

ACR

LEADERSHIP | INTEGRITY | QUALITY | INNOVATION

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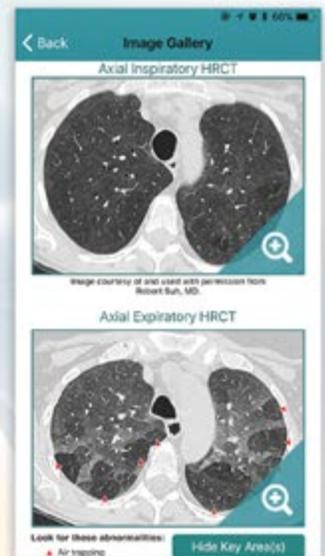
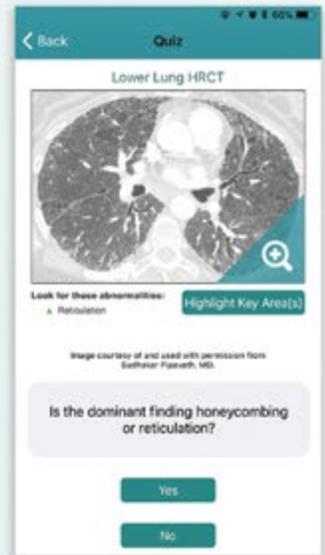
Bulletin



THE RIGHT TOOLS

Introducing a Peer-Reviewed
Interstitial Lung Disease
Educational App
for Pulmonary Healthcare Practitioners

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Rad Rounds – UIP to IPF



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FEATURE

10 The Right Tools

Radiologists have the ability to improve the appropriateness of image ordering, which can be impactful in a number of ways for patients and for healthcare costs.



Erratum

The *ACR Bulletin* editorial staff wish to retract the column, "Cancer Imaging: An Essential and Evolving Specialty" that was published on page 4 of the July 2019 issue. We sincerely apologize for our errors and the inconvenience that this has caused to Dr. Van den Abbeele, her team, and the ACR membership. A revised version will be published in October 2019.

OUR MISSION: The *ACR Bulletin* supports the American College of Radiology's Core Purpose by covering topics relevant to the practice of radiology and by connecting the College with members, the wider specialty, and others. By empowering members to advance the practice, science, and professions of radiological care, the *Bulletin* aims to support high-quality patient-centered healthcare.



QUESTIONS? COMMENTS? Contact us at bulletin@acr.org

Archives of past issues are available at ACRBULLETIN.ORG



Check out the digital edition!
Read more at acrbulletin.org

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What is the effect of surprise billing on patients?



No Surprises

The ACR is working with Congress to find a solution to the problem of surprise medical bills.

Lawmakers return to Capitol Hill this month and will resume their efforts to address the problem of surprise billing. Predominantly defined as a patient receiving an unanticipated medical bill from an out-of-network provider or facility, surprise bills can be financially catastrophic for the patient. The ACR has been working with Congressional leadership and other medical societies to enact equitable legislation that will spare the patient from being part of the reimbursement equation — while ensuring that physicians and insurers continue to have the ability to negotiate fair and reasonable agreements and maintain the ability to resolve payment disputes that may arise.

The AMA sent a letter — of which the ACR was a signatory — to Congress outlining several principles that should guide lawmakers as they draft surprise billing legislation ([read more at bit.ly/Surprise_Bill](https://bit.ly/Surprise_Bill)). Those principles include the following:

- Keeping patients from being caught up in out-of-network billing arrangements
- Making insurers accountable to patients by maintaining network adequacy and accurate provider listings
- Providing transparency on out-of-pocket costs to patients who may seek out-of-network care
- Benchmarking out-of-network payments to charge data rather than Medicare rates or non-transparent rates set by insurers
- Utilizing alternative or independent dispute resolution between physicians and insurers to settle disagreements over out-of-network reimbursement
- Applying any federal solutions to the surprise billing problem to all insurance plans, including the Employee Retirement Income Security Act of 1974

Many of these principles have been incorporated into state laws governing surprise billing. The ACR and other medical societies are encouraging Congress to adopt some of the more successful state models (such as those in New York and Texas) and avoid models that are not equitable to all stakeholders (such as those in California).

Engaging in the surprise billing debate is also an opportunity to realize ACR's commitment to its Imaging 3.0® goals. One aspect of Imaging 3.0 encourages radiologists to take more ownership of their patients' needs and expectations. Through its lobbying efforts on this issue, the College is seeking to assist Congress in

drafting legislation that is first and foremost designed to help the patient by alleviating the financial burden of surprise bills. ACR's efforts will also benefit patients by ensuring that access to imaging and other specialty services is not significantly diminished through unintended consequences borne by Congress attempting to solve this problem too quickly.

The ACR and other medical societies are encouraging Congress to adopt some of the more successful state models and avoid models that are not equitable to all stakeholders.

As the debate continues through the rest of 2019, I urge members to support our efforts by responding to potential calls to action requesting that you contact your lawmakers. Adding your voice will not only improve physicians' ability to receive a more robust legislative solution, but will also relieve future burdens for the patients we serve. **B**



Get Engaged

The problem of surprise billing isn't going away. Since several of the options currently being considered at the federal level could have significant impacts on the practice of radiology, it is imperative that we make our voices heard. There are plenty of ways to engage, including through the ACR and its Radiology Advocacy Network at acr.org/RAN.

Getting Ahead of the AI Game



The 2019 Data Science Summit, held by the ACR Data Science Institute™ (DSI) in conjunction with the Society for Imaging Informatics in Medicine annual meeting in Aurora, Colo., centered on the current state of data access; ethical issues regarding data ownership, privacy, sharing, bias and stewardship; and the democratization of AI. The summit, entitled, “Data Access in Healthcare — Implications

for the AI Ecosystem,” brought together thought leaders and attendees for a robust discussion and evaluation of where radiology is today and what the field can expect in the future.

The summit also marked the kick-off for seven pilot sites to begin using ACR AI-LAB™ to share AI between sites to create customized investigational AI models — while maintaining patient privacy. “We know algorithms can underperform when deployed at sites where they weren’t trained,” says ACR DSI Chief Medical Officer Bibb Allen Jr., MD, FACR. “Now radiologists in the pilot program will have access to AI algorithms developed outside their institutions to evaluate a model’s performance using their own data and, as necessary, retrain the algorithm using their local data to enhance its performance.” The seven sites include Massachusetts General Hospital, Lahey Hospital and Medical Center, Emory University, University of Washington, University of California San Francisco, Brigham and Women’s Hospital, and Ohio State University.

For more information about the AI-LAB, visit ailab.acr.org.



Gain New Rad-Path Skills From Top Faculty

ACR AIRP® rad-path categorical courses, held at the AFI Silver Theatre and Cultural Center in Silver Spring, Md., provide rad-path correlation for both radiology residents and practicing radiologists to show how the underlying pathology of a lesion relates to its imaging appearance. As a practicing radiologist, you may have limited access to the latest skills in rad-path correlation. Participating in these courses will improve your diagnostic accuracy in identifying specific diseases, treatment, and potential complications.

Upcoming AIRP courses offering *AMA PRA Category 1 Credits™* include the following:

- Breast: Sept. 13–14, 2019
- Abdominal: Sept. 16–20, 2019
- Musculoskeletal: Oct. 21–25, 2019
- Thoracic and Cardiovascular: April 6–9, 2020

Register for a course at airp.org/catcourse.

Navigating Corporatization

As the radiologist workforce continues to consolidate — leading to larger practices and disproportionately affecting single-specialty practices — ACR recognizes the need for a deeper understanding of the facts and trends impacting medical imaging.

To that end, the College last year formed the ACR Corporatization Task Force. As a subset of consolidation, the purchases of private practices by private equity and public companies has captured the attention of the entire profession. The goal of the Task Force was to research information on the potential impact on numerous fronts, including cost, quality, and patient access. The Task Force recently published a white paper in the *JACR*® on the potential impact of corporatization on radiologists and the patients they serve.

Many radiologists and practices have already experienced operational changes as a result of corporatization — including changes in leadership and decision-making roles. Findings of the Task Force come from numerous stakeholders with varying perspectives. Discussions included ACR’s international colleagues and U.S.-based medical professional organizations affected by corporatization — including the American College of Emergency Physicians, College of American Pathologists, American Academy of Dermatology, and American Society of Anesthesiologists.

While record valuations and access to new capital are opportunities, there are concerns over productivity strains, commoditization, and investors influencing practice strategy, priorities, and direction. As practice models develop, ACR — in alignment with other medical professional societies — is committed to promoting physician practice autonomy and quality, patient-centered care.

ACR will continue to assess and monitor the impact of corporate investment on the radiology profession and its patients. The College represents a diversity of physicians, practice models, and patients. ACR will continue to strive for guidance and consensus in promoting the profession and value-based patient imaging and care. ACR members can contribute to the discussion and potential policy development through the Council process.

On Oct. 17, the Radiology Leadership Institute® will host a webinar, “Basics of Corporatization.” The online discussion will define corporatization and explore how it may affect radiologists’ day-to-day operations, as well as potential impact on future career opportunities and employment benefits.

Visit JACR.org to read the white paper. To register for the webinar, visit acr.org/PowerHour.

PP & TS: 2019 Update

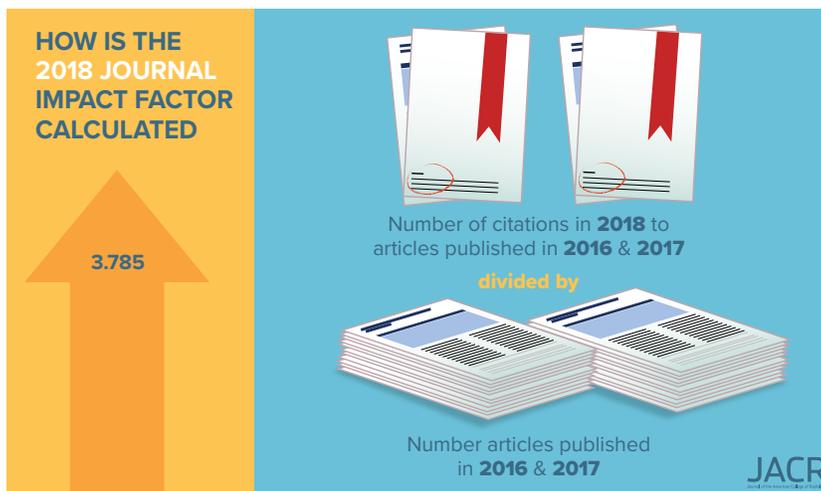
The ACR periodically reassesses and redefines its Practice Parameters and Technical Standards (PP & TS) to help advance the science of radiology and ultimately improve patient care. During ACR 2019, the Council passed 45 resolutions, including 26 revised and seven new practice parameters. The Practice Parameter for Communication of Diagnostic Imaging Findings was referred for further consideration. In addition, there were seven documents approved by the CSC and BOC — three radiation oncology practice parameters and four medical physics technical standards.

The new ACR PP & TS include the following:

- Practice Parameter for the Performance of MRI of the Pediatric Spine
- Practice Parameter for the Performance of Image-Guided Epidural Steroid Injection
- Practice Parameter for the Performance of Contrast-Enhanced US
- Practice Parameter for the Performance of US Elastography
- Practice Parameter for the Performance of Whole-Breast US for Screening and Staging
- Practice Parameter for Treatment of Benign and Malignant Thyroid Disease With ¹³¹I-Sodium Iodide
- Practice Parameter for the Performance of Therapy With Radium-223
- Technical Standard for Medical Physics Performance Monitoring of Stereotactic Body Radiation Therapy

The new and revised PP & TS will be available on the ACR website as soon as possible. The updated PP & TS will be effective Oct. 1, 2019.

For more information, visit acr.org/PP-TS.



JACR® Impact Factor on the Rise

According to the newly released 2019 Journal Citation Report, the *JACR*® has achieved a 2018 impact factor of 3.785 — its 7th consecutive increase in impact factor year-over-year. The new report ranks the *JACR* 25th among the 128 journals in the radiology, nuclear medicine, and medical imaging category — an increase from its previous rank of 28 and outpacing several peer publications.

“The *JACR*’s continued rise in rankings and impact reflects our ongoing commitment to deliver the highest quality content from the leading experts in the radiological sciences,” says *JACR* Editor-in-Chief Ruth C. Carlos, MD, MS, FACR. “From TI-RADS™ to burnout, and breast screening to ACR Appropriateness Criteria®, our readers trust us to consistently deliver the research and commentary they need to understand, innovate and advance their practice while improving the quality of care for patients.”

The 2018 impact factor measures a journal’s relevance to the scholarly publishing community. It is calculated by dividing the number of citations by the total number of articles published in the previous two years.

For more information, visit JACR.org.

“

TMIST will not only help tailor future breast cancer screening, but the demographic and socioeconomic information on those who enroll — and choose not to enroll — will help us know characteristics of those who take part in clinical trials and what barriers may prevent others from doing so.

— Amarinthia E. Curtis, MD, radiation oncologist and site investigator for TMIST at the Spartanburg Medical Center in South Carolina

”

ACR Wants to Hear From You!

“We are ACR” aims to connect members with the ACR community and highlight the radiology professionals, patients, and patient advocates who make up the fabric of the organization. Share your thoughts on the importance of providing high-quality imaging care, a story about a patient who inspires you, or a note on how ACR has improved your practice or grown your network of colleagues.

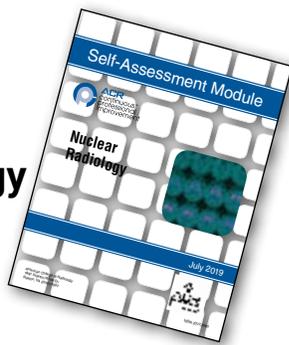
Visit acr.org/weareacr to record your testimonial.

Now Available: CPI Module in Nuclear Radiology

Test your knowledge and improve your diagnostic imaging skills with the new Nuclear Radiology Module 2019 from ACR Continuous Professional Improvement™ (CPI). Learn directly from the experts through studies in PET/CT, SPECT, CT, whole-body bone scans, scintigraphy, and more.

Each CPI module includes at least 50 self-assessment questions and offers up to 8 CME/SA-CME. Choose the print publication or the online examination and receive a free e-book copy. Members save \$35 per module when selecting six modules through a customized CPI Select Six Series.

Learn more at acr.org/cpi.



Imaging 3.0® Case Study: Lung Screening Solutions

A new case study explores how radiologists at Sanford Medical Center in Fargo, N.D., have collaborated with care partners to implement a life-saving lung cancer screening (LCS) program. With a dedicated nurse navigator, the radiologists provide longitudinal care to ensure the thousands of patients who come to the program from throughout the region receive appropriate follow-up care.

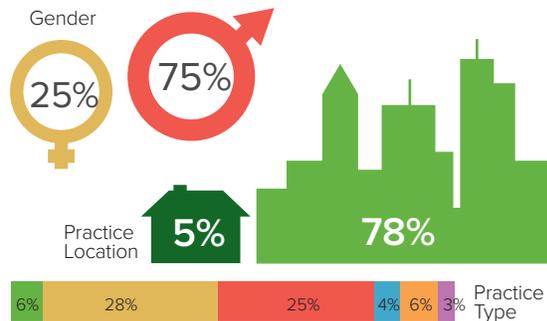
As part of its LCS program, Sanford Medical Center's radiologists have developed custom nodule recommendations that align with guidelines from related specialties. "The primary reason for our success is that we don't believe radiology operates in a vacuum," says Martha S. Kearns, MD, radiologist at Sanford Medical Center and guidelines project leader. "We know that to provide the best service, we have to reach out to our medical partners and work together to achieve continuity of care. This project is an example of how radiologists can lead an effort to ensure patients receive the care they need, when they need it."

To read the Imaging 3.0® case study, visit acr.org/LungScreeningSolutions.

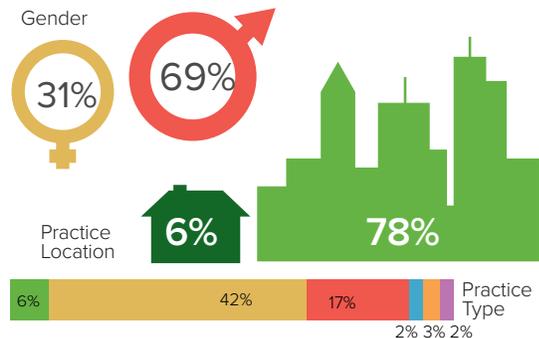
Demographics for ACR 2019

In 1998, the ACR Council passed a resolution, which was subsequently renewed in 2008 and 2018, to provide self-reported demographic information about the BOC, CSC, Commission Members, and ACR Councilors and Alternate Councilors. The following information is provided in accordance with that policy.

Councilors/Alternate Councilors **406** Total Members



Commission Members **107** Total Members



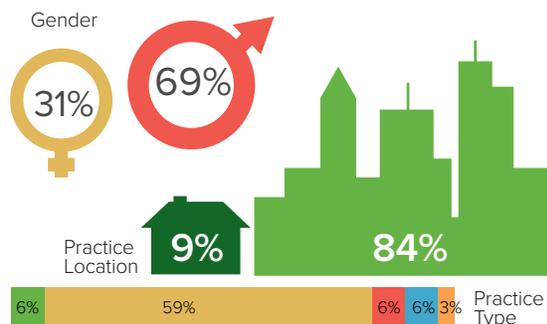
Practice Location

- Metro area (population ≥ 50,000)
- Small/Rural Area

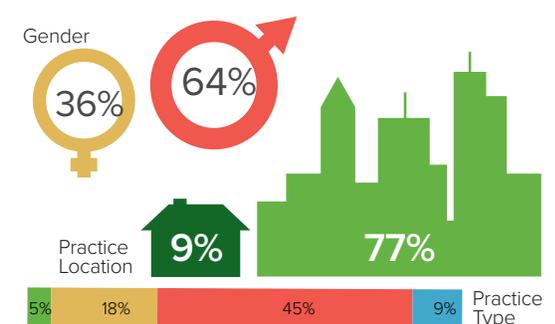
Practice Type

- Academic/Community
- Academic/University
- Community Hospital
- Multispecialty
- Private
- VA/PHS

Board of Chancellors **32** Total Members



Council Steering Committee **22** Total Members





When CDS is done well, clinicians are more efficient, more confident, and may even be able to think of a diagnosis that didn't occur to them immediately, all of which can lead to better care.

— Ben Harder, managing editor and chief of health analysis at *U.S. News & World Report*, and ACR 2019 Moreton lecturer

Here's What You Missed



The ACR website is home to a wealth of *Bulletin* content not featured in print. You'll find commentary, digital-only articles, and other updated multimedia content at acr.org.

Diving Into AI

A resident discusses his learnings about AI through his participation in the RFS Journal Club at bit.ly/RFS_JournalClub.

What You Missed at ASCO 2019

A radiation oncology resident recaps her experience attending the patient-themed American Society of Clinical Oncology annual meeting in Chicago at bit.ly/RFS_ASCO.



Taking the Lead From RLI

The Radiology Leadership Institute® (RLI) Taking the Lead podcast explores the challenges that transformed everyday radiologists into today's leaders.

In the latest episode, Carolyn C. Meltzer, MD, FACR, professor and chair of radiology and executive associate dean for faculty academic advancement, leadership, and inclusion at Emory University, shares her leadership journey from her days at the University of Pittsburgh as medical director of the PET center, chief of neuroradiology and vice chair of research, to her current time at Emory where she was instrumental in creating the Institute of Service Excellence that provides her team members with a strong foundation of both skills and knowledge essential to delivering service excellence to patients and their families. Along the way, Meltzer discusses her work to empower women leaders, why it's a great time to be in medicine, and why a world-class violinist was performing for patients undergoing studies at the PET center.

Listen to the podcast acr.org/RLI-Leading.

Research Finds Marked Increase of CDT for Treatment of Pulmonary Embolism

A new Harvey L. Neiman Health Policy Institute® study evaluates changes in the use of catheter-directed therapy (CDT) for pulmonary embolism (PE) treatment with attention to primary operator specialty in the Medicare population. According to the lead author Edward L. Gayou, MD, MPH, resident physician at Ohio State University, "The proportion of PEs treated with CDT increased 10-fold from 2004 to 2016, increasing from 0.1 percent to 1.0 percent. IRs are the dominant providers of these services, which was 70 percent of total CDT for PE procedures, followed by interventional cardiologists and vascular surgeons."

Read the full study online in the *Journal of Vascular and Interventional Radiology* at bit.ly/JVIR_PE.

CALENDAR

September

- 6–8 RLI Leadership Summit, Babson Executive Conference Center, Wellesley, Mass.
- 6–8 Coronary CT Angiography, ACR Education Center, Reston, Va.
- 9– AIRP® Correlation Course, AFI
- Oct. 4 Silver Theatre and Cultural Center, Silver Spring, Md.
- 12–15 The Society for Pediatric Radiology 2019 Fetal/Neonatal Imaging Course, Children's Hospital of Philadelphia
- 16–20 AIRP Categorical Course: Abdominal Imaging, AFI Silver Theatre and Cultural Center, Silver Spring, Md.
- 19–21 Breast Imaging Boot Camp With Tomosynthesis, ACR Education Center, Reston, Va.

October

- 5–6 2019 ACR Informatics Summit, Ronald Reagan Building/International Trade Center, Washington, D.C.
- 10–12 ACR Annual Conference on Quality and Safety, Sheraton Denver Downtown Hotel, Denver
- 11–13 Body and Pelvic MR, ACR Education Center, Reston, Va.
- 14– AIRP Correlation Course, AFI
- Nov 8 Silver Theatre and Cultural Center, Silver Spring, Md.
- 26 RLI Kickstart Your Career, DoubleTree by Hilton Hotel, Silver Spring, Md.
- 28–29 Prostate MR, ACR Education Center, Reston, Va.

November

- 4–5 Breast MR With Guided Biopsy, ACR Education Center, Reston, Va.
- 7–9 Breast Imaging Boot Camp With Tomosynthesis, ACR Education Center, Reston, Va.
- 7–8 AIRP Categorical Course: Abdominal Imaging, Pinewood House Education Centre, Stockport, U.K.
- 11–13 Pediatric Radiology, ACR Education Center, Reston, Va.
- 15–17 Musculoskeletal MR of Commonly Imaged Joints, ACR Education Center, Reston, Va.

Appropriate Use Criteria: Claims and Billing Guidance Arrives



CMS is committed to advancing AUC, motivating radiologists to implement the program.

On July 26, CMS released two documents updating the Appropriate Use Criteria (AUC) program, mandated by PAMA.^{1,2} The document restates the implementation timeline from previous CMS communications, including last year’s Medicare Physician Fee Schedule Final Rule. The anticipated guidance on billing claims is provided below. The education and operations testing period begins on Jan. 1, 2020, with full implementation of the AUC program expected Jan. 1, 2021.

During the education and operations testing period, CMS expects ordering professionals to begin consulting CDS mechanisms (CDSMs) and provide claims reporting information to the furnishing professional. CMS indicates that “claims will not be denied for failing to include AUC-related information or for misreporting AUC information.” In other words, payment is not at risk during 2020 — even if no information is provided. However, CMS goes on to state that “even though claims will not be denied ... inclusion is encouraged as it is important for CMS to track the information.”

CMS has created eight new modifiers to indicate the outcome of the AUC consultation (see Table 1).

1. When an AUC is consulted (ME through MG)
2. When a CDSM is not consulted — for instance due to hardship (MA through MD, MH)

CMS has also created 12 G-codes, which are Healthcare Common Procedure Coding System codes for reporting purposes. Each G-code is specific to one of the CMS-approved CDSMs. There is also a G-code for “not otherwise specified.” For instance, the G-code for the National Decision Support Company is G1004.

These modifiers should be placed on the same line on the claim form as the CPT® code for the advanced diagnostic imaging service, including MR, CT, and PET. Claims that report ME, MF, or MG — which indicate CDSM consultation — must also include the G-code for the qualified CDSM.

For those interested in claims processing, CMS provided further information regarding the G-codes (see Table 2). These new AUC-related G-codes are different than other G-codes as they do not include payment amounts (i.e., they are only for reporting). Each Medicare Administrative Contractor shall adjudicate these no-pay G-code line items with the messages in Table 3. CMS indicates that subsequent change requests will follow at a later date, which will further operationalize the AUC program.

The transmittals confirm CMS’ commitment to advancing this program — motivating radiology professionals to explore and implement the program. Payments are not at risk in 2020, providing time for education and testing before full implementation in just over a year. **B**

ENDNOTES

1. CMS Manual System: Pub 100-20 one-time notification, transmittal 2323, change request 11268. Accessed July 26, 2019.
2. CMS. MLN Matters Number: MM11268. Accessed July 27, 2019.

**Table 1:
New Modifiers**

When a CDSM is consulted (will also require a CDSM G-code)

ME – Order adheres to the AUC
MF – Order does not adhere to the AUC
MG – Order does not have the AUC

When a CDSM is not consulted (no CDSM G-code required)

MA – Emergency condition exemption
MB – Hardship – Insufficient internet access
MC – Hardship – EHR/CDSM vendor issue
MD – Hardship – Extreme, uncontrolled circumstance
MH – Order does not provide the AUC-related information

**Table 2:
G-Codes**

CDSMs: For 2020, there are 11 CMS-approved qualified CDSMs, each with its own G-code (full list available at bit.ly/G-code)

G1004: CDSM – ACR has a relationship with NDSC (CareSelect® Imaging)

**Table 3:
Additional Claims Guidance**

CARC 246 – This non-payable code is for required reporting only

RARC N620 Alert – This procedure code is for quality reporting/informational purposes only

THE RIGHT TOOLS

Radiologists can improve the appropriateness of
image ordering, transforming patient care and
driving down costs.



Appropriate diagnostic imaging is a key element of high-value healthcare. Careful selection of imaging exams can expedite diagnoses, reduce unnecessary testing, decrease radiation exposure and other risks, and diminish healthcare costs. A 2018 analysis of healthcare spending in the United States compared to other countries concluded that high healthcare costs in this country may trace in part to an overuse of diagnostic imaging.

While the ACR Appropriateness Criteria® (AC) can help guide appropriate image ordering, many referring providers do not know about the guidelines, let alone use them. But change is on the way. PAMA mandates that starting Jan. 1, 2020, providers must consult Appropriate Use Criteria (AUC) via a qualified clinical decision support (CDS) mechanism when ordering advanced diagnostic imaging for Medicare Part B patients. In preparation for this change, hospitals across the country must seek ways to integrate these tools into ambulatory clinical practice.

At the University of Chicago, an interdisciplinary team of radiologists and general internists have developed a lecture-based curriculum to raise awareness of the risks and costs of unnecessary tests. The curriculum also gives internal medicine interns tools to make more effective and informed decisions about diagnostic imaging for their patients. These tools include facts about radiation exposure and case studies from Radiology-TEACHES®, a program that radiologists at Baylor College of Medicine developed to simulate the image ordering process and teach medical students about appropriate image ordering using CDS technology. Twenty-four medical schools are using Radiology-TEACHES, including the University of Chicago's Pritzker School of Medicine.

Now in its second year as part of the University of Chicago's ambulatory program for internal medicine interns, the curriculum has garnered promising results, with nearly all of the interns who participated in the program reporting that they would change their ordering practices based on what they learned. The team of radiologists and general internists is now adapting the curriculum to other specialty groups, such as hospitalists and emergency medicine specialists who treat non-emergent, ambulatory patients in the ED.

"It's an area of great need and a lot of people are interested in the topic," says Joyce W. Tang, MD, MPH, assistant professor of hospital medicine, who has been on the team since the project's inception. "We have the ability to really improve the appropriateness of ordering, which can be very impactful in a number of ways for patients and for healthcare costs."

INTERDISCIPLINARY IDEA

Tang conceived the idea for the curriculum with Carina W. Yang, MD, director of pediatric neuroradiology, when the pair were postgraduate fellows in the University of Chicago's Medical Education Research, Innovation, Teaching, and Scholarship (MERITS) fellowship program.

Tasked with devising an innovative medical education concept and presenting it to their colleagues in the program, Tang and Yang discussed several hot topics. But when Yang described the frequent questions she gets from referring providers about which tests to order and the number of inappropriate diagnostic imaging orders she sees each day, this struck a chord with Tang, who immediately identified with the general internist side of the image ordering process.

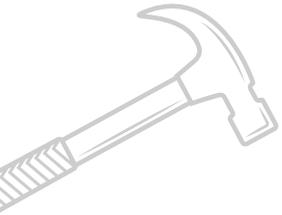
Given the breadth of conditions for which general internists order imaging studies, Tang admitted, "I often wonder if I'm ordering the most appropriate radiological test for a given patient." Despite the importance of judicious image ordering to quality patient care, it is not usually covered in depth in medical school or even residency.

Recognizing this, Yang introduced Tang to the ACR AC. Tang readily recognized the criteria's value, which dove-tailed nicely with the Choosing Wisely® campaign and with the increasing emphasis on high-value imaging. "We realized the problem of incorrect ordering went beyond us and is quite universal," Tang remembers. They based their curriculum on the AC and called it "Medical Overuse of Radiological Exams: MORE for less" and made a brief presentation to their colleagues in the fellowship program.

Keeping Up With PAMA

Beginning on Jan. 1, 2020, PAMA will require providers to consult AUC before ordering diagnostic imaging (including CT, MR, nuclear medicine exams, and PET scans) for Medicare patients. The mandate includes a phased rollout from CMS. Starting in July 2018, early adopters entered a voluntary reporting period. And in January 2020, a one-year testing period with no penalties will commence.

Fortunately, the College already provides tools for CDS, such as the AC. The AC fulfill the new CMS mandate for consulting CDS prior to diagnostic imaging in Medicare patients. Although several CDS systems exist, the ACR and the National Decision Support Company have developed CareSelect® Imaging, which uses the AC and other guidelines to advise providers ordering imaging for patients. Learn more about these tools at acr.org/CDS.



Tang and Yang connected with Mike K.W. Cheng, MD, an internal medicine resident who was applying to the residents' version of the MERITS program and who could serve as a champion for the project. With interests in medical education, high-value care, and quality improvement, Cheng's skills and experience meshed well with Tang and Yang's vision. To round out the multidisciplinary team, Yang brought radiology resident Andrea Magee, MD, onto the project.

CONTENT RESEARCH

Still in residency, both Cheng and Magee were able to dedicate time in their schedules to the project and set to work gathering and writing curriculum content with guidance from Yang and Tang. They decided that the training would cover balancing the benefits of diagnostic imaging with the risks of radiation and other exposures, as well as the costs of the tests.

“Their program acts as a connector, bringing radiologists and referring providers together to learn and work together in teams with the shared goal of providing high-value care to patients.”

— Marc H. Willis, DO

To that end, the team collected cost data for different imaging tests from the hospital billing department and compared it with average annual income levels for the surrounding communities, demonstrating the financial burden of over-testing on patients and the additional costs for adding contrast.

They also created a graphic showing typical radiation doses of common diagnostic exams nationally, as well as the increase of radiation exposure in recent years due to the rise in medical testing nationwide. The goal was to not only increase awareness of the potential financial and health consequences of inappropriate testing but also to enable physicians to answer patients' questions about the risks and benefits of recommended diagnostics.

To further emphasize appropriate image ordering, the team knew it needed to include case studies in its curriculum. Creating case studies can be arduous, but in an online search for ideas, Yang came across an Imaging 3.0® article about Radiology-TEACHES, which uses case vignettes from ACR's CORTEX case management system and the CareSelect Imaging® CDS tool to simulate the image ordering process.

Since the University of Chicago's Pritzker School of Medicine was among the Radiology-TEACHES pilot

sites, Yang and Tang spoke with Chris M. Straus, MD, who led the radiology clerkship that used the program at the University of Chicago. Straus, in turn, connected the team with Marc H. Willis, DO, associate professor of radiology at Baylor College of Medicine, who led development of Radiology-TEACHES with ACR support.

Willis and his team agreed to allow the University of Chicago group to use Radiology-TEACHES for the case study part of its curriculum. The Baylor team trained Cheng on the software and continues to provide support as needed. Willis says that while the original focus of Radiology-TEACHES was on medical students, he finds this expansion to interns and residents exciting. “The University of Chicago experience has been a great example of how this educational resource can benefit graduate medical education,” he says.

CURRICULUM DEVELOPMENT

From there, the University of Chicago team began developing a framework for the curriculum. They wanted it to appeal to different types of learners, so they included multiple components: two lectures, simulated case studies using Radiology-TEACHES, pre- and post-test assessments, and a three-month follow-up survey. The curriculum initially targeted internal medicine interns because these physicians are at the earliest stage of their careers, when they tend to be more open to new ideas.

Team members take turns presenting the lectures and leading the discussions with each of the three groups in the internal medicine class. Each time they include one radiologist and one internal medicine specialist for an interdisciplinary approach that Willis finds particularly appealing. “Their program acts as a connector, bringing radiologists and referring providers together to learn and work together in teams with the shared goal of providing high-value care to patients,” he says.

The first lecture introduces the interns to the cost and safety data, as well as the AC. After that lecture, the interns complete a homework assignment that involves practicing image ordering with Radiology-TEACHES. During the second lecture, the interns break into small groups to discuss the cases and review what they have learned. Pre- and post-tests and a follow-up survey document learners' progress and the curriculum's effectiveness.

SUCCESSFUL PILOT

To get approval to add the curriculum to the internal medicine program, the team approached the program director for the internal medicine residency's ambulatory curriculum and the ambulatory chief resident. While it can be difficult to get add-on curriculum approved, Cheng says the administration supported the



purpose and vision of the training and, based on initial discussions, allowed the team to add the lectures to the curriculum for one academic year.

As an add-on to the curriculum, the lectures start an hour before the official course, and attendance is optional. To encourage the interns to attend the first session, Cheng sent a reminder email a few days before to explain the course content, noting that residents had developed it.

Cheng later found that many of the interns were intrigued with this aspect, which seemed to add credibility to the class. “They were eager to attend not only to show their support, but also because they knew it was a topic valuable enough that internal medicine residents would want to help develop a curriculum about it.”

In the first year, 23 interns participated in the program and completed the pre- and post-tests. The results showed that before the curriculum was presented, more than a third of the interns did not know about the AC, and only 1 in 4 consulted the guidelines when ordering tests.

After the course, the interns unanimously deemed the curriculum helpful, and more than 90 percent said they would change their ordering practices as a result. Interns had improved performance on the knowledge assessment of appropriate image ordering and were more likely to reference the ACR AC tool while completing the assessment. Interns also reported feeling more comfortable discussing exam costs with patients. Three months after the conclusion of the program, 18 interns completed a follow-up survey. More than three quarters of those interns reported using the AC at least monthly.

Josh G. Waytz, MD, first-year resident in internal medicine at the University of Chicago who took the class in the fall of 2018, said coverage of radiological exams during medical school had been brief and broad. He appreciated that this class was tailored to internal medicine and found himself surprised by the cost and radiation exposure data of different imaging methodologies.

“I had no idea that certain X-rays carry much more potent radiation than certain CT scans,” says Waytz, who reported that even between the two lectures he consulted the AC to more appropriately order an ankle X-ray while working in the urgent care clinic. “The AC is a hidden gem and a useful resource that I’ll definitely be using going forward,” he says.

FUTURE PLANS

Based on the success of the pilot, the team has adapted the curriculum for hospitalists and has plans to adapt it for emergency medicine clinicians and other primary care specialists, as well as physician assistants and nurse practitioners.

In addition, the team has worked with the hospital’s

IT department to integrate a link to the AC within the EHR so clinicians can easily access the guidelines when ordering exams. In the future, they hope to track whether the curriculum leads to more frequent use of this feature of the EHR and helps physicians comply with the PAMA provisions as the hospital implements a qualifying CDS.

“We have the ability to really improve the appropriateness of ordering, which can be very impactful in a number of ways for patients and for healthcare costs.”

— Joyce W. Tang, MD, MPH

All indications are that the curriculum will help. The curriculum includes hands-on instruction on how to consult the AC when ordering tests in the EHR. It also lets learners “look behind the curtain and gives validity to the AC,” says Cheng. “We let them know, this is our experience with it, this is the value we find in it, this is how we use it in the clinic.”

“It’s been really well received by the primary care communities that we’re a part of and at the conferences we’ve presented at,” says Cheng. “A lot of providers are recognizing the importance of imaging appropriateness and the need to be providers who focus on high-value care and who are accountable to our patients and our organizations. It’s rewarding to help assist them along this path to providing better patient care.” **B**

By Emily Paulsen, freelance writer, ACR Press



Have you seen the AC Patient-Friendly Summaries?

The JACR® last year unveiled the first examples of the AC summarized in plain language to help patients better understand which imaging tests may be most appropriate for their particular condition. The new patient-written summaries are part of a larger effort by the ACR to provide more patient- and family-centered resources. To access the summaries, visit bit.ly/AC_Summaries-JACR.



No Patient Left Behind

Radiation oncologists and radiologists are changing the face of lung cancer screening for veterans.

Each year, more people die of lung cancer than of colon, breast, and prostate cancers combined.¹ Active duty and veteran military members have a significantly higher risk of developing lung cancer — due to exposure from carcinogenic chemicals on military bases and in the field of battle, as well as a higher rate of smoking.² From 2006 through 2015, 77,930 veterans were diagnosed with non-small cell lung cancer. Unfortunately, the majority presented with advanced stages, which are often incurable and carry a survival rate of only 2–13%.²

These concerning statistics are why the U.S. Department of Veterans Affairs (VA) has been studying lung cancer screening (LCS) since as early as the 1950s.³ And the VA is doing more each year to make LCS available to every veteran at risk, says Drew Moghanaki, MD, MPH, section chief of radiation oncology at the Atlanta VA Medical Center. “At least once a week I see a patient with advanced lung disease. And when you are faced with this issue at least 52 times a year, you start trying to find any sort of solution that can reduce the rate of this happening,” says Moghanaki. In 2017, Moghanaki formed the VA Partnership to Increase Access to Lung Screening (VA-PALS) Implementation Network. Together with the International Early Lung Cancer Action Program (I-ELCAP), the Bristol Meyers-Squibb Foundation, and other collaborators, the project is working to ensure that

VA LCS programs are using best practices.

The first phase of VA-PALS entails the installation of an open source screening software, adapted from the originally pioneered system that’s been in use by I-ELCAP since the 1990s. The newly adopted VAPALS-I-ELCAP software management system received the highest level of certification by the Open Source EHR Alliance in May of 2019 and is scheduled for deployment at ten VA medical centers throughout the country. The system borrows from I-ELCAP’s experience implementing LCS at over 80 institutions globally that has helped them define the way we screen today, says Moghanaki.² The software, which will be installed on VA networks, will simplify the clinical workflow of LCS by reducing the need for manual data entry and automating alerts for clinicians when patients are overdue for their next evaluations. The program will track patients and develop a data set.

According to Moghanaki, because the software is open source, it can be deployed to other healthcare providers around the world — something that can help increase access to LCS globally. And with such a large population of patients and outcomes being tracked with a harmonized system — including the thousands of VA patients and the 75,000 patients already within I-ELCAP’s LCS registry — this software could lead to the largest global data set ever assembled to guide important changes in how we screen in the future. “Based on the outcomes we will see through this program, we might be able to develop new screening methods, identify new risk factors to further refine eligibility criteria, and develop other quality indicators for radiologists to use in the future,” says Moghanaki.

The implementation project also has a focus on training; ensuring quality low-dose CT image acquisition, interpretation, and reporting of findings; and patient management resources — including advanced practitioners serving as LCS navigators to counsel and track patients at risk for lung cancer, says Ian A. Weissman, DO, FACR, chair of the ACR GSER Network VA Subcommittee. Weissman, a radiologist at the Milwaukee VA (one of the implementation sites for VA-PALS), has already seen the impact of the program at his facility. “When we began the program, many of my colleagues were struggling to find effective ways to increase access to LCS, including successfully tracking patients,” he says. “But now that we’ve hired the LCS navigator, I’ve seen the results of this new VA-PALS initiative.”

continued on page 21

Tracking AI

The College's latest survey included a deep dive into members' perceptions of machine learning — and how it will affect their practices.

The ACR is committed to empowering its members to advance the practice, science, and professions of radiologic care. The College works to equip members with the tools they need to succeed — while actively promoting and advocating for the profession before Congress, federal and state regulatory agencies, and state legislatures.

In addition, the College delivers many benefits to empower radiologists and the patients they serve. Understanding how members — and non-members — view the ACR and the benefits of membership is critical to helping the College fulfill its commitments to members.

The College recently conducted the ACR Membership Tracker — a quantitative survey of members and non-members from a sample of radiologists to gain a better understanding of their views on emerging trends affecting the profession, such as AI. A total of 1,738 interviews were completed, of which 1,343 were members, 376 were non-members, and 19 were state chapter members.

The survey found that a majority of both members and non-members believe that AI will be extremely or very prevalent in the future practice of radiology (see Figure 1). Members were significantly more likely than non-members to see a high degree of AI in the future practice of radiology. These trends were consistent among members — regardless of career stage or subspecialty. The survey also found that members and non-members agree that AI will have a significant positive effect on radiology, improving efficiency and reducing error rates. Members were significantly more likely than non-members to believe that AI will improve efficiency of reporting, and significantly less likely to agree that demand for radiologists will decline because of AI (see Figure 2).

The ACR, through regular messaging and the work of the Data Science Institute™, has been working to dispel some fears members have that AI will significantly disrupt their livelihoods. These survey results indicate that members are more optimistic about the future of the radiology profession than their non-member counterparts — due in part to their interaction with ACR. The College will continue to keep members abreast of developments within AI as it relates to radiology, as well as survey members annually to measure feedback and track trends that might affect industry growth as these perceptions evolve over the years. **B**

By Monique C. Talbot, CAE, ACR membership director, and Mary Jo Tarrant, MBA, ACR director of portfolio planning and environmental intelligence

Figure 1:

Likely Prevalence of AI in Future Practice of Radiology

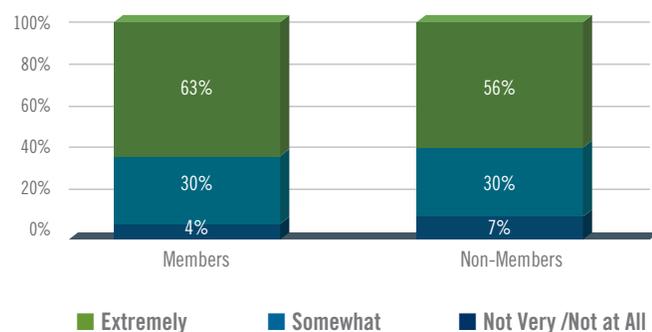
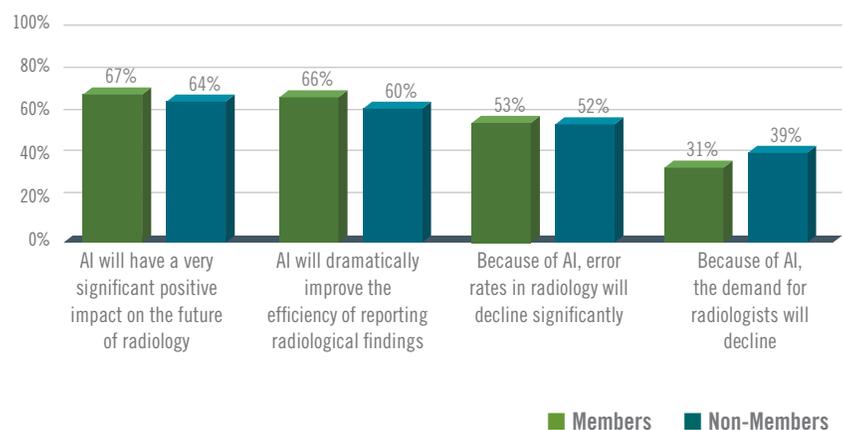


Figure 2:

Impact of AI in Radiology



The ACR Membership Tracker was developed on behalf of the Commission on Membership and Communications. Bill T. Herrington, MD, FACR, chair of the Commission, will be a guest columnist in the November issue of the *Bulletin*. Learn more at acr.org/Membership.



Taking Charge

A new initiative out of SCARD and GE Healthcare involves radiology leaders helping their female peers rise in the ranks.

Two years ago, Cheri L. Canon, MD, FACR, and Rachel Gilbreath, vice president at Hillrom, attended the Radiology Leadership Institute® Summit in Wellesley, Mass., and found themselves bonding over their experiences as leaders in their respective fields — and what they could do to make the path forward easier to navigate for their female peers in healthcare. Although they had different backgrounds — Canon is a professor and chair of radiology at the University of Alabama at Birmingham School of Medicine, while at the time Gilbreath led GE Healthcare’s strategy for academic medical centers across the U.S. — they found they’d encountered many of the same challenges on their rise to leadership positions.

“Women are not encouraged as much through our systems to visualize themselves as leaders,” says Canon.

According to Canon, although the number of women chairs in radiology has doubled since she became chair, it’s still far too low at 20 percent — which she believes speaks to the challenges women continue to face, despite the progress that’s been made.¹ “The biases facing women in academic medicine are substantial,” says Canon.

“Radiology is still a minority women field and has been for a very long time, so there are built-in expectations that leaders are predominantly men.”

Getting Started

Canon and Gilbreath’s partnership culminated in the development of a new program for burgeoning women leaders in radiology and the healthcare industry — designed to elevate participants’ careers and help them embrace their leadership potential. Their initiative, entitled Leading, Empowering, and Disrupting (LEAD), is a program jointly led by the Society of Chairs of Academic Radiology Departments (SCARD) and GE Healthcare to increase the number of women in leadership positions within their respective organizations and to build a national community of women across industry and radiology. LEAD, which began in September of 2018 and consists of 20 women — 10 radiologists and 10 GE Healthcare staff — is comprised of monthly one-hour virtual training programs, live meetings, and a mentorship program that spans the course of a year. “The aim of LEAD is to leverage the leadership expertise of both organizations, as well as develop synergies between program participants,” Canon says.

The synergy Canon refers to was a highlight of LEAD’s inaugural year. Alexander M. Norbash, MD, FACR, Summit faculty and co-director, president of SCARD, and LEAD faculty member, recalls one of his favorite moments that occurred at a roundtable discussion during the program’s inaugural event in Santa Fe, N.M. “I was the only man in the room with a large number of energetic, enthusiastic, and empowered women radiologists and executives from GE, and the optimism, joy, and energy

▲ Pictured are participants in 2018/2019 inaugural class of LEAD — consisting of 20 individuals, selected via a competitive application process, who have been recognized as emerging and current leaders in their organizations.

were palpable,” he says. “They found each other, they found their commonality, and they were inspired by each other. It was an incredibly positive moment, and that memory will stay with me.”

Gilbreath agrees. “It has been amazing to see the connections that have been made, friendships and relationships that have formed,” she says. “We celebrate each other’s successes and are there to lend our support when needed.”

Making Connections

Norbash wasn’t the only one impressed with the success of LEAD’s first year. One of the participants, Miriam A. Bredella, MD, professor of radiology at Harvard Medical School and vice chair for faculty affairs of the department of radiology at Massachusetts General Hospital, credits LEAD with changing her perspective and expanding her horizon — particularly in relation to what she discovered from her industry colleagues. “I learned so much about mentoring, career development, and leadership that has helped me in my new position as vice chair for faculty affairs in our department at my home institution,” Bredella says. “LEAD made me more aware of gender biases, and I speak up if I notice them and actively try to promote and sponsor other women.” According to Bredella, LEAD made such an impact on her that she has started a mentoring and leadership development program for her faculty at home.

Both Canon and Carolyn C. Meltzer, MD, FACR, professor and chair of radiology and executive associate dean for faculty academic advancement, leadership, and inclusion at Emory University, agree with Bredella that the mentorship aspect is so critical. According to Meltzer and Canon, women need to see other women in leadership roles so they can see themselves as future leaders. “Cheri and I are examples of something that isn’t very common,” Meltzer says. “We would love to see this program help to amplify the number of women chairs of radiology departments. We don’t particularly cherish being part of such a small minority.”



Rachel Gilbreath and Cheri L. Canon, MD, FACR, connected over what they could do to make the path to leadership easier to navigate for their female peers in healthcare.

“We would love to see this program help to amplify the number of women chairs of radiology departments. We don’t particularly cherish being part of such a small minority.”

– Carolyn C. Meltzer, MD, FACR

Leveraging the Power of Networking

According to Meltzer, the connection that formed among the participants was a key indicator of success during LEAD’s first-year run. “One of the most gratifying aspects of LEAD was that all of the women — from industry and from academic medical centers — clicked incredibly well,” Meltzer says. “Initially it seemed each were intimidated by the other, but they had so much in common and also very many complementary experiences.”

Norbash agrees. “Male networking — whether it’s on the golf course, in the boardroom, or at a bar — is something that has been leveraged so that men advance,” he says. “When we have a community of women who are looking out for each other, the things they can accomplish are much greater as a collective.”

Norbash, Meltzer, Gilbreath, and Canon all want to see this first year of LEAD participants take their learnings and run with them — and they believe they will. “What’s really great is this group of women are totally engaged and paying it forward,” Canon says. “They’re really going to become super alumni in helping us plan the next year, which is going to be even better.” According to Meltzer, the program will have many ripple effects. “Some of these women will become chairs or rise in the corporate leadership under GE or with other companies,” Meltzer says. “They will serve as role models for others, and we will look for a tipping point.” Gilbreath believes a network and community has formed that will continue to grow and extend beyond this program. “LEAD has provided GE Healthcare women and leaders expanded insights and perspectives into the challenges and opportunities that exists on the provider side, and not just from a diversity and inclusion standpoint,” Gilbreath says. Norbash agrees. “We should’ve done something like LEAD 20 years ago,” he says. “But we’re excited to be part of this current motion, this wave that’s moving forward.” **B**

By Cary Coryell, publications specialist, ACR Press

ENDNOTE

1. AAMC. Faculty roster: department chairs by department, sex, and race/ethnicity, Dec. 31, 2017; snapshot, as of Dec. 31, 2018. Accessed Aug. 11, 2019.



LEAD will send its inaugural class to the Radiology Leadership Institute® Summit, taking place Sept. 6–8, 2019, at Babson College in Wellesley, Mass. To register for the Summit, visit acr.org/RLISummit_2019.

Charting a Course

Keeping up and moving forward in machine learning means having a roadmap for success.

Gauging the practical implementation of day-to-day, timesaving AI in medical imaging is no simple calculation. Setting your group's compass to ensure quality care doesn't have to be an arduous endeavor.

According to Bibb Allen Jr., MD, FACR, chief medical officer of the ACR Data Science Institute™ (DSI), “AI translation to routine clinical practice has been slower than many expected because we have to ensure that AI in medical imaging is useful, safe, effective, and easily integrated into existing radiology workflows.” To move the needle, DSI created well-defined use cases for AI in 2018. These include implementing and streamlining existing ACR programs, including ACR Clinical Guidelines and ACR Assist™ modules. DSI is also working to engage other radiology societies to build models that support clinical guidelines and care pathways.

As part of a multi-stakeholder approach, the National Institute of Biomedical Imaging and Bioengineering held a workshop last year at the National Institutes of Health — from which a two-part roadmap to AI was published by RSNA and ACR. The most recent ACR report ([available at bit.ly/JACR_AIReport](http://bit.ly/JACR_AIReport)) details the real-world AI challenges facing radiologists, considering translational research in AI that will help medical imaging speed up the best uses of AI in clinical practice.

AI in Practice

To boost that transition, the College launched the ACR AI-LAB™ — a constellation of software tools designed to help radiologists learn the basics of AI and participate directly in the creation, validation, and use of health-care AI. The ability to improve on an algorithm, while keeping patients' personal information secure, protects them, your practice, and makes the adoption of AI more practical, Allen says.

“DSI is actively pursuing all of the aspects of translating AI to clinical practice,” Allen says. “The AI-LAB allows for sites to participate in algorithm validation and collaboration with other sites through transfer learning. Modifying algorithms using local data improves diversity and generalizability of the model.”

- The four key priorities set out in ACR's roadmap are:
- Creating structured AI use cases that define and highlight clinical challenges that may be solved by AI
 - Establishing methods to encourage data sharing for

training and testing AI algorithms to promote generalizability (spreading widespread clinical practice and mitigating bias)

- Establishing tools for validation and performance monitoring for AI algorithms to facilitate regulatory approval
- Developing standards and common data elements for the seamless integration of AI tools into existing clinical workflows

Recent Activities

The 2019 Data Science Summit in June, hosted by DSI (in conjunction with the Society for Imaging Informatics in Medicine's annual meeting), focused on the current state of data access and liquidity; ethical issues regarding data ownership, privacy, sharing, bias, and stewardship; and the democratization of AI. The event brought together thought leaders to discuss and evaluate where radiology is today and what the field can expect in the future.

“We know algorithms can underperform when deployed at sites where they weren't trained,” Allen says. “Now radiologists in the new AI-LAB pilot program will have access to AI algorithms developed outside their institutions to evaluate a model's performance using their own data and, as necessary, refine and tune the algorithm using their local data to enhance its performance.”

Future Events

AI tools will be a critical driver of the future of radiology. They hold the potential to deliver a wealth of information to inform accurate diagnoses and to identify patients most at risk of serious illnesses.¹ If you're interested in AI's potential to bolster patient-centered care, attend the ACR Annual Conference on Quality and Safety (acr.org/QSMeeting) to learn about patient-centered quality improvement initiatives in a scholarly environment conducive to networking and discussion among peers. The conference will be held in Denver, Oct. 11–12, with intensive pre-conference workshops available on Oct. 10 at no additional charge.

The ACR has also brought back the Imaging Informatics Summit for radiologists, practice leaders, industry partners and policymakers to explore strategies for putting AI to good use. This year, the summit is being held Oct. 5–6 in Washington, D.C. Sign up to participate in the hands-on, interactive event — including an onsite demonstration of the AI-LAB to inform AI implementation at acr.org/IISummit. **B**

By Chad Hudnall, senior writer, ACR Press

ENDNOTE

1. Allen B, Seltzer SE, Langlotz CP, Dreyer K, et al. A road map for translational research on AI in medical imaging [published online ahead of print May 28, 2019]. *J Am Coll Radiol*.



The Intersection of Data Science and Quality

The September special issue of *JACR*® includes an overview and risk-benefit analysis of AI tools for the radiological sciences, takes readers through the process of evaluating AI models for use in clinical practice, and examines how AI will assist institutions in developing quality improvement activities and peer learning opportunities. Find the special issue in your mailbox this month or online at JACR.org.

Learning from Patients

An innovative teaching initiative at Indiana University positions patients to drive care improvements.

“A patient presents ...” The medical community uses this phrase frequently when discussing patients’ symptoms. However, the idea of a patient presenting has taken on new meaning in the radiology department at Indiana University (IU).

There, radiology leaders have begun inviting patients to attend teaching conferences and present their imaging experiences to residents and other trainees. The goal is to inspire incoming radiologists to provide high-quality, patient-centered care and encourage them to remember the significant impact they can have on individual lives.

An Idea Takes Shape

Richard B. Gunderman, MD, FACR, chancellor’s professor of radiology at the Indiana University School of Medicine, says the notion of having patients share feedback at resident teaching conferences grew from a desire to improve the patient experience through education and awareness.

The noontime conferences usually include approximately 40 residents and fellows and about 20 medical students. Patients have presented at two of the daily conferences so far, and Gunderman plans to invite more patients to the meetings going forward.

“Normally a teaching conference would consist of a radiologist showing cases, such as chest X-rays and head CT scans, or having the residents look at cases and try to figure out the pathological conditions,” Gunderman explains. “But then we thought, ‘Instead of focusing solely on the images, let’s have patients come and talk about what their experiences were like being diagnosed with diseases such as cancer.’”

Gunderman reached out to several patients and immediately found two courageous women who were willing to share their stories. He believes one of the reasons the women, both of whom had been diagnosed with breast cancer, were so willing to participate in the conferences is that they both had worked in radiology departments in the past.

A Brave Reminder

At the start of the conferences, Gunderman asked a few questions, which prompted each of the women to detail her personal experience. The residents then had the opportunity to ask questions, with many inquiring

how the physicians might have done better and how the patients viewed radiologists.

Rachel Rincker, MD, a radiology resident at IU, says that while both women expressed unease about having received their diagnoses over the phone, their feedback about radiology was mostly positive. “Breast cancer is a particularly strong story because it’s a screening examination,” she says. “These women specifically said, ‘The radiologist made a huge difference in my care.’”

“Unless you have experienced it yourself, it can be difficult to appreciate what it’s like to be told you have cancer or another serious illness.”

– Richard B. Gunderman, MD, FACR

Through the Patient’s Eyes

Following the two patient-centered conferences, a survey of attendees revealed that many residents rated the conferences highly, while others also told Gunderman in person that they enjoyed the sessions. Based on this feedback, Gunderman says the department hopes to conduct multiple conferences like this each year and use what they learn to improve patient care.

“Most radiology residents are in their 20s, and, fortunately, most of them haven’t faced too many serious illnesses during their lives,” Gunderman explains. “Unless you have experienced it yourself, it can be difficult to appreciate what it’s like to be told you have cancer or another serious illness.”

Rincker agrees that the patient presentations were an important milestone of her training. “It’s such a good reminder of why we get into medicine,” she says. “A lot of physicians get lost in the daily work and forget why they got into medicine and how much it means to people, how much they can help change the course of someone’s life.” **B**

By Alyssa Martino, freelance writer, ACR Press



Physician Resources for Patient- and Family-Centered Care

The ACR is committed to helping you improve the patient experience. Explore materials to enhance your understanding of — and participation in — new practice and payment models and help you provide more patient- and family-centered care at acr.org/PFCCToolkit.



Experiencing Artificial Intelligence

Machine learning will result in even greater improvements in efficiency and accuracy, while at the same time reducing work fatigue.

Artificial intelligence was a major emphasis at RSNA in 2017, and I had an opportunity to check out the latest technology from several AI start-ups. Hands-on experiences with simulated PACS workstations quickly convinced me that AI technology could improve our accuracy and efficiency and reduce turnaround time.

The next step was to find an AI technology partner for the radiology department at the University of Rochester's Medical College. It was a learning process for us, but we navigated it successfully. Here are the steps we followed to bring AI to my institution.

Choosing an AI Vendor

One limitation of current AI software is how it interacts with a radiologist's work list. While all AI software is able to identify findings on images, not all AI software creates notification of high priority cases. Notifications were a priority for us and we worked with the vendor to implement this feature.

Compliance and workflow were also concerns. In order to be HIPAA-compliant, patient-identifying information has to be removed when it is sent to the cloud — then re-attached when it is sent back to the PACS. AI image processing can be performed either on a server located onsite or on a cloud-based system.

Though cloud-based systems are more cost-effective, they come with a built-in issue — sending sensitive information over the internet. As I evaluated the right AI partner for us, we looked for flexibility in how their inference models would integrate software into our existing PACS system, create work list notifications, and implement a cloud-based system in a HIPAA-compliant fashion. Those factors were a huge issue for us — and we

considered them among the most important factors in choosing a partner.

After returning from RSNA, I spoke with my chair about a potential collaboration between a developer partner and our department. After an enthusiastic response, I arranged a series of conference calls and onsite meetings with the vendor to discuss expectations and goals.

Because the vendor I selected was interested in an opportunity to test its software at a multicenter radiology department — and our goal was to gain experience using AI software and conduct research — we agreed to work together. We decided the first application would be detection of intracranial hemorrhage on head CT.

Starting the First Project

The AI tool we deployed was designed to improve our workflow. Before launching the test, we had to work through a few sticking points. One of our initial concerns was how to best differentiate stat exams ordered by referring physicians from routine exams tagged by the AI software as urgent. Our solution was to tag the AI-identified cases with a yellow badge symbol — whereas stat exams were marked in red. As a result, cases tagged with a yellow badge to indicate the presence of an intracranial hemorrhage were read with the same priority as stat cases. Consequently, the time interval from the CT scan completion to notifying the ordering clinician was reduced.

Our new AI tool was extremely accurate at finding both obvious bleeds and extremely subtle bleeds. As expected, it did not determine the cause of the bleed or identify any other types of findings unrelated to the intracranial hemorrhage. The end result was a useful AI tool on our PACS workstation that can detect subtle

bleeds, which can easily be missed by junior residents or even by experienced faculty when the caseload gets heavy.

Looking Ahead

Many of the attendings and residents in my department have embraced AI technology. We now have several active research projects evaluating turnaround time, accuracy of the tool, and its utility in a mobile stroke unit. We have also instituted weekly research meetings that include attendings, residents, and scientists employed by our vendor.

In the near future, we will deploy additional AI tools to identify pulmonary embolism on CT pulmonary angiograms, free air in the abdomen on CT, and cervical spine fracture on CT. All of these tools are examples of narrow AI, which is sensitive for doing a single task, in this case finding a single abnormality on an image. Despite the millions of dollars being poured into research, broad AI — capable of solving problems across multiple tasks — has not yet been developed. Perhaps,

“Despite the millions of dollars being poured into research, broad AI — capable of solving problems across multiple tasks — has not yet been developed.”

someday it will be able to identify all abnormalities on medical imaging, but that is not the case today.

Our department is asking many important questions about the use of AI, including:

- How can we best demonstrate the value of AI in radiology and justify the added expense?
- In what way should we allow private companies access to the “big data” that resides in our PACS archives?
- Who owns our data?

We are addressing these questions by developing a dedicated team consisting of radiology faculty, radiology residents, and IT staff to find the answers. In addition, we are collaborating with ACR’s Data Science Institute™ to help understand the role AI can play in improving diagnostic accuracy and efficiency, the value and reimbursement for the technology, and the potential limitations of AI technology.

As a mid-career academic radiologist, I have seen significant changes in the practice of radiology. Prior to AI, the biggest change was moving from film to PACS. All would agree that we are much more efficient and accurate with PACS. Based on our initial results with AI, it is clear that this technology will result in even greater improvements in efficiency and accuracy, while at the same time reducing work fatigue. Ultimately, work satisfaction will be improved as we are freed up to spend more time doing the work that drew us to this field. **B**

By Eric P. Weinberg, MD, FACR, professor of clinical imaging sciences at the University of Rochester Medical College



JOB LISTINGS

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Indiana – X-ray Consultants is seeking a breast imaging radiologist to provide state-of-the-art comprehensive care in the ACR-accredited Paqui and Brian Kelley Comprehensive Breast Center of Excellence. Modalities include digital mammography, tomography, MRI, US, and molecular breast imaging. Breast procedures include US, MRI, and stereotactic-guided biopsies. X-ray Consultants is also looking to fill a general radiology partnership track position. The group is accepting applications from residents, fellows, and practicing physicians. Fellowship subspecialty training is welcome but not necessary.

Contact: Send resumes to dhuffman@xrcmi.com

Pennsylvania – There is an available position for an independent contractor position for a diagnostic radiologist to work three to four days onsite every other week. The position is located in Northeast Pennsylvania, approximately two hours north of Philadelphia. The candidate must be comfortable with all modalities, except mammography, with an expected volume of roughly 100 mixed cases per day.

Contact: Send resumes@raww.com

No Patient Left Behind

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For others wanting to get involved in LCS, both in the VA and private healthcare, the key to success is to make sure your LCS program is multidisciplinary — a strength of VA-PALS. “When we first began the program, we all wanted it to be an interdisciplinary partnership so that we could pull in as many experts and resources in the field as possible,” Moghanaki says. Without the support and resources of their institutions, LCS programs simply cannot flourish at the pace that’s needed to reach everyone at risk, he says. Moghanaki further likens those who get involved with LCS programs to volunteer firefighters and other emergency service personnel: “These individuals, like physicians, are very dedicated to saving lives. However, they can’t be successful without appropriate infrastructure supporting them. They need trucks,

they need resources, and they need the backing of the city before they can safely run into burning buildings to save lives.” Through its software, training, and patient management, VA-PALS hopes to improve and provide continuous care for veterans throughout the entire LCS process: from screening, to diagnosis, to treatment and follow-up. “We cannot afford to lose any opportunity to save lives,” says Weissman. “No patient should be left behind.” **B**

By Meghan Edwards, freelance writer, ACR Press

ENDNOTES

1. American Cancer Society. Key statistics for lung cancer. Updated 2019.
2. Moghanaki D. Veterans Affairs – Partnership to increase Access to Lung Screening (VA-PALS) [grant proposal]. Bristol-Meyers Squibb Foundation. 2017.
3. Lilienfeld A, Archer PG, Burnett CH, et al. An evaluation of radiologic and cytologic screening for the early detection of lung cancer. *Cancer Research*. 1966;26(10):2083-2121.

What is the effect of surprise billing on patients?



“Surprise billing is all too common, particularly affecting patients with more severe diagnoses in emergency and hospital settings. Insured individuals can easily find themselves facing significant financial burdens even though they practiced adequate due diligence in selecting an in-network facility. These surprise bills have the potential to be drivers of stress, anxiety, and medical debt for our patients.”

— Michelle L. Dorsey, MD, chief of radiology at the Phoenix Veterans Affairs Health System



“When patients who have deliberately sought care from in-network providers receive surprise medical bills, the reaction can run the gamut, including surprise, grief, anger and disappointment. Worst of all, the uncertainty that their insurance policies will cover their healthcare needs can result in patients making the decision to forgo or delay needed healthcare. As a physician, this is truly disheartening.”

— Bojan D. Petrovic, MD, neuroradiologist at NorthShore University Health System and clinical assistant professor at the University of Chicago's Pritzker School of Medicine

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