

Bulletin



Hive Mind



ACR Updates Practice Parameters for Skin Marking in Mammography

Facilities should require consistent use of radiographically distinct markers to indicate palpable areas of concern, skin lesions, and surgical scars.¹

A consistent skin marking protocol using distinct shapes for marking areas of interest on the breast provides clear and immediate communication, helps reduce questions and misinterpretation of findings, and spares the patient from unnecessary additional views and/or call-backs.

"I am pleased to see the stronger wording regarding the use and documentation of breast skin markers for important clinical findings."

– Michael Linver, MD, FACR

The right marker for the right application for the right technology

Beekley Medical® has been helping breast imaging facilities standardize communication and documentation of important mammographic landmarks for years.

As technology has evolved, so have our markers to ensure the clearest visualization of underlying tissue detail with minimal artifact.

Learn more about the specific usage of the shape communication system in accordance with the ACR's newest recommendations.

Call 1-800-233-5539 • Email info@beekley.com • Visit www.beekley.com

Visit www.beekley.com for product safety information

¹ ACR PRACTICE PARAMETER FOR THE PERFORMANCE OF SCREENING AND DIAGNOSTIC MAMMOGRAPHY Revised 2018 (Resolution 35) section E, labeled Markers, part 2, page 5

FEATURE

8 Hive Mind

Delivering a good patient experience has taken center stage in radiology, and patient interactions with frontline professionals are paramount to a radiology group's success.



14

ALSO INSIDE

11 An Upcoming Transformation

Today's medical students hope to provide more connective patient care by embracing AI.

12 Protecting Patients

The ACR is engaged in the legislative process to ensure patients are protected and physicians maintain their right to fair negotiations.

14 The Time Is Now

Proponents of parental leave believe that taking a lead on the issue can help address some of the challenges facing radiology.

16 A Culture Change

A paid parental leave policy adds value for practice members — not just as radiologists but as parents.

17 A Collaborative Resource

A research roadmap on gadolinium identifies knowledge gaps and prioritizes directions for needed research.

18 Focusing on Metrics

The ACR PFCC Economics Committee is emphasizing patient-reported outcomes data.

19 Information Overload

How can radiologists achieve work-life balance amid the never-ending flow of digital updates?

20 Speaking Out

The ACR 2019 Open Microphone session involved the larger radiology community sharing their feedback with one voice.

DEPARTMENTS

4 From the Chair of the Board of Chancellors

ACR members have an opportunity to provide direct commentary on the College's future direction, programs, and services.

5 Dispatches

News from the ACR and beyond.

7 From the Chair of the Commission on Economics

Policymakers and payors are increasingly recognizing the importance of social determinants of health.

21 Job Listings

22 Final Read

How can we design and implement a parental leave policy to address the unique needs of each #RADparent?

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

Digital edition and archives of past issues are available at ACRBULLETIN.ORG



William T. Herrington, MD, FACR, Chair, ACR Commission on Membership and Communications

Guest Columnist

Membership Is Everyone's Business

The College welcomes feedback on its future direction and on the programs and services that it develops along the way.

According to the late radiology luminary and former CEO of ACR Harvey L. Neiman, MD, FACR, “Radiology is about the future. The ACR is not about one group of professionals. It is about a responsibility to those patients who rely on your expertise and commitment to quality, today and into the future — your future, our future.”

This simple yet powerful message still rings true today as the ACR strives to be forward-thinking — launching new programs and services that support our strategic vision, improve our profession, and enhance our value to members and the patients they serve.

Member Value and Voices

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 to the significant and extensive benefits that members already receive, the following new member value enhancements were launched in 2019:

- Radiology Well-Being Program
- 2019 Continuous Professional Improvement™ Modules in Adult Cancer Imaging, Ultrasonography, Musculoskeletal, Pediatric, and Nuclear Radiology
- Digital Breast Tomosynthesis guidance document
- My CT Colonography center locator
- “Talking to Your Patients About Breast Cancer Screening” CME Toolkit
- ACR Data Science Institute™ (DSI) ACR AI-LAB™
- MACRA and CDS guidance and training

In 2018, the ACR developed a Member 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. 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 not only helped to predict future industry trends, but also helped analyze members’ perceptions about the ACR as a whole (read more about the Member Tracker at bit.ly/Tracking_AI).

ACR membership remains strong and continues

to grow, with 2,297 new members joining the ACR in 2019 and more than 93% renewing their commitment to support the organization. According to the Member Tracker, rank-and-file member loyalty and ongoing commitment to the College is solid (see sidebar).

Professional development, staying informed, supporting advocacy, and advancing quality and safety are salient drivers for membership. While radiology residents and fellows value staying abreast of industry developments and supporting advocacy efforts, their primary need from the ACR centers on career advancement and their own professional development in the context of changes in radiology and healthcare.

Looking Ahead

Information and radiological technology are moving at breakneck speed, changing the way we network and communicate and how we respond to growing patient demands. In fact, the Member Tracker 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.

The long-term success of ACR members will be tied, in large part, to their ability to adapt and incorporate changing technologies into their workplace — especially in view of our heavy dependence on technology in our profession. Other dramatic changes include the way in which practices, hospitals, imaging centers, and academic institutions are structured; the growth of teleradiology and physician extenders; increasing workload demand and fewer human resources; the advent of AI and the uncertainty of regulatory and legislative initiatives.

The ACR stands ready to support its members and to provide the tools and resources needed to help them meet these future technological and market disruptors. For example, the ACR, through regular messaging and the work of the DSI, has been working to dispel fears some members have that AI will significantly disrupt their livelihoods. We are also guided by our strategic plan, which reflects the input of our members and is focused on the following membership-specific strategic objectives (read more at acr.org/Strategic-Plan).

You have an opportunity to provide direct commentary on our future direction and on the programs and services that we develop along the way. The next Member Tracker will be deployed by email in early 2020. Please take the time to share your thoughts. Your feedback will help us better understand your needs as a member of ACR, a member of the radiology profession, and a member of the healthcare community. **B**

84%

of members are extremely or very likely to renew their membership

71%

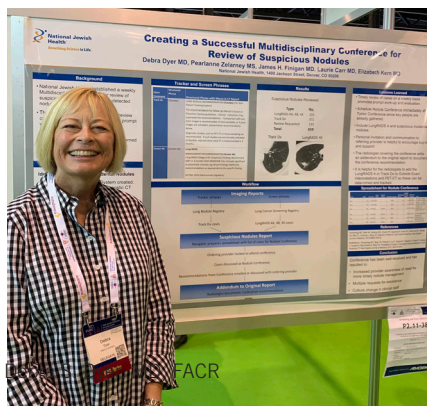
of members are likely to recommend membership to non-member colleagues

83%

of members are proud to be a member of ACR



Lung Cancer Screening Around the World



The annual International Association for the Study of Lung Cancer (IASLC) World Conference on Lung Cancer has become the world's largest international gathering of clinicians, researchers, and scientists in the field of lung cancer and thoracic oncology. This year's meeting, held in Barcelona, Spain, in September, was attended by Debra S. Dyer, MD, FACR, chair of the ACR Lung Cancer Screening 2.0 Steering Committee,

who describes it as “an important forum for presenting new scientific breakthroughs that includes discussions of everything from cancer prevention/tobacco control and early detection to treatment advances and survivorship. Lung cancer screening has a prominent role in the meeting, too.” The meeting also provides unique networking opportunities, with delegates from more than 100 countries typically in attendance.

“I had the good fortune to present my poster on how to create a multidisciplinary conference on suspicious lung nodules, both screen-detected and incidentally-detected,” says Dyer. “The poster presentations at the meeting are interactive. Attendees for my session were mainly radiologists, pulmonologists, and thoracic surgeons, and I was pleased with the feedback. All recognized the importance of having an organized approach to identifying cases for review of suspicious cases and the critical role of the radiologist in the process.”

For more information about the meeting, visit bit.ly/IASLC2020.



New Name, New Vision

The Society of Computed Body Tomography and Magnetic Resonance has recently announced a change: their new name is now the Society for Advanced Body Imaging. The change, announced at the society's annual meeting in Denver in October, better reflects an evolving mission of innovating and translating multiple modalities of leading-edge radiologic technology.

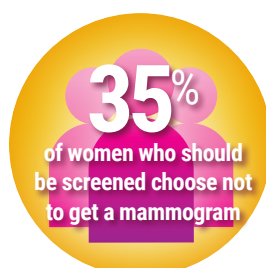
Learn more about the society's new name and vision at advancedbodyimaging.org.

Manage the Misinformation

Many studies show that annual screening greatly reduces breast cancer deaths. Still, 35% of women who should be screened choose not to get a mammogram — contributing to thousands of deaths each year. With conflicting screening guidelines and no modern randomized controlled trial (RCT) data, many doctors may not understand RCT and modern prospective study data on reduced mortality and morbidity due to screening. Providers may not know what to tell women regarding when and how often to be screened. This has contributed to confusion in women about when — or even if — they should get a mammogram. To help referring providers make better screening recommendations and ultimately improve breast cancer outcomes, the ACR has created a free “Talking To Patients About Breast Cancer Screening” toolkit for radiologists to share with referring doctors. The customizable resources help providers:

- Identify and assess reliable breast cancer screening and outcomes data
- Discern actual breast cancer screening risks versus benefits
- Discuss with patients when to be screened to avoid unnecessary death and treatment due to late breast cancer detection resulting from lack of screening
- Earn CME credit upon completing an online module

To access the toolkit, visit acr.org/CME-Toolkit.



Many women need a diagnostic mammogram to determine whether a screening study has indeed found cancer. We must ensure that our patients have affordable access to examinations they need.

— Georgia G. Spear, MD,
at bit.ly/VOR_Spear

CALENDAR

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.

December

- 9-11 Neuroradiology, ACR Education Center, Reston, Va.
- 13-15 Coronary CT Angiography, ACR Education Center, Reston, Va.

January

- 9-10 CT Colonography, ACR Education Center, Reston, Va.
- 13-15 Abdominal Imaging, ACR Education Center, Reston, Va.
- 17-19 Body and Pelvic MR, ACR Education Center, Reston, Va.
- 17-19 ACR/RBMA Practice Leaders' Forum, Hilton La Jolla Torrey Pines, California
- 23 MR Imaging of Breast Implants, Cosmos Club, Washington, D.C.
- 23-25 Breast Imaging Boot Camp With Tomosynthesis, ACR Education Center, Reston, Va.
- 27-28 Breast MR With Guided Biopsy, ACR Education Center, Reston, Va.
- 30-Feb 1 NIOSH B-Reader Training and Examination, ACR Education Center, Reston, Va.

Slowing the Burn

Burnout exacts a distressingly high toll, with almost half of radiologists reporting burnout in the 2019 Medscape Radiology Lifestyle Report.* The ACR has developed the ACR Radiology Well-Being Program to help. The program, formed by the Commission on Human Resources and the Commission on Publications and Lifelong Learning, provides you with tools and resources to assess your level of wellness and identify ways to improve your well-being over time. All ACR members, including residents, fellows, and medical students, receive free access to the following at acr.org/Member-Resources/Well-Being:

- The Well-Being Index (WBI) survey tool, created by the Mayo Clinic to help physicians anonymously self-evaluate their level of well-being
- A toolkit of radiologist-specific, high-impact articles and resources on critical well-being topics such as

relationship and work-life balance, health behavior, and emotional concerns

- A well-being curriculum for residents, medical students, and career physicians
- An ACGME-aligned curriculum for residency program directors, program coordinators, and other program leaders designed to meet specific well-being requirements for residency programs

Contact copllstaff@acr.org if you have a resource or feedback you would like to share.

For more information on combating radiologist burnout, read "The Road to Wellness," a special section in the May 2019 *Bulletin*.

*SOURCE: Kane L. Medscape radiologist lifestyle, happiness & burnout report 2019. Medscape. Published Feb. 20, 2019.



Engaging More URMs and Women

The ACR is proud to offer the Pipeline Initiative for the Enrichment of Radiology (PIER) internship program to current first-year medical students who identify as underrepresented minorities (URMs) or women. The initiative will give URMs and women increased opportunity to explore the radiology specialty and engage in research. The ACR initially launched PIER in 2016 with the help of Nth Dimensions™. This year's internship begins in June 2020 and culminates with a presentation of the students' research to the radiology section of the National Medical Association (NMA) at the NMA Annual Convention and Scientific Assembly. Five PIER candidates will be selected to work with experienced radiologists in both academic and private practice environments.

"The ACR Commission for Women and Diversity is committed to ensuring that the diversity of the radiology community continues to reflect the increasing diversity of the U.S. population and the patients we serve," says Johnson B. Lightfoote, MD, MBA, FACR, chair of the Commission. "The PIER internship attracts young talent who not only diversify our physician workforce, but also increase effective communication, improve patient compliance, and enhance quality of care."

Qualified applicants are encouraged to apply for the PIER internship at acr.org/PIER by Dec. 31, 2019. In addition, the PIER program is still looking for radiologists and radiation oncologists to serve as preceptors. A preceptor supervises a student for eight weeks and assists with a research project. After the internship concludes, preceptors serve as academic and career mentors for their students. To apply to be a preceptor, visit bit.ly/PIERPreceptorApplication2020. Preceptor applications may be submitted through Jan. 31, 2020.



Assembly-line medicine kills doctors. Brilliant, compassionate people can't care for complex patients in 15-minute slots.

— Pamela Wible, MD, at bit.ly/Assembly-Line

The Economics of Social Need

Policymakers and payors are recognizing the importance of social determinants of health.

What does it take to keep people healthy? Certainly, high-quality clinical care is important. But the relative contribution of clinical care is lower than we think. Data suggests that clinical care impacts only 10–20% of overall health.¹ Think about that for a moment. Clinical care addresses only a small percentage of population health. About 80–90% of overall health is determined by social determinants of health (SDOH).

SDOH are the conditions in which people are born, grow, live, work, and age. These circumstances are shaped by the distribution of money, power, and resources at global, national, and local levels.² The data are far-reaching. In my home state of Texas, for example, around 9.5 million people screen positive for unmet social needs.^{3,4} Let's look at one SDOH and its effect. Food insecurity is the disruption of food intake or eating patterns because of lack of money and other resources.⁵ If we look at the diagnosis-related groups (which determine inpatient payments) for malnutrition, meaningful trends emerge. There is a direct correlation between increased payments for those diagnosis-related groups and counties with a high number of food deserts (locations lacking access to healthful whole foods).⁶ On a practical level, people experiencing food insecurity often are forced to choose between food and other essentials such as medications or the transportation necessary for their medical care. This becomes relevant for physicians who may have their quality performance scored by metrics, such as medication adherence or diabetes control. Both are influenced by SDOH.

Policymakers and payors have been slow to recognize the importance of SDOH in healthcare. For instance, MIPS includes about 250 measures — none of which relate to SDOH. But this circumstance may be changing. In late 2018, Alex M. Azar II, the U.S. Secretary of Health and Human Services, indicated that the administration was evaluating the role SDOH play in healthcare.⁷ In 2017, CMS created the Accountable Health Communities model to identify patients who use extreme amounts of healthcare services for factors of social and health insecurity. When such needs are identified, the project helps arrange navigators who can match them with community resources.⁸

Private payors are also increasingly recognizing the

impact of SDOH. Among the 9.5 million Texans who screen positive for unmet social needs, the percentage is higher for the Medicare and Medicaid populations; however, the percentage for those with commercial insurance is not insignificant. Among those with employer-provided health insurance, 25% report unmet social needs.³ To address this need and possibly achieve cost savings, many private payors are surveying their beneficiaries for SDOH. Others are pushing for greater identification through the creation of more ICD-10 diagnosis codes for SDOH (referred to as Z codes). Still others are reaching out to community groups to create partnerships to advance population health management (PHM).

What are the opportunities for radiology? First, we need to recognize the role of SDOH on health and have the confidence to engage in conversations with policymakers. We are already active in PHM. In my May 2018 *Bulletin* column, I wrote about the opportunities that screening studies afford us and about better surveying patient medical needs.⁹ How about also screening for unmet social needs? Such discussions are not always easy, as they can be very personal — and sometimes uncomfortable — issues for our patients. Affected individuals may be hard to reach in general, but the gains are worth the effort.

Government and private payors are increasingly reaching out to community organizers to create shared opportunities. How can we engage in those collaborations? What is the role of innovation here? Are there opportunities within digital health to improve access, diagnosis, and treatment of disease, while being mindful not to widen health disparities? There are many questions to be answered — and much insight to be gained.



ENDNOTES

1. Hood CM, Gennuso KP, Swain GR, Catlin BB. County health rankings: relationships between determinant factors and health outcomes. *Am J Prev Med*. 2016;50(2):129–135.
2. World Health Organization. Social determinants of health. 2012.
3. Berkowitz SA, Hulberg AC, Standish S, et al. Addressing unmet basic resource needs as part of chronic cardiometabolic disease management. *JAMA Intern Med*. 2017;177(2):244–252.
4. Kaiser Family Foundation. Health insurance coverage of the total population – Texas. 2017.
5. Coleman-Jensen A, Gregory C, Singh A. Household food security in the United States in 2013. USDA Economic Research Service. 2014.
6. CMS. Medicare provider utilization and payment data: inpatient. Updated Aug. 28, 2019.
7. Pifer R. 'Stay tuned,' says Azar: CMMI to take a closer look at social determinants of health. Healthcare Dive Web site. 2018. Accessed Sept. 22, 2019.
8. CMS. Where innovation is happening. Accessed Sept. 22, 2019.
9. Silva E. The economics of PHM. *ACR Bulletin*. 2018. Accessed Sept. 22, 2019.



Hive Mind

Championing a team approach with frontline workers can define the patient experience.

Radiologists' appreciation for the RTs, nurses, and front office staff who drive patient care in an imaging-rich healthcare system can make them better physicians. Building, sustaining, and strengthening relationships with frontline workers should be top of mind.

"Many radiologists don't have a good grasp of what frontline staff do on a daily basis," says Jennifer L. Kemp, MD, FACR, a diagnostic radiologist and body imaging subspecialist with Diversified Radiology in Denver. These are the people who actually see patients — directing the imaging workflow and guiding patient satisfaction. It behooves radiologists, Kemp says, to get to know frontline staff if they want to maximize the skills those workers bring to the table.

The challenges of building relationships with frontline workers vary from setting to setting — and are certainly nuanced between private practice and hospital-based and academic radiologists. Regardless, Kemp says, not taking the time to acknowledge frontline contributions is bad for business and can erode patients' trust of radiologists.

First Contacts

"At my outpatient breast center, we constantly interact with frontline staff — we count on them," says Stamatia V. Destounis, MD, FACR, clinical professor of radiology at the University of Rochester and partner at Elizabeth Wende Breast Care, LLC, in Rochester, N.Y.

Schedulers and front office staff make first contact with patients, Destounis points out. "They take all our calls, schedule appointments, collect reports for us, and make sure that anything the primary care doctor wants done, actually gets done," she says. They are responsible for getting patients to the right place at the right time for the correct study. By walking patients through the imaging process and keeping track of the workflow, front office staff can bolster patient satisfaction and reduce the number of no-shows, she adds.

Beyond logistics, they meet the individual needs of radiology patients. "We get nervous patients or elderly patients who need assistance," Destounis notes. "Our staff might help them find a private place to sit or get them a glass of water. They talk to patients about routine mammograms, answer basic questions, and explain next steps."

Radiologists should be aware of front-end

Did You Know?

Fostering good relationships between radiologists and RTs is critical to ensuring patient safety and providing quality radiologic services. RTs serve as the primary liaison between radiologists, patients, and imaging equipment. The American Society of Radiologic Technologists (ASRT), first founded in 1920, will celebrate its centennial at its 2020 Educational Symposium and Annual Governance and House of Delegates Meeting, June 24–28, at the Albuquerque Convention Center. Learn more about the event at asrt.org.

“When there is open communication between an RT and a radiologist, quality is top-notch.”

— Erin Zubia, RT(R)(QM)

interaction with patients to ensure the imaging experience is beginning on the right foot. “You need front office staff who are friendly, efficient, and smart,” says Michael A. Bruno, MD, FACR, professor of radiology and medicine and vice chair for quality and safety at the Penn State Milton S. Hershey Medical Center. “Securing these types of workers is an investment in your future. Without staff who are capable problem solvers — who know how to read patients — your practice is going to have problems.”

Open Exchanges

Those skills are equally important for radiology nurses and RTs. Putting the clinical staff's talents to optimal use requires efficient but constant communication with radiologists.

“When there is open communication between an RT and a radiologist, quality is top-notch,” says Erin Zubia, RT(R)(QM), lead mammographer at Gila Regional Medical Center in Silver City, N.M. RTs gather critical information and double-check why a particular type of exam has been ordered, she says. “We ask a lot of questions before an exam. This could include prior surgeries, family history of cancer, and so on. We document all of this for the radiologist in the PACS.”

Frontline staff should be empowered to call the radiologist when a patient presents with a potentially critical condition, such as a bone fracture or pneumonia, says Zubia. “When possible, we have the patient wait while images are read and results are reported to a patient's ordering physician,” she says. “This allows the patient to get treatment sooner, instead of sending the patient home to get the results later the same day.” Cross training within your group is important, too, she adds, so that several people can handle different tasks when you are short-staffed. “We have department heads for each group — RTs, medical assistants, and front desk and call center staff — and they have weekly (sometimes daily) meetings with their staff to discuss concerns about process, workflow, and safety procedures,” Destounis says. The meetings provide a forum for an equal exchange of ideas for improving the patient experience — subsequently shared with radiologists.

Radiologists should continue to be advocates for frontline staff, Zubia believes. “We want them to be involved in our team and educate us. There is something to learn each day in our field,” she says. Monthly team meetings that include all imaging staff, not just

radiologists and administration, keep everyone on the same page, Zubia says. “It helps us know what areas are working well and how to improve workflow processes that ensure quality care throughout the hospital or clinic.”

Extra Duties

Radiologist guidance on performing exams can improve quality, minimize repeat exams, and save the radiology group valuable time.¹ When given a chance to talk through processes and daily challenges, however, some frontline staff can be reluctant to speak up or challenge an existing workflow policy.

Nursing staff often accommodate heavy workloads. They communicate any special needs of patients to RTs, administer medications, monitor vital signs, assist with catheters, help with sedation, and generally attend to patients' comfort. Staff shortages, walk-in patients, and keeping providers and referrers happy can add to the load.

Because radiology departments provide services to a wide variety of patients with diverse needs and little information to offer, radiology nurses work at an intense pace — and must have a high level of knowledge, expertise, and independence. Awareness of staff stress helps to build trust and can lead to a more constructive dialogue that benefits everyone. Studies of nurse staffing have shown that extended shifts can lead to burnout, fatigue, and, most importantly, can compromise patient safety.²





All frontline staff at some point will face difficult patients while trying to stay focused on the quality of the care they are providing. A radiologist's understanding of staff challenges is essential to ensuring patients get the best possible treatment. Encouraging real-time communication among frontline staff can expedite the transfer and management of patient information — with the goal of avoiding patient care delays and minimizing clinical and medical record errors.³

Collective Counsel

"It's easy to get caught up in your own work for the day, never stopping to think that what other staff are doing is an integral part of the imaging and care delivery process," Kemp says. "It definitely crosses my mind to shadow one of our RTs for a day — to go into patient rooms with them. Daily tasks get in the way, but I'm determined to change that."

Radiologists should be visiting the front lines not just when a problem needs to be resolved, Kemp says. Taking a walk to see what staff are up against can provide new insight on the type and quality of care patients receive, such as how many patients are waiting and how many scanners are in use. Moreover, it shows those staff your commitment to the process and your willingness to hear ideas and facilitate changes.

Some radiology groups employ messaging

tools that allow radiologists to reach RTs with questions about patients, or front desk staff to check patient information with other departments. These types of tools can speed up workflow, but should never replace face-to-face conversations, Kemp says. Clinical decision support and AI applications can reduce human error and potentially free up radiologists' time, she notes, and it is important to use that time to engage frontline staff.

"Joining hospital committees can also give radiologists an opportunity to interface with frontline workers — not only from their own department but from others," Bruno says. Private practice radiologists can sit on committees and volunteers are always welcome, he adds. "It's a chance for radiologists to hear staff voices and discuss barriers."

These types of meetings can reveal problems that are happening outside your own department. "It's imperative that radiologists get involved — and take leadership roles," Bruno says. "If you don't, you may have other committee members making decisions that could directly impact your group's work."

Delivering a good patient experience has taken center stage in radiology, and patient interactions with frontline professionals are paramount to a radiology group's success. Keeping frontline staff happy is also important for continuity of care. Replacing staff is expensive, and some referrers are more comfortable with familiar voices and faces. A frontline worker who believes their work is acknowledged and appreciated is more likely to pay that forward to patients.

Most frontline staff understand the need to treat patients with empathy and respect — and that their willingness to do so feeds patient satisfaction. Staff may engage even more if radiologists take the time to stress how their service ties into revenue under a value-based system. Education among all members of the team will better serve the practice and patients.⁴

Radiologists cannot be effective when they do their job in isolation. "We need those around us to make sure we're doing the right things," says Destounis. "The truth is that frontline staff keep radiologists at the top of our game — and keep our patients safe." **B**

By Chad Hudnall, senior writer, ACR Press

ENDNOTES

1. Advisory Board. The changing radiologist role. Published January 8, 2013. Accessed September 27, 2019.
2. Watson L, Odle TG. Patient safety and quality in medical imaging: the radiologic technologist's role. The ASRT Foundation. Published in 2013. Accessed September 27, 2019.
3. Lang EV. A better patient experience through better communication. *J Radiol Nurs*. 2012; 31(4):114–119. Accessed September 27, 2019.
4. Kennedy DM. Creating an excellent patient experience through service education. *J Patient Exp*. 2017;4(4):156–161. Accessed September 27, 2019.

Working Together for Patients

Radiologists should be aware of front-end interaction with patients to ensure the imaging experience is beginning on the right foot. Delivering a good patient experience has taken center stage in radiology, and patient interactions with frontline professionals are paramount to a radiology group's success. The ACR's Imaging 3.0® initiative is designed to help radiologists shape their future using tools and processes for practice management and patient care.

- **Instant Results (acr.org/Imaging3-InstantResults):** With the help of RTs, radiologists in Colorado are taking a more active role in patient care through an immediate results delivery program.
- **Direct Connection (acr.org/Direct-Connection):** Columbus Radiology's results communication call center and other collaborative solutions keep radiologists and referring physicians connected.
- **Failsafe (acr.org/Fail-Safe):** Radiologists at Penn State Milton S. Hershey Medical Center lead a team in the development of a program that closes the gaps in follow-up of incidental findings for ED patients.

An Upcoming Transformation

Medical students who are more willing to embrace new technology believe that AI will be shaped by them — for better or worse.

Is AI good, bad, or both to radiologists? As the buzz around AI has reached near-peak hype levels, many medical students are left wondering what radiology will look like as a specialty in 10 years — or if it will even exist. Will radiologists be summarily replaced and driven to extinction by their algorithmic counterparts?

Just as there is no stable, long-term demand for the faddish Bitcoin — which has yet to establish its value for merchants worldwide — the sheer complexity of medicine and challenges to implementing AI make questions about its future hard to answer. Despite living on the fringe of radiologists' daily duties, AI is no fad. Ultimately, AI will transform radiology in much the same way CT and MRI technology has.

Medical Students and AI

It's easy to assume that medical students have the same apprehension toward new technologies that some doctors do — yet in my experience that's far from the truth. I recently had an opportunity to present on AI and radiology at the American Medical Student Association. I was surprised to see a younger generation ready to embrace the technology. When I asked if they would jump into a driverless car today, student hands shot up throughout the room signaling an overwhelming “yes!”

I am a little older and more skeptical, but maybe the younger generations see AI more as an opportunity rather than a threat. As I told the students in attendance, for better or worse, AI will be shaped by them — with the goal of transforming any radiologist into a super-radiologist. So what questions did the medical students have?

Do I need to learn to program to be a radiologist?

Understanding how AI works — and particularly how training data shapes an AI algorithm — is important. Coding is a great skill, but radiologists won't need to learn to code, just as you don't need to know how to assemble a car transmission in order to drive. In fact, in many ways AI will make data analysis easier than ever.

What will happen to physician compensation in the era of AI?

Clearly, AI will cost money, and the question quickly

becomes: Who is going to pay for it? If we look at other industries — airlines and banking, for example — automation hasn't been a primary driver of change to compensation. It is likely to be the same in radiology.

Insurance programs will likely continue to reimburse a portion of costs with specific procedural codes — and radiologists, in combination with patients, will pick up the remainder. As AI boosts radiological productivity, new opportunities will open for radiologists seeking more direct patient consultations. There may also be cost savings from lower malpractice premiums that reflect more accurate scans and patient outcomes. When CT technology became commonplace and simplified interpretation, pundits similarly predicted that radiologists would be superfluous. That didn't happen.

Who will be responsible for AI interpretations?

The radiologist will be responsible for AI outputs, much like a pilot is responsible for the airplane, or an attending is responsible for a resident. As we have seen with computer-aided diagnosis, radiologists still need to be the penultimate decision makers. AI can and will be wrong on many occasions and for multiple reasons. It will be up to physicians to catch these mistakes. No one is likely to thank us for catching mistakes, but as physicians, it is already included in our job description.

Most radiologists strive to be highly sensitive and specific in diagnosing patients. I have yet to meet a fellow diagnostician who wants to over- or under-call a diagnosis, saying, “I really want to miss cancer!”

As many of us know, practicing radiology has a way of breaking down hubris: The “this has to be cancer!” or the “looks okay to me” moments can become famous last words. For the next generation of radiologists, AI will offer a helping hand in detecting subtle findings or for classifying not-so-subtle findings. AI will have a role in more quickly concluding, “Maybe that isn't cancer after all.”

AI Career Training

Future generations will need to understand how we build AI and how to make AI work in their institutions, but not necessarily how to program it. Knowing and understanding the Python® programming language may certainly be useful, but just as radiologists don't need to know the programming code to adjust MRI pulse sequences, neither will we need to know programming code for AI to tune AI models for our facilities.

Still, many programmers see AI as more data curation



DATA SCIENCE
INSTITUTE™
AMERICAN COLLEGE OF RADIOLOGY

If you're interested in setting up an AI presentation before an undergraduate medical student group, contact the ACR Data Science Institute™ team at aloughlin@acr.org.

continued on page 21



Protecting Patients

Surprise insurance gaps are causing patients to walk away with unexpectedly high medical bills. What causes this, and how can radiologists help?

With headlines like, “Trouble Shooters Help Local Woman Reduce ‘Surprise Medical Bill’ by \$22,000,” so-called “surprise billing” has garnered a lot of attention lately.¹ States around the country are passing legislation to confront surprise billing. At the federal level, both the president and Congress have expressed frustration on this topic. There are currently multiple proposals in both houses of Congress to meet the challenge. So what is surprise billing (and why should you care)?

Billing Practices

Insurance companies negotiate contracts with provider organizations to create care networks. As part of this negotiation, medical practices provide significant discounts to the standard charges for their services. In exchange for these discounts, in-network practices expect certain benefits — including a simpler revenue cycle process.

But what happens when a patient with private insurance receives care from a provider that is not in-network? In this scenario, there is no negotiated discount, and the standard charge is billed. Usually, insurance companies will reimburse the out-of-network (OON) provider a fraction of the billed amount, leaving the balance of the non-discounted charge for the patient to pay. When the patient does not anticipate receiving care from an OON physician, the bill for the balance of those services is referred to as a “surprise bill.”

Relevance to Radiology

Patients may incorrectly assume that all of the physicians within a facility in their plan’s network are in-network.

Imagine a patient who needs elective surgery: they do their homework, find a well-respected in-network surgeon, and proceed with the surgery at an in-network facility. What they don’t know is that the radiology group at that in-network facility is OON.

What is the result for such patients? They end up with a bill for the balance of the non-discounted charge from the radiology group. In many instances, the only thing a patient knows about radiologists’ involvement in their care is that they delivered an unexpected, large bill. Of course, we as radiologists are unaware of a patient’s insurance network status when we read their exams or perform procedures. It’s only later that billing and insurance companies must sort this out, with patients unfortunately getting stuck in the middle.

The term “surprise bill” is itself a misnomer. In reality, it’s a “surprise insurance gap.” Often, enrollees do not understand deficiencies — or gaps — in their insurance coverage. This problem has been exacerbated by the proliferation of narrow network plans in recent years. These plans reduce their costs by greatly limiting the number of providers that are in-network. Those physicians that are in-network are expected to offer even more significant discounts from their standard charge. However, by doing this — and excluding large groups of providers — the network has coverage gaps.

Solutions to Insurance Gaps

There is widespread agreement that we need to address this problem of unanticipated OON coverage. Any solution should follow a few basic principles:

- 1. Hold patients harmless:** For unanticipated OON care, patients should be limited to paying their in-network cost-sharing responsibility.
- 2. Provide transparency:** Insurance companies should have easy-to-understand plans with appropriate network standards.
- 3. Ensure access:** Protect patient access to care by preserving markets. The issue of market-based payment standards based on good-faith negotiations is crucial. If this is disrupted, and a payment standard is utilized that is significantly below market, groups will adapt to the new financial reality and patients may experience reduced access to care.

Moreover, a state-by-state approach alone won't solve the problem; a national solution is required. That is because the Employee Retirement Income Security Act (ERISA) of 1974, which deals with private employer-sponsored health plans, is under federal (not state) jurisdiction. Since these ERISA plans are not subject to state regulation and cover more than half of the privately insured population, state-based fixes would leave large portions of the population exposed.

The term “surprise bill” is itself a misnomer. In reality, it’s a “surprise insurance gap.”

Here are some federal-level solutions that have been suggested to address the problem of surprise insurance gaps:

- 1. Network matching:** This would require hospital-based providers (like radiologists) to be in-network with all networks with which the facility contracts. Potential legal questions aside, by interrupting good-faith negotiations between providers and insurance companies and disrupting markets, this approach would violate a core principle. For example, imagine the negotiating leverage an insurance company would have if they knew the radiology group was legally prohibited from going OON.
- 2. Bundling:** This strategy would ban hospital-based practices (like radiology) from independently billing for their services. Instead, practices would rely on the facility to share a portion of a global fee with them. This would also disrupt markets and thus could limit access to care.
- 3. Rate-setting:** While straightforward, this approach would disrupt markets by effectively picking winners

and losers between payers and providers. If the rate is too high, groups could negotiate higher contracts or go OON to capture the better rate. If the rate is too low, payers could cancel contracts and re-negotiate lower deals, knowing that the providers' only recourse would be to go OON, receive a below-market rate, and not gain any of the advantages of being in-network. Some have even proposed Medicare as a standard for payment, despite the fact that it was never intended to reflect market rates. The bottom line is that if groups experience a marked reduction in revenue as a result of rate-setting, it will force some practices to alter their operations — and some may even close. The result would be that patients may experience reduced access to care.

- 4. Alternative dispute resolution:** This solution, which has been successfully field-tested in states like New York, establishes a binding arbitration process. If one side makes an unreasonable charge/payment, there is a mechanism to settle the dispute. Importantly, N.Y. uses “baseball style” arbitration, whereby the arbiter is not permitted to split the difference but must choose either the provider's charge or the payer's reimbursement. Since the arbitration loser also pays the arbitration fees, both sides are incentivized to keep their charges and payments reasonable.

What Radiologists Can Do

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 ([see sidebar](#)). The problem of surprise billing isn't going away. The ACR, through its advocacy efforts, is actively engaged in the current legislative process to ensure patients are protected and physicians, including radiologists, maintain their right to fair negotiations. We, as physicians, should advocate for sensible policies that take patients out of the middle, promote transparency, and preserve access to care. It's critical for our future, and vital for our patients. **B**

Richard E. Heller III, MD, MBA, is vice president of clinical services at Radiology Partners.

ENDNOTE

1. Avila J. Trouble shooters help local woman reduce 'surprise medical bill' by \$22,000. NEWS4SA. April 25, 2019.



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.



Paid parental leave is an important mechanism for preventing burnout and addressing diversity in radiology.

It's no secret that the United States lags far behind other developed nations on parental leave. While many countries offer between 12 and 52 weeks of paid parental leave, the U.S. remains the only developed country without a national policy on the issue.¹ Only 19% of private sector employees have access to paid parental leave of any length.² Perhaps not by coincidence, the U.S. also sees a higher level of maternal and infant complications and mortality than other developed countries.³

An increasing number of physicians — and radiologists specifically — say that it's time for medicine to lead by example, offering paid parental leave in residency, academia, and private practice. This is more than a women's issue or a family issue, they say. It's a health issue and fits squarely with the emphasis on health outcomes.⁴

Proponents of parental leave also believe that taking a lead on this issue can help address some of the challenges facing radiology. This includes attracting and retaining talent, preventing burnout, and increasing diversity — including increasing the percentage of women entering the field.

In the past year, individuals and organizations within medicine and radiology have taken a stand on the issue, including the American Academy of Pediatrics, the AMA, the Society of Chairs of Academic Radiology Departments (SCARD), the American Association for Women in Radiology (AAWR), the Association of Program Directors in Radiology (APDR), and the ACR.⁵

Katarzyna J. Macura, MD, PhD, FACR, ACR vice president, believes innovation and forward-thinking about parental leave can positively affect the future of radiology and radiologists. According to Macura, "Family-friendly policies and well-being plans have potential

to positively impact all radiologists, not just women and their families." Flexible leave plans can also help people of all genders caring for parents or spouses or those who want to work reduced hours without fully retiring.

Elizabeth K. Arleo, MD, president of AAWR and a leading voice on the topic, agrees. Arleo says the AAWR has been taking a three-pronged approach to advocate for paid parental leave in the field of radiology. The initial step focused on advocating for 12 weeks paid parental leave for attendings in academia, the second stage focused on trying to improve parental leave in residency, and recent efforts have included addressing the issue in private practice ([read more on page 16](#)).

Proven Benefits

Research has shown that paid leave of 12 weeks or more increases immunization rates, extends the length of breastfeeding, and improves bonding between parent and child.⁶ Paid leave has also been found to decrease rates of post-partum depression.⁷ These benefits lead to better health outcomes for both parent and child — as well as the health of the community.⁸

According to Arleo, physicians are well aware of these health benefits and rightfully want them for their own families. "You have young people who love their careers and taking care of patients and who also love their families," says Arleo. "They shouldn't have to choose between the two."

Especially in a tight labor market, employee benefits such as parental leave can make the difference in attracting and retaining talent, and increasing profitability, productivity, and employee morale.⁹ Research shows that 57% of jobseekers report that benefits and perks are among



The AAWR Women's Caucus at ACR 2019 focused on recent victories on this issue and next steps. Learn more about what the AAWR has accomplished in the past year on paid parental and family leave at bit.ly/AAWR_Caucus.

their top considerations for accepting a job.¹⁰ Extending parental leave options is a tactic successfully employed by the IT industry, with companies like Google, Amazon, and Facebook leading the way. Google reported that after implementing a policy of 18 weeks of paid parental leave, new mothers were twice as likely to stay on the job after welcoming a new child. Many top companies offer much longer leaves — up to a year in some cases.¹¹

Reduced Burnout

These statistics and outcomes speak directly to the field of radiology, where women make up less than one-quarter of the profession — a percentage that hasn't changed significantly in decades, Arleo points out.¹²

That's why the SCARD and APDR positions on the topic are so important, she says. The APDR statement affirms that residents are considered employees and have a right to family leave of 12 weeks under the Family and Medical Leave Act and empowers residents to exercise that option.¹³ In addition, a new policy from the ABR now allows radiologists to sit for their core exams after 32 months of residency instead of 36 — and residents can take their full 12 weeks of leave and still take their exam at the same time as their class.¹⁴ “This has the potential to change the gender landscape in the profession,” Arleo says.

Monica J. Wood, MD, a fourth-year radiology resident at Massachusetts General Hospital, agrees. Although she had already decided on a career in radiology, the fact that her residency program offered a generous paid leave policy has helped her feel supported professionally and personally as she welcomed a new baby during her residency. “It makes a difference in my ability to complete training and also be able to start a family,” Wood says.

Parental leave can also help address the rates of burnout that affect 45% of radiologists.¹⁵ Kamran Ali, MD, FACR, a radiologist with Wichita Radiological Group, says he has prioritized physician wellness, work-life balance, and preventing burnout since becoming president of his private practice that employs 20 radiologists and includes a small residency program. Even so, parental leave was not a top concern for him until Amy K. Patel, MD, a former resident at his practice, and Arleo approached him at ACR 2019. Ali quickly saw the connection. “If we really care about value and resilience, then we should take a look at implementing a parental leave policy at our practices,” he says. “It goes a long way in mitigating burnout and making a more resilient and inclusive workforce.”

Broken Barriers

Extended parental leave can be a tough sell, especially in private practice, says Ali. Implementing the new

policy will involve making some financial and logistical adjustments, Ali says, but he feels optimistic. His firm already accommodates 12 weeks of vacation a year for radiologists on staff, and he believes that this next leap of implementing paid parental leave is manageable.

According to Ali, in addition to mitigating burnout, the parental leave policy also sends a message to staff and prospective employees. “It shows we think outside the box and are inclusive in our thought process, which opens the door to welcoming people of different religious backgrounds, gender identities, or physical abilities,” he says.

Cheri L. Canon, MD, FACR, president-elect of SCARD, agrees. She points out that promoting diversity encourages the fresh thinking and innovation that health-care requires. “Diversity of ideas creates better solutions, particularly for complex problems that we see in medicine and our hospital systems,” says Canon.

Macura urges radiology departments and practices to look at innovations for creating flexible and inclusive work options to improve physician well-being. Alternative hours, part-time employment, job sharing, and remote work opportunities can actually grow business and accommodate the needs of patients — as well as employees in a variety of life circumstances.

Even a relatively simple solution — such as a private workstation to allow new parents to pump breastmilk, while continuing to keep up with readings and dictation — can make a significant difference to a new parent trying to balance work and family. While incorporating paid parental leave into radiology practices will be an adjustment, Arleo admits, she thinks it's well worth the investment of time and effort, pointing out, “What's the cost of *not* offering sufficient paid parental leave?” **B**

By Emily Paulsen, freelance writer, ACR Press

ENDNOTES

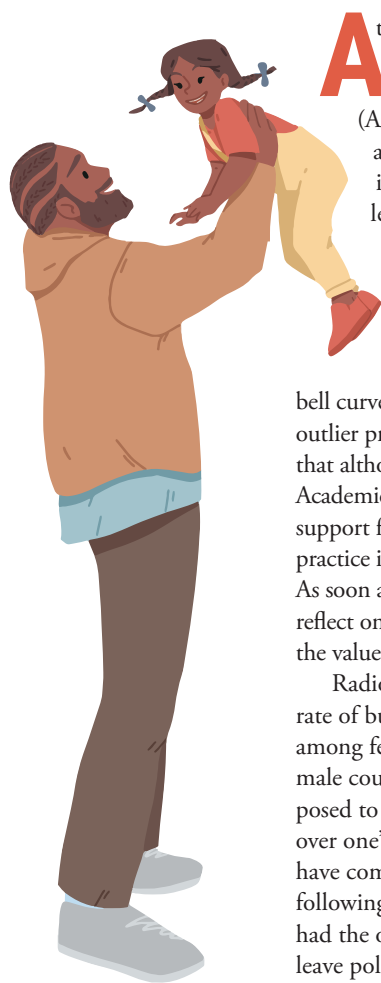
Full list of references available in the digital edition at [ACRBulletin.org](https://www.acrbulletin.org)



Amy K. Patel, MD, (left) and Elizabeth K. Arleo, MD, (right) approached Kamran Ali, MD, FACR, at ACR 2019 about implementing a paid parental leave policy at his private practice.

A Culture Change

Paid parental leave adds value for practice members — as radiologists and as parents.



At ACR 2019, I had the pleasure of meeting with Elizabeth K. Arleo, MD, president of the American Association for Women in Radiology (AAWR). During our conversation, she asked me, as head of a private radiology practice in Wichita, Kan., if I would support a paid parental leave policy of 12 weeks.

I'm sure I had an awkward expression on my face, like a child with his hand in a cookie jar. I shrugged my shoulders, knowing our group had no defined policy. I thought to myself, "Oh no, we must be so far behind the bell curve on this that even the AAWR knows we are an outlier practice!" I was shocked when she informed me that although the AAWR and the Society of Chairs of Academic Radiology Departments issued a statement of support for 12 weeks paid leave in academia, no private practice in the country is known to have such a policy.^{1,2} As soon as I returned from the conference, I began to reflect on the benefit of a paid parental leave policy and the value it could bring to our practice.

Radiology as a specialty has the seventh highest rate of burnout in medicine. In addition, burnout rates among female radiologists (54%) are higher than their male counterparts (47%).³ One of the strategies proposed to mitigate burnout is to restore a sense of control over one's work-life balance. Several of my colleagues have commented that they would have handled the time following the birth of their children differently if they'd had the option of paid parental leave. A paid parental leave policy places value on the bonding that is necessary immediately after birth or adoption and may help mitigate against burnout when a colleague feels their work-life balance in this crucial period is respected.

Culture change is important in creating an environment where a paid parental leave policy would be championed by a group and not viewed as a sign of weakness. One in five American fathers who have access to paid parental leave actually use it. Only 50% believe their employers would support them, and one-third feel that taking leave could negatively impact their careers.⁴ If we, in private practice, create a culture of acceptance for parents and support the nurturing relationship between parent and child, we will have come a long way in reducing stress for parents and making our work environment one that looks beyond a stack of films that need to be read.

A paid parental leave policy would also be advantageous from a cost-benefit perspective. As more households become primarily dual-income, a parent not having the option to maximize parental leave may decide to leave a job and take the necessary time off to be with their child. This would create a vacuum in the workplace as the time needed to find the best replacement would likely be longer than the time the parent would be gone on leave. Even if the parent were to return out of necessity prior to their desired time off, consequences on the job could be felt. They may be physically present but emotionally and psychologically absent — which could be even more costly.

Seeing all the upsides of a paid parental leave policy, I put the item on our agenda for our practice's board of directors meeting. The pros and cons were discussed and the board gave me approval to move the discussion forward to the shareholder agenda. The policy was brought up in our shareholder meeting the same month. I was pleasantly surprised at how supportive the shareholders were in discussing the merits of such a policy. The policy was subsequently approved and a committee was created to establish the best way to implement it.

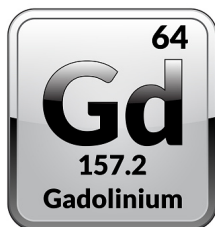
The most likely policy will utilize a combination of vacation, sick leave, and "borrowed" vacation from the next calendar year for those who qualify for parental leave — as defined by the Family and Medical Leave Act. The creation of a discretionary fund to put money away for a "rainy day" is also under consideration by the committee.

Leaders in the private radiology sector should work towards implementing a 12-week paid parental leave policy. The major emphasis of the ACR's Imaging 3.0[®] platform is to transform our specialty from a volume-based to a value-based healthcare model. The best way to contribute to adding this value for our patients is by adding value to those who provide the services to them — and a parental leave policy will do just that. It will allow a parent time to bond with their child and lessen the stressors of financial security. It will lead to improved morale and increased productivity. Equally importantly, it will demonstrate an inclusive workplace that values the importance of a healthy and resilient workforce. **B**

Kamran Ali, MD, FACR, is a radiologist with Wichita Radiological Group in Kansas.

ENDNOTES

1. Canon CL, Enzmann DR, Grist TM, et al. SCARD statement of support for paid parental leave. *J Am Coll of Radiol*. 2019;16(3):271–272.
2. AAWR. Statement of support for 12 weeks paid family leave. Published Oct. 31, 2018. Accessed Sept. 26, 2019.
3. Harolds JA, Parikh JR, Bluth EI, et al. Burnout of radiologists: frequency, risk factors, and remedies: a report of the ACR Commission on HR. *J Am Coll of Radiol*. 2016;13(4):411–416.
4. Ohanian A. Work-life Balance. Medium Web site. Published June 19, 2019. Accessed Sept. 26, 2019.



A Collaborative Resource

A roadmap on gadolinium identifies knowledge gaps about its retention.

Gadolinium-based contrast agents (GBCAs) have revolutionized MRI, enabling physicians to obtain crucial life-saving medical information that often cannot be obtained with other imaging modalities. Since initial approval by the FDA in 1988, more than 450 million intravenous GBCA doses have been administered worldwide, with an extremely favorable pharmacologic safety profile.¹ However, recent information has raised new concerns about the safety of GBCAs.

On Feb. 15, 2018, the National Institute of Biomedical Imaging and Bioengineering (NIBIB) convened an international meeting in Bethesda, Md., to identify and prioritize future research initiatives regarding the mechanisms, biological importance, and clinical implications of gadolinium retention. The research roadmap resulting from this workshop identifies knowledge gaps about gadolinium retention and prioritizes directions for needed research. The *Bulletin* recently spoke with Herbert Y. Kressel, MD, FACR, co-author of the roadmap, and Deborah Levine, MD, FACR, also a co-author of the report, to discuss their efforts to shed light on this tool in diagnostic imaging.

What was the result of the workshop?

HK: In December of 2017, the FDA issued a communication about GBCAs as part of its post-market monitoring of drug safety — requiring a class-wide warning about gadolinium retention in the labeling of these agents, and additional studies by manufacturers to assess their safety.² In 2018, the NIBIB workshop, sponsored by the ACR, NIH, and RSNA, was held to review what is known about gadolinium retention and its potential clinical significance. Most importantly, a major goal was to identify key gaps in current knowledge to form the basis of a prioritized research roadmap.

Two reports based on the workshop have been published ([available at bit.ly/Gad_Roadmap](http://bit.ly/Gad_Roadmap)). In May of 2018, at the request of the FDA, the four manufacturers of GBCAs — Bayer, Bracco, GE Healthcare, and Guerbet — co-authored a letter sent to all providers, alerting them that GBCAs may remain in the body months to years after injection. The letter noted that retention is highest with the linear agents and lower with the macrocyclics. The letter also clarified that no adverse clinical or pathological consequences of this retention have as yet been identified. To help educate patients, the FDA — in collaboration with the GBCA manufacturers

— has created a medication guide specific to each agent for distribution prior to a contrast-enhanced MRI examination.

What led to the development of the resources?

DL: Both Dr. Kressel and I had been working in the editorial office of *Radiology*, and we had accepted for publication early reports of gadolinium deposition in the brain; we knew that this was a very important topic. And because we're talking about a very low incidence — if any — of patients having symptoms, we needed large studies; we needed researchers to collaborate to answer this really important question. But as more papers came out, it seemed like different research groups were working in their own silos and doing their own studies differently — using different types of contrast, different concentrations, different techniques — not all of which were optimized for detecting gadolinium — so you couldn't really compare or combine results. So the idea of bringing this scientific community together was to figure out where the research gaps were and to make a roadmap — to really talk about best practices for studies going forward so that hopefully we could generate interest from the research community to collaboratively come up with answers.

The important thing to understand about the controversy with gadolinium is that, historically, the safety profile is still there; it's still an exceptionally safe contrast medium. We don't want to scare people and have them not use gadolinium with contrast because it's so helpful for so many different medical conditions. So we always talk about a cost-benefit ratio; the benefit is getting the right diagnosis, or helping with treatment or tailoring treatment in cancer patients, and the risk — right now — is still a theoretic risk.

How can the radiology community use these presentations as a resource?

HK: The slides of the entire workshop have been posted on the NIBIB website ([available at acr.org/Clinical-Resources/Contrast-Manual](http://acr.org/Clinical-Resources/Contrast-Manual)). These include presentations on the chemical properties, stability, biodistribution, toxicology, and speciation of these agents — as well as on retention in central nervous system (CNS) and non-CNS tissues in animals and in humans.

continued on page 21

Focusing on Metrics

The ACR PFCC Economics Committee is emphasizing patient-reported outcomes data.

For many years, medicine has seen a shift toward value-based physician reimbursement. As part of the Imaging 3.0® initiative, which was launched to help radiologists make this transition, ACR formed the Commission on Patient- and Family-Centered Care (PFCC). Comprised of six committees, the PFCC's mission is to encourage radiologists and the ACR to place the patient at the center of imaging care. One of these committees, the PFCC Economics Committee, strives to inform economic policy with the patient firmly in mind. As such, a key component of the committee's work involves supporting the creation of metrics to measure how well radiologists are adopting patient-centered practices.



The PFCC Economics Committee supports the PFCC's overall work to improve healthcare satisfaction by promoting constructive relationships between radiologists and other physicians with their patients, families, and communities. Learn more about the committee at acr.org/PFCC-Econ.

Growing Metrics

One growing area of metric development involves patient-reported outcomes data, which has become a focus for the committee. Such data collection efforts seek to ascertain what the patient most values, not what physicians think they should. For a variety of reasons, however, the radiology profession has not made the collection of patient-reported outcomes data a priority. As James V. Rawson, MD, FACR, PFCC chair, writes, "Traditionally, these metrics are obtained from patients by means of surveys and tend to be more lifestyle focused. These surveys are more than just patient satisfaction surveys, however."¹

The importance of such measures was recently highlighted in the CMS CY 2020 Medicare Physician Fee Schedule Proposed Rule, in which CMS requested public comments on significant changes to its Quality Payment Program (QPP). In particular, the agency sought comments on incorporating more patient-reported outcomes and care experience measures into a modified version of the Merit-Based Incentive Payment System (MIPS) — also called the MIPS Value Pathways, or MVPs.

The MVPs are a proposed series of refinements to previous iterations of MIPS, which had required clinicians to report on many different measures across multiple performance categories. At this point, MVPs are a conceptual alternative, and CMS is continuing to gather stakeholder input on their potential implementation.

The MVPs may invite clinicians to report only a few measures — establishing a more straightforward path for participation in MIPS and potentially a better glide path toward alternative payment model (APM) participation. As part of the rollout, CMS requested information on patient experience and satisfaction measurement tools or approaches to capturing patient-centered information that would be appropriate for inclusion in MVPs.

In response to this change, on Sept. 23, the ACR submitted comments to CMS responding to multiple components of the Proposed Rule. These comments included those developed by physician volunteers from the Commission on Economics and the Economics Committee on MACRA; staff from ACR's economics, quality and safety, and government relations departments; and physician leaders from the PFCC Economics Committee. In terms of the PFCC's contribution, the effort was led by Melissa M. Chen, MD, chair of the committee, and was supported by staff from the ACR's Center of Excellence on Environmental Intelligence. According to Chen, "The request in the Proposed Rule offered an opportunity for us to support efforts by CMS to create pathways for the development of patient surveys and patient-reported outcomes."

Capturing Feedback

CMS' focus on patient-centered metrics and outcomes coincided with efforts already underway in the committee to develop a focus group and survey to capture patient-reported outcomes data related to diagnostic mammography. The focus group — comprised of former and current mammography patients — will help inform the development of survey questions, which will, in turn, evaluate radiologist performance based on what patients most value in their breast imaging experience.

At the conclusion of the focus group, physician volunteers will be in charge of developing survey questions based on participant feedback. These same physicians will administer the finished survey to their breast imaging patients, gathering patient-reported outcomes data along the way. Going forward, this survey could be adopted by breast imagers nationwide to help ensure quality patient care. The committee's ultimate hope is that the survey produces patient-reported outcomes data from which metrics specific to radiology can be created. Regardless of refinements CMS may make to MIPS, MVPs, and APMs, patient-reported outcomes will remain a primary focus. This survey will be a tool for radiologists to demonstrate their value in delivering patient-centered care. **B**

By Chris Hobson, Imaging 3.0® senior communications manager

ENDNOTE

1. Rawson JV. Invited commentary: metrics and value in radiology and the role of the patient. *RadioGraphics*. 2015;35(3):876–878.

Information Overload

The ability to instantly connect has benefits for radiologists — but also inevitable distractions.

Smartphones are an important aspect of modern life, especially for professionals. According to the Pew Research Center, 81% of adults — and 91% of U.S. adults who have a college degree — own smartphones.¹ Recently, I had a conversation with a friend and discovered that between various social media networks, email, and traditional phone call and text messaging, I could privately contact them through 14 different ways — just from my smartphone.

Information has never been more accessible and the ability to instantly connect with another person has its benefits. However, the constant barrage of alerts and notifications that ease of connectivity entails brings with it inevitable digital distractions. A changing digital landscape has meant that discussions are shifting to social media platforms. Social media has completely changed the way information is disseminated. Now, texts, emails, and social media notifications follow many radiologists home, and these alerts affect neural networks that regulate attention.² This leads to a constant state of alertness, awaiting the next notification or ping. This heightened level of alertness is not sustainable forever, and it can lead to what has been described as “techno-brain burnout.”³ In fact, a recent survey by the ACR Commission on Human Resources found that 77% of radiology practice leaders report burnout as a “very significant” or “significant” workplace problem.⁴ Requirements for emailing for work and, more recently, social media have contributed to burnout.⁵

Our connection to digital media has crept into off-hours as well. According to a recent study, Americans check their phones on average 80 times per day while on vacation.⁶

Between balancing work requirements with personal priorities such as family, friends, exercise, and personal time, what is a busy professional to do? Here are a few specific steps individuals can take:

1. Realize you have control. Radiologists want more control over their time, and modern smartphones allow the user to have a fair degree of it. Notifications and alerts for specific apps and programs can be turned off, as can, if needed, the entire smartphone. These settings are

present, and users should take some time familiarizing themselves with and making use of those settings.

2. Exercise email discipline. A recent study found that limiting how often you check email to three times a day leads to decreased overall stress.⁷ Turn off or limit new email notifications and alerts and set aside specific intervals during the day to check it as opposed to checking every time you get a new email. During those five to ten minutes of emailing, take an action with each new email: delete, save, or archive; respond in two or three sentences; or flag when it warrants a more detailed response and more time is available.

Texts, emails, and social media notifications follow many radiologists home, and these alerts affect neural networks that regulate attention.

3. Be judicious with notifications. When an app requests to send notifications and alerts, I almost always decline. I am an avid social media user, and yet I do not have Twitter or Facebook notifications or alerts enabled on my devices.

4. Create digital-free time. Set aside time every day to disconnect completely from email and social media to focus on friends and family. If possible, attempt to occasionally have extended time logged off completely from digital life — perhaps except for voicemail or emergencies.

5. Respect others' off-time. If writing work emails during the weekend, consider pre-scheduling them or saving them as drafts to be sent on Monday morning.

One of the greatest assets of a smartphone is the ability to connect with family, friends, and colleagues. However, the pressure to stay perpetually up to date can have insidious consequences for radiologists attempting to balance the never-ending stream of technological advancements, their daily work, and their personal well-being. While we may have more resources vying for our attention, we still only have a limited number of hours in the day — this places a premium on our ability to discern what is really worth knowing. In the digital age, we think our most important sources of knowledge are our smartphones or access to the internet. In fact, what we need now more than ever are connections with our mentors and professional role models, relationships with our families and friends, and time to ourselves. **B**

Tirath Y. Patel, MD, is a radiologist at Houston Radiological Associates.

ENDNOTES

Full list of references available in the digital edition at ACRBulletin.org



The ACR Radiology Well-Being Program is comprised of a validated well-being self-assessment, a toolkit of resources for recovery, and an educational curriculum for strategies to promote improved well-being. Access the program at acr.org/Member-Resources/Well-Being.

Richard Duszak Jr., MD, FACR, Speaker, and
Amy L. Kotsenas, MD, FACR, Vice Speaker

Speaking Out

The ACR 2019 Open Microphone session promoted robust discussion — with the larger radiology community sharing their feedback with one voice.

The Open Microphone session is always eagerly anticipated at the annual meeting, and ACR 2019 was no exception. In planning the 2019 session, the Open Microphone Session Workgroup reviewed feedback from prior years. We heard that attendees wanted input into the topics discussed during the session and requested that input be obtained in a timely manner prior to the annual meeting. We identified several hot topics — those with the most robust and engaging discussions on ACR Engage — and published an online poll of those topics on Engage to invite members to provide feedback. Based on feedback, lifelong learning and certification was, by far, the topic of greatest interest, followed by the effects of corporatization in radiology and a write-in topic on burnout and physician well-being. We also heard that members did not want a lengthy introduction to the Open Microphone session topic by a panel of experts, thereby reserving as much time as possible for open dialogue on the floor.

When it came to the discussion on certification, the CSC's goal for the session was to tackle a potentially contentious topic while maintaining a respectful and engaging dialogue. The need to monitor and measure our professional competence, the influence this has on our ability to practice medicine, and the data demonstrating the benefit of these activities — these are sensitive topics and have been since the early days of medicine. To that end, the session was introduced by BOC Chair Geraldine B. McGinty, MD, MBA, FACR, who reiterated our goal to promote open dialogue and robust discussion. McGinty reminded us that we will speak more effectively in the larger radiology community if we speak with one voice — after considering diverse perspectives in this forum.

To allow all voices to be heard — by members present at the session, as well as by members unable to attend in person — we invited conversation, comments, and questions during the session on ACR Engage, on Twitter via #ACROpenMic and #ACR2019, and through an anonymous poll that was sent to attendees on the meeting app. A total of 51 participants shared comments, with 22 comments coming from the anonymous poll. Workgroup members Daniel Ortiz, MD, Colin M. Segovis, MD, PhD, and Aradhana M. Venkatesan, MD, did an exemplary job capturing the themes on the anonymous poll and presenting them from one of the



Johnson B. Lightfoote, MD, MBA, FACR, chair of the ACR Commission for Women and Diversity, addresses Council members during the ACR 2019 Open Microphone session.

microphones in the room. Due to the overwhelming response on the poll, and to be respectful of those who rose to the microphones in the room, they were unable to share every anonymous comment.

The top themes of the discussion centered on the cost and time investment for initial and continuing certification (especially for residents and fellows), the time investment by radiology professionals in the process, and the relevance to quality and patient outcomes. Several members who commented during the session cited examples of medical certification processes outside of the U.S. or in other industries such as aviation. Others suggested that the current ABR Online Longitudinal Assessment process is, in fact, simpler than the 10-year exam process and recommended that it be given more time to be implemented before changes were considered. Several questions were raised with respect to the ABR's accountability, transparency, and diversity, with respect to practice type. ABR President Brent J. Wagner, MD, and Valerie P. Jackson, MD, FACR, executive director of the ABR and president of the RSNA, participated in the discussion, accepted ACR member feedback, answered questions, and sought to clarify items of confusion.

All comments from the floor, social media, and the anonymous poll — as well as a recording of the session — have been made available to the Task Force on Certification in Radiology, chaired by BOC Vice Chair Howard B. Fleishon, MD, MMM, FACR. Eric B. Friedberg, MD, FACR, also a member of the task force, reiterated that the task force would be open to hearing from all constituents as it continues its work.

We thank the Council and members who attended for engaging in a robust and respectful dialogue and look forward to another successful Open Microphone session at ACR 2020. If you have comments or suggestions, please reach out to us, as your elected leaders, or to ACR staff Trina Behbahani at tbehbahani@acr.org and Catherine Herse at cherse@acr.org. **B**

Influence the Future of Imaging

Please visit acr.org/CNC2019 to review the updated list of open positions, now featuring the addition of the chair of the Commission on Patient- and Family-Centered Care. The chair of the Commission on Informatics will now be appointed and is no longer open for application. Submit your 2019 candidate information form by Dec. 12, 2019, and email Amy Shipp at cnc@acr.org with any questions.

An Upcoming Transformation

continued from page 11

and collection than traditional programming, and that's where partnerships between data scientists and radiologists will become invaluable. AI is only as good as the data it is fed. As the saying goes: garbage in, garbage out. Poorly tagged or labeled data creates worthless AI, and radiologists will be required to correctly annotate datasets.

Four Steps to Embracing AI

How can medical students be great consumers of AI?

1. **Learn the basics of data science.** AI requires some understanding of data science, from which much evidence-based medicine is derived. It is important to understand basic statistics, as these frame the discussion of how well AI works.
2. **Know the applications in which AI works best.** AI works well with very specific tasks (such as a classifier), but isn't able to classify a disease it hasn't been trained to detect. AI is no panacea, and it won't work like that for a long time. Narrow AI, for specific tasks such as classifying lung nodules, will have real benefits in the short-term. Broad AI, intended to classify all forms of lung disease, is likely to provide poor results for now and the foreseeable future. AI will still be beneficial, helping unload some of the tedious work such as finding micronodules. This will allow the radiologist to consider the bigger picture — "Is this perhaps a strange fungal infection?"
3. **Understand the role of data in developing and training AI.** Those using AI need to understand how the dataset impacts the algorithm and how augmenting the dataset will change the results. For example, if a database has only male patients, we can expect to have some serious problems applying the algorithm to a female population. As a result, fair questions to ask a vendor may include how the algorithm was trained, where it was developed, what studies support it and what equipment was used for image acquisition.
4. **Consider how AI will be incorporated into a workflow.** If AI adds the burden of more clicking and time, no one will want to use it. AI needs to make radiologists more efficient. It is important to consider how AI will be integrated into the workflow and how it will perform seamlessly in the background to support radiologists.

Future generations of radiologists are sure to advance and shape the field tremendously — creating new opportunities to improve patient care. The medical students I meet seem rightly excited about this new era.

AI will offer us modern wisdom, and convert radiologists into super-radiologists by vastly expanding the data we use to make decisions. In effect, AI is a means of compressing data and experience. An AI algorithm can be trained on millions of examples in a matter of days. It can process far more images than a human reviewer ever could, which absolves us of our natural human deficits and super-sizes our abilities. Today's younger generations of medical students hope to achieve better interpretive results and provide more connective patient care by embracing this technology. **B**

Ayis T. Pyrros, MD, is a neuroradiologist with DuPage Medical Group in Hinsdale, Ill.

A Collaborative Resource

continued from page 17

DL: Having the slides available on the NIBIB website was something that we thought was very important because, again, there is only so much that you can put in print. By having the original agenda, the transcript of what was actually said at the meeting, and the slides available, we believe that anybody doing research in this area can use these resources. In addition, most of the general ACR community aren't researchers, but if they do MR, they want to have a good understanding of contrast. This resource can help them understand the benefits and the risks of using GBCAs, as well as how to put those risks in context — because a lot of patients will come in and have questions, and rightly so. **B**

ENDNOTES

1. Levine D, McDonald RJ, Kressel HY. Gadolinium Retention After Contrast-Enhanced MRI. *JAMA*. 2018;320(18):1853–54.
2. Brooks, M. FDA to Require Warning Labels on Gadolinium-Based Contrast Agents. Medscape. Published Dec. 19, 2017. Accessed Oct. 2, 2019.

JOB LISTINGS



CLASSIFIED ADS These job listings are paid advertisements. Publication of a job listing does not constitute a recommendation by the ACR. The ACR and the ACR Career Center assume no responsibility for accuracy of information or liability for any personnel decisions and selections made by the employer. These job listings previously appeared on the ACR Career Center website. Only jobs posted on the website are eligible to appear in the *ACR Bulletin*. Advertising instructions, rates, and complete policies are available at jobs.acr.org or e-mail careercenter@acr.org.

Wisconsin - Advocate Aurora Health is seeking a board-certified/board-eligible diagnostic radiologist to join an established team in family-friendly Manitowoc/Two Rivers, Wis. The candidate must be able to perform mammography, including breast biopsies/procedures. Fellowship training is welcomed.

Contact: Email Alison.Burki@aurora.org or call 414-389-2543 for more information.

Michigan - A radiologist is needed in a four-season resort community in the Petoskey-Harbor Springs area of lower Northern Michigan. The position offers a full range of diagnostic imaging provided by a progressive radiology group serving three hospitals. A partnership track will be offered to a board-eligible or ABR/AOBR-certified candidate.

Contact: Call 231-487-7091 for more information.

Pennsylvania - A traditional private practice is seeking a full-time radiologist for teleradiology coverage on weekdays from 4:00 p.m. to midnight. The candidate must be comfortable in a fast-paced environment covering mostly ER stats, as well as inpatient and outpatient studies. The candidate should be proficient in CT, US, MRI, X-ray, and nuclear medicine in this salaried position — which is not RVU-based. The position is located in Northeastern Pennsylvania and welcomes onsite coverage in lieu of teleradiology.

Contact: Email CVs to Linda.Bush@raww.com.

How can we design and implement a parental leave policy to address the unique needs of each #RADparent?



“Parental needs are not necessarily a one-size-fits-all solution. When you get into the very basics of pregnancy, labor, and delivery, some women have C-sections and they need more recovery time than those with a vaginal delivery. Every single person has different physical, emotional, and unique family needs – depending on their support at home. Hence, it’s really important that when we approach policymaking, we approach it with an individualized plan.”

— K. Elizabeth Hawk, MS, MD, PhD, radiologist with Radiology Partners in Studio City, Calif., and member of the ACR CSC



“We know that about half of the people coming into medical school now are female. We’ve talked about how we want to have more women in radiology specifically, and so we have to do things that will make this specialty more appealing to them – and to men too. I think our current generation – and the one that will come after us – want to be there with our family during those first few weeks after birth/adoption.”

— Cody R. Quirk, MD, radiologist with University of Virginia Health System in Charlottesville

ACR BOARD OF CHANCELLORS

Richard A. Barth, MD, FACP
 Jacqueline A. Bello, MD, FACP
 Claire E. Bender, MD, FACP
 Lincoln L. Berland, MD, FACP
 Beverly G. Coleman, MD, FACP
 Lori Ann Deitte, MD, FACP
 Keith J. Dreyer, DO, PhD, FACP
 Richard Duszak Jr., MD, FACP (Speaker)
 Howard B. Fleishon, MD, MMM, FACP (Vice Chair)
 C. Matthew Hawkins, MD
 William T. Herrington, MD, FACP
 Andre A. Konski, MD, MBA, MA, FACP
 Amy L. Kotsenas, MD, FACP (Vice Speaker)
 Jonathan B. Kruskal, MB, ChB, PhD, FACP
 Frank J. Lexa, MD, MBA, FACP
 Johnson B. Lightfoote, MD, FACP
 Katarzyna J. Macura, MD, PhD, FACP (Vice President)
 Mahadevappa Mahesh, MS, PhD, FACP
 Mary C. Mahoney, MD, FACP
 Alan H. Matsumoto, MD, FACP
 Geraldine B. McGinty, MD, MBA, FACP (Chair)
 Debra L. Monticciolo, MD, FACP (President)
 Alexander M. Norbash, MD, FACP
 Robert S. Pyatt Jr., MD, FACP
 James V. Rawson, MD, FACP (Secretary-Treasurer)
 Seth A. Rosenthal, MD, FACP
 Ezequiel Silva III, MD, FACP
 William Small Jr., MD, FACP
 Dana H. Smetherman, MD, MPH, FACP
 Gilles Soulez, MD
 Richard Strax, MD, FACP
 Timothy L. Swan, MD, FACP
 Pamela K. Woodard, MD, FACP
 Don C. Yoo, MD, FACP

ACR BULLETIN ADVISORY GROUP

Rebecca L. Seidel, MD (Chair)
 Jennifer Buckley, MD
 Neena Davison, MD
 Efrén J. Flores, MD
 Antony J. Hayes, MD
 Ryan K. Lee, MD
 Kay D. Spong Lozano, MD, FACP
 Amy K. Patel, MD
 Colin M. Segovis, MD, PhD
 Courtney M. Tomblinson, MD
 Hari M. Trivedi, MD
 Scott M. Truhlar, MD, MBA, MS, FACP

ACR BULLETIN STAFF

G. Rebecca Haines, MSM, CPXP
Vice President and Publisher
 Brett Hansen, CAE *Director of Operations, ACR Press*
 Lyndsee Cordes *Director of Periodicals*
 Nicole Racadag, MSJ *Managing Editor*
 Cary Coryell *Publications Specialist*
 Lisa Pampillonio *Art Director*
 Chad Hudnall *Senior Writer*
 Chris Hobson *Sr. Communications Mgr., Imaging 3.0*
 Jenny Jones *Imaging 3.0 Managing Editor*
 Jess Siswick *Digital Content Editor*

CONTACT US

To contact a member of the *ACR Bulletin* staff, email bulletin@acr.org.

ACR Bulletin (ISSN 0098-6070) is published monthly by the American College of Radiology, 1891 Preston White Drive, Reston, VA 20191-4326.

From annual membership dues of \$900, \$12 is allocated to the *ACR Bulletin* annual subscription price. The subscription price for nonmembers is \$90. Periodical postage paid at Reston, Va., and additional mailing offices. POSTMASTER: Send address changes to *ACR Bulletin*, 1891 Preston White Drive, Reston, VA 20191-4326 or e-mail to membership@acr.org.

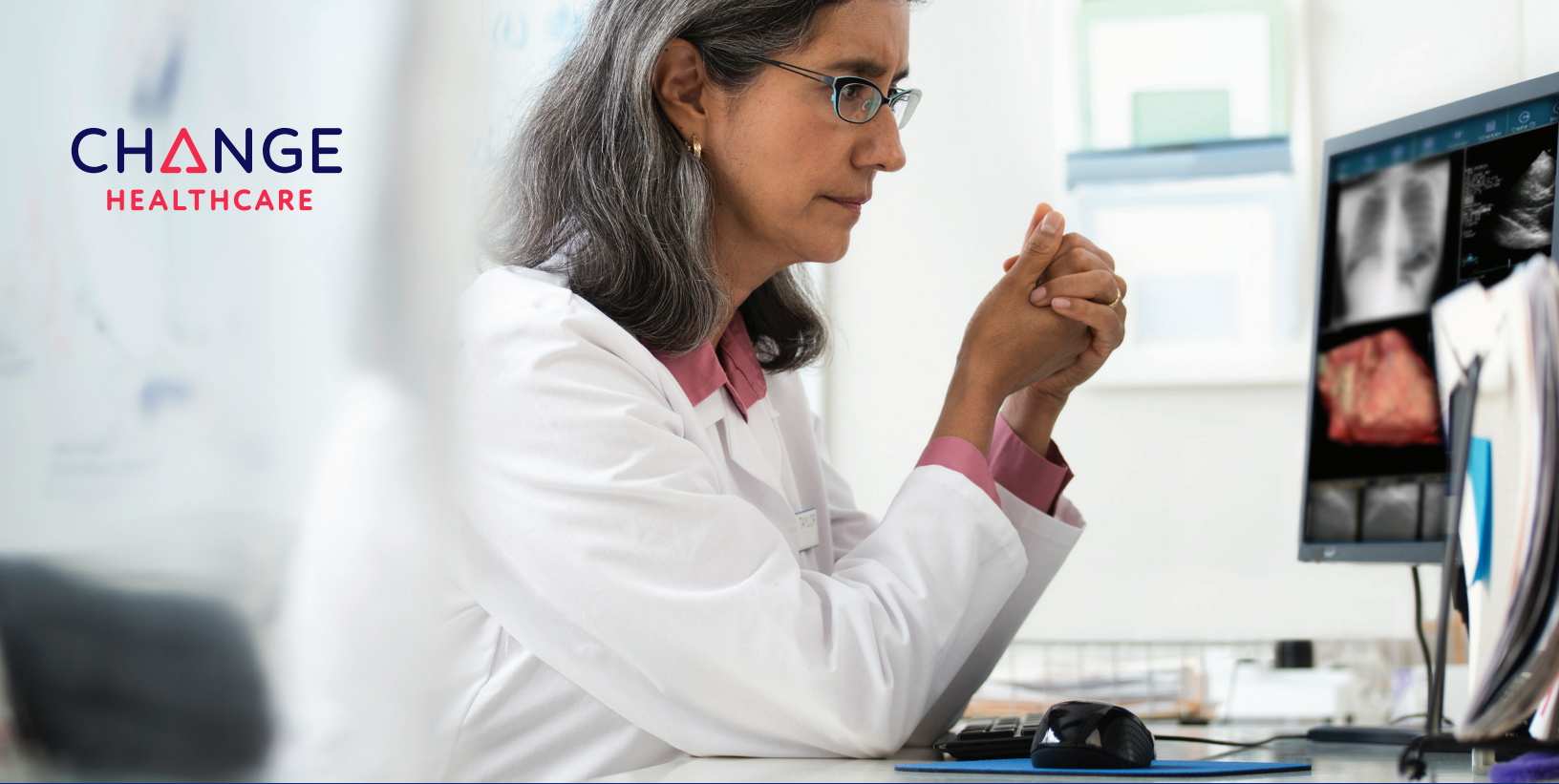
Copyright ©2019 by the American College of Radiology. Printed in the U.S.A.

Opinions expressed in the *ACR Bulletin* are those of the author(s); they do not necessarily reflect the viewpoint or position of the editors, reviewers, or publisher. No information contained in this issue should be construed as medical or legal advice or as an endorsement of a particular product or service.

The ACR logo is a registered service mark of the American College of Radiology.

For information on how to join the College, visit www.acr.org or contact staff in membership services at membership@acr.org or 800-347-7748.

For comments, information on advertising, or reprints of the *ACR Bulletin*, contact bulletin@acr.org.



The Keys to Improving Revenue



Getting paid for the services you provide isn't easy. Between continually changing codes, varying contracts, decreasing reimbursement, and compliance pressures—we know managing the financial aspects of your practice is both complex and challenging.

We focus on three key areas to help radiology practices optimize revenue:

- **Billing and accounts-receivable management services**—We help you boost accuracy and efficiency to facilitate cash flow and improve the bottom line
- **Analytics and patient experience solutions**—You'll gain insights to decrease referral/patient leakage and to make data-driven decisions
- **Practice-management services**—We assist with strategic plans and payer contracts to guide business decisions and to help maximize reimbursement

Visit <https://www.changehealthcare.com/solutions/radiology-practices>
or call 866.817.3813 to learn more.



MEDRAD® Stellant has a new FLEX Appeal.

The newest MEDRAD® Stellant FLEX CT Injection System from Bayer takes your contrast delivery to the next level with:

- › Updated scan room and control room technology
- › Flexible choice of a smaller, lower-cost syringe option with less environmental impact
- › New features designed for easy visualization of fluids
- › Automated, accurate documentation*

See how effortless it is to lower operating costs while enhancing imaging workflow. **Explore our CT solutions at stellantflex.com.**

*Requires additional software purchase.

**Visit us at RSNA 2019
Booth 2529**

medrad® Stellant FLEX
CT Injection System

Bayer, the Bayer Cross, MEDRAD Stellant FLEX, MEDRAD, Stellant FLEX are trademarks owned by and/or registered to Bayer in the U.S. and/or other countries. © 2019 Bayer. This material may not be reproduced, displayed, modified or distributed without the express prior written consent of Bayer. PP-MSTE-F-US-0041-1 March 2019