patients heads to assist in face transplantation surgery; *bottom*: A cast model (*left panel*), a wall model of the interior of the right ventricle (*middle*) and a wall model of the base of the heart (*right*) showing a double outlet right ventricle with a ventricular septal defect (VSD) in subpulmonary location, interrupted aortic arch and a large patent ductus arteriosus. (VIF=ventriculoinfundibular fold).

In terms of software and hardware, expenses to implement a 3-D printing laboratory, funding has become increasingly difficult as federal resources have decreased, making the process extremely competitive. "Applying for funding used to be a fairly quick process, but now it's becoming ever more prolonged," said John F. Hibbeln, M.D., who operates the 3-D printing lab at Rush University Medical Center in Chicago. "In the era of increasing restraint on medical costs, how does this fit in? The real issue is money and who's going to pay for it."

Dr. Hibbeln said his institution uses an independent contractor for their 3-D printing rather than buying the equipment. But he believes costs will begin decreasing soon as more companies become involved.

"The price of printing will come down. The number of printers out there is increasing. The utility is increasing. The software is improving. And the prices are dropping with all computers, so I anticipate the overall price will drop," Dr. Hibbeln said.

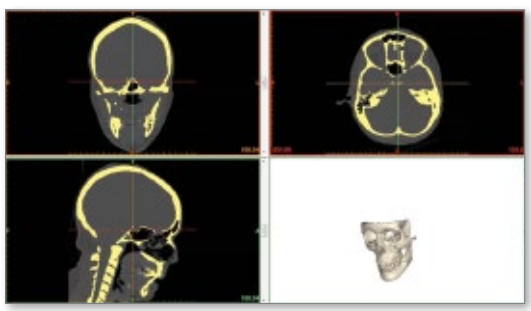
Because he works at a teaching hospital, Dr. Hibbeln sees the greatest potential for 3-D printing in areas of education, training and research. He added one other oft-overlooked potential benefit:

"We teach medical students, residents, fellows and junior physicians, but we are also here to teach patients," he said. "This is another part of the teaching mission that is underestimated. How do patients understand what is going on?"

A 3-D printed model can be extremely effective for physicians seeking informed consent for patients and their families. "When the patient actually holds his actual abnormal anatomy, or the parents hold that anatomy of their child in their hands, they can truly understand the problem and what the physician intends to do to correct the abnormality," Dr. Rybicki said.

"3-D printing has tremendous potential. Like so much else in the world, the only constraints are money and inventiveness," Dr. Hibbeln added. □

PAUL LaTOUR is an *RSNA News* staff writer.



WEB EXTRAS

Go to *RSNA.org/News* to view a series of videos related to Dr. Rybicki's RSNA 2014 research on 3-D printing including footage of the animated face transplant process on a male and female patient, a close-up of facial tissue, veins and blood cells during face-transplant surgery, and a doctor-patient consultation before the procedure. *RSNA News* online also features an RSNA 2014 interview with Dr. Rybicki explaining the 3-D printing process, as well as video footage of Dr. Rybicki's RSNA 2014 press conference on his research.

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Radiology in Public Focus

Press releases were sent to the medical news media for the following article appearing in a recent issue of *Radiology*.

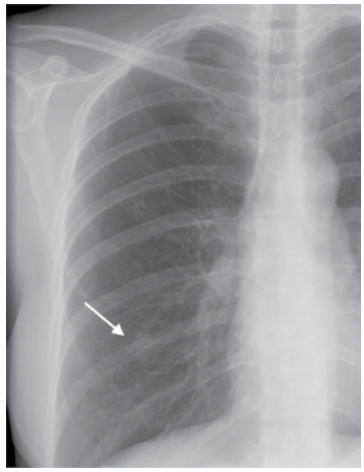
Diagnostic Yield of Recommendations for Chest CT Examination Prompted by Outpatient Chest Radiographic Findings

A radiologist recommendation for chest CT to evaluate an abnormal finding on an outpatient chest radiographic examination has a high yield of clinically relevant findings, including newly discovered malignancy, new research shows.

H. Benjamin Harvey, M.D., J.D., of Massachusetts General Hospital in Boston, and colleagues used the department's radiology information system (Centricity; GE Healthcare) to query for all outpatient diagnostic imaging examinations with chest radiographic examination codes performed and interpreted at the institution in 2008.

Of chest CT examinations performed within one year of the recommendation, 41.4 percent (286 of 691 [95 percent confidence interval {CI}: 37.7 percent, 45.2 percent]) detected a corresponding abnormality that required treatment or further diagnostic work-up and 8.1 percent (56 of 691 [95 percent CI: 6.2 percent, 10.4 percent]) detected a corresponding abnormality that represented a newly diagnosed, biopsy-proven malignancy.

"Because the U.S. health care system is shifting from volume-driven to value-based payment models, it is increasingly important for the radiology community to validate the clinical effect of its work," the authors write. "Our study demonstrates that chest CT examinations obtained within one year of recommendations for additional imaging (RAIs) are associated with a high diagnostic yield of clinically relevant findings, and one in every 13 examinations yielded a previously unknown malignancy. These findings suggest that RAIs for chest CT examinations prompted by outpatient chest radiographic examinations represent a valuable contribution to patient care."



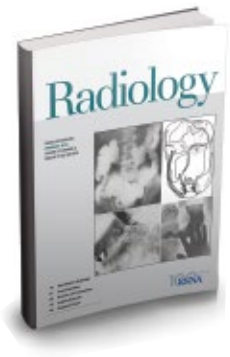
Examples of lesions seen on chest radiographic images that prompted a recommendation for chest CT examination and the corresponding abnormality on chest CT. A nodular opacity (*arrow*) is seen projecting over the right posterior ninth rib in the chest radiographic image of a 50-year-old woman who presented with cough.

(*Radiology* 2015;275;1:InPress)

MARCH PUBLIC INFORMATION OUTREACH ACTIVITIES FOCUS ON COLORECTAL CANCER

To highlight National Colorectal Cancer Awareness Month in March, RSNA is distributing radio public service announcements (PSAs) encouraging listeners to be screened for colorectal cancer.

In addition, RSNA is distributing the "60-Second Checkup" audio program to nearly 100 radio stations across the United States. The segments focus on knowing the risks, symptoms and diagnostic methods of colorectal cancer.



Media Coverage of RSNA

In November, 2,335 RSNA-related news stories were tracked in the media. These stories reached an estimated 280 million people.

A study published online in *Radiology* received widespread attention in the press during October and November. "Right Arcuate Fasciculus Abnormality in Chronic Fatigue Syndrome" was covered by more than 766 print, broadcast and online outlets, including *The New York Times*, *The Huffington Post*, *Yahoo! News*, *U.S. News & World Report*, KCBS-TV (Los Angeles), KCAL-TV (Los Angeles), KING-TV (Seattle), *Newsday*, *Today.com* and *CNN.com*.

Outlets covering other RSNA-related news stories included *The New York Times*, WGN-TV (Chicago), WPVI-TV (Philadelphia), *Reuters.com*, *Boston.com*, *CNBC.com*, *Medical News Today*, *Auntminnie.com* and *MedicineNet.com*.

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For patients

Journal Highlights

The following are highlights from the current issues of RSNA's two peer-reviewed journals.

The Developing Asymmetry: Revisiting a Perceptual and Diagnostic Challenge

Developing asymmetry is an important and challenging mammographic finding, associated with a moderate risk of malignancy. Biopsy is nearly always indicated if the finding persists following diagnostic evaluation.

In an article in the March issue of *Radiology* (*RSNA.org/Radiology*), Elissa R. Price, M.D., Bonnie N. Joe, M.D., Ph.D., and Edward A. Sickles, M.D., of the University of California-San Francisco, clarify and review:

- The defining features of a developing asymmetry
- Tools to facilitate its appropriate identification and evaluation at mammography and sonography
- Relevant percutaneous biopsy considerations
- Benign and malignant pathologies that may present as developing asymmetries

Step obliques were performed at 15° increments, starting from the CC view where the lesion is seen (0°), and the lesion (*circled*) is "followed" into the upper breast. Knowing the region of interest, spot compression magnification views can then be obtained in steeper obliquities to demonstrate the location of the abnormality (*circled*). The finding, now identified on two views, is best termed a developing asymmetry. No US correlate was identified. Stereotactic biopsy was performed and postbiopsy mammogram confirms accurate targeting (J). (*Radiology* 2015;274;3:642–651) ©RSNA 2015 All rights reserved. Printed with permission.

The likelihood of underlying cancer when a developing asymmetry is identified at screening mammography is 12.8 percent, and when identified at diagnostic mammography (performed for evaluation of a symptom or performed for short interval follow up of a probably benign lesion, of a benign concordant biopsy, or in the first five years following breast conservation surgery) is 26.7 percent.

"Developing asymmetries are often subtle mammographic findings. They are more likely to be perceived as abnormal when multiple prior examinations are compared side-by-side with the current study. The finding needs to be confirmed as a true abnormality (not representing summation artifact) by depiction on at least two different mammographic projections," the authors write.

This article meets the criteria for *AMA PRA Category 1 Credit™*.SA-CME is available online only.

Mammographic Breast Density: Impact on Breast Cancer Risk and Implications for Screening

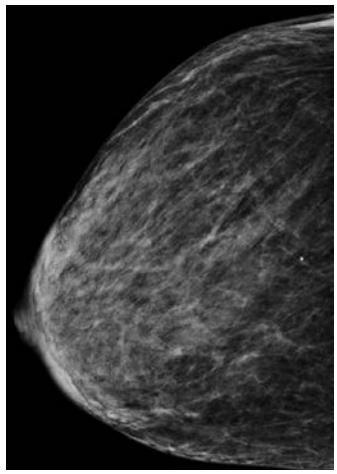
Mammographic breast density is rapidly becoming a hot topic in both the medical literature and the lay press. In the U.S., recent legislative changes in 19 states now require radiologists to notify patients regarding breast density as well as the possible need for supplemental screening. Federal legislation regarding breast density notification has been introduced, and its passage is likely on the horizon.

An understanding of the context, scientific evidence, and controversies surrounding the topic of breast density as a risk factor for breast cancer is critical for radiologists, according to Phoebe E. Freer, M.D., of Massachusetts General Hospital, author of an article in the March-April issue of *RadioGraphics* (*RSNA.org/RadioGraphics*).

As the interpreting physician for screening mammography, the radiologist is, by default, at the epicenter of conversations with patients and providers regarding breast density.

Breast density legislation is due, in large part, to patient-driven advocacy and the desire to seek more information. For radiologists, this brings a wonderful opportunity to enhance patient health and increase the number of beneficial discussions with the patient and her health care provider. The benefit of increased information will be realized, however, only if a patient is guided appropriately and understands the risks, benefits, and supporting medical evidence (or lack of evidence) regarding her options.

"As breast density legislation becomes more widespread and perhaps national, it is critical that radiologists continue to practice evidence-based medicine and ensure that the benefits of any additional testing offered outweigh the risks. Further, breast imagers must take the lead in advancing current knowledge with evidence-based studies that help guide decision making in tailored screening and in establishing evidence-based standards," the author writes.



Normal right craniocaudal screening mammogram, obtained after the patient underwent a gastric bypass procedure and experienced extreme weight loss, shows extremely dense breast tissue. (*RadioGraphics* 2015;35;InPress) ©RSNA 2015 All rights reserved. Printed with permission.

This article features an Invited Commentary by Reni S. Butler, M.D., Department of Diagnostic Radiology, Yale University School of Medicine, New Haven, Connecticut.

This article meets the criteria for *AMA PRA Category 1 Credit™*.SA-CME is available online only.

Listen to *Radiology* Editor Herbert Y. Kressel, M.D., deputy editors and authors discuss the following articles in the January issue of *Radiology* at *pubs.rsna.org/page/radiology/podcasts*:

- "Respiratory Motion Artifact Affecting Hepatic Arterial Phase MR Imaging with Gadoxetate Disodium Is More Common in Patients with a Prior Episode of Arterial Phase Motion Associated with Gadoxetate Disodium," Mustafa R. Bashir, M.D., and colleagues.
- "In a discussion from the RSNA 2014 annual meeting, *Radiology* Editor Herbert Y. Kressel, M.D., and Deputy Editor Deborah Levine, M.D., interview Anna E. H. Zavodni, M.D., who—along with her co-authors—was awarded the 2014 Alexander R. Margulis Award for Scientific Excellence, for the article, "Carotid Artery Plaque Morphology and Composition in Relation to Incident Cardiovascular Events: The Multi-Ethnic Study of Atherosclerosis (MESA)," published in *Radiology* in May 2014. Co-author David A. Bluemke, M.D., Ph.D., is also interviewed for the Podcast.

R&E Foundation Individual Donors

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Education and Funding Opportunities

Demonstrate Your Leadership Skills: Earn an ARLM Certificate of Achievement

Radiologists looking to take the next big step in their careers can solidify their commitment to leadership excellence by earning an Academy of Radiology Leadership and Management (ARLM) Certificate of Achievement. This award demonstrates dedication to gaining professional leadership skills and an effort towards becoming a leader among your colleagues.

Earn the certificate by completing ARLM-approved courses, both in-person and online. Several new courses were added to the online catalog and can be found at *www.radleaders.org*.

Each ARLM-approved course meets one or more of the elements of identified key learning domains, each representing an integral part of a well-rounded leadership curriculum. Participants must earn at least 50 education credits—including at least 30 credits in-person—within a three-year period. A minimum of three credits in each of the core learning domains is required.

Spring 2015 In-Person Meetings with ARLM-approved Courses:

- **Association of University Radiologists 63rd Annual Meeting**
  April 14-17, 2015
  New Orleans Marriott
  New Orleans, Louisiana
- **American Roentgen Ray Society (ARRS) 2015 Annual Meeting**
  April 19-24, 2015
  Metro Toronto Convention Centre
  Toronto, ON, Canada
- **American College of Radiology (ACR) 2015 Annual Meeting**
  May 17–21, 2015
  Marriott Wardman Park Hotel
  Washington, DC

Nomination Forms for IRIYA at RSNA 2015 Now Available

Deadline for Nomination
April 15, 2015

Young radiologists from around the world with research interests are finding the RSNA Introduction to Research for International Young Academics (IRIYA) program to be a beneficial step in attaining their goals.

"This is a really good, highly-organized program," said Chong Hyun Suh, M.D., a fourth-year resident at Asan Medical Center in Seoul, South Korea, who was accepted to the IRIYA program during RSNA 2014. "It's a good opportunity to learn basic research. I learned a lot from not only the speakers but also the other participants."

The four-day seminar held at each RSNA Annual Meeting encourages young radiologists from countries outside the U.S. and Canada to pursue careers in academic radiology by:

- Introducing residents and fellows to research early in their training
- Demonstrating the importance of research to the practice and future of radiology
- Sharing the excitement and satisfaction of research careers in radiology
- Networking with successful radiology researchers, future colleagues and potential mentors

***From left*: Amy Sevao, M.D., Mickael Ohana, M.D., and Chong Hyun Suh, M.D., at the RSNA 2014 IRIYA seminar.**

"IRIYA provides a good stimulus to young researchers," Dr. Suh said. "I would highly recommend it to our colleagues in Korea."

Nominations are now being accepted for IRIYA during the 2015 RSNA Annual Meeting. The RSNA Committee on International Radiology Education (CIRE) recommends 15 young academics for consideration by the RSNA Board of Directors each year.

Eligible candidates are residents and fellows currently in radiology training programs or radiologists not more than two years out of training from outside the United States and Canada, who are beginning or considering an academic career. Nominations must be made by the candidate's department chairperson or training director. Fluency in English is required.

Selected candidates receive complimentary registration, shared hotel accommodations and a travel stipend to defray the cost of air fare.

Medical Meetings March-April 2015

MARCH 21-25
American Institute of Ultrasound in Medicine (AIUM), Annual Convention and host of the World Federation for Ultrasound in Medicine and Biology Congress (WFUMB), Walt Disney World Swan & Dolphin Resort, Lake Buena Vista, Florida
• *www.aium.org*

MARCH 22-27
Society of Abdominal Radiology (SAR), Annual Scientific Meeting and Educational Course, Hotel del Coronado, Coronado (San Diego), California
• *www.abdominalradiology.org*
Visit the RSNA Booth

MARCH 22-27
International Diagnostic Course Davos (IDKD), 47th IDKD, Diseases of the Chest and Heart, Convention Center Davos, Switzerland
• *www.idkd.org*

APRIL 9-11
American Brachytherapy Society (ABS), Annual Meeting, Orlando Renaissance Sea World, Orlando, Florida
• *www.americanbrachytherapy.org*

APRIL 10-12
American Society for Radiation Oncology (ASTRO), 2015 State of the Art Radiation Therapy (START) Meeting, Las Vegas, Nevada
• *www.astro.org*

APRIL 11-14
American Physical Society (APS), April Meeting 2015, Baltimore, Maryland
• *www.aps.org*

APRIL 12-16
Healthcare Information and Management Systems Society (HIMSS), Annual Conference and Exhibition (HIMSS15), McCormick Place, Chicago
• *www.himss.org*

APRIL 14-17
Radiological Society of North America (RSNA), Association of University Radiologists (AUR), Joint Sponsored 63nd Annual Meeting, in conjunction with **SCARD, APDR, A3CR2, ACER, AMSER, RAHSR, RRA, APCR, SNMMI,** New Orleans Marriott, New Orleans, Louisiana
• *www.aur.org*

APRIL 16-19
Japan Radiological Society (JRS), 74th Annual Meeting in conjunction with the 71st Annual Scientific Congress of Japanese Society of Radiological Technology, the 109th Scientific Meeting of Japan Society of Medical Physics, and the International Technical Exhibition of Medical Imaging 2015, Pacifico Yokohama, Japan
• *www.congre.co.jp/jrs74/eng/*

APRIL 17-20
Australian and New Zealand Society of Nuclear Medicine (ANZSNM), 45th Annual Scientific Meeting, Brisbane Convention and Exhibition Centre, Brisbane, Queensland
• *anzsnm2015.com.au*

FIND MORE EVENTS AT *RSNA.org/Calendar.aspx*.

REGISTRATION FOR 2015 CORE WORKSHOP OPENS APRIL 1

The 2015 Creating and Optimizing the Research Enterprise (CORE) workshop will take place Oct. 2-3, 2015, in Oak Brook, Ill.

The workshop will focus on strategies for developing and/or expanding research programs in radiology, radiation oncology and nuclear medicine departments. New sessions include "Managing Research Finances in the Era of Constrained Resources" and "Building Diversity in Imaging Research."

The CORE program features a combination of presentations, case studies and group discussions.

For more information and to register for this free workshop, go to *RSNA.org/CORE*.

Residents & Fellows Corner

RadioGraphics Compiles Articles Helpful for Core Exam Study

A new online index of *RadioGraphics* articles is designed to help members-in-training studying for the diagnostic radiology examination administered by the American Board of Radiology (ABR).

With approval from the ABR Board of Trustees, Jennifer A. Harvey, M.D., and Sanjeev Bhalla, M.D., *RadioGraphics* editorial board members for Resident and Fellow Education, worked with volunteer experts to select appropriate articles published in the journal over the past 10 years and index them according to the radiology subspecialties and topics outlined in the ABR Diagnostic Radiology CORE Examination Study Guide.

The *RadioGraphics* ABR Diagnostic Radiology Core Exam Study Guide Article Index can be reached from the journal home page at *RSNA.org/RadioGraphics* or accessed directly at ***pubs.rsna.org/page/radiographics/abr-core-exam-study-guide***.

Annual Meeting Watch

RSNA 2015 Online Abstract Submission Open

The online system to submit abstracts for RSNA 2015 was activated in late January. The submission deadline is noon Central Time (CT) on Wednesday, April 8, 2015. Abstracts are required for scientific presentations, education exhibits, applied science, quality storyboards and quantitative imaging reading room showcase.

To submit an abstract online, go to *RSNA.org/abstracts.*

The easy-to-use online system helps the Scientific Program Committee and Education Exhibits Committee evaluate submissions more efficiently.

For more information about abstract submissions, contact the RSNA Program Services Department at 1-877-776-2227 within the U.S. or 1-630-590-7774 outside the U.S.

Registration Fees

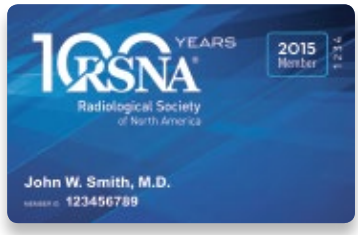
BY NOV. 6	AFTER NOV. 6	
$0	$150	RSNA/AAPM Member
0	0	RSNA Member-in-Training, RSNA Student Member and Non-Member Student
0	0	Non-Member Presenter
200	350	Non-Member Resident/Trainee
200	350	Radiology Support Personnel
900	1,050	Non-Member Radiologist, Physicist or Physician
900	1,050	Hospital or Facility Executive, Commercial Research and Development Personnel, Healthcare Consultant and Industry Personnel
325	325	One-day registration to view only the Technical Exhibits

Important Dates for RSNA 2015

Wednesday, April 29	Member registration and housing open at 10 a.m. CT
Wednesday, June 3	Non-member registration and housing open at 10 a.m. CT
Wednesday, July 8	Course enrollment open at 10 a.m. CT
Friday, October 16	Deadline for international badge mailing
Friday, November 6	Final housing and discounted registration deadline at 5 p.m. CT
Wednesday, November 25	Deadline to guarantee a seat for all ticketed courses at 5 p.m. CT
November 29 – December 4	101st Scientific Assembly & Annual Meeting

Value of Membership

RSNA Offers Affordable Membership as Residents Transition into Practice



Residents and fellows transitioning into practice will likely find a strong incentive for maintaining their RSNA membership: reduced rates.

While members-in-training receive free RSNA membership, members transitioning from training qualify for greatly reduced rates during the first and second years of practice—just $100 in year one and $200 in year two. It is not until the third year of practice that transitioning members pay standard membership dues.

The RSNA benefit gives residents time to settle into the profession before paying the full membership fee. Under the program, transitioning members receive all the benefits of full membership, including subscriptions to *Radiology*, *RadioGraphics* and *RSNA News*, free admission (with advance registration) to the annual meeting and free access to online CME opportunities.

For more information about these reduced rates, contact the Membership Department at 1-877-RSNA-MEM (1-877-776-2636) or *membership@RSNA.org*.

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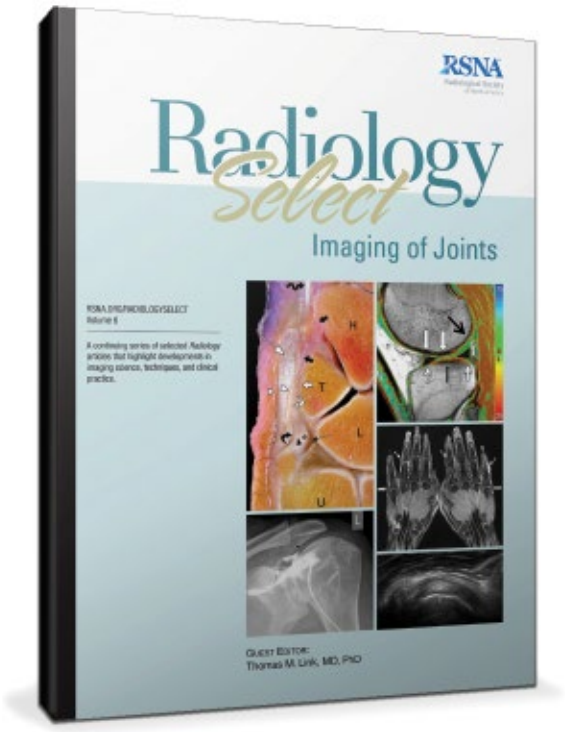

Newest *Radiology* Select Volume Available on *RSNA.org*

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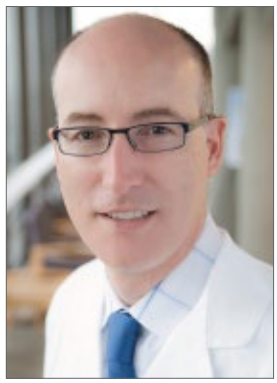

***Radiology* Select, Volume 6, Guest Editor, Thomas M. Link, M.D., Ph.D.**

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