

**ACR**

LEADERSHIP | INTEGRITY | QUALITY | INNOVATION

JUNE 2021 | VOL. 76 | NO. 6

# Bulletin

**THINKING  
ABOUT AI?**



# Hone Your Diagnostic Skills with ACR® AIRP® Virtual Categorical Courses

Improve your diagnostic accuracy  
in identifying specific diseases,  
treatment and potential  
complications.

**Earn CME!**



**Neuroradiology Imaging**  
August 2–5, 2021



**Pediatric Imaging**  
August 11–13, 2021



**Abdominal Imaging**  
November 8–12, 2021



**Musculoskeletal Imaging**  
September 13–16, 2021



**Breast Imaging**  
October 22–23, 2021



**Cardiothoracic Imaging**  
March 24–25 and 28–30, 2022

[airp.org](http://airp.org) | 1-800-373-2204 |   

#### Accreditation Statement for Physicians

The American College of Radiology is accredited by the Accreditation Council for Continuing Medical Education (ACCME) to provide continuing medical education for physicians.

#### Designation Statement for Physicians

These AIRP activities have been approved for *AMA PRA Category 1 Credit™*.

For information about the accreditation of this program, please contact the ACR at [info@acr.org](mailto:info@acr.org).

Courses are provided by the American Institute for Radiologic Pathology, an affiliate of the American College of Radiology®.

**ACR**<sup>®</sup>  
AMERICAN COLLEGE OF  
RADIOLOGY

**AIRP**<sup>®</sup>  
AMERICAN INSTITUTE FOR  
RADIOLOGIC PATHOLOGY

## 9 THINKING ABOUT AI?

Radiologists are starting to understand that they may be undone by radiologists who use AI if they lag in adopting it.

### ALSO INSIDE

#### 13 Exploring FDA-Cleared Algorithms

A better understanding of the training and validation parameters of AI algorithms will help users understand potential biases and pitfalls that can arise in clinical use, leading to a better user experience overall.

#### 14 How are ACR Members Using AI?

The ACR Data Science Institute® conducted its first annual survey of ACR members to provide a baseline for monitoring trends in AI use over time.

#### 15 Exploring Quality Improvement

The chair of the ACR Commission on Quality and Safety discusses the specialty's ongoing focus on Q&S and the opportunities ahead for continuous improvement.

#### 16 Shared Prevention

For more than a decade, the CT Colonography Registry has provided evidence-based health outcomes and process data for decision-making — allowing facilities to compare their results regionally and nationally.

#### 18 Leaders Matter

A radiologist shares the five behaviors that all leaders can practice now to boost morale, improve well-being, and reduce burnout among their teams.

#### 20 Confronting the Pandemic

As the specialty improved its safety protocols and better learned how to safely care for patients with known or unknown COVID-19 in the healthcare environment, lost imaging examinations slowly recovered — but still haven't reached expected levels.

**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.

### DEPARTMENTS

#### 4 From the Chair of the Board of Chancellors

Every year, at the end of the annual meeting, the ACR undergoes a scheduled transition of elected ACR officers to ensure a rotation of ideas and innovation in the oversight and governance of the College.

#### 5 Dispatches

News from the ACR and beyond

#### 8 From the Chair of the Commission on Economics

CMS is allowing Medicare Administrative Contractors to cover FDG PET for infection and inflammation.

#### 21 Final Read

How can we reach gender equity in radiology?



**ACR**  
AMERICAN COLLEGE OF  
RADIOLOGY

**QUESTIONS? COMMENTS?** Contact us at [bulletin@acr.org](mailto:bulletin@acr.org).

Digital edition and archives of past issues are available at [ACR.ORG/BULLETIN](http://ACR.ORG/BULLETIN).



## Celebrating New Leadership

At ACR 2021, a new panel of officers will govern the College.

Every year, at the end of the annual meeting, the ACR undergoes a scheduled transition of elected officers to ensure a rotation of ideas and innovation in the oversight and governance of the College. This year, despite the meeting taking place virtually once again, that same transition in leadership will take place.

Beverly G. Coleman, MD, FACR, is our new president. Dr. Coleman is well-known to the BOC, CSC, and the College through her many years of service to the ACR and the profession. Most recently, she served as chair of the ACR Commission on US for six years, from 2014 to 2020. Dr. Coleman has represented the College and the profession through many challenging negotiations as US transitions to handheld extensions of the stethoscope. She has a well-earned reputation as a passionate advocate of radiology, US, and the ideals of the College. Dr. Coleman has an incredible list of accolades and accomplishments that establish her as an international luminary in fetal imaging. Currently, she serves as professor emeritus at the University of Pennsylvania and director of fetal imaging in the Center for Fetal Diagnosis and Treatment at the Children's Hospital of Philadelphia. Dr. Coleman and her department are at the epicenter of implementing the ideals of Imaging 3.0<sup>®</sup> in their interactions with expectant parents and ultra-specialized referring physicians. Dr. Coleman is widely recognized for her advocacy and passion for her students and her patients. We are fortunate to have such a remarkable talent as an integral part of the College. Dr. Coleman will now represent us on both domestic and international stages. If you listen closely, another glass ceiling is breaking as we elect a Black woman to be ACR president.

Dana H. Smetherman, MD, MPH, MBA, FACR, is our new treasurer. She is transitioning from her role as chair of the ACR Commission on Breast Imaging, where she did a fantastic job representing the life-saving benefits of mammography and breast imaging. Dr. Smetherman is highly qualified to be a steward for our longstanding commitment to financial stewardship, accountability, and transparency. She also serves as chair of the Ochsner Medical Center's department of radiology — along with an extensive list of other responsibilities. Her remarkable talent, experience, and training deliver the leadership skills that will continue to advance our financial expertise. She will be a valued contributor to our executive team.

Amy L. Kotsenas, MD, FACR, is our new Council

speaker. Dr. Kotsenas brings a wealth of skills as she takes on the responsibilities of representing our Council, running our annual meeting, leading the CSC, and joining the executive leadership of the College. She has distinguished herself at the College, especially through leadership in IT and the emerging field of integrated diagnostics. Interestingly, she credits the Radiology Leadership Institute<sup>®</sup> for preparing her for her leadership roles. With her long list of accomplishments and leadership expertise, she serves as a mentor and exemplar for a long line of future leaders.

James V. Rawson, MD, FACR, is our new vice president. Dr. Rawson has done an outstanding job as our treasurer — taking on several challenges brought on by the COVID-19 pandemic. He leaves us in a secure financial position. Dr. Rawson and the finance team implemented a series of innovations and improvements that continue to serve the College and present a sound foundation as we move forward. Dr. Rawson has continuously distinguished himself as an innovator and a leader at the Medical College of Georgia and now at Beth Israel Deaconess Medical Center. His advice and experience will be highly valued.

Jacqueline A. Bello, MD, FACR, and I serve as vice chair and chair, respectively. Dr. Bello, who serves as director of neuroradiology at Montefiore Medical Center and professor of radiology and neurosurgery at Albert Einstein College of Medicine, previously served as chair of the ACR Commission on Quality and Safety. She will also champion the Radiology Health Equity Coalition to eliminate health disparities across healthcare. We will have the opportunity to celebrate Dr. Bello's transition to chair at ACR 2022. The vice speaker role is a contested election and results are not yet known at the time of this writing (see sidebar). We are fortunate to have excellent candidates for the Council to consider.

Please raise a virtual glass and help us welcome the next iteration of ACR leaders. I look forward to working with and learning from them, as individuals and as a team. They are each incredibly talented and immensely qualified to lead us. On behalf of each new officer, we are humbled by the confidence placed in us by the Board and Council. As we celebrate the diversity that our elected leaders represent, we also recognize and respect the inclusive nature of our specialty and the College. Despite the polarized world around us, we come together in the spirit of unity. Irrespective of color, gender, or age, we are fortunate that this panel of leaders are willing and enthusiastic to volunteer their time and expertise so that we, together as a profession, can continue to advance the science of medical imaging. **B**

Watch your mail for the July issue of the *ACR Bulletin*, which will announce the result of the ACR vice speaker election and include more coverage on the new panel of officers.



## Resources to Help Impact Population Health

A recent ACR Patient- and Family-Centered Care (PFCC) Commission Population Health Management (PHM) Committee webinar explained how radiologists can leverage payment models to achieve PHM success. Although PHM is historically centered on primary care, the webinar was the latest in an educational series aimed at conveying the central role that radiology can play in population health management.

Presenters Syed F. Zaidi, MD, MBA, and Ryan K. Lee, MD, MBA, co-chairs of the PFCC PHM Committee, and John H. Lohnes Jr., MD, FACR, broke the PHM continuum down into three major areas: surveillance/prevention, acute care, and chronic disease management. The various areas of focus while distinct, build off of one another in several important ways, particularly with respect to individual patient populations.

The presenters offered that PHM is a concept whose time has come, particularly in light of the COVID-19 pandemic. For many, it is clear that fee-for-service is an inadequate payment scheme as the predominant source of revenue. It is also a common view that radiology quality measures haven't gone far enough in recognizing radiology's value. The healthcare landscape is experiencing a digital transformation and moving toward value-based payments in a PHM framework. Radiologists can position themselves to succeed in this new paradigm by learning more about tools for risk stratification, and benchmarking and triaging patients in order to become partners with PCPs, health systems, and payers in risk-sharing arrangements.

To learn more about the PFCC's PHM efforts, watch the webinar series at [acr.org/PHM](http://acr.org/PHM).

“As radiologists, we play a central role in providing high-quality care for our patients and communities — but we can't do it alone. With collaboration among our fellow radiologists, referring providers, administrative colleagues, and patients themselves, we can continue to empower each other to provide the best care for all.”

ARUN KRISHNARAJ, MD, MPH,  
CHAIR OF THE ACR COMMISSION ON PATIENT- AND FAMILY-CENTERED CARE

## ACR Launches National Clinical Imaging Research Registry™

The ACR has launched the National Clinical Imaging Research Registry™ (ANCIRR) to collect and curate case images and anonymized patient data from multiple practice settings to produce large data sets that support scientific research, AI development, and regulatory submissions. The ANCIRR will use the ACR Informatics platform, including TRIAD™ and ACR Connect™, for seamless data and image collection.

According to BOC Chair Howard B. Fleishon, MD, MMM, FACR, the new initiative “will benefit members and others in radiology by creating integrated imaging and clinical data resources for clinical research, health equity, and, ultimately, improved patient care, including among diverse populations and geographies.”

The ANCIRR differs from the National Radiology Data Registry (NRDR®), which receives data from facilities to enable practice quality improvement through site feedback and benchmarking against peers. There are six active registries in the ANCIRR suite and eight more in development. The data from these registries will enable researchers to address complex scientific questions and produce results applicable across various care settings, geographic locations, and populations. Participation in various registries is open to ACR members.

The ANCIRR is a primary data collection pathway for the National Institute of Biomedical Imaging and Bioengineering-funded Medical Imaging and Data Resource Center, which may become the largest COVID-19 medical imaging archive in the world.

For more information and to learn how to participate, visit [acr.org/researchregistry](http://acr.org/researchregistry).



## JACR Launches New Journal Club

Join host Amy K. Patel, MD, associate editor for digital media for the *JACR*®, and a panel of authors this month as they kick off the new *JACR* Journal Club. The first meeting, which takes place June 24 at 8 p.m. ET, will be an interactive discussion on “Transitioning to Independent Practice: An Early Career Perspective.”

Follow @JACRjournal on Twitter for more details on how to join the journal club livestream.

The RUC's foremost task is to ensure that patients receive the highest quality of care possible and that physicians have the resources to provide that care. The ACR has held a permanent seat on the RUC since its inception, and I am honored to be the first radiologist to hold the position of chair — but I am certainly not the first to make lasting contributions to the RUC.

— EZEQUIEL "ZEKE" SILVA III, MD, FACR, IMMEDIATE PAST CHAIR OF THE ACR COMMISSION ON ECONOMICS AND CHAIR OF THE AMA RUC

## New Pediatric Radiology Webinar Series

Pediatric radiologists are dedicated to improving the health of children through imaging that is tailored to a child's unique needs. The ACR Commission on Pediatric Radiology's Education and Workforce Committees, in collaboration with the Society for Pediatric Radiology's Physician Resources Committee, present an on-demand webinar series — "Pediatric Radiology: Journey to Imaging Our Future." During the webinar, you will hear from several pediatric radiologists on the following topics:



- Pediatric Radiology
- Pediatric MRI
- Pediatric Neuroradiology
- Fetal MRI
- Pediatric Elbow Injuries and Intervention
- Informatics

To learn about specializing in pediatric radiology, the rewards and challenges of working with children, and the wide spectrum of opportunities that pediatric radiology has to offer, register for the webinar series at [acr.org/pediatric-webinars](http://acr.org/pediatric-webinars).

## Performing 3D Printing?

If your practice performs 3D printing, you can now join the new 3D Printing Registry to foster the growth of this exciting new imaging area. Developed collaboratively by the ACR and the RSNA, the Registry collects anonymized 3D printing case-related information to characterize resource utilization, with the ultimate goal of improving patient care. The data collected will answer questions on clinical indications and intended uses for printed models, the source imaging employed, model construction techniques and effort, 3D printing technique and effort, and the clinical impact of the models.

Facilities already participating in the GRID or DIR registry can participate at no additional cost. Learn more at [acr.org/3D-Printing](http://acr.org/3D-Printing).

## Imaging 3.0: Ask a Radiologist

Inspired by other specialties, radiologists at Cincinnati Children's Medical Center spearheaded an initiative to integrate a messaging system into the EHR that allows patients to ask radiology-specific questions directly to radiologists through the patient portal. Allowing patients to ask radiologists questions through the portal can decrease their anxiety. It also allows radiologists to connect directly with patients.

Read the full case study at [acr.org/AskRad](http://acr.org/AskRad).

When patients message radiologists directly, does it improve care?

Patients have imaging-related questions but can't easily connect with radiologists.

**GOAL:** Give patients and radiologists a means to engage.

Radiologists at Cincinnati Children's Medical Center developed a radiology messaging system.

The system alleviates parent and patient anxiety and increases radiologists' job satisfaction.

Increasing interaction between radiologists and families is a win-win.

ACR Radiology



## Taking the Lead: Leading for a Bright Future

The Radiology Leadership Institute® (RLI) Taking the Lead podcast explores the challenges that transform everyday radiologists into today's leaders. In a recent episode, Lawrence R. Muroff, MD, FACR, a member of the RLI board, traces his remarkable leadership journey — from 6th grade safety patrol to one of the most highly sought-after professional practice consultants for radiologists, hospitals, and corporations today. His appreciation for hard work has led to 42 years of continuous major leadership roles within the specialty, including the ACR. Throughout his career, he has worked tirelessly to educate and inform on important topics such as leadership, contracts, negotiations, interpersonal issues, and group governance.

To listen to the podcast, visit [acr.org/RLIPodcast](http://acr.org/RLIPodcast).

## NOW AVAILABLE: CPI Module in Neuroradiology

Test your imaging knowledge and improve your diagnostic imaging skills with the new Neuroradiology Module 2021 by the ACR Continuous Professional Improvement (CPI) program. Designed to be an excellent teaching and learning tool for general diagnostic radiologists, neuroradiology subspecialists, and residents, this module has 50 self-assessment questions featuring more than 200 images and includes:

- High-yield review questions for any practice setting, from the community to the academic subspecialty level
- Comprehensive neuroradiology topics covering brain, spine, and head and neck pathology
- A variety of patient ages from pediatric to adult cases
- Commonly misdiagnosed and “can't miss” pathologies
- Questions covering ACR Practice Parameters and emerging state-of-the-art imaging techniques

Choose your format (print or online), download the free e-book copy, and earn 8 CME/SA-CME. Members save \$35 per module when bundling six modules via a CPI Select Six.

Learn more at [acr.org/cpi](http://acr.org/cpi).



**According to the Association of American Medical Colleges, Asians make up the second largest racial group among medical students and doctors in the U.S., and they constitute 20% of medical school faculty. But the numbers start dwindling among higher levels of seniority.**

—AUGUSTINE M.K. CHOI, MD, DEAN OF WEILL CORNELL MEDICINE AND PROVOST FOR MEDICAL AFFAIRS OF CORNELL UNIVERSITY, AT [BIT.LY/CNN\\_CHOI](http://bit.ly/cnn_choi)



## IMAGING 3.0: Quality Care for All

Radiologists at Vanderbilt University Medical Center (VUMC) have developed a formal health equity program focused on three core areas: increasing awareness of health equity principles, generating interest among trainees, and fostering health equity research. In this Q&A, Lucy B. Spalluto, MD, MPH, vice chair of health equity at VUMC, and Andrea A. Birch, MD, FACR, professor of clinical radiology at VUMC and a member of the ACR's Commission for Women and Diversity, discuss the program's development and how the team hopes to inspire action within radiology and beyond to ensure all patients have high-quality care.

“We recognized the need to focus departmental efforts on addressing health disparities — specifically, we determined that providing the infrastructure and support for these efforts is essential to drive real change,” says Spalluto. “Now is the time for radiology to claim their seat at the table for health equity. We need to show that radiology is committed to providing the best care possible to the diverse populations that we serve.”

Read the full **Imaging 3.0®** case study at [acr.org/imaging3-qualitycare](http://acr.org/imaging3-qualitycare).



## Apply for the 2021 ACRF Goldberg-Reeder Resident Travel Grant

Are you a member-in-training who is interested in providing volunteer service to assist healthcare in a low-to-middle income country? The ACR Foundation supports the Goldberg-Reeder Resident Travel Grant program, which awards up to \$2,000 to qualified residents looking to serve up to a month advancing radiology in low- and middle-income countries. COVID-19 travel restrictions will be monitored to determine an appropriate time to travel for the grant recipient(s). The deadline to apply for the grant is June 30. For more information, contact Joan Lynch at [jlynch@acr.org](mailto:jlynch@acr.org).

Apply for the grant at [acr.org/Goldberg-Reeder](http://acr.org/Goldberg-Reeder).



**Benjamin L. Franc, MD,  
MS, MBA**

Chair, Economics  
Committee on Nuclear  
Medicine

Guest Columnist

# A Unified Approach

The ACR is working with other stakeholders and individual MACs to chart a path to reimbursement for FDG PET for Infection and Inflammation.

Effective March 19, 2008, CMS issued a National Coverage Determination (NCD) for FDG PET for Infection and Inflammation — establishing non-coverage for this modality when used to explore indications of infection or inflammation ([learn more at bit.ly/FDG-PET](https://bit.ly/FDG-PET)). Effective Jan. 1, 2021, CMS retired this NCD — citing the criterion established in 2013 to regularly identify and remove NCDs that no longer contain clinically pertinent and current information. With the removal of the NCD, CMS will modify the NCD manual to ensure that contractors have the authority to make a coverage determination when claims are submitted for FDG PET for inflammation or infection. The NCD for FDG PET for Infection and Inflammation had barred coverage for this item/service; therefore, retirement of this NCD under Title XVIII (national non-coverage NCD) allows Medicare Administrative Contractors (MACs) to cover the item or service if the MAC determined that such action was appropriate.

Members of the ACR, the Society for Nuclear Medicine and Molecular Imaging, the American Society of Nuclear Cardiology, and the American College of Nuclear Medicine are currently holding joint teleconferences with each of the MACs to discuss each MAC's perspective on the next appropriate steps.

Whether or not FDG PET for infection or inflammation will be covered by the local MAC within any given jurisdiction is unclear at this point in time. Seven MACs cover one or more jurisdictions. Some of these MACs have issued guidance on filing claims for PET-CT for the evaluation of cardiac sarcoidosis. This is communicated in a bulletin from the MAC that is issued on a monthly or quarterly basis or inquiries can be made directly.

At present, none of the MACs have issued official guidance on filing claims for PET-CT for the detection

of infection. Members of the ACR, the Society for Nuclear Medicine and Molecular Imaging, the American Society of Nuclear Cardiology, and the American College of Nuclear Medicine are currently holding joint teleconferences with each of the MACs to discuss each MAC's perspective on the next appropriate steps. Potential next steps include payment of claims outright by a MAC and development of a local coverage determination (LCD), among others. MACs have statutory authority to develop LCDs for their individual jurisdictions. An LCD, as defined in §1869(f)(2)(B) of the Social Security Act, is a determination by a MAC about whether or not a particular item or service is covered in the MAC's jurisdiction in accordance with section §1862(a)(1)(A) of the Act.

The 2016 21<sup>st</sup> Century Cures Act updated the LCD process in terms of who may request a new LCD or an informal meeting with the MAC to discuss potential LCD requests. This action may be initiated by beneficiaries residing or receiving care and healthcare professionals/interested parties doing business within a MAC jurisdiction ([learn more at bit.ly/LCD-process](https://bit.ly/LCD-process)). MACs must follow the revised LCD process to make any changes in coverage. When developing an LCD, the MAC(s) may supplement evidence from required peer-reviewed literature with clinical guidelines, consensus documents, consultation by experts, or advisory opinions by medical associations or other healthcare professionals. Although an LCD is local to every jurisdiction, MACs covering more than a single jurisdiction have typically tried to maintain homogeneity of LCD policies across jurisdictions covered by that MAC. Furthermore, there is a recognized need for greater consistency between existing LCDs across MACs and the joint development of new LCD topics across MACs ([learn more at bit.ly/MAC\\_2014](https://bit.ly/MAC_2014)).

The ACR's Contractor Advisory Committee Network, the Commission on Nuclear Medicine and Molecular Imaging, and the Economics Committee on Nuclear Medicine are all monitoring progress of discussions with the individual MACs — with the intent of joining other stakeholders in a unified approach to establishing reimbursement for FDG PET for Infection and Inflammation. In the meantime, if a provider performs/interprets an FDG PET for Infection and Inflammation for a Medicare beneficiary and files a claim that is denied by the provider's MAC, the provider may file an appeal of that denial. If such an appeal is made, please reach out to Alicia Blakey, ACR senior economic policy analyst, at [ablakey@acr.org](mailto:ablakey@acr.org) for educational resources that may be used to assist the MAC in assessing the evidence for FDG PET for infectious and inflammatory disease indications. **B**



# THINKING ABOUT AI?

*AI has become part of the radiologist's day-to-day practice — and practices that delay implementing these tools may soon be left behind the curve.*

"Healthcare needs AI," says Nina E. Kottler, MD, MS, vice president of clinical operations and associate chief medical officer of clinical AI at Radiology Partners. "I am a huge fan of being an early adopter of AI. Most importantly, early adopters can help drive the direction of this disruptive technology; and this technology can transform the practice of medicine. In addition, early experience provides expertise allowing early adopters to avoid mistakes that others will make later — at a time when there will be far less latitude to make those mistakes." As Curt Langlotz famously said, radiologists are not going to be replaced by AI, but radiologists who use AI and — Kottler adds — understand AI, will replace those who don't.

Kottler's group deployed AI algorithms several years ago and has seen positive results. "We have gained experience in identifying use cases that provide value for our patients and practice, choosing AI products and vendors, piloting vendors' algorithms, and creating our own," Kottler says. "Our radiologists have adapted to using the AI tools and have integrated them into their clinical workflow."

**“It is becoming increasingly feasible for regular radiology practices to begin to incorporate AI into their workflows.”**

— Christoph Wald, MD, MBA, PhD, FACR

## GETTING STARTED

To ensure scalable, useful AI implementation, multiple steps are required — including preparing your data, your systems and your radiologists, Kottler says.<sup>1</sup> Radiology AI is still immature, with limited adopters and few use cases in practice. With this in mind, Kottler’s group has successfully managed challenges and experienced unexpected benefits from using AI.

“Deploying AI wasn’t a huge issue for us,” Kottler says. “We had a use case, similar to the ones the ACR Data Science Institute® (DSI) now collects and maintains.” Kottler’s group has gained experience in both identifying use cases that provide value for patients and in creating their own AI algorithms. Beyond image evaluation and detection, Kottler says, AI is helping manage radiology workflows, collect patient information, assist in scheduling and follow-up, create portions of the radiology report, and more.

We are already starting to see unexpected benefits of AI, Kottler says. One of the more common AI use cases is computer-aided triage. Many of the current FDA-cleared products are triage algorithms — software that decides which patient studies should be moved up the reading worklist to expedite evaluation. “We tested two such algorithms and found surprising benefits beyond the expected expedited time to review exams with critical findings,” Kottler says.

When asked about these additional sources of value, “Number one, the software improved patient care and outcomes,” Kottler says. “We identified 2.4% more intracranial hemorrhages and 4.4% more pulmonary embolisms that we were missing without the AI software,” she says. “Even though most of the missed findings were subtle, several of those cases progressed to significant findings, including a patient with a barely visible intracranial hemorrhage that returned with massive enlargement of the hemorrhage requiring surgical decompression.”

Another positive, she notes, is a decrease in the cost of care to the health system. The use of these triage algorithms decreased length of stays and improved ED throughput. In addition, “We saw radiologists’ efficiency shoot up by 11 or 12%. The reason: the algorithms are highly specific,” Kottler says.

### **The Define-AI Directory**

A use case is a scenario where use of AI may help improve medical imaging care. Use cases were created to empower AI developers to produce algorithms that are clinically relevant, ethical, and effective. Each use case provides narrative descriptions and flow charts that specify the healthcare goal of the algorithm, the required clinical input, how it should integrate into the clinical workflow, and how it will interface with users and tools. The ACR DSI Define-AI use cases help radiologists and allied professionals by ensuring that AI tools provide needed information, can be efficiently implemented into daily workflow, and have the potential to improve the quality and efficiency of patient care.

According to Kottler, efficiency is also a source of value for radiology practices who are often struggling to keep up with escalating volumes. “The reason for improved radiologist efficiency doesn’t come from the positive cases — those are few and far between,” she says. “Increased efficiency actually stems from the negative cases. Why? If a highly specific AI algorithm provides a negative result the radiologist doesn’t perseverate on the study looking to see if there is something subtle they are missing.”

Kottler emphasized that when selecting any AI technology — if you are not building your own algorithms — you should focus on identifying vendors who are willing and available to work with your organization. Your first priority should not be to find the most accurate algorithm, but rather the best algorithm vendor. Accuracy measurements are based on a set patient and exam population that may not reflect your data. Moreover, the use of AI in healthcare is still new. With that, both the technical and clinical deployment of algorithms is not always seamless. It is helpful to have a partner who can help manage the challenges. “We don’t partner an algorithm, we partner with people who can help us effectively manage that algorithm,” Kottler says.

## CHOOSING VENDORS

“It is becoming increasingly feasible for regular radiology practices to begin to incorporate AI into their workflows,” says Christoph Wald, MD, MBA, PhD, FACR, chair of the department of radiology at Lahey Hospital and Medical Center and chair of the ACR Commission on Informatics. “Some vendors offer portfolios of algorithms,” he says. Other AI marketplace options, he adds, aggregate AI from multiple vendors.

You need a good working relationship with your AI vendor, Wald says, and possibly a third-party workflow orchestrator to integrate AI algorithms into your clinical workflow. One really important issue for practices is monitoring real-time performance once the AI is deployed, Wald says. It is especially important for practices with no onsite data scientist. Practices need to remember that they will have to initially assess whether the AI is working as marketed. Each practice almost certainly has different scanners and protocols than those used to train the AI. Furthermore, diversity of patients in a given practice may differ from what the AI was trained on, creating bias, which can theoretically result in unintended health inequity consequences. Practices will need to monitor AI algorithm performance as their machines and protocols change over time. The ACR Commission on Quality and Safety and the Commission on Informatics will collaborate with domain experts over time on ways to foster the safety, effectiveness, reliability, and transparency of AI in radiology.

There will continue to be significant vendor

consolidation in the industry, Kottler notes, which will make it difficult for practices to identify the vendors that will be viable in the future. The ACR AI-LAB™ can be a huge help for practices looking to move forward with AI, Kottler says. The ACR AI-LAB is a data science toolkit designed to democratize AI — enabling radiologists to develop algorithms at their own institutions, using their own patient data, to meet their own clinical needs. Some services through the ACR AI-LAB portal include exploring existing use cases for AI in medical imaging, proposing your own idea for a use case, learning how AI applies to imaging through a series of videos, and creating structured data sets around specific AI use cases.

“With AI algorithms, we are going to be gleaned more data from images than the visual information,” Kottler says. “We need to understand how to process that information and add context to it based on the patient.” In the not-too-distant future, she says, radiologists are going to use AI to predict patient outcomes — with precision guidelines for preventive health. “That capability would be huge, and of great value to patients,” Kottler says. “We will be busier, but we’ll be practicing at the top of our licenses.”

## UNDERSTANDING THE CHALLENGES

“I think the radiology community has moved beyond a fear of being replaced to a culture of accepting that AI will assist us,” says Scott J. Adams, MD, resident physician in the department of medical imaging at the University of Saskatchewan’s College of Medicine and an E. Stephen Amis, Jr., MD, Quality and Safety Fellow. Adams echoes Kottler in thinking that more radiologists are starting to understand the advantages of using AI.

“The hope is that radiology groups of all sizes will be able to use AI easily and cost-effectively,” Adams says. “I’m hoping we are going to see AI marketplaces become simple, so that as many algorithms as possible can be integrated as add-ons into existing systems — and that the integration aspect is seamless.”

“I think in the future, a tailored regulatory framework for AI will provide increased flexibility for AI developers and vendors,” Adams says. That would open up the market to more practices, of any size and scope, with far more choices. “For now, with all the hype around AI, there are overinflated expectations to an extent,” Adams says. While the goal is that off the shelf AI algorithms can be seamlessly integrated into a workflow, a misperception is that all AI algorithms will achieve desired performance across all practices, he says.

“We have to be careful about the way AI algorithms are trained — to consider their accuracy for certain populations,” Adams says. There can be bias in the data, he says, around geographical population, sex, race, and gender. Accuracy is also tied to the quality of a study, the image acquisition protocol, a practice’s equipment, and so on. “We have a tendency

## Mitigating Biases

There can be bias in AI algorithm data around geographical population, sex, race, and gender. What is needed to mitigate these biases are large datasets, featuring data from a variety of sources within healthcare institutions that is representative of a diverse patient population. The ACR is creating such datasets through the National Clinical Imaging Research Registry™ Program (ANCIRR). The current ANCIRR registries and those in development will collect and curate images and clinical data from multiple practice settings to produce large datasets that enable researchers to address complex scientific questions and produce results applicable across various care settings, geographic locations, and multiple populations. Learn more at [acr.org/researchregistry](http://acr.org/researchregistry).

to think that once an algorithm is developed, it is going to be accurate across all populations and institutions,” he says.

“Monitoring accuracy and performance in real time is going to be easier for some practices than others,” Adams says. “If you have the bandwidth at your institution, it is possible to do that via real-time performance evaluation. But if you are a smaller practice, without a lot of IT support, there are going to be some real challenges.”

“The ACR DSI is really working hard to develop systems to monitor performance in real time,” Adams notes. “That is going to be huge for many practices to benefit from the work of a professional society. You may see vendors take on some of that responsibility as well, but you should be prepared with your own monitoring strategy.”

According to Adams, radiologists must continue to be involved — even step up their game — in terms of the safety of AI algorithms and their patient-centeredness. “AI is never ‘in place of’ or ‘an alternative to’ radiologists — they will have a key role in the supervision of AI to ensure patient safety,” he says.

With so many AI use cases to choose from, radiologists are well-positioned to maximize AI’s strengths, Adams says. AI applications can support workflow efficiency and exam scheduling, image acquisition and interpretation, and report writing and communications for patient follow-up. “In each of these areas, there is tremendous potential for AI in the specialty — and many opportunities for this and the next generation,” he says.

## SEEING POTENTIAL

“Medical students hear about AI doing some tasks extremely well and assume it is just a matter of time until it can do all things well — especially in radiology,” says Bibb Allen Jr., MD, FACR, the ACR DSI’s chief medical officer and a diagnostic radiologist at Grandview Medical Center in Birmingham, Ala. “What they may not realize is that as AI becomes

**“AI has the potential to complement your daily tasks, making the time in the reading room or IR suite more productive and economical — ultimately making the clinical experience safer for the patient.”**

— Neil Jain, DO

proficient at thousands of narrow tasks it will become an invaluable assistant to radiologists and allow them to bring greater value to patients and the healthcare system as a whole.”

The ACR DSI recently conducted its first annual survey of ACR members to find out how radiologists are using AI in clinical practice. The results indicated modest use of AI, but most survey respondents were satisfied with their experience and believed AI provides value to their practices and patients. The survey found the most popular AI algorithms are tied to screening mammography, PE, MR brain analytics, and brain hemorrhage. About 20% of practices not currently using AI plan to in the near future ([learn more in the infographic on page 14](#)).

“At the ACR DSI, we are pragmatic,” Allen says. The ACR believes AI and machine learning hold great potential benefits for patients and radiology practices — but only if those tools are brought into routine practice in the correct manner, he says. “We need to assume a leadership role in developing and implementing AI to do that,” Allen says.

“At the same time, we must ensure a trained workforce — capable of interpreting imaging examinations and guiding research and innovation into new imaging techniques,” Allen says. There is no better time to choose radiology as a specialty, he says, but AI’s complementary potential is a tough sell to many medical students.

### REACHING OUT TO STUDENTS

“The first time I was introduced to AI in radiology, it was not depicted in the most positive light at all,” says Neil Jain, DO, integrated IR resident at MedStar Georgetown University Hospital and chair of the ACR Medical Student Subcommittee. “Many non-radiologists voiced that radiology would be entirely taken over by AI, leaving them jobless.”

“Of course, that isn’t true, but that’s the problem — we have outsiders looking in and interpreting our field,” Jain says. “This is partially our fault though. We are not pushing back hard enough and voicing all of the incredible aspects about our specialty and debunking this dark reading room myth.”

### AI Central

In 2020, the ACR DSI created a searchable catalog of AI algorithms cleared for use in radiology to help simplify research on available AI tools and vet algorithms — an important step for any practice considering incorporating a new algorithm. As of April 2021, it included 122 models, ranging from detecting pneumothorax in chest X-rays to highlighting segments of the brain on MRI. Each model in the catalog includes a summary with the model manufacturer, FDA product code, body area, modality, predicate device, product testing, and evaluation related to product performance and clinical validation. Many of the models match the DSI’s Define-AI use cases and are linked under related use cases at [models.acrdsi.org](https://models.acrdsi.org).

“Especially in IR, I see AI as a monumental advantage in visualizing visceral structures with higher accuracy and completing procedures with greater confidence,” Jain says. “AI has the potential to complement your daily tasks, making the time in the reading room or IR suite more productive and economical — ultimately making the clinical experience safer for the patient.”

Jain is committed to getting medical students excited about radiology. “Earlier this year, we hosted our first-ever virtual ACR Medical Students Symposium — with more than 300 students in attendance — where radiologists from across various subspecialties discussed their niche and showcased how diagnostic imaging goes beyond a routine chest X-ray,” Jain says. AI was a part of the conversation — with an introduction to what AI is and how it will be used in radiology. “To truly appreciate the future of radiology, we must first understand the challenges that we currently face. This will provide us with the necessary framework of where we are headed,” he says.

“The ACR Medical Student Subcommittee is also in the process of designing a mini-curriculum for AI in radiology,” Jain says. “As part of the medical students’ section on the ACR website, we’re developing an eight-module recorded curriculum for individual students with speakers talking specifically about radiology AI.”

“This material is geared toward medical students with the goal of setting the record straight,” Jain says. “Some of the topics we hope to touch upon include the economics of AI, how AI can be applied in a global health setting, and how AI plays into radiology careers.” On July 15, there will also be a webinar hosted for medical students entitled “Beyond the Hype: How AI Will Really Impact Careers in Radiology.”

“When you first begin learning about AI, it can feel strange and scary,” Kottler says. “As a new tool AI is unknown and unfamiliar, but we must be the authors of change.” Radiologists must become the experts understanding where AI works and where it does not — and share that expertise with one another, she says. “This collaboration will boost our value and expand our role as consultants who referring clinicians rely upon to combine our expertise with the data AI provides.”

“Ultimately what you are looking for in an AI solution is how it can add value to the system,” Kottler says. “The best thing the ACR can do is to continue to ensure that the things we learn from and about AI in practice are shared. AI tools will fundamentally change how we do our jobs and adopting AI should not be a series of individual efforts.” **B**

BY CHAD HUDNALL, SENIOR WRITER, ACR PRESS

### ENDNOTE

1. Kottler NE. Artificial intelligence: a private practice perspective. *J Am Coll Radiol*. 2020;17(11):1398–1404.

# Exploring FDA-Cleared Algorithms



A better understanding of the training and validation parameters will help users understand potential biases and pitfalls that can arise in clinical use.

Many people hear “FDA-cleared algorithms” and think of all of the work that has been done. The extensive research that goes on behind the scenes to vet medical devices at the FDA is no secret and concluding that FDA clearance comes after a rigorous review is simple enough to do. When it comes to FDA-cleared AI algorithms related to medical imaging, however — here’s why it pays to do your homework.

Let’s start with the basics: Not everyone understands the difference between the terms “FDA approved” and “FDA cleared” when it comes to medical devices. Do they mean the same thing? Are the terms interchangeable? Not at all.

AI algorithms for medical imaging are not FDA approved, despite various articles you may have read that misclassify them this way. According to the FDA, devices (including software as a medical device) are classified according to risk. For a device to be FDA approved, it must be approved via a premarket application as a Class III device, “demonstrating with sufficient, valid scientific evidence that the devices are safe and effective for their intended uses.” FDA-cleared algorithms, on the other hand, need only to demonstrate “substantial equivalence” to a predicate device.

So, there is far more than semantics involved in the two terms. The FDA processes are very different. FDA approval is much harder to achieve than FDA clearance.

## Learning About the Catalog

In 2020, the ACR Data Science Institute® (DSI) created a catalog of AI algorithms “cleared” for use in radiology to help simplify research by radiologists and developers. As of May 2021, the regularly updated catalog had models, ranging from detecting pneumothorax in chest X-rays to highlighting segments of the brain on MRI.

Each model in the catalog includes a summary with the model manufacturer, FDA product code, body area, modality, predicate device, product testing and evaluation related to product

performance, and clinical validation. Many of the models match the ACR DSI’s Define-AI use cases and are linked under related use cases. Clicking on individual models takes users directly to the FDA summary letter for more details. All of these features make it easier to vet the algorithms — an important step for any practice considering incorporating a new algorithm.

Here are some interesting factoids about the current ACR DSI catalog of FDA-cleared algorithms:

- The clearances include 94 products, meaning that so far only 17 in the current catalog have undergone updates or revisions that required reevaluation and clearance. This might be surprising given that many people think of AI and the concept of continuous learning as synonymous. But according to current FDA guidelines, algorithms are locked and cannot be modified in any significant manner without necessitating a (likely costly and time-consuming) repeat evaluation by the FDA. So, except for these 17, all of the algorithms remain exactly as they were initially approved — despite any improvements or learnings the vendors might have had since release.
- Ninety-four products represent 65 companies operating in this space. So contrary to what you may have thought, the major tech companies are not dominating this space yet. The vast majority of the companies are startups with only one cleared product.
- As of May 2021, none of the products in the catalog underwent the more rigorous premarket approval process (Class III); 108 underwent the 510K process and three underwent the De Novo process — which provides a pathway to classify novel medical devices for which general controls alone, or general and special controls, provide reasonable assurance of safety and effectiveness for the intended use, but for which there is no legally marketed predicate device.

## Caring About the Catalog

For starters, if you’re thinking about purchasing an AI product, this catalog is a great place to see what’s available. If you know the type of algorithm you’re looking for (for example, which organ system, subspecialty, or specific use case is most applicable), you can see how many companies offer products in that space. It’s also a great

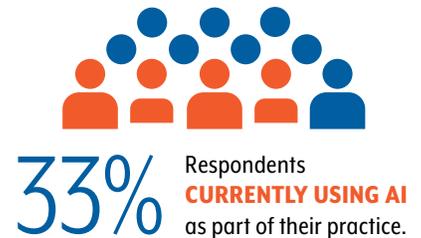
*continued on page 22*

# HOW ARE ACR members using AI?

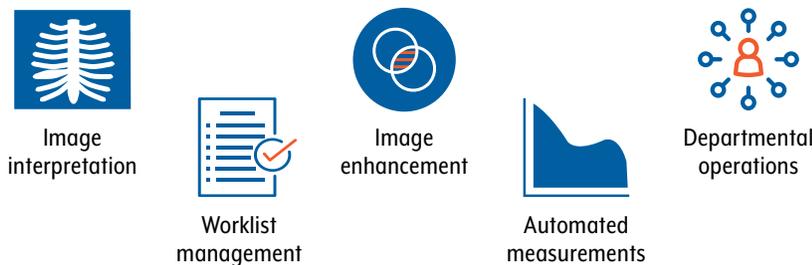


The ACR Data Science Institute® conducted its first annual survey of ACR members to understand how radiologists are using AI in clinical practice. While the survey results indicate modest use of AI in current clinical practice, most respondents were satisfied with their overall experience and found it provided value to them and their patients.

## OPPORTUNITY FOR GROWTH



## CURRENT USES OF AI



## FUTURE PLANS



## CAUSES OF INCONSISTENT PERFORMANCE

94% of respondents reporting inconsistency **POINTED TO BIAS AS A MAJOR CAUSE.**



## NEED FOR PERFORMANCE MEASURES

Respondents indicating they want some form of external **VALIDATION OF AI MODELS ACROSS REPRESENTATIVE DATA SETS.**



Respondents indicating they want to be able to assess the **PERFORMANCE OF AN AI MODEL ON THEIR OWN PATIENT DATA** before deploying it into their clinical workflows.

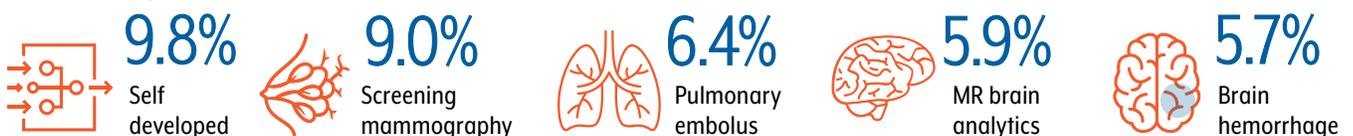
## POPULARITY OF SELF-DEVELOPED ALGORITHMS



More of those using AI in clinical practice were using **ALGORITHMS THEY CREATED THEMSELVES** vs. any single commercially developed algorithm.



## MOST POPULAR ALGORITHMS



READ THE FULL ARTICLE IN THE JACR AT [BIT.LY/JACR\\_AI](https://bit.ly/JACR_AI).

# Exploring Quality Improvement



David B. Larson, MD, MBA

The chair of the Commission on Q&S discusses the specialty's opportunities to improve practices in meaningful and measurable ways.

“There is no better training ground for leadership, no more collaborative community, and no greater sense of accomplishment than what you will encounter in the field of quality improvement.” This is how David B. Larson, MD, MBA, chair of the ACR Commission on Quality and Safety (Q&S) and professor of pediatric radiology and vice chair for education and clinical operations practices in the department of radiology at Stanford University, feels about the field of Q&S. Larson, a national thought leader in radiology quality improvement and patient safety and a regular speaker on topics ranging from pediatric CT radiation dose optimization to radiologist peer review, recently spoke with the *Bulletin* about the specialty's ongoing focus on Q&S and the opportunities ahead for continuous improvement.

## What are the opportunities ahead for improving Q&S in radiology?

This is an exciting time for radiology. From its inception, our specialty has been one of almost continuous change, especially over the last several decades. The advent of AI presents many new opportunities in many areas, but I believe that as the hype fades, AI in radiology will be almost entirely about quality.

It will give us the ability to measure what was previously unmeasurable. It will give us tools to easily and broadly apply content developed by the ACR over the last several years, such as the ACR Appropriateness Criteria® (AC), Practice Parameters and Technical Standards (PP&TS), and the RADs programs. We will increasingly have both the ability and the expectation to improve our practices in meaningful and measurable ways.

Another major opportunity will be a greater emphasis on collaboration, both with each other as radiologists and with others in the medical community. This is partially facilitated by technology but also by a changing mindset within the field and across medicine. Those deepening collaborative relationships will be a true benefit to both radiologists and patients and will provide a more exciting environment to practice in.

## What does continuous improvement mean?

Quality is about delivering consistent excellence. Continuous improvement is the dedication to the proposition that we can always become better. Continuous quality improvement is the

processes of objectively evaluating our performance, continuing to set high goals for ourselves, and pushing ourselves to meet those goals in tangible ways. The willingness to seek feedback and then act on that feedback — to improve tools, processes, and skills that go into creating excellence — is what drives continuous improvement.

## What have been the greatest accomplishments to come out of the Commission?

One thing that's really exciting to see is the continued advancements of the various RADs programs. In the last few years, that process has moved quickly with the addition of several classification systems. Now we have an opportunity to look at those RADs development processes and see if we can make them even more systematic and useful.

In addition, the PP&TS continue to become more refined and more relevant; they provide a strong foundation on which to build AC into practice. And a heroic effort has gone into making the AC available through clinical decision support.

We are currently at the intersection of several forces that are driving the need for a relentless pursuit of quality.

The ACR Accreditation program has continued to grow and make a major impact on our specialty and patient care. This is a significant driver in ensuring quality standards in practice across the country.

Finally, the annual ACR Q&S conferences have been outstanding — and they keep getting better and better every year, with greater participation, more networking opportunities, and increased focus on actionable improvement.

## Why is Q&S in radiology more important than ever before?

We are currently at the intersection of several forces that are driving the need for a relentless pursuit of quality. Imaging technology is maturing and becoming increasingly complex. At the same

*continued on page 22*

Looking for regular updates on ACR activities and issues related to quality and safety in radiology? Subscribe to the quarterly e-newsletter, “Inside Quality & Safety,” at [acr.org/QSNews](http://acr.org/QSNews).



Courtney C. Moreno, MD

# Shared Prevention

Collective colon cancer screening data is at radiologists' fingertips.

“As an abdominal radiologist, it is not uncommon to see patients who have never been screened present with abdominal pain from an obstructing colon tumor — and disease that has already spread,” says Courtney C. Moreno, MD, chair of the ACR’s CT Colonography (CTC) Registry Committee, associate professor in radiology and imaging sciences at Emory University, and a member of the ACR Colon Cancer Committee. “It’s so sad to me that people are still dying of colon cancer when it is preventable or treatable with early detection.”

For more than a decade, the ACR’s CTC Registry has provided evidence-based health outcomes and data for decision-making — allowing facilities to compare their results regionally and nationally ([learn more at \[acr.org/CTCRegistry\]\(https://www.acr.org/CTCRegistry\)](https://www.acr.org/CTCRegistry)). Process measures include rate of adequacy of diagnostic CTC examination and rate of adequacy of screening CTC examination. Outcome measures include rate of colonic perforation, true positive rate, and extracolonic findings. Data collected in the CTC Registry evaluate colonography as an alternative to colonoscopy. Participating facilities and physicians can review reports based on aggregated data to facilitate patient safety and boost quality improvement efforts.

The *Bulletin* recently talked with Moreno about the importance of colon screening and the CTC Registry — an invaluable tool connecting radiologists who want to gain insight about CTC exam performance at their institution and demonstrate improved patient outcomes.

## Why is staying current on colon health so important?

Colorectal cancer is the second leading cause of cancer death in the U.S.<sup>1</sup> So much of what we do in radiology in the cancer space is seeing people who have already been diagnosed — to determine if their cancer is getting better or worse. CTC is really a way to diagnose precancerous polyps that can be removed — preventing cancer. There are a lot of different options out there — from CTC to screening optical colonoscopy to stool-based tests. The American Cancer Society says the best test is the one that patients are willing to undergo. Even with all of the tests that are available, the estimated percentage of the American population who say they are up-to-date with colorectal cancer screening is only around 68%.<sup>2</sup> And that number may be artificially high because the data comes from phone interviews by the CDC — relying on self-reported data about tests done as long as a decade ago.

## Which colon screening exam would you recommend?

CTC. But I would not discourage anyone from getting any of these colon screening tests. The stool-based tests are potentially easier for patients to undergo because with some of the tests you produce the sample in the privacy of your own home and mail it off for testing. A limitation of stool-based tests, however, is that their ability to detect polyps and advanced neoplasia is lower than the structural examinations of the colon — which include optical colonoscopy and CTC. There can also be some false positives with the stool-based tests, so patients end up getting a colonoscopy or CTC anyway.

## Are there other advantages to CTC?

From a patient- and family-centered care perspective, CTC is much safer than optical colonoscopy. With the floppy catheters we are using now, there is essentially no risk of perforation. You can also get a CTC without sedation, while optical colonoscopy requires sedation. That means that to undergo optical colonoscopy you need to recruit a friend or family member to accompany you or drive you home because of the sedation involved. We know that one reason for low screening rates is the challenge of taking time off of work and finding someone else (who may also be of working age) to go with you. People may have childcare responsibilities or take care of older family members. Whatever the case, it is tough for them to devote a day or two to the test — prepping the day before and then recovering from sedation the day of the exam. With a CTC, you can work the day before the exam, start the prep the night before, have your CTC done in the morning, and go back to work the same day.

## Why should ACR members participate in the CTC Registry?

Participating radiologists and sites can use the CTC Registry as a way to compare their facility’s performance to other registry participants. That means they submit data and receive regular reports

### Did You Know?



A new Harvey L. Neiman Health Policy Institute® study found a 50% increase in screening CTC utilization rates following a USPSTF announcement of updated recommendations on colorectal cancer screening. In 2016, the USPSTF added CTC to its

list of recommended tests for colorectal cancer screening. Prior to the recommendation, CTC rates had remained steady from 2010 through 2016 — despite significant declines in the percentage of screenings subject to patient cost-sharing, from 38.2% to 10.2% over that period. [Learn more at \[bit.ly/HPLUSPSTF\\\_CTC\]\(https://bit.ly/HPLUSPSTF\_CTC\)](https://bit.ly/HPLUSPSTF_CTC).

on things like radiation dose, the number of exams that were of acceptable image quality, the true positive rate, the number of exams that found a polyp a centimeter or larger in size — among other findings that have been entered into the registry for others to learn from. Participants get reports in graph form, allowing you to keep tabs on how you are doing compared to other places. It really helps us as a field to learn from each other and to collect data to help us advance the practice of CTC.

**Even with all of the tests that are available, the estimated percentage of the American population who say they are up-to-date with colorectal cancer screening is only around 68%.**

### **How do you submit data if you want to participate in the CTC Registry?**

There are two main ways to submit data. If a practice prefers, it can submit information about individual exams using a web form. A low- or medium-volume practice may prefer to do it that way — submitting data as they go for each CTC exam. Practices can also submit the data in a batch through a spreadsheet. The ACR provides participating sites with a spreadsheet to fill in and upload to the registry. Practices generally identify someone like a CT technologist, a nurse practitioner, or an administrative employee to submit data to the registry. The ACR has put together a start-up guide at [bit.ly/DIR\\_Guide](http://bit.ly/DIR_Guide) to walk people through the process of enrolling in and submitting data to the CTC Registry.

### **Are cost and coverage of screening issues for patients? Is this a discussion that radiologists should have?**

I think the medical community is pretty convinced that CTC is the right thing to do. Insurance makes things more complicated. There is a commercial insurance mandate as part of the Affordable Care Act (ACA) of 2010 for any screening test graded as an A or B by the U.S. Preventive Services Task Force (USPSTF). Commercial insurance coverage of screening CTC is therefore mandated by the ACA based on its A grade from the USPSTF. A small caveat to that is that about 12% of commercial insurance plans (those in existence before Sept. 23, 2010, and

### **Training for CTC**

Looking to improve the performance and outcomes of screening CTC at your facility — and to advance the practice of CTC? Check out the free webinar, “CTC Registry: How to Benchmark Your Practice and Help Advance the Field,” at [acr.org/CTCRegistry-Webinar](http://acr.org/CTCRegistry-Webinar).

not substantially altered since 2010) are grandfathered in and therefore not required to cover the screening exams mandated by the ACA, although many of these grandfathered plans have also decided to cover USPSTF-recommended screening exams including CTC. While the commercial insurance market mandate is part of the ACA, Medicare does not cover screening CTC.<sup>3</sup> Medicare non-coverage is something we see as an issue. We have to tell those older patients that they will potentially have to pay out of pocket for CTC. Because of that out of pocket cost, some Medicare patients are unable to undergo CTC because they cannot afford it. Using CTC Registry data, we found that the lack of Medicare coverage of screening CTC disproportionately impacts CTC utilization by minority patients as compared to White patients.

### **What are some things members might not know about participating in the CTC Registry?**

Participation in the registry allows you to get credit for the ABR’s Maintenance of Certification Part IV requirements. Members should also know that if their practice already participates in the ACR’s Dose Index Registry or the General Radiology Improvement Database — participating in the CTC Registry is free. That is a big selling point. Even if they don’t participate in those registries, CTC participation is relatively inexpensive. The cost is on a sliding scale based on the number of participating locations and radiologists. It starts at \$500 for up to five sites and five radiologists. In terms of medical pricing, that is pretty cheap. Another big selling point is that registry data can be used for research that provides insight into nationwide practice patterns. For example, the CTC Registry team used registry data for the project looking at the impact of Medicare non-coverage on CTC utilization.<sup>3</sup> Currently, with more than 17,000 CTC exams in the registry, there is a lot of information about how different practices are performing CTC. The NRDR Data Access and Publications Policy ([available at nrdrsupport.acr.org](http://availableatnrdrsupport.acr.org)) describes the process for requesting support to work with an ACR data analyst to carry out a research project. **B**

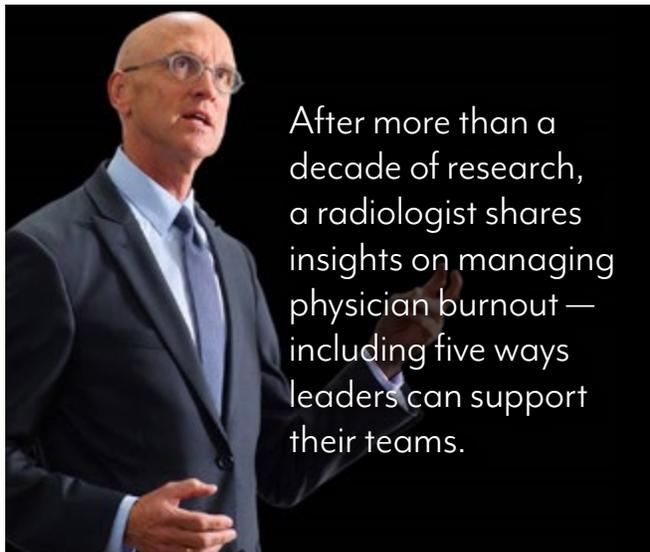
### **Why Colorectal Cancer Screening Matters**

Read an online article with contributions by Judy Yee, MD, FACR, chair of the ACR Colon Cancer Committee, on why colorectal screening matters at [bit.ly/VOR-CTC](http://bit.ly/VOR-CTC).

INTERVIEW BY CHAD HUDNALL, SENIOR WRITER, ACR PRESS

ENDNOTES available in the digital edition at s

# Leaders Matter



**B**urnout was already a pervasive problem in medicine before the onset of COVID-19. Now, more than a year into the pandemic and a return to “normal” not yet a reality, radiologists and their teams face unprecedented new stressors in the challenge to combat work fatigue.<sup>1</sup>

“Professional burnout is an epidemic in America and in other Western countries,” says Stephen J. Swensen, MD, FACR, senior fellow at the Institute for Healthcare Improvement and professor at the Mayo Clinic. “In China, the numbers are even worse than they are in America. It’s pervasive on the planet — and the healthcare profession is among the worst.”

As part of his quest against burnout, Swensen co-authored a book, *Mayo Clinic Strategies to Reduce Burnout: 12 Actions to Create the Ideal Workplace*, which pinpoints commonalities in those who experience burnout: They may be emotionally exhausted; have lost confidence in their work; be more likely to make a medical error; be more likely to have patients who have a bad experience or poor outcomes; more likely to abuse substances; more likely to have troubles with relationships; and be less likely to feel empathy. Swensen shared his perspectives and lessons learned about managing burnout during his guest appearance on the RLI Taking the Lead podcast ([listen at \[acr.org/RLI-Swensen\]\(https://www.acr.org/RLI-Swensen\)](https://www.acr.org/RLI-Swensen)).

The *Bulletin* spoke with Swensen about his work — and the five behaviors that all leaders can practice now to boost morale, improve well-being, and reduce burnout among their teams.

## How did you come up with the five behaviors in leaders that build esprit de corps for the team and increase individual well-being?

At the Mayo Clinic, we survey all 65,000 staff — from custodians to accountants to CEOs to nurses and doctors — on leadership and well-being every year. For close to 15 years, we’ve been asking our Mayo Clinic staff the same 12 questions about the leader to whom they report. The thought was that there is a connection between leaders and morale — and the data confirmed this in

spades.<sup>2</sup> We found an amazingly strong and significant correlation between how staff assessed their immediate leader and the morale, fulfillment, and professional burnout of team members. And the 12 questions basically boiled down to five behaviors ([see sidebar](#)).

So 12 questions on a Likert scale of 5 points means the best leaders could get up to 60 points, if their staff rated them 5 out of 5 on every question. Just to give you an idea of how powerful this is — for every 1 point tick upwards, out of 60 total points a leader could receive from the confidential and anonymous survey of their staff each year, there is an 11% increase in professional fulfillment and satisfaction and a 7% reduction in professional burnout.

We’re in a time when we need our leaders more than ever, so we should double down on supporting and developing our leaders.

## What can radiology leaders do in the wake of the pandemic to reduce burnout among their staff?

Burnout has gotten worse during the pandemic. All of us are more socially isolated, and humans are social beings — we need that kind of contact. This is compounded for those of us in healthcare by all the stresses of more patients who are sick and dying in our hands, often without the resources we need to take care of them.

We’re in a time when we need our leaders more than ever, so we should double down on supporting and developing our leaders.

Leaders need to have the right staffing models, support, and rotations so that their staff can get a break. Leaders need to facilitate

### Five Behaviors to Cultivate Positive Leadership

According to Swensen, there are five behaviors that when practiced by a leader, drastically reduce team burnout rates.

#### 1 INCLUDE:

Treat everyone with respect and nurture a culture where all are welcome and are psychologically safe.

#### 2 INFORM:

Transparently share what you know with the team.

#### 3 INQUIRE:

Consistently solicit input from those you lead (participatory management).

#### 4 DEVELOP:

Nurture and support the professional development and aspirations of team members.

#### 5 RECOGNIZE:

Express appreciation and gratitude in an authentic way to those you lead.

the opportunity for staff to spend time with each other — which is one of the keys to reducing burnout — and support their time at home with family and friends. I think when we look back at this pandemic era, we'll see that the organizations and teams that thrived in it were those that had leaders who work *with* staff — not to do everything for them, but to do everything *with* them, so they co-create the best response to challenges.

### Do you have any advice for anyone experiencing burnout?

I would encourage radiologists experiencing burnout to connect with other colleagues and share their thoughts and feelings with someone who's willing to listen. That can be therapeutic in itself — but it can also lead them to connect

with someone (perhaps their boss or immediate supervisor) who can get them to the next level of support.

Our survey findings show how leaders can improve and become better at what they're supposed to be doing — engaging staff. So what we can do for each other is to listen and get professional help for the people for whom burnout has gone into a really bad place. **B**

INTERVIEW BY CARY CORYELL, PUBLICATIONS SPECIALIST, ACR PRESS

#### ENDNOTES

1. Kruskal JB, Shanafelt TD. Radiologist well-being and professional fulfillment in the COVID-19 era: fostering posttraumatic growth. *J Am Coll Radiol*. 2021.
2. Swensen SJ, Shanafelt TD. Cultivating leadership: measure and assess leader behaviors to improve professional well-being. *AMA STEPS Forward*. December 10, 2020.



Want to strengthen your leadership skills? The RLI can help! Visit [acr.org/rli](http://acr.org/rli) to view programs that will help you take your leadership to the next level.

## RENEW YOUR 2021 ACR MEMBERSHIP TODAY!



The ACR® is committed to providing you with the virtual learning opportunities you need during COVID-19. We kindly ask you to renew your 2021 membership to maintain your member benefits, including access to free and discounted virtual education opportunities:

- **Daily Case in Point®** — Complete challenging clinical cases including a new COVID-19 vaccine case while earning CME.
- **Upcoming Virtual Education Center Micro-Courses** — Hone your imaging skills in the comfort of your home and while earning CME and SAM credits. New courses coming this spring!
- **New CPI Cardiac Imaging Module** — Explore current, content-rich casework directly from the present-day practices of leading subspecialists. Access the casework on your schedule and earn CME and SA-CME credits.
- **Virtual ACR AIRP® Neuroradiology Categorical Course** — Receive a comprehensive review of neuroradiology. This course provides synchronous and asynchronous lectures, including access to on-demand recordings.

[acr.org/renew](http://acr.org/renew)

### NOTE: Changes to the 2022 Membership Dues Grace Period

Thank you in advance for renewing your 2021 membership.

Please note the following change for the 2022 membership year, which begins Jan. 1, 2022:

The grace period to renew your 2022 ACR membership will end on March 31, 2022. This will give you 3 months after your 2021 membership expires on Dec. 31, 2021 to pay your 2022 dues before losing access to member benefits, including member-only resources and the ability to complete and claim online CME.

Please note that this does NOT affect the grace period for 2021, which is still 6 months (ending on June 30, 2021).

If you have any questions, please contact membership services staff at [membership@acr.org](mailto:membership@acr.org).

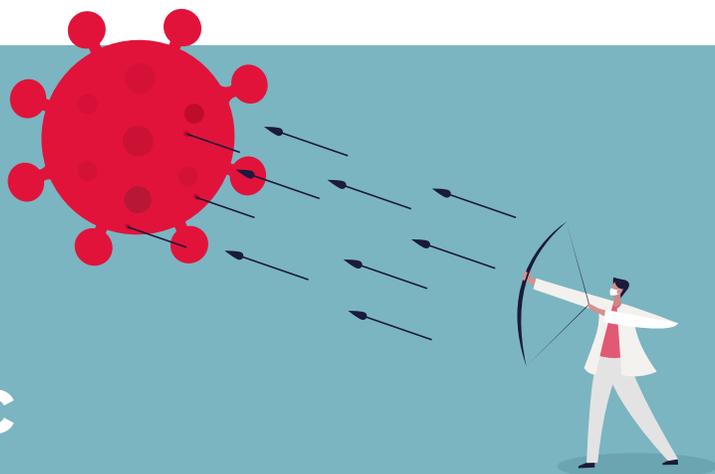
*"When I found a home in the ACR I said, 'Absolutely, this is the place that I want to be.'"*

Efrén Flores, MD  
ACR Member since 2012



We encourage you to renew now at [acr.org/renew](http://acr.org/renew).

# Confronting the Pandemic



Since March 2020, lost imaging examinations have slowly recovered — but they still haven't reached expected levels.

The COVID-19 pandemic has had a broad impact on patients, providers, payors, and healthcare organizations. A little more than a year after the world declared a public health emergency, we are only beginning to understand the full consequences of this pandemic. I had the pleasure of collaborating with a handful of colleagues, including the ACR's consultant Tom Fruscello, MBA; Mythreyi B. Chatfield, PhD, executive vice president of quality and safety at the ACR; Stefanie Weinstein, MD, professor of radiology in the department of radiology and biomedical imaging at the University of California, San Francisco; William F. Sensakovic, PhD, chair of the ACR Dose Index Registry Committee and chair of the division of medical physics and associate professor at Mayo Clinic (Arizona); and David B. Larson, MD, MBA, chair of the ACR Commission on Quality and Safety and professor of pediatric radiology in the department of radiology at Stanford University, on a recent study highlighting the impact of COVID-19 on CT volumes across the U.S. using data from the ACR Dose Index Registry. While you can read the full article in the *JACR*<sup>®</sup> at [bit.ly/CTVolumes](https://bit.ly/CTVolumes), I'd like to share top takeaways and speculate about how they may relate to our future.<sup>1</sup>

In the spring of 2020, the CDC released guidance that advised medical facilities to reschedule non-urgent outpatient visits, which included non-urgent imaging examinations and image-guided procedures. Soon thereafter — due to a combination of this guidance and various other factors — there was an abrupt and rapid decline in radiology volume.

At its nadir in the spring of 2020, there were approximately 50% fewer CT examinations being performed per day compared to historical predictions. Since that time, as we improved our safety protocols and better learned how to safely care for patients with known or unknown COVID-19 in the healthcare environment, those lost imaging examinations have slowly recovered. However, as of April 2021, we still haven't reached expected levels. In the U.S., there are approximately 10–15% less CT examinations being performed per day compared to historical predictions. You can

track this ongoing disparity by visiting the National Radiology Data Registry publications highlights on the ACR website at [acr.org/NRDR-Publication-Highlights](https://acr.org/NRDR-Publication-Highlights).

Though the partial recovery has been encouraging, it remains unclear to what extent these continued lost diagnostic tests are having a detrimental effect on patient care. For example, decreased patient engagement with healthcare during the pandemic likely resulted in delayed diagnosis and delayed care of other diseases. This trend was most substantial in urban communities, communities with a greater population density, communities with greater unemployment, and communities with a greater proportion of people of color.

COVID-19 exacerbated preexisting disparities in healthcare that are prevalent in the U.S. (see sidebar). Already underserved populations have seen the gap widen between care needed and care provided during the pandemic. We must take action to ensure that all of our patients can access quality healthcare. **B**

MATTHEW S. DAVENPORT, MD, IS VICE CHAIR OF THE ACR COMMISSION ON QUALITY AND SAFETY, CHAIR OF THE ACR COMMITTEE ON DRUGS AND CONTRAST MEDIA, AND ASSOCIATE CHAIR OF OPERATIONS IN THE DIVISION OF ABDOMINAL RADIOLOGY AT THE UNIVERSITY OF MICHIGAN.

#### ENDNOTE

1. Davenport MS, Fruscello T, Chatfield MB, Weinstein S, Sensakovic WF, Larson DB. CT Volumes from 2,398 Radiology Practices in the United States: A Real-Time Indicator of the Effect of COVID-19 on Routine Care, January to September 2020. *J Am Coll Radiol.* 2021; (18)3: 380–387.

### Focusing on Health Equity

Medical imaging impacts most patients at some point in their care journey, and radiologists have the potential to be unifying change agents across an inequitable healthcare system. Overcoming racial, socioeconomic, and geographical barriers supports high-quality imaging care and vibrant practices. In a recent *ACR Bulletin* podcast episode, ACR President Geraldine B. McGinty, MD, MBA, FACR, discusses the formation of the Radiology Health Equity Coalition and its mission to ensure the best care is provided to every patient, regardless of background or income level. Listen to the episode at [bit.ly/HealthEquityCoalition](https://bit.ly/HealthEquityCoalition).

## How can we reach gender equity in radiology?

“We need to increase medical students’ exposure to our specialty and show how we partake in direct patient care, longitudinally impact care from diagnosis to treatment to follow-up, and make a difference in healthcare disparities. The best way to accomplish this is by increasing the representation of women leaders in academic radiology. When students can see themselves becoming their role models, a new door opens to them that may have seemed unimaginable before.”

— Ann K. Jay, MD, vice chair of education and program director of diagnostic radiology residency at MedStar Georgetown University Hospital



“The journey to achieving equity is closely tied to inclusion. We need to make room for women at all levels — training, practice, and leadership. We must critically evaluate how we invite, treat, support, develop, and promote women and other underrepresented minorities and take deliberate steps to be more inclusive.”

— Jamlik-Omari Johnson, MD, vice chair of diversity, equity, and inclusion, and chief of radiology and imaging sciences at Emory University



## QUALITY IMPROVEMENT

continued from page 15

time, our interfaces with other parts of the medical system are growing rapidly. Not surprisingly, we find that quality tends to break down at those interfaces. Practices are becoming large, bringing a different level of scale. And lastly, AI will offer the opportunity to develop quality improvement tools that were not previously possible. These forces together will bring both the motivation and the ability to increase consistency in excellent performance. But it will not build itself; we will need to work together to bring these changes about in a way that will ensure the patient remains at the center of it all.

### What advice do you have for your colleagues about getting more involved in Q&S?

I would say, especially to the younger members, that a career focused in quality improvement is extremely rewarding, albeit challenging. Quality improvement is something you can start early but takes an entire career to master — and then some. It requires a diverse and complementary skillset: engineering, design, data science, cognitive and social psychology, systems management, project management, and leadership. It will constantly challenge you, keeping you honest and humble. If it's easy, you're doing it wrong. But if you do it right, you can effect dramatic change that did not previously seem possible. **B**

INTERVIEW BY LINDA SOWERS, FREELANCE WRITER, ACR PRESS

## FDA-CLEARED ALGORITHMS

continued from page 13

way to understand more about the types of algorithms that are available — which ones are triage/notification only, post-processing algorithms, detection algorithms, or actual diagnostic algorithms.

A recent ACR DSI survey found that 95% of current AI users find FDA-cleared algorithms to be inconsistently accurate when tested on their own data (see page 14 for more information from the survey). What does this mean for you? Unfortunately, there's no way of knowing if an algorithm will work at your institution just by looking through the FDA clearance details — but it may give you some hints. For example, studies have shown that algorithms work best on the images acquired using the same manufacturer of the scanner that the algorithm was trained on. Typically, this information is included in the FDA summary, and you can compare it to the type of scanners you use. More generally, you can also get a sense for the types of studies that were conducted to gain clearance, including how many images were included in their trials or whether clinical validation studies were performed.

### Looking to the Future

We look forward to a time when algorithm manufacturers provide more robust information about their products' validation process. A better understanding of the training and validation parameters will help users understand potential biases and pitfalls that can arise in clinical use, leading to a better user experience overall. The ACR DSI hopes to be able to provide validation and training information through the catalog, when available, to assist the medical imaging community in better understanding which algorithms provide the greatest benefit to their patients. **B**

SHEELA AGARWAL, MD, MBA, IS AN ACR SENIOR SCIENTIST AND A DIGITAL MEDICAL ADVISOR WITH BAYER HEALTHCARE.

#### ACR BOARD OF CHANCELLORS

Howard B. Fleishon, MD, MMM, FACR (Chair)  
Jacqueline A. Bello, MD, FACR (Vice Chair)  
Geraldine B. McGinty, MD, MBA, FACR (President)  
Alexander M. Norbash, MD, MS, FACR (Vice President)  
Richard Duszak Jr., MD, FACR (Speaker)  
Amy L. Kotsenas, MD, FACR (Vice Speaker)  
James V. Rawson, MD, FACR (Secretary-Treasurer)  
Richard A. Barth, MD, FACR  
Lori Deitte, MD, FACR  
Lauren P. Golding, MD  
William T. Herrington, MD, FACR  
John E. Jordan, MD, FACR  
Andre A. Kanski, MD, MBA, MA, FACR  
Arun Krishnaraj, MD, MPH  
Jonathan B. Kruskal, MB, ChB, PhD, FACR  
David B. Larson, MD, MBA  
Frank J. Lexa, MD, MBA, FACR  
Johnson B. Lightfoote, MD, FACR  
Mahadevappa Mahesh, MS, PhD, FACR  
Mary C. Mahoney, MD, FACR  
Alan H. Matsumoto, MD, FACR  
Andrew K. Moriarty, MD  
Gregory N. Nicola, MD, FACR  
Robert S. Pyatt Jr., MD, FACR  
Andrew B. Rosenkrantz, MD, MPA  
Eric M. Rubin, MD, FACR  
William Small Jr., MD, FACR  
Dana H. Smetherman, MD, FACR  
Gilles Soulez, MD  
Richard Strax, MD, FACR  
Timothy L. Swan, MD, FACR  
Christoph Wald, MD, MBA, PhD, FACR  
Pamela K. Woodard, MD, FACR  
Don Chan Yoo, MD, FACR

#### 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  
Kirang Patel, MD  
Colin M. Segovis, MD, PhD  
Courtney M. Tomblinson, MD  
Hari M. Trivedi, MD  
Scott M. Truhlar, MD, MBA, MS, FACR  
Po-Hao Chen, MD, MBA

#### ACR BULLETIN STAFF

Elizabeth Bleu, Vice President and Publisher  
Brett Hansen, CAE Director of Operations, ACR Press  
Lyndsee Cordes Director of Periodicals  
Nicole Racadag, MSJ Managing Editor  
Cary Corneil Publications Specialist  
Lisa Pampillonia 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](mailto:bulletin@acr.org).

ACR Bulletin (ISSN 2160-4754) is published monthly and printed bi-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 email to [membership@acr.org](mailto:membership@acr.org).

Copyright ©2021 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](http://www.acr.org) or contact staff in membership services at [membership@acr.org](mailto:membership@acr.org) or 800-347-7748.

For comments, information on advertising, or reprints of the ACR Bulletin, contact [bulletin@acr.org](mailto:bulletin@acr.org).

## Is a New Job in Your Near Future?



The ACR Career Center, one of the most accessed member benefits, is actively responding to the evolving transition of employment among radiology professionals.

Post your resume online today to make sure you're noticed — whether you're supplementing income because of reduced hours or are seeking a brand new opportunity as communities reopen.

Creating an account will allow you to access resources, take advantage of the CV review service, and receive customized Job Alert emails applicable to your specialty and location interests. In addition, you may pursue career counseling that includes interview advice at your convenience.

**Find a job today at [acr.org/CareerCenter](http://acr.org/CareerCenter).**



# 2021 RLI Summit

SAVE THE DATE | Sept. 10–11 | Virtual Event

Join us for the 2021 RLI Summit and learn to see radiology through a new lens — the healthcare ecosystem.

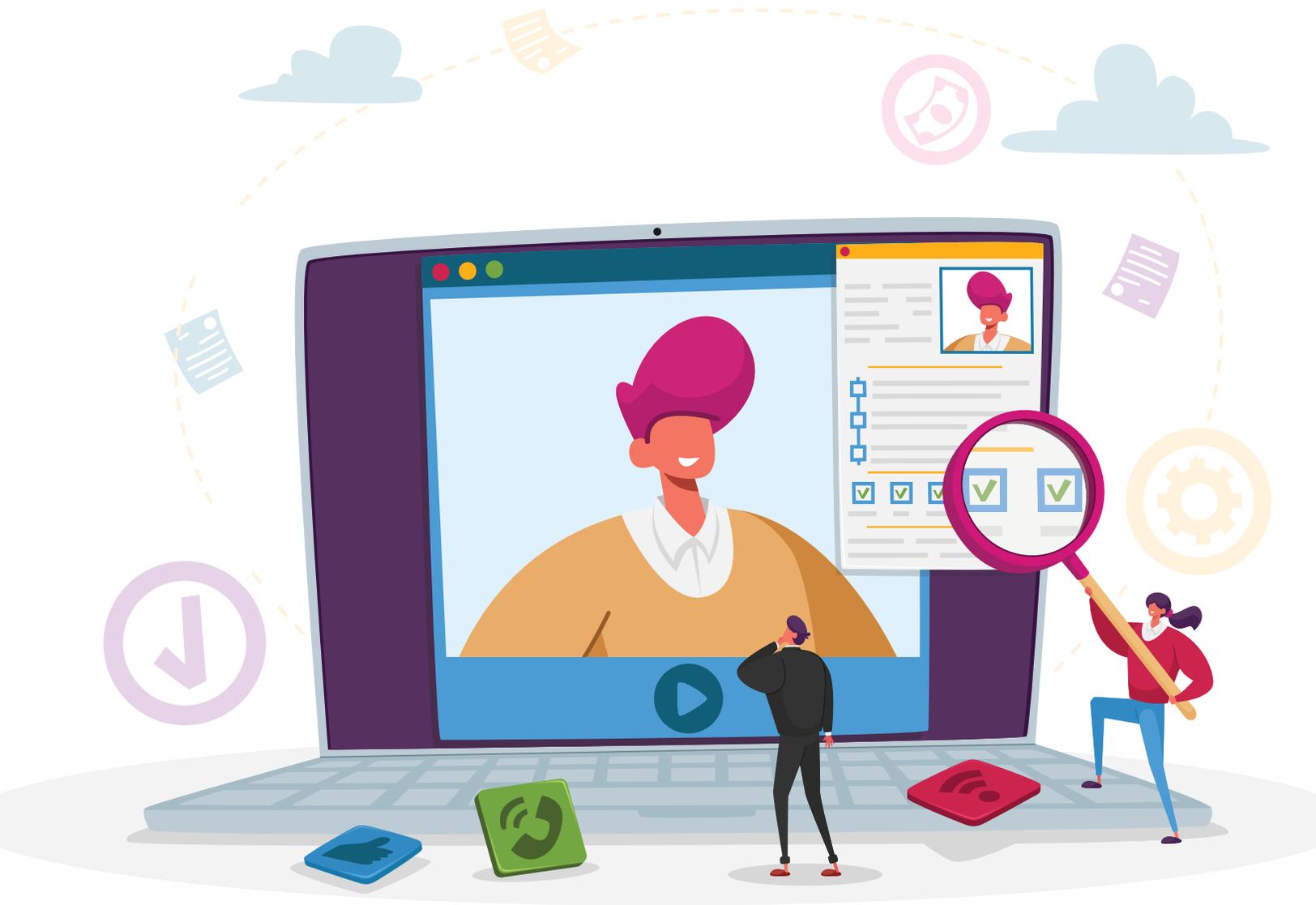
During this two-day virtual event, you'll discover how to bolster your place in the healthcare value chain among contributors ... collaborators ... and competitors.

You'll also have a chance to put your ecosystem learnings into practice during hands-on breakout sessions and an interactive case study review with your peers.

The RLI Summit only happens once a year.  
Don't miss this chance to learn from the leaders.

**Register today!**  
[acr.org/RLIsummit](https://acr.org/RLIsummit)

**Special leadership programming for residents on Sept. 9!**



# ACR Career Center Virtual Career Fair

**Registration Now Open!**

Wednesday, Aug. 11, 2021  
3–6pm EDT

## Job Seekers

Advance your career. Upload your CV and schedule one-on-one meetings with potential employers to begin the next step in your career.

Visit [acr.org/careerfair](https://acr.org/careerfair) to reserve your spot.

## Employers

Find the perfect fit for your organization. Showcase your open positions and find top talent in radiology.

Visit [acr.org/careerfairexhibitors](https://acr.org/careerfairexhibitors) to book your virtual booth.

Visit the ACR Career Center for all 2021 Virtual Career Fair updates

**jobs.acr.org**

**ACR**<sup>™</sup>  
**CAREER**  
**CENTER**