Knowledge Sharing

Educating medical students about radiology

The U.S. is facing a shortage of doctors — and radiologists are no exception. According to a 2021 report from the Association of American Medical Colleges, a nationwide shortage of 37,800 to 124,000 physicians is expected by 2034.¹

This shortage of physicians presents a looming crisis, particularly as the nation’s population ages. According to the U.S. Department of Health and Human Services, the number of adults 65 and older in the U.S. is expected to increase by nearly 18 million come 2030.² This population shift will drive increased demand for healthcare services.

In radiology, a key to reducing the impact of this crisis is to attract more medical students to the specialty. But exposure to radiology often comes late in the medical student curriculum, after students have already chosen a specialty. With this in mind, we all have a responsibility to find opportunities to engage medical students earlier in their training and encourage them to consider radiology as a career path.

Even if students ultimately choose a specialty other than radiology, we have a responsibility to help educate them about evidence-based imaging. When medical students become practicing physicians in their respective fields, it is crucial that they understand the importance of appropriate image ordering to ensure the most optimal patient care. As imaging experts, we are in the best position to share this knowledge, and the ACR is committed to this cause.

The case studies and resources in this issue can help us advance these objectives. Each provides practical steps that we can follow and programs that we can deploy to teach medical students about this dynamic profession and the critical impact imaging and radiologists have on patient care every day. The future of our specialty and the health of our patients depend on us.

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Introducing Medical Students to Radiology
Chicago radiologists develop a free Radiology Expo to increase the specialty’s pipeline for women and people from underrepresented groups.

Key Takeaways
To bridge the gender gap and expand the representation of people of color in radiology, University of Chicago radiologists developed a free expo to promote the field to women and people from traditionally underrepresented groups.

Medical students indicate that the event gave them an increased understanding of the field of radiology.

In 2020, the event transitioned to a virtual platform, reaching students across the U.S. and around the world.

WHEN ANNIE N. DINH, MD, initially heard that the University of Chicago (UChicago) was hosting its first Radiology Expo in 2016, she wasn’t sure she wanted to attend. A second-year medical student at Michigan State University at the time, Dinh had little exposure to radiology and was undecided about her specialty. She assumed that the daylong event, which was intended to attract medical students to imaging, wasn’t for her.

“Radiology isn’t really integrated into the curriculum in many medical programs,” Dinh says. “Many people don’t have a good understanding of what radiologists do, and medical students, including myself, often believe the stereotype that radiologists sit in a dark room and don’t have interaction with patients. It didn’t seem like something I wanted to pursue.”

However, after two friends who were interested in interventional radiology invited Dinh to the expo, she decided to go. Not only did the Radiology Expo open Dinh’s eyes to the diverse patient-facing opportunities in imaging, but it also influenced her decision to pursue radiology as a career.

“The expo led me to admire a field that is often underappreciated,” says Dinh, now a second-year radiology resident at Geisinger Medical Center in Pennsylvania.

Since 2016, the Radiology Expo, now called the Chicagoland Radiology Expo, has reached hundreds of medical students, both nationally and internationally, and has helped encourage many medical students to pursue careers in radiology. Originally hosted by UChicago’s Department of Radiology Diversity & Inclusion Council, the expo is a free, hands-on experience designed to introduce medical students to radiology and radiation oncology and to encourage more women and underrepresented minorities (URMs) in particular to join the specialty.
**Increasing Diversity**

According to the ACR 2019 Diversity Report, nearly half of all medical students in the U.S. are women, but women represent only about 29% of radiology faculty. People who are considered URMs represent 15.3% of medical school graduates, but they account for only 6.5% of diagnostic radiologists and 7.2% of radiation oncologists. This is a problem for multiple reasons, says Johnson B. Lightfoote, MD, MBA, FACR, chair of the ACR Commission for Women and Diversity, not the least of which is suboptimal patient care. “People who come from a particular community are more likely to understand the perspectives of patients who look and think like they do,” he says. “Radiology is not just a technical specialty; it is a service specialty. We have to concentrate on what patients need because we are serving them, and we need diverse representation to accomplish that mission.”

Part of the problem, emphasizes Lightfoote, is that students have limited exposure to the field. “Radiology is offered as a late elective in most medical schools,” he says, “and many minorities go to schools that lack radiology residency programs. Therefore, women and minorities learn about the radiology field too late to get their applications together, so many do not apply.” As co-chairs of the Diversity & Inclusion Council at the University of Chicago, associate professors of radiology Carina W. Yang, MD, and Zheng Feng Lu, PhD, DABR, FAAPM, wanted to do something to help change these statistics and increase diverse representation throughout the specialty. They wanted to give women and minorities a chance to experience the field and learn what it can offer as a profession. “If they experience it and dislike it, that is one thing, but if students don’t choose radiology because they are not exposed to the field, then we have work to do,” Yang says.

**Getting Started**

With this in mind, Yang, Lu, and the Diversity & Inclusion Council organized a lunch and learn in 2015 called “Radiology Residency: Where Are the Women?” and emailed invitations to the event to all four of the medical school classes within UChicago’s Pritzker School of Medicine. Approximately 60 medical students attended the event.

At the luncheon’s start, attendees completed a pre-event survey to gauge their understanding of radiology and their hesitation about joining the specialty. Many of the students who attended expressed concerns about the lack of patient contact and isolation from other clinicians. “We hear a lot of misconceptions — that radiologists are isolated in a reading room and don’t talk to anyone,” says Yang, who also serves as director of the neuroradiology fellowship and director of pediatric neuroradiology at UChicago. “We wanted to dispel that myth by discussing our experiences and motivations for being in the field.”

A racially, ethnically, and gender diverse panel of five speakers, including Yang, discussed who they are, how they became radiologists, and why they love radiology. They offered anecdotal evidence about how radiologists interact with patients and how the career can offer a healthy work-life balance for physicians with families. A Q&A and imaging case study followed the panel discussion.

At the end of the program, attendees completed a post-event survey to see whether their perceptions of radiology had changed. The results revealed that not only did the event allay participants’ concerns about patient interaction, but it also familiarized them with radiology in general. “The impact it made inspired us to put our heads together for a bigger event that would allow us to engage students from all over Chicagoland,” Yang says. (Chicagoland is the nickname for the Chicago metropolitan area, spanning parts of Illinois, Indiana, and Wisconsin.)

With the idea to expand the event, Yang partnered with Kirti M. Kulkarni, MD, MBBS, associate professor of radiology at UChicago, to co-chair the first Radiology Expo. “We realized we needed to do something on a bigger scale to attract more students,” Kulkarni says. “In particular, we wanted to host talks and learning opportunities that catered to women and URMs. We, as women in science and leadership roles, owe it to one another. This was another venue for us to strengthen the pipeline and share what radiology has to offer.”

**Planning the Expo**

The committee applied for and received a $1,000 grant from UChicago’s Biological Sciences Diversity Committee to finance the expo. The university’s radiology department
believed in the expo and its goals and offered to fund the remaining cost of $4,000. With this funding, the group rented several rooms on campus, covered the keynote speaker’s travel expenses and honorarium, purchased raffle prizes, and paid for marketing.

Although the group had discussed charging students a registration fee, they ultimately decided not to charge attendees in order to encourage more people to attend. To spread the word about the event, the committee created a digital poster and circulated it to the Pritzker School of Medicine and to the medical school deans in the surrounding states. Nearly 100 students registered and approximately 70 attended.

The event took place on Nov. 8, 2016, in conjunction with the International Day of Radiology, a day commemorating Wilhelm Conrad Röntgen’s X-ray discovery. Etta D. Pisano, MD, ACR chief research officer and professor in residence at Harvard Medical School, gave a keynote address called “Professional Climate for Women in Radiology,” and breakout sessions focused on life as a radiologist, the future of radiology, program application advice, and other topics.

Students had the opportunity to meet current and former radiology program directors through one-on-one speed advising sessions. They also participated in interactive exhibits that took them through biopsy procedures and ultrasound scans using models and imaging equipment. And they had an opportunity to solve a mystery case study or participate in a game show for a chance at a raffle prize.

In the same spirit as the luncheon, the expo sought to foster connections between practicing radiologists and medical students. Dinh felt encouraged to ask questions and engage with the speakers. “We spend so much of our time trying to impress the attending or resident we are working with,” she says. “It was nice to be in an environment where I felt relaxed enough to ask basic questions about the field.”

Katie L. Hughes, MD, who attended the expo in 2018 and 2019, also felt comfortable and encouraged during the events. “I went back a second time because I was applying to radiology programs,” says Hughes, who attended the event during her third and fourth years at Rush University Medical College. “I had so much fun the first year, and I thought it would be a good networking opportunity.” Like Dinh, Hughes was inspired to pursue radiology after attending the expo and is now a first-year diagnostic radiology resident at Rush University Medical Center.

**Forming a Partnership**

Following the first event’s success, the committee immediately made plans to host the expo annually. The first step was to form the Chicagoland Radiology Expo Planning Committee to help focus and increase its efforts on the event. This task force knew it needed to increase its fundraising efforts, so Kulkarni and Yang approached the Chicago Radiological Society, a local chapter of the ACR, with hopes of securing a partnership.

“We emphasized how we wanted to bridge the diversity gap and inspire medical students in the Chicagoland area,” Kulkarni says. “We have to make an effort to break down all barriers as well as the misconceptions about radiology to ensure students understand our patient-centered role and that women and minorities can and should be a part of that.”

At the time, the Chicago Radiological Society’s outgoing president, Bojan Petrovic, MD, assumed the role of expo director. Petrovic, who was an expo panelist in 2017, was invested in the expo and helped build a bridge between the two groups. As a result, the Chicago Radiological Society was immediately interested in supporting the expo and agreed to partner with the Diversity & Inclusion Council to sponsor refreshments, provide volunteers, and promote the event to its members. This partnership also highlighted the focus on the entire Chicago area, so the planning committee changed the program’s name to the Chicagoland Radiology Expo.

As the event continued to grow over the years, the planning committee applied for additional educational and diversity grants as part of its expanded fundraising efforts. It received support from the Hodges Society (the UChicago
radiology alumni society) and imaging equipment vendors as well as other groups. The planning committee also wrote letters to the chairs of other Chicago-area university radiology departments and residency programs seeking monetary and promotional sponsorship.

In 2019, the ACR Commission for Women and Diversity joined in to sponsor the expo, which was recognized as a high-impact project during the ACR Annual Meeting for its success in exposing medical students to radiology with a focus on increasing diversity.

“We need to do a better job at recruiting and retaining professionals in radiology,” says Lightfoote, medical director of the department of radiology at Pomona Valley Hospital Medical Center. “Success in radiology is not a choice between diversity or excellence; it is excellence through diversity. It is important not only for minorities but for non-minorities to see minorities as excellent contributors in the field. To know and understand that women and minorities can be in charge of a program and enhance the level of excellence is incredibly important to the future of radiology. Reaching students early through events like the Chicagoland Radiology Expo aligns perfectly with the goals of the commission.”

**Going Virtual**

When COVID-19 began to threaten the U.S. in the spring of 2020, the planning process for the 2020 expo had just begun. Faced with a decision to cancel the event or pivot to a virtual platform, the planning committee unanimously agreed to host the event virtually.

“Because we could reach more students and we had never used a digital platform for the event, this was our most ambitious year. We were nervous but excited about these opportunities,” Yang says. “Without geographical limitations, we blanketed medical schools and residency programs in every state with digital promotional flyers. In fact, when I interviewed medical students this year from all over the country, they had all heard about our expo.” The planning committee also heavily promoted the event on social media.

Knowing that developing the virtual platform would require more funding than in years prior, Kulkarni created a tiered sponsorship package. Sponsors could support at the silver, gold, and platinum levels. Silver status required a $1,000 sponsorship and included publicity for the sponsor on all expo marketing materials, company logo on expo video presentations, and linked vendor sponsor pages on the expo website. Gold status required a $3,000 sponsorship and also included an optional live sponsor video session in the digital expo hall. Platinum status required a $5,000 sponsorship and also included playing the sponsor’s video prior to the keynote session. This effort secured enough funding to hire an IT developer to help design and create the virtual platform. “He gave us a creative way of presenting the audio and video and helped us to see different opportunities for designing more effective content while staying true to our mission,” Kulkarni says. “Everything was so well done that it almost felt as if you were physically walking into different rooms.”

The Chicagoland Radiology Expo virtual experience was held on Nov. 14, 2020. Over 500 people registered for the virtual event, 10% of whom were international students. The website garnered nearly 2,000 hits, with 60% of those visits occurring the day of the event. Expo content is recorded and available on the expo website.

In addition to the regular expo content, the planning committee added a combination of live and pre-recorded talks from many other areas of radiology, including artificial intelligence, neuroradiology, pediatric interventional radiology, and molecular imaging. It also created a virtual expo hall that allowed vendors to set up digital booths. “We were able to offer more content than ever before because we could offer so much synchronously,” Kulkarni explains.

Even though the planning committee was unable to simulate the hands-on experience of reading images using the picture archiving and communications system, the group created an interactive Q&A that allowed students to observe as residents and radiology faculty read anonymized case studies. During this live session, students could report about what they saw and receive feedback from the residents.

Participants were enthusiastic and grateful for the event. One participant tweeted: “Thank you Dr. Birch for taking
[sic] about INTENTIONAL recruitment of URM candidates and the positively wonderful downstream effects!"2
Another participant was inspired by keynote speaker Richard B. Gunderman, MD, and tweeted, “An inspiring reminder of our history, the amazing work and dedication of Marie Curie, and how far we have come and will continue to progress!”3

Excellence Through Diversity

In 2021, the Chicagoland Radiology Expo Planning Committee again hosted the event virtually to maintain COVID-19-safe practices and to reach as many students as possible. As it looks to the future, the planning committee remains grounded in its commitment to diversity and medical student education — two areas that former ACR President Geraldine B. McGinty, MD, MBA, FACR, says are critical to the specialty’s future.

“When we don’t have radiologists with diverse backgrounds, we are not going to be as well positioned to develop work plans and pathways of care to best serve our diverse patient communities," says McGinty, who delivered the closing remarks at the 2020 expo. "If we are going to provide the best care, we have to have a diverse healthcare workforce. Events like this help expose more students to radiology, which opens the doors to diversifying the specialty."

Nina Kottler, MD, MS, who served as a keynote speaker during the 2019 expo, agrees. “We can only be creative if we have a diverse group of people with diverse experiences,” says Kottler, associate chief medical officer for clinical artificial intelligence at Radiology Partners. “When I was growing up, there weren’t many women I could look to and say, ‘That is what I want to be.’ All of my mentors were men. For women in radiology, it helps to have female mentors because we have shared experiences as minorities in our field. We run into similar challenges and are fighting the same fight. In addition to the benefit of having advice from someone who has managed these challenges, female mentorship also provides a sense of unity, knowing that we are not alone.”

Hearing from McGinty, Kottler, and other women in leadership roles at the expo also inspired Dinh and Hughes. “With any specialty, when you have support from leaders of the same gender, it makes such a difference," Dinh says. “Women face so much pressure to be the primary family caregiver as well as to have a professional career. When you see other women who went before you balancing those expectations, it just makes you feel like you can succeed.”

Looking Ahead

As the planning committee looks ahead, it hopes to grow and expand the expo into other communities across the nation and around the globe. "This is our investment in the future of the field," Yang says. "We want the best of the best, and we need a diverse group of students to enter the field of radiology. The rate of women choosing radiology hasn’t increased in nearly two decades. Something needs to change."4

To increase the number of URMs and women entering the radiological professions, Yang focuses on engaging medical students early in their medical education journeys. She encourages all radiologists to join in efforts to spread the word about the benefits of the specialty. "Get involved with community outreach," says Yang, who also spends her time offering radiology educational sessions to fifth graders to introduce them to the field. "It is never too early. Start small and local. The key is to give those without exposure to radiology the opportunity to learn.”

Students like Dinh and Hughes remain grateful that the Chicagoland Radiology Expo offered them these opportunities. "The expo was a stepping-stone," says Dinh. "I had no interest in radiology before I attended the event. I was just going on a trip with my friends. Look at me now: I’m on my way to becoming a radiologist. The expo empowered me as a female and encouraged me down the path that will challenge and encourage me. For me, it was the opportunity that changed my life.”

By Chelsea Krieg, freelance writer
Endnotes
3. @SeungkyuPark_. An inspiring reminder of our history, the amazing work and dedication of Marie Curie, and how far we have come and will continue to progress! #RadExpo2020 Thank you Dr. Richard Gunderman. bit.ly/ParkTweet. Posted Nov 14, 2020.

Now It’s Your Turn

Follow these steps to engage future radiologists, and tell us how you did at imaging3@acr.org or on Twitter with the hashtag #Imaging3.

Get involved with the Chicagoland Radiology Expo by volunteering and/or promoting the event to medical students in your area.

Consider ways to expand early recruitment (high school, college, or medical school) in your community. Start small by organizing a luncheon to promote radiology education to women and minorities.

Get involved with diversity initiatives in your area. Consider using the ACR’s Diversity Toolkit as a starting point.

Lessons in Radiology

The ACR Medical Student Curriculum Panel has compiled a wealth of resources to help members teach medical students about the profession and appropriate image ordering. Known as the Medical Student Curriculum, the repository includes tools, targeted lectures, videos, and other resources that educators and students have submitted.

The Medical Student Curriculum Panel, a group of member volunteers, has vetted and approved the materials and encourages their use to engage medical students in radiology. The panel continues to add to the curriculum as materials are submitted. A selection of the resources available includes:

- **Radiology Jeopardy**
  Clue-based game encompassing various radiology topics that educators can employ to encourage active student learning

- **Pelvis Anatomy Video Module**
  Video guide reviewing pelvis anatomy identifiable using common imaging modalities

- **Basic Guide to Transitioning from the Classroom to the Hospital Wards**
  Overview of how students’ roles change as they transition from pre-clinical to clinical years, with tips on how to best assist care teams and practice vignettes to introduce students to image interpretation skillsets

- **Introduction to Radiology**
  Introduction to the major imaging modalities, with a discussion of each modality’s relevant strengths and weaknesses

View the entire Medical Student Curriculum at acr.org/Medical-Student-Curriculum.
CASE STUDY Published July 2021

Radiology’s Escape Room
An ACR-developed escape room with radiology-themed puzzles is attracting medical students and others in the field.

Key Takeaways
The ACR developed a novel educational experience in the form of an escape room to engage medical students through radiology-related content.

With the onset of COVID-19, the in-person escape room was moved online, resulting in revised implementation via software solutions and opportunities for expanded outreach.

ACR-provided guides help educators and group leaders autonomously run their own educational, team-building, virtual adventures.

While medical imaging is not typically characterized by intrigue, the ACR has zeroed in on a big mystery: the case of a missing radiologist. “Dr. Pickalock” has disappeared from her lab, leaving behind a trail of radiology-related clues that, if successfully decoded, will reveal her whereabouts. Curious and committed puzzle-solvers are collaborating to come to her rescue.

Stay calm; there’s no need to file a missing person report. The above scenario is the basis of an escape room mystery called Radiology Escapes: A Virtual Adventure, which presents compelling, specialty-themed clues that help teams of participants solve the puzzle. The ACR initially designed the escape room as an in-person conference event to attract medical students to the field of radiology, but as COVID-19 spread nationwide, the organization moved the adventure online and provided guidance for groups to host it independently.

Casey Cable, MD, interventional radiology resident at Vanderbilt University Medical Center in Nashville, Tennessee, co-created the escape room with ACR staff and says that it’s a fun way to introduce medical students to radiology. “In medical school, you don’t get much exposure to radiology, and you don’t get it early enough in your training to help you decide that it’s the right career path for you,” he explains. “Many students don’t take a radiology rotation until their fourth year, at which point they’ve already applied into another specialty. So, I reasoned the escape room would be a great recruitment tool to attract students to radiology earlier in their journey.”

Since the ACR launched the program in 2020, nearly 400 participants, including medical students, residents, attending physicians, and other groups, have experienced the creative twist on medical imaging education that the escape room offers. Post-event surveys show that medical students who participated in the escape room found it enjoyable and learned more about the specialty. Additionally, the ACR Medical Education & Student Outreach (MESO) team has
leveraged the escape room to connect with numerous medical students about careers in radiology, raising the profile of the specialty.

“We’ve received feedback that the escape room experience has helped attract students to radiology, which was one of our primary goals,” says Michele Huneke, MT(ASCP), business analyst and manager for ACR Press and escape room co-creator. “Student programs don’t often include radiology, so they aren’t exposed to it. In some cases, the experience involves only sitting in the reading room watching radiologists interpret exams. By introducing radiology earlier, in a fun way, students may then consider it as an option for residency.”

Initiating the Adventure

Cable conceived the idea for the ACR escape room after he participated in a similar program that the University of Arkansas for Medical Sciences (UAMS) organized for radiology residents during the 2018 Radiological Society of North America meeting. Groups of approximately five residents from training programs across the country teamed up to compete against each other in a timed escape. UAMS puzzles included the use of ultrasound to find a secret code inside a gelatin brain mold and a lightbox to read and interpret a series of radiographs, which allowed teams to solve the puzzles required to escape a “locked dungeon.”

Cable recognized the educational value of the UAMS escape room and the following year, he presented a proposal to the ACR Resident and Fellow Subcommittee and then the ACR Education Committee to develop one for medical students. “I suggested that we create our own escape room focused on medical student outreach that would give students hands-on opportunities reading radiographs, CTs, and ultrasounds to get a really solid idea of what radiologists do in a typical day,” Cable says. “In doing so, we could target students who were trying to make up their minds about a career path.” The committee approved Cable’s proposal to develop the adventure with mathematical, linguistic, and logic-based puzzles that include some basic elements of medicine and radiology. But the team knew they needed support from dedicated ACR staffers to develop the escape room and lead the project.

In August of 2019, Jan Cox, PHR, SHRM-CP, ACR senior director of operations, approached two ACR staff members who have an affinity for gamification and adventure films about working with Cable to co-create the escape room. Huneke is an escape room enthusiast, and Ted Reuss, MS, PMP, an ACR Press program manager, is an Indiana Jones movie fanatic.

“Jan’s timing was perfect: Our group at the ACR just had an excellent team-building experience at a local escape room, and we were jazzed about the idea of creating a radiology-themed one ourselves,” Reuss recalls. “Both Michele and I knew we’d be able to incorporate that much-needed fun element into the development process.”

Concentrating on Clues

To start, Cable, Reuss, and Huneke contacted the Association of University Radiologists/Association of Program Directors in Radiology, the organization that provided a grant for the UAMS escape room, for some background about how that team developed their clues and puzzle. Using their robust documentation as a foundation, Reuss and Huneke spent the next several months researching types of puzzles and modifying various clues to fit a medical student audience. Ashmit Mittal, then a second-year medical student and member of the Medical Student Subcommittee that is part of the Resident and Fellow Section of the ACR, consulted with the team to ensure that the clues were at an appropriate level for medical students and assisted with outreach of the escape room. “We felt it was important to incorporate the basics of radiology at the heart of the puzzles as well as disease processes that students would learn early on in medical school. By also introducing students to unique concepts that are not normally taught in the curriculum, such as facts about scientists and physicians who helped pave the way in radiology, we were focused on capturing their attention and making them want to learn more about the field,” Mittal says. Escape room developers brainstormed radiology concepts and built off of UAMS’ puzzles to generate clues using Morse code charts, periodic tables, informational atlases/guides, and ciphers. One puzzle also incorporated...
materials and physical radiology equipment, substituting them with digital images and other imaging-related content. They also leveraged a host of online tools, including video conferencing to facilitate participant interaction, document sharing to circulate the mystery’s clues, and digital survey forms to present the puzzles.

From there, the team developed a virtual process in which a moderator would lead the hour-long adventure — sharing a screen with “hints” to solve clues and helping groups navigate the mystery to find Dr. Pickalock. They also created a post-activity survey to gauge the impact and solicit participant feedback about the game. After extensive testing, Radiology Escapes: A Virtual Adventure went live in August of 2020.

The team soon realized that the virtual format provided an opportunity to reach a larger audience than an in-person venue could, including engaging older students and residents. With this in mind, the team developed an intermediate version of the virtual adventure tailored to third- and fourth-year students and radiology trainees; the original escape room is geared toward pre-med and first- and second-year medical students. Cable used medical training review books as guidance to target the optimal difficulty levels of the radiology-related clues.

Pre-health students, college cohorts, educators, and others interested in radiology have also participated in the escape room. “We’ve been able to share this experience with a lot more people than would have been possible with the in-person version, which is a huge pro,” Cable says. “Since all you need is internet access, this tool is introducing medical students across the U.S. to the exciting and rapidly changing field of radiology. Even if they don’t ultimately choose radiology, they’ll understand how beneficial radiology is to whatever specialty they choose.”

Guiding the Journey
ACR staff facilitated the virtual escape room for several groups with positive results. This garnered the attention of the Stanford Center for Continuing Medical Education, which invited the ACR to present a CME Live session about how they pivoted from a live event to a virtual escape room. “The educators and faculty who attended our presentation thought the escape room was such a unique way to provide content, and they wanted to know how they could do it themselves,” Huneke says.

As interest in the escape room grew, the ACR team realized that it needed a more sustainable plan for running the program. “We just didn’t have enough staff to facilitate...
the escape room for every group that wanted to go through it,” Huneke says. After some consideration, the team determined that with the right tools, any leader could share their screen and run the adventure.

In February of 2021, the ACR released an eight-page, how-to guide for running the escape room independently. It explains the goals and objectives; the importance of knowing your audience; a host of tools and components, including live links for the survey form and clues; all of the puzzles, clues, and documentation required; a checklist of tips and tricks; and a contact email for ACR staffers who can answer questions. A participant guide, leader guide, and YouTube video also serve as detailed roadmaps for facilitation.

All of the links, materials, and resources are free to use — a boon during the pandemic. “We’re really seeing this take off as educators are running these virtual escape rooms with their medical students because they can’t get together in person. This is a great method for students to collaborate in a fun, low-pressure situation,” Huneke says.

Suzanne Weiner, MD, assistant professor of medicine at Florida Atlantic University Schmidt College of Medicine in Boca Raton and director of the year-four clerkships, took 55 of her students through the virtual escape room, which she described as “a very well-done, fun, and different experience.” She says, “My students had been apart on rotations, and I thought it was important that they come back together and interact as a class. The escape room provided gamification, radiology education, and entertainment.”

Assessing the Impact
The ACR team created two post-participation surveys, one for the early student group and one for fourth-year medical students, residents, and physicians. The survey for the latter group requested feedback about the puzzles and possible areas for improvement. The responses were generally positive, although some said certain clues were “too easy.” The medical student survey asked if the escape room piqued their interest in radiology as a possible career path.

“When we got the answer ‘yes’ regarding interest in radiology, we knew we had done our job,” says Reuss, who notes that they also asked if the participants wanted to know more about a career in radiology. For students who affirmed interest, their contact information was sent to the MERO Committee for follow-up as part of the ACR’s broad focus on medical student outreach. Committee representatives emailed students, providing information about ACR’s opportunities. Mittal, who both contributed some clues and participated in the virtual adventure, recalls being inspired after participating in the escape room. “I recognized many of the concepts I had learned in class, and it gave me confidence and motivation to continue exploring the field of radiology,” he says.

Based on positive feedback like this, the ACR continues to share the escape room and its companion materials with various groups, and the team hopes to run the program in person at various conferences once the pandemic recedes. “We’re providing a way to promote teamwork and collaboration while teaching participants about radiology in a fun way,” says Reuss.

With the comprehensive support resources available through the ACR, group leaders can facilitate their own educational escape room to promote radiology and provide a unique, collaborative experience for participants of all interest levels. “We encourage anyone who is interested in introducing radiology as a possible career path to host the escape room,” Reuss says. “It’s a fun and engaging way for students to learn about the specialty.”

By Kerri Reeves, freelance writer

Follow these next steps to facilitate your own event, and tell us how you did at imaging3@acr.org or on Twitter with the hashtag #Imaging3.

Email radiologyescapes@acr.org to request assets for facilitating your own Radiology Escapes: A Virtual Adventure.

After reviewing the escape room leader’s guide, evaluate available collaboration and survey tools to determine your path to implementation.

Contact medical students or other interest groups to promote your educational, interactive program.
Introducing Medical Students to Appropriateness Criteria

A medical school offers a self-directed ACR Appropriateness Criteria® course in lieu of clinical rotations during the COVID-19 shutdown.

When medical students could no longer conduct clinical rotations during the pandemic, one medical school created a radiology elective to educate students about the ACR Appropriateness Criteria (AC).

Third- and fourth-year medical students created AC presentations that aligned with their subspecialty interests.

Of the 80 students who engaged with the online AC material, 90% found the curriculum valuable to their future careers.

WHEN COVID-19 sent the nation into lockdown, Tyler Pease was completing his third year at Rutgers Robert Wood Johnson Medical School (RWJMS). As universities across the country pivoted to online learning, it soon became clear that regular clinical rotations — during which medical students often receive the greatest exposure to radiology — would be unavailable to most medical students.

“My peers and I were wondering what was going to happen with our education,” Pease says. “We weren’t sure how we would complete our clinical requirements.”

In March of 2020, Judith K. Amorosa, MD, FACR, vice chair for faculty development and academic affairs at RWJMS and radiologist partner with University Radiology, received an urgent email from the dean’s office requesting ideas to address the necessary changes in educational instruction. After thinking about how radiology could rise to the challenge, she conceived a proposal to virtually introduce medical students to radiology and appropriate imaging ordering practices.

Drawing from her experience developing a hybrid class for students who were interested in radiology but unable to attend lectures, Amorosa created a self-directed radiology course to educate medical students about the ACR Appropriateness Criteria® (AC). The ACR developed the AC to help referring physicians make appropriate image-ordering decisions. This elective has allowed students to focus on the AC most relevant to their own subspecialty interests and receive credit for clinical hours during the pandemic. Twenty students have completed the requirements and gained considerable knowledge about the AC since the course began in April of 2020.
“Without this course, I wouldn’t be able to say that I felt fluent in navigating and using the ACR AC,” says Pease, who was the first student to enroll in the class. “The course gave me a leg up when it came to gaining clinical experience in radiology.”

**Addressing a Need**

The idea for the elective grew from a previous program that predated COVID-19. “I received many calls from medical students asking me about radiology,” says Amorosa. “Many medical students couldn’t take the courses we offered because their schedules were too demanding. Instead, they would send scribes to take notes on lectures so that they could learn the material on their own. This gave me the idea to create a hybrid course that encouraged independent and self-directed learning.”

The original program, named Radiology on the Interview Trail, combined clinical experience with online instruction to educate busy medical students about imaging methodologies and basic radiology procedures. “It worked well because students were able to take advantage of radiology resources while also navigating specialty interviews and other demands on their time,” Amorosa says.

When the dean’s message went out about ways to pivot to virtual learning, Amorosa saw this existing virtual program as an opportunity to expand on an already successful course model. She immediately knew she wanted to incorporate the AC to help expand its use. She also added the AC project to Radiology on the Interview Trail, exposing more than 80 additional students to the AC guidelines.

**Leveraging the Guidelines**

As Amorosa recognized, even though the ACR introduced the AC in 1993 to help minimize inappropriate image ordering, many ordering providers still do not rely on or even know about the resource. In 2009, she was part of a team that led a study to determine how often physicians use the AC. Of the 126 physicians surveyed, only three reported using the AC when ordering image studies.1

Amorosa, who has served on panels to develop the chest thoracic AC, has seen firsthand how much time, effort, and care go into developing the guidelines. She knows how valuable this resource could be for medical students and the radiologists who work with them.

The AC’s value only increased in June of 2016 when the Centers for Medicare and Medicaid Services (CMS) named the ACR a qualified provider-led entity. The designation means that providers can consult the AC to meet the requirements of the Protecting Access to Medicare Act (PAMA). Under PAMA, providers must consult qualified appropriate use criteria through clinical decision support when ordering imaging for Medicare patients. This requirement is slated to take effect in 2023.

“This course helps prepare medical students to comply with PAMA,” says Amorosa. “These medical students will be familiar with the background and resources from the ACR as they become practicing physicians.”

**Developing the Course**

In March of 2020, Amorosa presented the proposed elective to the curriculum committee, which is chaired by Meigra M. Chin, MD, associate professor and assistant program director of emergency medicine at RWJMS. After several conversations about the course structure and how its objectives would provide effective substitutes for clinical hours, the committee approved it for the 2020 spring and summer terms.

“It was clear that students were going to need opportunities to progress in their education in this time without patient contact,” Chin says. “The committee was completely supportive of Dr. Amorosa’s elective course because we all recognize that radiology is an area in which students do not always receive guided and specific education.”

In less than a week, 20 students enrolled in the new Remote Radiology elective for April and May 2020. “It was a desperate time,” says Amorosa, “but there was great enthusiasm for the course, and I was encouraged to move forward.”

**Implementing the Course**

Amorosa partnered with Jasmine Allen, radiology course coordinator at RWJMS who coordinates the residency and medical student rotation program, to organize the course and maintain its content. Allen also helped roll out the course through the school’s learning management system and track student success throughout the course.

During the course, students worked directly with Amorosa to learn about the AC. She asked students to develop presentations around the AC topics that aligned
Musculoskeletal radiology at Northwest Radiology, was then serving as chief resident at Rutgers Robert Wood Johnson University Hospital. Both Amorosa and King provided feedback about Pease’s ideas and materials and helped guide his presentation content by suggesting imaging modalities connected to specific pathologies. “Dr. Amorosa and Dr. King gave invaluable feedback that led me to relevant AC guidelines,” Pease says. “This helped me to identify appropriate imaging modalities.”

Presenting the Research
For each presentation, students delivered scripts and decks of 30-45 slides. No formal reports were required, but some students chose to present their materials to Amorosa and a consulting specialist, as well as their peers. Currently, the radiology department is in the process of uploading the learning materials they created to the department’s website.

Pease presented his final research as case studies. For example, in his presentation on the acutely limping child, he introduced a hypothetical 4-year-old whose parents were concerned about him limping and favoring his right foot. Pease also developed additional context that the child had spent the morning with his maternal aunt, who is the mother of two similarly aged children. This helped Pease explore multiple possible reasons for the limp.

Pease discussed potential diagnoses for limping children based on different possible sub-scenarios, such as whether the child could identify the pain source. Using the AC for the acutely limping child, he discussed the advantages and disadvantages to different imaging techniques, such as MRI, ultrasound, and three-phase bone scan.

He also reviewed other important considerations for image ordering, such as radiation exposure, patient immobilization, and sedation, as well as parent and patient preparedness and age-appropriate imaging selection. His presentation included appropriate images and citations for each option.

Amorosa was impressed with the quality of the materials that Pease and the other students developed. “Most of these students are better at making these kinds of presentations than I am,” she laughs. “They are very imaginative, and I am always impressed with how well they take their interests and the AC and make something incredible.”

Soliciting Student Feedback
Throughout the process, Amorosa encouraged her students to keep process and research journals. She asked
the students to provide feedback to help improve the curriculum in the future.

Of the 20 students who participated in the Remote Radiology course and the students who evaluated their project experience with the AC in Radiology on the Interview Trail, 90% said they learned and found the experience "very useful/useful" for their future career.

Pease says he was extremely satisfied: "I thought the ACR AC was really excellent as an educational resource," he says. "I didn't know it existed before I took this course. I would definitely recommend that other medical students reference the AC when familiarizing themselves with radiology in their specialties." Pease says that he plans to use his Remote Radiology presentations as educational materials if asked to explain appropriate image-ordering protocol to colleagues or trainees in the future.

In the survey, another Remote Radiology student noted, "By creating the topic slides, I had to dive into the material. The process of creating the cases myself allowed me to deeply engage with the material and review a variety of different pathophysiologies. I found the process educational and learned valuable information that will greatly benefit me in clinical practice."

Looking Ahead

Based on positive feedback like this, the curriculum has been regularly offered as an elective since April of 2020. In addition, Amorosa has introduced a similar project as part of the Radiology on the Interview Trail course, and she is already considering how it might be reconfigured when students are able to see patients again. She hopes to continue offering the elective alongside regular clinical rotation opportunities and to introduce additional AC resources.

"I would like to see some portion of this particular elective become a requirement for the fourth-year experience," Chin says. "I think the AC is something medical students need to be educated about. Helping them determine the best and safest study for patients is something they should be prepared to do, and this course can help position them to make rational decisions when necessary."

Amorosa says programs like this add tremendous value to the medical student experience without requiring much additional work from radiologists. "The amount of work to develop and monitor a course like this is not overwhelming for faculty," Amorosa explains. "It is more of an advisory role. Students just need to know what resources are out there, and they can mostly take it from there."

Amorosa encourages others to find ways to engage medical students with appropriate radiology ordering practices throughout the pandemic and beyond. "Ultimately, courses like these can boost student confidence in image ordering," she says. "They can also show medical students how appropriate orders help radiologists and ordering physicians work together to enhance patient care. As physicians, we have an obligation to pass this knowledge along to the next generation of care providers."

By Chelsea Krieg, freelance writer

Endnotes


Now It's Your Turn

Follow these steps to engage future radiologists, and tell us how you did at imaging3@acr.org or on Twitter with the hashtag #Imaging3.

- Look for opportunities to educate medical students about the value of the ACR Appropriateness Criteria to improve image ordering.
- Direct medical students to the ACR Appropriateness Criteria website, acr.org/AC, for the most current appropriateness guidelines.
- Allow students to focus on areas that interest them and encourage them to develop presentations for an immersive learning experience.
Teaching Imaging Appropriateness

A simulation-based educational program increases medical students’ ability to identify appropriate imaging.

Key Takeaways

Radiologists at Baylor College of Medicine partnered with the ACR and National Decision Support Company to develop a web-based program that uses case vignettes and clinical decision support to teach students and practicing providers about appropriate imaging through simulation education.

Known as Radiology-TEACHES™ (Technology Enhanced Appropriateness Criteria Home for Education Simulation), the program fills an existing imaging appropriateness training gap in traditional medical education curricula.

The platform is scalable and can be customized to address gaps in curricula across the continuum of medical education.

Nearly every hospital patient undergoes some type of radiological exam. Yet, undergraduate medical education curricula have traditionally lacked comprehensive instruction about ordering appropriate imaging. This training gap means referring trainees and practicing providers are often unprepared to order appropriate imaging in the clinical setting — and as a result, some patients receive unnecessary imaging that can expose them to undue radiation and costs.

Improving education about appropriate imaging is imperative for better patient care, and all radiologists have an important role to play in advancing such training.

Radiologists at Baylor College of Medicine in Houston are addressing the issue by partnering with clinicians to launch a web-based program called Radiology-TEACHES, which uses case vignettes in the ACR's Cortex system integrated with the CareSelect® Imaging clinical decision support (CDS) tool to simulate the image-ordering process and educate learners about appropriate imaging.

Baylor radiologists developed Radiology-TEACHES in collaboration with the ACR and National Decision Support Company (NDSC) — the licensing agent for CareSelect Imaging, which offers the digital version of the ACR Appropriateness Criteria®.

In 2015, the team conducted an initial pilot of the program with 34 medical students, 85% of whom indicated that the program should be incorporated into the medical school curriculum.¹ Now, the team is expanding the program’s reach throughout the medical community with a multisite pilot project.

Volunteer Effort

The idea for Radiology-TEACHES was born in 2013. As the ACR and NDSC began offering CareSelect Imaging to clinical practices, Marc H. Willis, DO, MMM, who at the time was associate professor of radiology and associate chair for...
Cross Collaboration

By January of 2015, Radiology-TEACHES was ready for its initial pilot. Willis approached Baylor’s medical school leadership and faculty about using the program with their students. Nadia J. Ismail, MD, MPH, associate dean of clinical sciences, says she immediately saw value in the project, which aligns with medicine’s shift toward high-value care as well as with Baylor’s efforts to make radiology more explicit in its curriculum. “Radiology is really core to most patient care, so any chance we have to educate our students about it, the better,” she says.

With faculty members on board, Willis and his team recruited volunteers to participate in the pilot from a group of second-year medical students who had completed their clinical classroom work and were entering clinical rotations. Volunteers were recruited through verbal announcements at the start of their regular classes and through emails, including one from the associate dean of Baylor’s Office of Undergraduate Medical Education. As a result of these efforts, 34 students signed up to participate in the project, which did not impact their grades.

Allison M. Khoo, a third-year medical student at Baylor who plans to specialize in interventional radiology, was one of the students who volunteered for the pilot. Khoo says she signed up to learn about the decision-making process for different types of imaging studies — training she wouldn’t have otherwise received as an undergraduate. “Generally, we don’t learn much about imaging, like when to use contrast, what kinds of contrasts are available, the differences between CT and MRI, or the relative costs of different exams,” she explains. “This, unfortunately, opens the door for a lot of overuse and wasteful imaging in the clinical setting.”

Initial Pilot

Willis kicked off the pilot with a 10-minute presentation to student participants. He explained what evidence-based medicine and CDS are and how they can optimize decision-making to improve patient outcomes. Then, the

quality improvement at Baylor, started thinking. He knew CareSelect Imaging was a valuable tool to help clinicians identify appropriate imaging at the point of order, but he also recognized the potential for leveraging it in the medical-education setting.

“I saw a great opportunity for a program where learners can access case vignettes and simulate the ordering process with the CareSelect Imaging product,” says Willis, who was also the chief of musculoskeletal imaging and intervention and associate program director of the diagnostic radiology residency program at Baylor.

Willis shared his idea with his department chair and Baylor’s medical school leadership, who liked the concept but didn’t have the money to fund its development. With his departmental leadership’s support, Willis turned to the ACR and NDSC, which both agreed to partner with him on the project.

Soon thereafter, efforts began to build the program’s user interface with a direct link to CareSelect Imaging. “Connecting to CareSelect Imaging was essential to give students access to evidence-based appropriateness criteria, information about how to order contrast, relative radiation dose data, and a cost range for different imaging exams,” explains Willis, who is now associate chair of quality improvement at Stanford University.

From there, Willis approached one of his colleagues, Karla Sepulveda, MD, associate professor of radiology and fellow associate program director of Baylor’s diagnostic radiology residency, about co-leading the program’s development. Sepulveda, who is also the radiology department’s director of medical student education, agreed, and together she and Willis assembled a team of colleagues to help author the pilot program’s case vignettes.

The team included representatives from eight radiology subspecialties: musculoskeletal, breast imaging, gastrointestinal imaging, neuroradiology, thoracic and cardiac imaging, genitourinary imaging, women’s imaging, and vascular imaging.

For two years, the team spent countless hours authoring cases in Cortex, a computer application for collecting, storing, and distributing educational materials in various formats. “Without a budget, we primarily worked on this during nights and weekends as volunteers,” Willis says. During that time and since then, the team has authored more than 150 vignettes, covering topics in each of the represented subspecialty areas. In the future, users will be able to author their own cases to fit specific educational needs.
The Radiology-TEACHES Workflow
Learning to order appropriate imaging

**Portal Set Up & Case Authoring**
- Radiologists
  - CareSelect Imaging portal set up for this activity
- Institution Faculty
  - Medical students, residents, and faculty author cases
- Medical students registered for integrated portal use

**Classroom Session 1**
- Medical students take optional pretest
- Institution faculty lead classroom lectures

**Virtual Classroom for Medical Students**
- Medical Student
  - Education portal (CareSelect Imaging)

**Simulate Ordering Imaging Studies**
- CHEST
- CV
- ED
- GU
- GU/NUCS
- MSK/NEURO
- NEURO
- PEDS

**Feedback and discussion**
- Institution Faculty
- Feedback and discussion

**Feedback on Imaging Appropriateness**
- Appropriateness score 1-9
- Independent study

**Classroom Session 2**
- Optional Post-test

At the end of these modules, learners will be able to:

- **Formulate** an approach to appropriately utilize imaging to diagnose and treat patients, including appropriate collaboration with other members of the healthcare team.
- **Develop** a baseline knowledge of the cost of imaging examinations.
- **Construct** a diagnostic workflow to select the safest imaging work-up for patients.
- **Examine** the value of evidence-based feedback that clinical decision support provides.
students took a 20-minute pre-assessment exam to gauge their ability to order appropriate imaging before logging into the Radiology-TEACHES portal to review a few practice cases. Once the students understood how to use the platform, they had two weeks to work through 48 case vignettes within the program. The format is learner-directed, allowing each student to complete the vignettes at their own pace.

“One advantage of this educational model is that it creates an asynchronous learning environment, where students can log in remotely and do the cases,” Willis says. “It doesn't have to fit into classroom time.”

Here’s how the program works:
1) A student logs into the Radiology-TEACHES web-based portal and reads a case vignette, outlining a patient’s clinical scenario.
2) Then, the student clicks on the CareSelect Imaging tab, where they enter the patient’s demographic and clinical information.
3) From there, CareSelect Imaging provides a list of imaging exams, ranking them from the most to least appropriate based on the appropriateness criteria — just as it does in the clinical setting.
4) The student then selects the study they want to order and, most importantly, receives immediate decision-support feedback before moving to the next case vignette.

**Positive Results**

At the end of the two-week pilot, participants took a post-assessment exam. Compared to the pre-assessment test, the students showed a “statistically significant” improvement in identifying the most appropriate imaging exams in multiple areas: intermediate cases, advanced cases, and cases covering Choosing Wisely® topics.

“Most encouraging was the students’ improvement in vignettes covering Choosing Wisely topics, a national campaign aimed at reducing the amount of waste in medicine,” Willis says.

The students also reported feeling more prepared to order appropriate imaging after participating in the program. On the pre-assessment test, 70% of participating students said they were “unprepared” or “totally unprepared” to order appropriate imaging. On the post-assessment test, after the simulation module, 53% of participants said they were at least “slightly prepared” to order appropriate imaging.

Additionally, the students provided feedback about the program’s value as a curriculum tool, with 96% reporting that it provided “some value” or was “very valuable” or “extremely valuable.”

“Radiology-TEACHES really fills a gap in our current working knowledge in medicine,” Khoo says. “I feel fortunate to have had the opportunity to get this robust training early in my career; it has definitely bolstered my interest in becoming a radiologist. Hopefully, more people will use this tool in the future.”

**Additional Pilots**

To turn that hope for further dissemination into reality, Willis and his team have begun several additional Radiology-TEACHES projects. One of them involves piloting the program with Baylor’s physician assistant students, bringing appropriate imaging education to the allied health arena. Willis notes that this is an important project because, in many practices, physician assistants often order imaging studies.

In another effort, Willis and his team are collaborating with the directors of Baylor’s seven required medical student core clinical clerkships (general surgery, internal medicine, family and community medicine, pediatrics, neurology, obstetrics-gynecology, and psychiatry) to integrate the program into those rotations. This project blossomed after Ismail invited Willis and his team to present Radiology-TEACHES at a clerkship director’s meeting, and Willis received a 2016 Radiological Society of North America Education Scholar Grant to fund the initiative.

Andrew C. Caruso, MD, assistant professor of medicine and director of Baylor’s internal medicine clerkship, says he looks forward to sharing the program with the students in his rotation. “Radiology-TEACHES will expose students to the various imaging studies and help them learn which ones are safe and cost-effective based on a patient’s clinical condition,” he says. “This evidence-based information is vital for them to experience prior to becoming trainees.”

To expand Radiology-TEACHES’ footprint even further, the Baylor, ACR, and NDSC team has initiated a multisite pilot at four other institutions across the nation: University of Chicago, Montefiore Medical Center, Uniformed Services University of the Health Sciences, and University of North Carolina at Chapel Hill. The team plans to evaluate the program’s effectiveness and scalability before implementing it more broadly. The ultimate goal is to make Radiology-TEACHES accessible to all medical students, ensuring they receive the essential training they need to make informed decisions about imaging in today’s healthcare environment.
and Augusta University. The team expects this project to prove that the program’s success at Baylor is transferable to other institutions.

**Future Efforts**

Since this case study’s initial publication in 2017, the Baylor, ACR, and NDSC team has made Radiology-TEACHES available as an educational resource to additional academic institutions, hospitals, and practices at no charge. Medical schools across the country have implemented the program to fill gaps in their curricula. Hospital and medical groups have also found value in the program as a continuing education tool to teach practicing providers more about appropriate imaging.

“The goal of Radiology-TEACHES is to prepare current and future medical providers to deliver high-value healthcare by decreasing waste and increasing patient safety through improved imaging utilization, as outlined in healthcare’s Triple Aim,” Willis explains. “The platform provides a simulated education environment that is flexible and scalable. It can be used across a wide spectrum — from individual learners to interprofessional teams — ensuring patients receive the best care possible. That’s something we should all be focused on as we transition from volume- to value-based care.”

By Jenny Jones, Imaging 3.0 manager

**Endnotes**


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**Call for Mentors**

One of the most direct and impactful ways radiologists can help medical students learn about the profession is through mentoring, but some radiologists may not know where to begin. Radiology-TEACHES offers an opportunity.

The Radiology-TEACHES team matches mentor volunteers with medical students who are interested in the same subspecialty area, when possible. The mentor and mentee work together on case creation, and approved cases are published within Radiology-TEACHES, allowing the pairs to claim publishing credit.

The time commitment for the mentoring opportunity depends on the number of cases each pair can manage. The program team anticipates a commitment of four hours per month.

To get started, fill out the application form at bit.ly/RadMentor.

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**Now It’s Your Turn**

Follow these steps to begin implementing Radiology-TEACHES in your practice. Let us know how you did at imaging3@acr.org or on Twitter with the hashtag #Imaging3.

- Determine whether Radiology-TEACHES is a good fit for your academic institution, medical practice, hospital, or healthcare system.
- Start engaging collaborators and leadership within your institution to begin exploring ways to integrate this program into your organization’s portfolio of educational resources.
- Email radiologyteaches@acr.org to learn more and engage in the program.
AI is a tool that helps radiologists do their jobs better and engage more closely in patient care. Radiologists will remain the interpreters of imaging data to ensure optimal patient outcomes. What’s more, AI will help triage cases and handle tedious tasks, such as counting pulmonary nodules, giving radiologists more time to collaborate with referring physicians and help manage the continuum of patient care.

Radiologists at a Massachusetts hospital integrate artificial intelligence into their workflow to help triage critical cases. 

Breast imagers, radiologists who perform and read ultrasound, pediatric radiologists, interventional radiologists, and radiologists who perform fluoroscopy have a long history of speaking directly with patients. Increasingly, diagnostic radiologists also are consulting with and delivering imaging results to patients. These interactions are occurring both virtually and in person. As AI advances, radiologists will have even more opportunities to speak with patients and manage longitudinal care.

Ohio radiologists collaborate with a patient advocate to implement a direct results delivery program that decreases patient anxiety and gives radiology a face.

With nearly all hospital patients undergoing some type of imaging and with screening recommended for certain populations, radiologists are central to addressing healthcare disparities and making care more equitable for all patients. Radiologists across the nation are leading efforts to ensure that all patients, regardless of their gender, race, socioeconomic status, cultural background, etc., receive the care they need.

Radiologists are leading PHM through breast, lung, colorectal, and other cancer screenings. Their impact on PHM continues to increase as more radiologists track actionable incidental findings, ensuring appropriate follow-up care, and as they take on responsibilities beyond image interpretation.

A Florida nonprofit connects women to medical and social services, helping them overcome barriers to care.

While the profession had been relatively homogeneous in the past, radiologists nationwide are taking actions to increase diversity across the field. Professional societies, including the ACR, are also committed to advancing diversity and inclusion within the specialty. It’s important that all communities be represented in this important medical specialty. The priorities and insights of women and minorities are essential in guiding exceptional patient care now and into the future.

Radiology leaders in Nashville bring diversity and inclusion to the forefront with initiatives to recruit, retain, and advance top talent.

In many cases, radiologists are leading PHM through breast, lung, colorectal, and other cancer screenings. Their impact on PHM continues to increase as more radiologists track actionable incidental findings, ensuring appropriate follow-up care, and as they take on responsibilities beyond image interpretation.

A Florida nonprofit connects women to medical and social services, helping them overcome barriers to care.

Medical students shouldn’t pursue careers in radiology because artificial intelligence (AI) is going to replace radiologists.

Radiologists sit in dark rooms and read images all day. They never interact with patients.

With limited direct interaction with patients, radiologists don’t have an opportunity to improve health equity.

The radiology profession is full of men. It’s not a profession for women and people from diverse cultures and backgrounds.

Radiologists don’t manage longitudinal care, so they don’t have a role to play in population health management (PHM).
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