

Bulletin



CHANGING
DIRECTION

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2020 marks the ASRT Centennial! For 100 years, ASRT has played a vital role in supporting the nation's medical imaging and radiation therapy professionals.

Throughout the year, we'll highlight ASRT's mission to advance and elevate the medical imaging and radiation therapy profession and to enhance the quality and safety of patient care.

Thanks for your support as we lead the profession into the next century.



asrt.org/centennial

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10 Changing Direction

Ignoring potential disruptors to everyday practice can feed a business-as-usual mindset. To avoid being caught unprepared — for the spread of AI, mergers and acquisitions, or even a pandemic — radiology leaders must tap into the wisdom and determination of a core group with a common vision.



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



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

Digital edition and archives of past issues are available at ACR.ORG/BULLETIN.

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FROM THE CHAIR OF THE BOARD OF CHANCELLORS

Howard B. Fleishon, MD, MMM, FACR



The Best of Intentions

As radiologists re-establish their practices post-pandemic, the ACR will continue to serve as a strong foundation.

Every ACR physician volunteer starts their term with the best of intentions — excited to build on the foundation of one of the most influential organizations in medicine, eager to reinforce the good work of past leaders, and keen to introduce proposals to guide the organization forward. As the incoming chair of the ACR BOC, I certainly had a list of optimistic plans and goals. Then came COVID-19.

The pandemic has changed our world. Each of us has been affected, directly or through our family and friends. Our personal lives and routines have been rerouted. New terms such as *social distancing* and *elbow bump* have become part of our daily vocabulary. As with other historic events, such as 9/11, the Challenger explosion, and the Great Recession, we will always remember our shared experiences during this crisis.

The impact on our professional lives has been equally unprecedented. The postponement of annual meetings by multiple organizations has put our professional networking schedules on hold. We have been forced to move into a world of virtual conferencing — linking with friends and colleagues online. Every radiology practice, department, and corporation has faced financial pressures. For some, especially smaller practices, the pressures have reached existential levels. Staffing challenges have been intensified by the unknown: changing guidelines, exposure risks, furloughs, and practice uncertainty.

The ACR quickly established a Coronavirus Resource Center (acr.org/COVID-19) to compile resources to help the radiology community battle COVID-19 and strengthen practices during the pandemic. The resource center has had a profound impact — generating over 300,000 page views cumulatively since the first page launched in March. In addition, our global partners have reinforced the resource center's reach by reproducing the composite of webpage information. The ACR has been coordinating efforts with multiple societies such as the American Society of Breast Surgeons, the Society of Breast Imaging, the American Society for Radiation Oncology, and the RSNA to establish position papers for our members, referring physicians, and patients (check out some of these at acr.org/position-statements).

As with radiology practices, the College has been financially impacted by the pandemic. Difficult choices will have to be made over the coming months to balance our charge to our members and patients, along with our commitment to financial sustainability. While I understand that your focus right now is on your patients, the place you practice, and your personal network, I urge those of you who have yet to renew your membership to do so today at acr.org/renew. I am truly honored that so many of you have spent a significant amount of time and money investing in our profession and our College, but now more than ever, the success of our future depends on your continued support.

Not surprisingly, the crisis has presented an incredible dynamic in the political arena. Unprecedented stimulus packages are creating legislative and funding opportunities that will influence radiology for years to come. Policy issues including scope of practice, licensing, self-referral laws, CDS/PAMA implementation, and telemedicine will require constant vigilance and lobbying. Proposals for small business loans, analysis of the role of imaging in the diagnosis of COVID-19, and practice support may apply to radiologists. ACR is your most credible representative for the profession on Capitol Hill, and our economics and government relations staff is working tirelessly to ensure radiology is at the table.

I am confident that we will get through this crisis together. I am optimistic that the rest of the medical community will view radiology and the ACR as a valued and reliable partner during this pandemic. The ACR will continue to serve as a strong foundation for us all as we re-establish our practice referrals and build new and stronger relations with each other to achieve our best intentions and advance the science and practice of radiology for our members and patients. **B**

Read a story. Leave a story.

The COVID-19 pandemic is having a profound impact on radiology practices across the country. **We Are ACR** is available to you, your colleagues, your patients, and patient advocates to contribute uplifting stories and personal testimonials of how you're battling the effects of the pandemic. These stories are meant to inspire you and exemplify just how important your work is. While you're here, take a moment to submit your picture and written story, a soundbite or short video clip — share how COVID-19 has impacted your practice. Please write a short piece, 1,000 words or less, or record a brief video to share your thoughts and action items so that your ACR community can learn more about your work. Visit acr.org/WeAreACR to share your story today.

DISPATCHES

NEWS FROM THE ACR AND BEYOND



ACR Offers New Support Guide to Self-Care Series

The ACR Radiology Well-Being Program, which provides members with resources to assess and improve their level of wellness, recently released a new support guide to self-care as part of a new series of guides for well-being. The Well-Being Support Guide to Self-Care includes links to podcasts, videos, articles, books, and apps on topics that radiologists at all career levels need to reduce burnout, including sleep, nutrition, exercise, relationships, and more.

“As physicians, we entered a unique set of life circumstances when we began medical school,” says Ann K. Jay, MD, member of the ACR Well-Being Workgroup and a neuroradiologist at MedStar Georgetown University Hospital. “There was an unsaid understanding that we would be conceding time and life opportunities for the noble pursuit of medicine. But there is a level of self-care we need to subscribe to for a healthy and happy life.”

Other support guides, created and reviewed by radiologist and patient advocate volunteers, focus on conflict resolution, resilience, mentoring, diversity and inclusion, and communication. **To access the guides and all the program has to offer, visit acr.org/WBI.**

NOW AVAILABLE: CPI Module in Emergency Imaging

Back by popular demand, the ACR Continuous Professional Improvement (CPI) program has released the new CPI Emergency Imaging Module 2020. Designed to be a teaching and learning tool for radiologists at different career levels, this module features head-to-toe imaging using multiple modalities and over 100 images.

Each CPI module is created to be a comprehensive learning experience broad enough to meet the educational needs of general diagnostic radiologists, subspecialists, and residents. Test your knowledge with 50 self-assessment questions and earn 8 CME/SA-CME. Choose your format (print or online) and download the free e-book copy. Members save \$35 per module when bundling six modules via CPI Select Six.

Learn more at acr.org/cpi.

New Study Evaluates COVID-19 Impact on Imaging Volumes

As a result of COVID-19, many radiology departments have experienced a rapid decline in imaging case volumes. A new study, funded by the Harvey L. Neiman Health Policy Institute[®], evaluated the impact of the pandemic on imaging case volumes using real-world data from a large healthcare institution.

The study examined retrospective imaging case volumes at Northwell Health from Jan. 1, 2019 through April 18, 2020. “The results revealed an overall 28% decline in the total imaging volume over a seven week-period during COVID-19, compared to 2019, including all patient service locations and imaging modality types,” said Pina C. Sanelli, MD, MPH, FACR, senior author and professor of radiology at Northwell Health.

According to Jason J. Naidich, MD, FACR, lead study author and senior vice president of the central region at Northwell Health, “Our study demonstrates the magnitude of the disruption caused by the pandemic and suggests that practices that depend on outpatient imaging will be most severely affected. Even though healthcare institutions and small businesses may be eligible for some economic relief from a variety of government programs, the crisis has placed significant financial strain on many practices and radiologists.”

Read the full study online in the *JACR*[®] at bit.ly/HPI_COVID.



Though all of us are facing unprecedented uncertainty, we are striving to highlight positive outcomes, such as the number of patients extubated and discharged, the development of abundant, readily available in-house polymerase chain reaction and antibody testing and successful recruitment to COVID-19 clinical trials.

— Dana H. Smetherman, MD, MPH, MBA, FACR, chair of the ACR Commission on Breast Imaging, at bit.ly/VOR_LeadinginHotZone

We Need Your Input

Please share your opinion in support of two ACR initiatives seeking broad feedback on the follow-up of incidental findings on imaging exams. Your response to a brief survey will guide the work of the Gordon and Betty Moore Foundation Diagnostic Excellence Initiative technical expert panel in the development of quality measures that drive adherence to radiologists' evidence-based follow-up recommendations. Additionally, the survey will inform the development of a care coordination white paper — a collaboration between the ACR and the American College of Emergency Physicians on the follow-up of incidental imaging findings in an ED setting.

Three surveys are available for radiologists, referring providers, and patients. You can help these initiatives by encouraging others to share their experiences and preferences.

“These projects present a tremendous opportunity to improve the delivery of evidence-based radiologist-recommended follow-up care,” says Nadja Kadom, MD, chair of ACR's General Radiology Improvement Database Committee. “As a result, we expect to see a greater volume of patients benefiting from the early detection of cancer or other treatable conditions and significantly better outcomes.”

To complete the survey, visit acr.org/Excellence-Initiative.

ACR Guidance Can Help Radiology Facilities Resume Non-Urgent Care

New ACR guidelines can help radiology practices, as safely as possible, resume offering mammograms, oncologic and orthopedic imaging, image-guided biopsies, and other non-urgent imaging previously postponed due to the COVID-19 pandemic. The guidance, published in the *JACR*[®] in May, helps practices make informed decisions on when, where, and how to once again offer these non-emergency services.

“Radiology practices largely followed WHO, CDC, and ACR guidance to postpone non-urgent care,” says ACR BOC Vice Chair Jacqueline A. Bello, MD, FACR. “While local conditions prevent a single prescriptive strategy to resume such care, general principles can apply in most settings. These ACR recommendations can help practices safely and efficiently resume non-urgent care in areas where pandemic conditions allow.”

Read the guidance at bit.ly/JACR_COVID.



ACR Research Featured at ASCO 2020

Research conducted by NRG Oncology — one of the National Cancer Institute's National Clinical Trials Network groups based out of the ACR's Center for Research and Innovation (CRI) — was featured at the 2020 annual meeting of the American Society for Clinical Oncology, held virtually in May. The research included three NRG Oncology clinical trials presented as posters and three presented orally in main sessions, including:

- Follow-up analysis on ¹⁸F FDG PET/CT scans taken from the clinical trial NRG-HN002, which sought to determine whether 12–14 week post-treatment PET/CT scans could correlate with locoregional control or progression-free survival outcomes for patients with locoregionally advanced oropharyngeal cancer.
- Results from a study (NRG-RT0G 1114) of the addition of low-dose, whole-brain radiotherapy to a methotrexate-based chemotherapy regimen consisting of rituximab, methotrexate, procarbazine, vincristine, and cytarabine. Researchers on this trial aimed to determine if the experimental treatment could improve progression-free survival for patients with newly diagnosed central nervous system lymphoma.
- Results from the NRG-RT0G 1010 trial combining the monoclonal antibody trastuzumab to trimodality treatment of chemotherapy, radiotherapy, and surgery for patients with newly diagnosed, *HER2* overexpressing esophageal cancer. Researchers on this trial aimed to discover whether the combination treatment improves disease-free survival outcomes for this patient population.

NRG Oncology conducts practice-changing, multi-institutional clinical and translational research to improve the lives of cancer patients. NRG Oncology involves a network comprised of medical oncologists, radiation oncologists, surgeons, physicists, pathologists, statisticians, and more than 1,300 research sites worldwide.

To access NRG Oncology research, visit nrgoncology.org. To learn more about the ACR CRI, visit acr.org/Research/Clinical-Research.



IMAGING 3.0: COVID-19 Response

Radiologists are playing a critical role in the national COVID-19 pandemic response. The case studies at acr.org/Imaging3-COVID highlight how radiologists are contributing to the response and outline actionable steps for others to follow.

A Moral Duty

In response to the personal protective equipment shortage, radiologists and engineers at Vanderbilt University Medical Center have designed a reusable surgical mask that can be easily crafted on any 3D printer.

The team is currently testing the design and plans to eventually make it available at no cost so that healthcare providers can use it to print their own masks for protection from COVID-19 and other communicable diseases.

Read the case study at acr.org/Imaging3-MoralDuty.

A Shock to the System

In a new case study, Syed F. Zaidi, MD, chair of the Population Health Management Committee of ACR's Patient- and Family-Centered Care Commission, discusses the importance of health equity as the pandemic poses a formidable challenge for underserved communities where many imaging clinics face tough economic headwinds.

"Once some of these practices and centers close up, they might never come back," Zaidi says. "The care would shift to hospitals, which could be located far from a given community. In that scenario, uninsured patients and those with high deductibles would have more out-of-pocket costs to bear since, on average, imaging costs are higher in hospital settings than in outpatient imaging clinics. It would become more challenging for patients to obtain appropriate preventive care and basic follow-up, likely resulting in patients presenting with more advanced states of disease."

Read the full case study at acr.org/Imaging3-ShocktotheSystem.



Working the Wards

Dania Daye, MD, PhD, an IR fellow at Massachusetts General Hospital, spent four nights caring for COVID-19 patients in the wards.

In a Q&A, Daye shares insights from her experience. She discusses providing clinical care to patients, talking with families about end-of-life wishes, admitting patients to the hospital, coordinating intensive care transfers, and witnessing the impact of healthcare disparities during her time in the wards.

Read the full case study at acr.org/Imaging3-WorkingtheWards.

Heard on Social Media



Yiing Hu, MD, MSc
@yiinghu

Diversity & inclusion are essential for achieving #HealthEquity. Grateful for the opportunity to lead a subcommittee dedicated to making radiology more inclusive for all, & for the mentorship of the ever-inspiring @ShadiEsfahani and @AnnaLeeMDMPH on my 1st term serving in @AAWR_org.

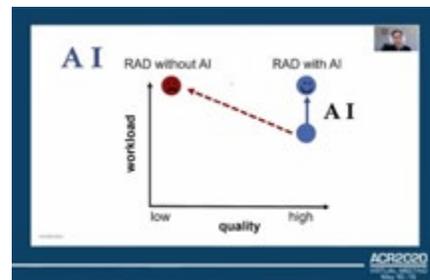


May 13, 2020



Join Y Luh, MD
@j_luh

Excellent graphic showing the role #AI plays in #quality and #physicianwellness by @RadiologyACR president @DrDMonticciolo at #ACR2020



May 18, 2020



Michelle L Dorsey, MD
@M_Dorsey_MD

No virtual badge but I'm enjoying a beverage from my #ACRBulletin tumbler! #ACR2020 #radxx @RadiologyACR



May 13, 2020



The pandemic has accelerated radiology's role in the utilization management of medical imaging. It has pushed referring physicians and patients to think carefully about the exams they order and undergo, respectively.

— Krishna Nallamshetty, MD, president of Radiology Associates of Florida and executive vice president of Radiology Partners, at bit.ly/DI_Nallamshetty



ACR Career Center Expands COVID-19 Imaging Postings



The COVID-19 pandemic has begun to spur massive changes in the way businesses operate in the U.S. — radiology being no exception.

The ACR Career Center observed a growth in both CT and teleradiology postings, and job seekers were also more likely to search specifically for teleradiology openings.

More than 500 new jobs were posted during the beginning of the pandemic in March, and almost 540 applications were sent to employers who were actively hiring. The Career Center is also seeing a growth in employers looking for radiologists to help read the increased volume of COVID-19-related imaging. This growth began as states started closing to prevent the spread of the disease and as practices and hospitals halted elective imaging.

For more information about the ACR Career Center, visit jobs.acr.org.



ASRT Celebrates 100 Years

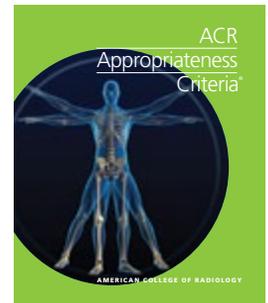
Founded in 1920, the American Society of Radiologic Technologists (ASRT) is commemorating its centennial anniversary with a year-long series of initiatives that pay tribute to the organization's seminal role in shaping the radiologic sciences and promoting the advancement of RTs.

Throughout the year, ASRT is highlighting its mission to elevate the medical imaging and radiation therapy profession and enhance the quality and safety of patient care. The association's centennial web page uses an animated, interactive timeline to chart the milestones that shaped the profession and includes information and facts about the history of the world's largest radiologic science association.

Learn more about the centennial at asrt.org/100.

New Updates to ACR Appropriateness Criteria

The ACR released an update to its Appropriateness Criteria® (AC), which includes 193 diagnostic imaging and IR topics, with 942 clinical variants covering more than 1,680 clinical scenarios. This update includes four new and 12 revised topics. All topics include a narrative, evidence table, and a literature search summary. Patient-friendly summaries — written with patients, for patients — are also available for a number of topics.



“Our goal for the Appropriate Use Criteria is to create consistent behaviors for medical imaging and IR procedures for all patients,” says Frank J. Rybicki, MD, PhD, FACR, chair of the ACR Committee on AC. “The ACR AC continue to be a comprehensive and critical resource that help providers fulfill the new PAMA requirements while ensuring the highest-quality care.”

The ACR AC were first introduced in 1993 by expert panels in diagnostic imaging and IR to help providers make the most appropriate imaging or treatment decision for specific clinical conditions.

To view the full list of new and revised topics, visit acr.org/ACRUpdatesAC.



A Roadmap for Patient and Family Engagement

The ACR Commission on Patient- and Family-Centered Care is working with patients, family members, radiologists, and others to enhance the first toolkit for radiologists designed to improve patient- and family-centered care. Equip your practice or institution for more patient-focused care through a collection of free online tools and resources that prioritize the needs, wants, and values of patients and communities. Tools vary from simple-but-effective patient infographics to a detailed guide for patient and family engagement and include articles, graphics, videos, checklists, and case studies.

To access the ACR PFCC Toolkit, visit pfcc toolkit.acr.org.

By Gregory N. Nicola, MD, FACR

Waves of Change

In the wake of COVID-19, the Commission on Economics is looking at alternative ways to pay radiologists who practice enhanced forms of accountability, especially in areas of care gaps.

As of this writing, the world is still in the grip of the COVID-19 pandemic. I cannot write an economics column without acknowledging the extreme difficulties our patients, members, practices, staff, and families are facing. Radiology and radiologists will survive, and I am sure we will hear countless stories of true leadership within the profession. The College has had a long line of leaders throughout all of its commissions, and I would be remiss if I did not thank my predecessor, Ezequiel “Zeke” Silva III, MD, FACR, for his tremendous dedication to our specialty. Zeke is a unique asset who has and will continue to bolster the position and reputation of radiologists throughout the medical community.

As the new chair of the Commission on Economics, I will lead a team of highly dedicated and skilled ACR volunteers, supported by equally skilled staff. COVID-19 is the first of many challenges we will face. I won't claim to have all the answers, but I will promise to respect the central thesis of a quote previously attributed to former CMS Administrator Donald M. Berwick, MD. According to the story, Berwick was asked how he planned to transition the massively expensive U.S. healthcare system from fee-for-service (FFS) to value-based. He answered, “There is only one way, and that is to learn our way out of it.”

We are a specialty that will need to learn our way out of many things, including devaluation of our services, lack of accountable quality metrics, inappropriate utilization of imaging, and inconsistent management of incidental findings. These are just a few of many roadblocks we must continue to navigate. I can assure you that the Commission on Economics will lead these charges, while protecting our FFS payments. However, we would be shortsighted not to recognize a mounting tidal wave of change around us, and we must learn how to participate in such change.

While the radiologist's role in alternative payment models (APMs) and the central thesis of Imaging 3.0[®] help define a path forward to value-based care, they lack the gravitas of a true burning platform that spurs real urgency.

Our profession should heed a valuable lesson learned during the early phases of COVID-19. A sizeable number of those with this virus are asymptomatic carriers. These carriers are helping spread the infection to those at risk of serious respiratory illness. Governments across the globe must define rules and hold their citizens accountable to these rules to stop the spread of this potentially lethal infection. Like the asymptomatic carriers, the argument goes that radiologists have no direct accountability to patient care or well-being. However, similar to the culturally sensitive accountability rules disparate governments are prescribing during the COVID-19 crisis, our accountability may not be as obvious at face value. Yet we must acknowledge and embrace accountability. We are a specialty that will need to learn our way out of many things, including devaluation of our services, lack of accountable quality metrics, inappropriate utilization of imaging, and inconsistent management of incidental findings.

While radiologists are certainly accountable for the care we provide our patients, what can we do better?

The answer has significant payment implications as it will serve as the cornerstone of our transition to value-based care. Under Zeke's leadership, this charge has already been formalized. The Commission is actively looking at alternative ways to pay radiologists who practice enhanced forms of accountability, especially in areas of care gaps. For example, who is ultimately responsible and best suited to manage incidental radiographic findings? The answer is complex, but if radiologists are willing to participate, shouldn't there be ways to financially reward those services?

Unfortunately, more than payment gaps limit our participation in APMs. The College has responded by formulating a multi-pronged and multi-commission approach, including metric development, requesting reversal of regulatory language prohibiting radiologists from ordering downstream studies, and addressing economics and technologic barriers in our local practice. The Commission will continue to fight for you, and together we will learn our way out of any adversity that comes our way. **B**



The ACR's Commission on Economics invites you to review the regularly-updated ACR COVID-19 Economic and Regulatory Updates for Radiologists available at [acr.org/COVID-19](https://www.acr.org/COVID-19).



Become a Change Agent

The Radiology Leadership Institute® (RLI) provides the training and services you need throughout your career to ensure sustainable success in modern healthcare. Whether you need help addressing your practice's culture, employing change management solutions, or expanding your leadership skills to advance your career, the RLI has a robust portfolio of programs to ensure you — and radiology — succeed. Learn more and enroll at acr.org/RLI.

CHANGING DIRECTION

In the wake of COVID-19, leaders must employ change management solutions to drive life-saving innovation in radiology.

“We should be fearful of complacency — it is a fatal problem,” says ACR Vice President Alexander M. Norbash, MD, MS, FACR, professor and chair of radiology at the University of California, San Diego, and faculty member with ACR’s Radiology Leadership Institute® (RLI). “You can’t allow a focus on recovering from change to dull your interest in dynamically moving forward.”

This is a core tenet of change management, a long-accepted business discipline aimed at creating successful transformations by moving away from the status quo toward a desired change. Being prepared for a new or altered process is critical to the success and sustainability of adapting to new ideas.¹

For radiologists, change may be driven internally — to improve efficiency, quality of service, structured reporting, or economic return, as examples. Change brought about by external mandates could include compliance with new laws, new reimbursement policies, new board education requirements, or the introduction of new technologies. The implementation of new or modified operational or strategic plans can be disruptive for practice managers and radiologists — requiring considerable energy, time, and resources.

Avoiding the cost of addressing potential disruptors to everyday practice can feed a business-as-usual mindset. To avoid being caught unprepared — for the spread of AI, mergers and acquisitions, or even a pandemic like COVID-19 — radiology leaders must tap into the wisdom and determination of a core group with a common vision, Norbash says. “Management is kind of pedestrian — it is a bit of an accounting thing where you are trying to make sure you are falling within budget and following the rules,” he says. “Leadership has to do with the charisma and power of an idea, how you generate that idea, and how people are drawn to it.”

START NOW

Change management starts with a vision — a plan to adapt to possible, inevitable, or even unthinkable disruptions in current practice. That vision often evolves from what you know or suspect you are facing, says Frank J. Lexa, MD, MBA, FACR, chief medical officer of the RLI and chair of the ACR Commission on Leadership and Practice Development.

“Change management comes in many flavors, and certainly there’s a difference between changes you successfully anticipated and changes you did not,” Lexa says. “The latter is the realm of crisis management, where you are in one way or another reacting to something you either didn’t expect or didn’t adequately prepare for.”

According to Lexa, disruptors to everyday workflow that radiologists might see coming could include new technology, such as disruptive imaging technologies or machine learning tools. They might be facing a reduction in pay or new regulatory requirements, Lexa says. “These are things that could add hours to a radiologist’s week or cause financial or labor pressures that ultimately make the specialty less attractive,” he says.

Being forward-looking with hiring practices also falls under the purview of change management. “If you are looking at substantial changes to how radiologists are practicing, you might question if there is going to be an adequate workforce for the amount of imaging we will be doing and how we’ll be doing it,” Lexa says. “Do we have enough radiologists everywhere in the U.S. to read cases? Are we really adept at using teleradiology?” The ratio of specialists to general radiologists is something to evaluate, as is how radiologists are deployed for coverage, Lexa says.

Some radiology groups do remarkably well at overcoming these types of logjams, Lexa says. “They don’t wait for things to happen then react. They plan, they anticipate, they pay attention,” he says.

Determining the best place and use for radiologists has

“We need to pay close attention to what we are learning from this instance. The last thing we want to do is breathe a sigh of relief at the end and go back to business as usual.”

— Alexander M. Norbash, MD, MS, FACR

been a hot-button issue during the COVID-19 pandemic — an event even most change agents could not have anticipated. Applying the lessons learned once the crisis passes is another matter.

PREPARE WITHOUT WARNING

“Many people thought something like COVID-19 wouldn’t happen in their lifetimes,” Norbash says. “We need to pay close attention to what we are learning from this pandemic. The last thing we want to do is breathe a sigh of relief at the end and go back to business as usual.”

According to Norbash, one unmistakable lesson has come from the availability and proper use of personal protective equipment (PPE). “Up until this crisis, I would say 80% of my department had not watched a PPE video,” Norbash says. “For example, most of us didn’t realize that as you are taking off PPE, you use hand sanitizer in between every single step. You take off your goggles, you sanitize your hands; you take off your mask, you sanitize your hands; you take off your gown, you sanitize your hands.”

As another example, having home teleradiology workstations seems wise, so your faculty are not exposed to danger, Norbash says. “But you want to spend an equal amount of energy and effort to make sure the RTs, nurses, front desk people, transporters, and your residents are safe,” he stresses.

Post-COVID-19, radiologists (and everyone in the house of medicine) are going to have to examine the size and scope of their workforce, Norbash insists. Income will drop, and saving for a rainy day might matter more, he says. “We’ll have to reevaluate how convertible our individuals in academic medical centers may be — in terms of if there is a sudden drop in breast screening, for example, what do we do with those practitioners?”

In times of upheaval, it is an opportunity to reexamine everything, Norbash adds. “How are we imaging? What’s happening with point-of-care imaging and with remote interpretation? How do we crowdsource around interpretation of radiologic images, and how are we introducing AI to decrease our workload?”

LEARN BY CRISIS

“It’s interesting how you can fast-track initiatives you’ve been trying to do for years — things like home workstations or telehealth,” says Dana H. Smetherman, MD, MPH, FACR, chair of the department of radiology and associate medical

director for medical specialties at Ochsner Medical Center in New Orleans.

“COVID-19 compelled us to implement changes we had already considered,” Smetherman says. “Our neuro IR clinics are now all virtual. In 2019, our whole health system did only about 2,500 video visits for all of our clinicians. We now do more than 3,000 a day,” she says. “For years we couldn’t pull that off. This digital disruption we’ve heard about in meetings for a decade basically happened in a week.”

Some innovations propelled to the frontlines during the pandemic may not be rolled back, Smetherman says. “The rapid transition to telehealth is a genie that will not be put back in the bottle,” she says.

“It has been surprisingly well-accepted in our institution by both patients and our clinical colleagues,” Smetherman says. “I could envision a day when the people on-site at healthcare facilities are RTs, some IRs, surgeons, and breast imagers — everything else would be done digitally.”

“I feel like the disaster management skills that we got from Hurricane Katrina definitely translated [for this pandemic]. This is an example of how you should never waste a good crisis,” Smetherman says. “We have a robust employee stress and psychological assistance system in place now. There is a social worker or a psychologist rounding with every COVID team. If you have these resources available to you, I would encourage your staff to use them.”

While these resources are valuable, as a leader your physical presence in crises is critical, Smetherman stresses. “It would be very difficult to lead remotely during something like this,” she says. “Your team has to feel like you are there for them, alongside them.”

WELCOME ALL-COMERS

Beyond a crisis situation, it behooves radiology leaders to employ change management solutions with the input of individuals who can adapt quickly, Norbash says. “Solicit ideas,” he says. “Some people may turn out to be dangerous risk-takers. Or they could be the change agents you need.”

Once you identify potential disruptors to change and have a clear vision of how to adapt, build a team that welcomes opportunities for innovation. “The team you build should have the same core values and goals,” says Michael P. Recht, MD, Louis Marx professor and chair of the department of radiology at NYU Langone Medical Center. “That doesn’t mean

Addressing the Need for PPE

In response to the PPE shortage, a radiologist and radiology resident from Massachusetts General Hospital’s Medically Engineered Solutions in Healthcare Incubator worked together to create a simple design for low-cost face shields that anyone can easily assemble without machining. The design calls for using readily available materials: clear binder covers, weather stripping, and elastic roll gauze. Read the Imaging 3.0® case study at acr.org/Imaging3-ExpertDesign.



they have to be like you, or even agree with you. It's okay if they are your critic."

Change management isn't predicated on the experience level of team members working to accomplish the same goals, Recht says. Mid- to late-career team members have a lot to offer in terms of trying new ideas, he says. "I have also brought on some very junior level people who have distinguished themselves as really smart, strong, and innovative thinkers," he adds.

Your best shot at success starts with a diverse team with different skill sets, Recht says. "You have to have people with different points of view." Members of the team should speak openly and disagree, he says. "But once the team has made a decision, every member has to accept that decision and move on."

Team leaders are no exception. "Don't get too attached to any idea, especially if it's your own," Recht cautions. "We all love our own ideas, but at some point, if it is not working you have to say, 'We tried it, it didn't work — what did we learn from it?'"

The use of AI in radiology presents a good example. "There may be members of your team who say AI isn't ready for primetime — and they might have valid arguments," says Recht. You don't want them off the team just because they disagree with the majority of the group though, he says.

REIMAGINE THE PROCESS

Progress can be slow. "You don't want to run into analysis paralysis, where you keep arguing over the same thing year after year and there is never a decision," Lexa says. The key to successful change management is to look at the whole board of ideas and possible outcomes, he says. "If you're going to do change management effectively, you need to treat it as a process."

There will be roadblocks, as some people inevitably slow the process of moving forward. "Sometimes it's just laziness and sometimes a person's resistance to change is well-intentioned," Lexa says. "Then there are people who just don't want to see anything change. They might have some advantage or secondary gain from preventing anything from changing."

It is important to remember that leaders are imperfect and can be replaced, Norbash says. Radiologists who aren't currently in a position to drive innovation and change must prepare now, he says, by connecting with like-minded individuals. "They should be seeking out experiences that help them become more innovative thinkers — and better

leaders themselves in the future," he says.

"We're starting to do more as radiologists in coming together to share what we are learning," Norbash says. "We're asking other groups how they are handling problems and to share ideas." Social media, he says, is playing a big role in that. "It gives us the ability to connect quickly and effectively across the country and leverage our strengths in a very fundamental way," he says.

"You have to be able to adapt quickly," Recht says. "Don't get locked into place." Radiology departments need to be agile and should use the same tools other industries have employed, he says. "We've been really big on using informatics and analytics. Many radiology departments don't. They are still managing without those tools, which I think are absolutely necessary to make the right decisions."

"I try to picture what might happen five years from now," Recht says. Even that is a tough timeframe the way things change so rapidly, he says. "Few people would have predicted five years ago, for example, that AI would be where it is today."

Whatever the potential disruptor you are trying to manage or anticipate, Recht says, you should always consider whether the solution is truly going to help patients or is ultimately for financial gain and security. There is an ethical component of change management that must drive the innovation, he says.

"I think we all worry about the financial ramifications, but ultimately we have to be true to ourselves," Recht says. "We want to survive and we want to do well. But you have to be able to look yourself in the mirror and say that what you're doing is right for patients."

Current radiology leaders are well-positioned to challenge the status quo and remove barriers to collaboration — if they continually adjust their outlook based on lessons learned. The COVID-19 pandemic serves as a reminder that they should never forget what they are going through in the present, Norbash says. "Remembering what is happening right now will ensure that complacency never impacts our children and grandchildren." **B**

By Chad Hudnall, senior writer, ACR Press

ENDNOTE

1. Fleishon H, Muroff LR, Patel SS. Change management for radiologists. *J Am Coll Radiol*. 2017;14:1229-1233.



Change Management for Radiologists

Leading a team through challenging times requires familiarity with an organization's culture, people, and structure. With changes occurring throughout healthcare and within the field of radiology itself, it will be increasingly important for radiologists to adopt the principles of change management in their practices. Learn more in the JACR® article "Change Management for Radiologists" at bit.ly/Change_Rad.

FRONT LINES



▲ The USNS *Comfort* is pictured sailing into New York Harbor as part of the COVID-19 pandemic relief efforts in New York City.

▶ Lt. A. Scott Morris, MD, USN, is pictured on his arrival in New York on March 30.

On a Mission

A radiologist shares his experience working on the front lines in the fight against COVID-19 aboard the USNS *Comfort*.

As New York's COVID-19 caseload ballooned into the thousands during the first wave of the outbreak, the city requested backup: the increasingly overwhelmed hospitals needed somewhere to treat patients who needed care unrelated to coronavirus. The United States Naval Ship (USNS) *Comfort* had a thousand beds and a large healthcare staff and crew — and the ship headed to the aid of the beleaguered New York health system.

Among the 600 doctors, nurses, and other crew on the ship was A. Scott Morris, MD, a Lieutenant in the Navy's Medical Corps. Morris, who led the radiology division, reported for duty on the Navy hospital ship on March 18 and returned to Norfolk, Va., on May 2, after New York's health system was more stable and the ship's mission was complete. In a recent interview, Morris shared how the ship provided comfort to patients and relief to healthcare personnel — and also saved lives.

How did the radiology unit function on board the ship?

We had a total of 21 enlisted personnel, comprised of 20 RTs and one noncommissioned chief petty officer, and five radiologists — four diagnostic radiologists and one IR. We were able to provide services in conventional radiography, fluoroscopy, CT, US, and IR.

How long did it take for the ship to get into a rhythm of diagnosis and treatment?

Our original mission was to only treat patients who did not have COVID-19, but that changed within the first week. Early on, there were several pneumonia patients who had negative nasopharyngeal screening tests — in several cases, multiple negative tests — but continued to worsen clinically on antibiotics. CTs were performed, and the findings showed high probability for COVID-19, which led to bronchoscopy and induced sputum — which turned out to be positive.

After about a week, we increase in our patient population, particularly in the ICUs. We went from very few ICU patients to treating nearly 40 at one time over the course of 10 days. One evening, our ICU accepted 11 or 12 patients during a two-and-a-half hour period. While much of the focus was on COVID-19 patients, we treated a wide array of medical and surgical patients as well.

Were you ever afraid for your own health and well-being?

There was certainly a concern of contracting the virus. However, we used appropriate PPE when involved in direct patient care with a COVID-19 positive patient, and no radiology personnel ever developed symptoms of the virus. All radiology equipment was also sanitized and left to dry for one hour after use with a COVID-19-positive individual.

What was it like being on the USNS *Comfort* in New York City during the peak of the pandemic?

As a service member, it was an honor to provide medical care to our countrymen here at home. Very few civilians ever come in contact with the military directly (as we are designed to operate abroad) so this provided an opportunity for people to see us in action. However, it was difficult being away from my wife, Natalie, and my two-year-old daughter, Audrey. Fortunately, we had excellent cell phone service and I was able to communicate with them daily. We developed a great working relationship with our critical care colleagues, and we provided excellent care to the people of New York. **B**



Radiologists have been playing a critical role in the national COVID-19 pandemic response. The case studies at [acr.org/Imaging3-COVID](https://www.acr.org/Imaging3-COVID) highlight how radiologists have been contributing to the response and outline actionable steps for others to follow.

Making the Grade

For 15 years, ACR's Case in Point has brought radiologists fresh, interesting cases and CME opportunities.

15th
ANNIVERSARY
Case in Point

Fifteen years ago, several radiologists had a great idea: create a case-based educational tool that was accessible to physicians at every level, from medical students to

the seasoned radiologist. After attempts at other institutions, Case in Point (CiP) landed at the ACR, where it has flourished. Thousands of submissions, and thousands of cases and CME credits later, CiP continues to bring new and exciting cases to your inbox. Why has CiP flourished for so long? Here are five reasons:

1 CiP is flexible. CiP cases focus on a variety of topics and formats, including the issues radiologists might see every day in the reading rooms — as well as more complicated topics and aspects of patient care, such as communication. “No case is cookie cutter,” says CiP Editor-in-Chief Kitt Shaffer, MD, PhD, FACR, professor of radiology at Boston University Medical Center. “Each one has a different level of interactivity and appeals to every type of reader.” What’s more, the CiP editors and staff keep up with the times. CiP was among the first online teaching tools to feature COVID-19 cases. Aware of the growing need for coronavirus-related content, CiP staff solicited cases from ACR members and worked around the clock to fast track them so that radiologists could start becoming familiar with the clinical presentation of the virus. While users can sign up for the case-of-the-day email, they can also access the substantial archival case collection.

2 CiP is realistic. One of CiP’s main goals is to emulate cases that radiologists might see each day in their practice. Each case features a brief history, image-based questions, differential diagnoses, and discussions of the diagnosis. “We try to design cases so that they walk radiologists through the case as it was presented, from presentation to diagnosis and follow-up,” says Shaffer. “I think that’s very attractive to both practicing radiologists as well as residents.”

3 CiP is an effective teaching tool. One of Shaffer’s favorite things about CiP is that it comes in easily

digestible bites of information. Education and CME credits are difficult enough to obtain during a radiologist’s busy day; CiP helps fit it in. And as users move through the daily cases, the program can provide feedback on performance over time.

With over 4,200 cases, CiP also covers a variety of topics. Michael J. Opatowsky, MD, MBA, a neuroradiologist with Baylor University Medical Center and a CiP editor, says he finds it useful to look at cases in other specialty areas so that he can stay up to date. He adds that CiP’s archival tool has been helpful during daily readout sessions. “I’m often able to tell my medical students, residents, and fellows about a case I’ve seen on CiP and refer them to the archives for more content that helps them understand a particular diagnosis,” he says.

4 CiP is an entry point for publication. Anyone — from medical students to established radiologists — can submit a case. From there, the case is peer reviewed by a panel of radiologists for accuracy, utility, and image quality. According to Shaffer, “It’s a great opportunity for medical students and residents to see the publication process from beginning to end. CiP gives younger submitters a sense of what’s involved in a case and how it should be put together to ensure publication. They have to think about teaching points and about the evolution of the case. Given enough guidance, it’s easy and it’s a positive first experience with publishing.” Opatowsky adds, “By the time residents at my institution complete their training, most of them have published at least one CiP case.”

5 CiP is always looking to the future. Over the years, CiP editors have worked hard to ensure that the program meets all its users’ needs, including creating a searchable archive and lexicon — as well as more substantial references and resources. But editors aren’t resting on their laurels. “We’re looking into more streamlined and robust ways to submit case material so that publication time is decreased,” says Shaffer. “We’re always thinking of ways to improve the program for our users.” **B**

By Meghan Edwards, freelance writer, ACR Press

Free COVID-19 Cases

To further support the radiology community during the pandemic, Case in Point has provided public access to all COVID-19 cases that have been submitted. Please note: CME is not offered for these cases. To access a case, click on the case title and login at cortex.acr.org/cip.

Crisis Management

As the COVID-19 pandemic wears on, private practice radiology leaders take action to ensure quality patient care — and the long-term viability of their businesses.

Healthcare systems worldwide are nearing capacity as a result of the COVID-19 pandemic. As infections continue to mount, the medical community has been forced to divert resources away from elective procedures and routine screenings to treat coronavirus patients and reduce the spread of infection. Combined with an environment where unemployment is rising and many are losing insurance coverage, specialties like radiology have seen a drastic reduction in patient volumes. For radiology, this means a precipitous drop in non-urgent imaging and image-guided procedures, which make up a significant portion of overall patient volume and revenue.

Although some intrepid radiologists have entered the front lines of the COVID-19 wards, seeking to lend their expertise where they can, most imaging professionals have had to decrease their involvement in patient care. For private-practice radiologists in particular, this has resulted in rescheduling many imaging exams, indefinitely postponing others, and planning ahead to keep their businesses afloat through an uncertain time.

Delaying Care

“Our independent, private practice has been in existence since 1904,” states Samir B. Patel, MD, FACR, diagnostic radiologist, value management program founder, and executive board member at Radiology, Inc., a private radiology practice in Mishawaka, Ind. “The practice has endured the flu pandemic of 1918, the Great Depression, multiple recessions, a spinal fungal meningitis epidemic in 2012, and two world wars. Prior challenges were successfully navigated through resilience and strong leadership, which we are confident will lead us past this pandemic.”

Patel notes that his group has successfully navigated past challenges through resilience and strong leadership. It’s this kind of determination that has led Patel, who is also a board member of Beacon Health System, the region’s largest healthcare entity composed of seven hospitals, and his colleagues at Radiology, Inc., to work

around the clock managing this crisis, from both a patient care and a financial standpoint. In addition to Beacon Health System, the practice provides professional services for three hospitals from two other health systems as well as a multispecialty independent clinic — each of which has different policies in terms of exam rescheduling and patient management.

“Overall, our imaging volume is down about 45%,” Patel explains. “We have not rescheduled screening exams, electing instead to suspend them indefinitely. This is because it is difficult to predict if volume levels will remain normal because of multiple variables. Other exams will be rescheduled in accordance with individual sites’ global response plans, which include imaging and non-imaging procedures.” Beyond this, Patel notes, radiologists are reviewing previously scheduled outpatient imaging exams to determine their urgency. If delaying an exam would negatively impact a patient, typically determined after direct communication with the ordering provider, the procedure would be performed as scheduled.

When it comes to rescheduling exams, many practices across the country are aiming to ramp up appointments once newly diagnosed COVID-19 cases begin to decline. Robert S. Pyatt Jr., MD, FACR, chair of the radiology department at Wellspan-Summit Hospitals, anticipates a return to normalcy in the early summer. “In our county, COVID-19 cases are increasing to some degree,” notes Pyatt, who is also chair of the ACR’s Commission on General, Small, Emergency and/or Rural Practice. “But we are hoping the statewide stay-at-home orders will be lifted by early June.”

Although the majority of Chambersburg Imaging Associates’ routine procedures have been rescheduled, Pyatt anticipates that some rescheduled patients may be reluctant to return until they feel that the crisis is truly over, which may push back their appointments even further. Because of this reality, Pyatt sees his group’s approach as a phased-in return to normalcy. “It will take a majority of patients some time to feel that it is safe enough to return,” notes Pyatt. “The more that radiology practices can assure patients of their return to a safe environment, the better.”

Daniel Ortiz, MD, musculoskeletal and general radiologist at Summit Radiology Services, P.C., a 25-person independent practice in northern Georgia, echoes the merits of this phased-in approach to patient scheduling. “Temporary care delay is completely appropriate and necessary,” states Ortiz, who is immediate past chair of the ACR’s Resident and Fellow Section. “But eventually, we will have to adapt to an intermediate phase, with protections in place that ensure patients can

get their routine care.” Ortiz believes that summer makes for a good target to be operating at, or close to, optimum patient volume.

Adjusting Finances

Care delays not only have ripple effects for a patient’s long-term health, but also for the ongoing viability of practices of all sorts, particularly private practices. To contend with monetary shortfalls, groups across the nation have adopted a broad array of approaches, from instituting hiring freezes and salary cuts to, in some cases, furloughs and layoffs.

Pyatt predicts that some rescheduled patients may be reluctant to return until they feel that the crisis is truly over. For Pyatt’s group, which sees itself as an extended family and maintains a culture of inclusiveness, laying off employees hasn’t been an option. “We have looked to decrease multiple expenses,” notes Pyatt. “These include outside moonlighter radiologists on weekends, and teleradiology expenses. We have also eliminated bonuses and dividends from joint ventures, along with reducing or eliminating partner paychecks in exchange for funding their pensions.”

To smooth out any bumps in the road ahead, the practice leaders at Summit Radiology Services have started at the top when it comes to making sacrifices. “My practice’s partners chose to defer their bonuses and take a base salary cut to preserve the salaries of associates and employees,” explains Ortiz. “This stands in stark contrast to some of my friends in other groups who have experienced up to an 85% salary cut. Given the low volumes and need for fewer radiologists at this time, the partners are being given extra time off, since they took the financial impact.”

As for part-time staff, Pyatt is looking to keep them in house as well. “We plan to use our part-time radiologists two weeks per month in May and June, and hopefully more in July,” he says. “It would be difficult for them to find new jobs right now given the circumstances, and since we value them as key members of our team, we can provide some income each month.”

Pyatt thinks that although it will take at least a few months for patient volumes to return to form, once the first wave of the COVID-19 pandemic abates, it will have to be all hands on deck. “Our radiologists and staff members are being advised to plan on working longer hours on weekdays and more weekend hours once patients begin returning. With that, there is concern for increased burnout, as less vacation time will likely be allowed during the ramp-up.”

Anticipating Volumes

While some groups are anticipating that patient volumes will rise steadily to meet past levels, others suspect that

patients may be slow to return to imaging for a number of reasons, including a loss of health insurance due to unemployment or out of a fear of contracting the illness until a vaccine is approved. If patient volume doesn’t rebound over the next 12 months or more, says Patel, “our practice leaders, with input from all of our team members, would discuss how to right-size the organization.”

Ortiz believes that, although patient volumes might not rise precipitously in June, radiology will remain in a strong position coming out of this first wave of the epidemic. “Our current plan anticipates a return to near-average volumes by balancing the factors driving down volumes, such as a loss of insurance coverage and attendant economic concerns, and those driving them up, such as a backlog of canceled routine cases.”

Ortiz anticipates a return to near-average patient volumes by this summer. Like Ortiz, Pyatt is optimistic about his group’s ability to endure the next year or more. “Safety-wise, seven of our 11 radiologists have PACS at home, so that will prepare us for the next wave of infection. Our part-time radiologists are flexible with their work hours, and our partners will take significant pay cuts to weather the low points that might happen in the late fall or winter.”

Bridging the Gap

Beyond internal bookkeeping and reading scans from home, applying for available loans can mean the difference between private practices remaining open and having to close shop. The ACR has posted information on its website about how to apply for a Small Business Administration (SBA) loan to bridge challenging financial gaps. As the ACR website states, the Coronavirus Aid, Relief and Economic Security Act revised eligibility criteria, allowable uses, and other considerations to make SBA’s programs more inclusive, expansive, and useful.

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Leading During a Crisis

To help radiology leaders guide their practices, departments, and institutions through this unprecedented national health hazard, the ACR has collected several radiology-specific materials.

Free JACR® Webinar: COVID Recovery: Practice Management Post-Pandemic: This webinar brings together leaders from throughout the specialty to discuss how to move forward in the aftermath of the pandemic (bit.ly/JACR_COVID2).

Free ACR Webinar: What Might Your Practice Look Like Post-Peak COVID-19? Expert speakers discuss major changes they anticipate to their diverse radiology business and practice models, following the COVID-19 peak (acr.org/COVID-19).

RESIDENTS AND FELLOWS

Radiology on the Front Lines



Jeremy Ford, MD, MBA

A resident shares his experience working at the epicenter of the country's coronavirus outbreak.

Let me begin with a flashback to the beginning of the COVID-19 pandemic: I had been following the news coming out of northern Italy for several weeks. My Italian relatives were forwarding me stories of overrun hospitals, PPE shortages, and heart-wrenching moments. Little did I know that I was looking into my future.

Maria A. Mitry, MD, my co-resident at New York-Presbyterian/Weill Cornell Medical Center, and I got the call from our program director, Andrew D. Schweitzer, MD, at 7:37 p.m. on March 24, around my son's bedtime. I was being redeployed. After the call, I got the go-ahead from my wife. She said, "Do what you need to do. You are a doctor. This is your call to arms." I got back to Dr. Schweitzer with my answer: "Tell me when and where."

When I arrived at NewYork-Presbyterian in Flushing, N.Y., I found a hospital in the midst of an unprecedented surge. A medical resident handed me an N95. "Guard this with your life," he said. "It may be a few days before you can get another one." Fortunately, the PPE situation improved, with donations and bulk purchases pouring in from all over the world.

Maria and I were soon deployed to a brand new COVID-19 ICU, repurposed from a former cardiac catheterization recovery unit. Maria, who was kind enough to take the night shift, arrived at the unit around midnight. "The unit was empty," she told me. "Various learning materials and posters for cardiac catheterization patients were strewn across the unit. There weren't many supplies. It was a calm before the storm, but spirits were high at the time. Then we got three back-to-back admissions. By the following day, the unit was full."

The following weeks were a lesson on what happens when the curve is not sufficiently flattened, and a hospital is stretched beyond its capacity. While ventilators were the bottleneck getting the most press, many ICU patients were going into renal failure. Due to the

hypercoagulable state of COVID-19 patients, their dialysis machines would often clot. With a shortage of nurses, I was almost constantly drawing partial thromboplastin time tests, often alongside an orthopedic surgeon who had also joined the fight.

In an attempt to lift spirits, the hospital played Journey's "Don't Stop Believin'" every time a COVID-19 patient was discharged. However, on our unit, most patients continued to decline — regardless of our interventions. Hydroxychloroquine resembled a placebo. The discharge song was drowned out by the cacophony of monitor alarms and the far more frequent Code Activation Team announcements, which I would often hear in the silence long after I returned home from my shift. The only thing that kept our waning morale afloat was the emerging sense of comradery among the residents and attendings — many of whom I will never forget.

I began to wonder if this was how medicine was practiced before the age of antibiotics, biologics, and gene therapy. What is it like to be a doctor when the medicines stop working? We were all finding out.

I realized this is when our humanity as physicians must shine the brightest. I decided to call each patient's family, every day. Given the grim course of severe COVID-19, I was often repeating myself. "There are slight improvements in your daughter's lung function, but the kidneys are failing. This is a potentially deadly virus, but we are doing everything we can for them." Since families could not see their loved ones in person, FaceTime sessions became paramount. They would often ask, "Can they hear me?" I would respond, "I don't have scientific proof one way or the other, but I'd like to think that somehow, some way, they can hear you — or already know in their heart what you're about to say." Their cries of grief and devastated facial expressions are forever etched in my memory.

I understand the deep impact that this pandemic has had, economically and financially. However, there is no equivalency between the temporary loss of livelihood and the permanent loss of life — including the hole it leaves in the fabric of communities and families. The scar COVID-19 will leave on Queens and the broader New York City community will last for many years.

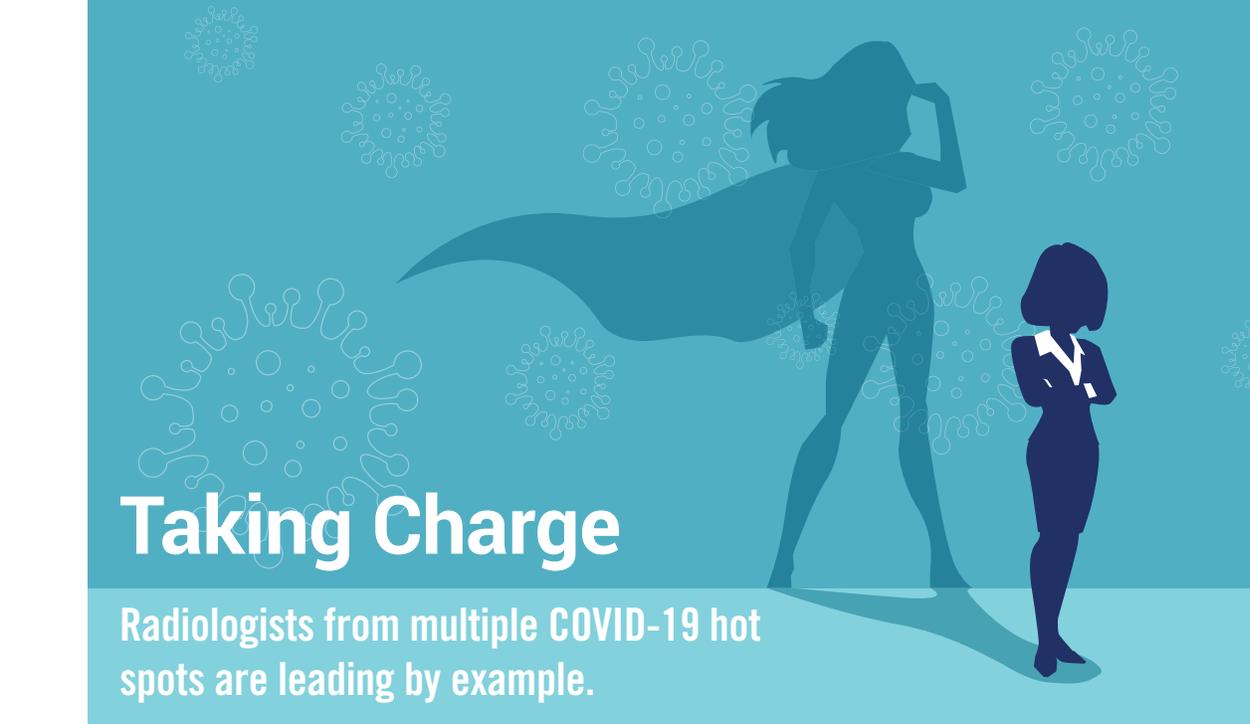
I hope we will all emerge from this stronger and better prepared, but I also hope we will emerge a little kinder. I am not the same person I was pre-COVID-19, but I hope my experience has forever made me a better doctor. **B**

Jeremy Ford, MD, MBA, is a radiology resident at NewYork-Presbyterian/Weill Cornell Medical Center. He would like to acknowledge the role of Maria A. Mitry, MD, for her contributions to this column.



Training Resources for Residents During COVID-19

The ACR is here to support radiology residency programs during the COVID-19 outbreak with free online residency training resources at [acr.org/COVID-Resident](https://www.acr.org/COVID-Resident).



Taking Charge

Radiologists from multiple COVID-19 hot spots are leading by example.

In times of crisis, such as the COVID-19 pandemic, we see the importance of leadership when people step up and are tested as leaders. During the April Radiology Leadership Institute's (RLI) Leadership Town Hall: Leading in Times of Crisis (available at bit.ly/RLITownHall_COVID), several radiology leaders highlighted key elements of leadership, some of the challenges they've faced, and how they've been able to step up and succeed. Among them were several women leaders who articulated the need for distributed decision-making and multi-level leadership — now more than ever.

According to Dana H. Smetherman, MD, MPH, FACR, chair of the department of radiology and associate medical director for medical specialties at Ochsner Medical Center in New Orleans, one cannot over-communicate as a leader during a crisis. "I think you have to use virtually every channel that is available to you," said Smetherman. "I round a lot. I make sure I'm seeing everyone and I ask them what they need. I'm on the phone and I'm texting with people."

Ochsner's health system has 19 owned, operated, and managed hospitals in Louisiana and Southern Mississippi, overseeing care of about 60% of the inpatients in the greater New Orleans area. According to Smetherman, the greater New Orleans area, in April, had the highest concentration of cases — more than 50% in the state of Louisiana. For Smetherman and her colleagues, these statistics added up to a dangerous situation — emphasizing the need for her to lead with humility.

"I've had to acknowledge that my decisions are a best guess," said Smetherman. "I didn't have months to come up with a fabulous strategic and implementation plan. I've had to let my team know over and over again that I'm not going to be perfect and I'm going to make mistakes. In a crisis, people at least appreciate that you're able to show your own clay feet."

Judy Yee, MD, FACR, chair of the ACR Colon Cancer Committee and professor and chair of the department of radiology at Montefiore Medical Center

in the Bronx, N.Y., agreed. When COVID-19 struck, Montefiore had several faculty who were immediately quarantined as part of the cluster in New Rochelle, N.Y., and in less than a week the institution's ERs flooded with coronavirus patients. According to Yee, the crisis showed her the importance of being as adaptive as possible as a leader — as well as being honest and transparent.

"Clear communication is critical," said Yee. "I personally send out e-mail updates to the team at least twice a week with specific radiology updates. We deployed a third of our radiology residents to the frontlines and I checked in with each one of them because it's a stressful and anxious experience for them. It's really important as a leader to be empathetic to your personnel. It's going to be different based on whether you're dealing with the RT versus the nurse versus the resident versus the attending, but trying to make everybody feel supported — and being confident, fair, kind, and transparent in how you're doing it — is very important."

Most importantly, both Smetherman and Yee noted that the crisis highlighted to them the need for leaders to celebrate wins and successes amidst the darkness. "I personally will go out and talk to our frontline RTs and healthcare workers to congratulate them for a job well done," said Yee. "We hold breakfasts for them, as well as luncheons — appropriately socially distanced, of course — and they really appreciate that."

Smetherman agreed. Her advice to radiology leaders battling the crisis is to find the positives and over-express one's gratitude. "In our meetings, we not only talk about the number of patients who have died, or who are in our hospital, or who are on ventilators, but we talk about the number of patients who have been discharged," said Smetherman. "I think everybody looks to you as the leader and if you are uncertain or if you are stressed and show that, it trickles down. We have to keep staying positive if we're going to win this thing." **B**

By Nicole B. Racadag, MSJ, managing editor, *ACR Bulletin*

Making Image-Labeling Projects Successful

When implementing machine learning projects, it is important to plan your image-labeling process in advance and discuss considerations for software selection.

While much ink and industry interest have focused on the role AI will play in radiology, the release of major AI datasets and the development of novel algorithms, comparatively little has been said about a key part of the process — annotation of those datasets. Any data scientist will tell you the quality of an algorithm depends critically on the quality of the data used for training.

Data quality comprises two parts: the source images and the attributes assigned to those images by humans, directly or indirectly. The latter includes both text reporting information and visual annotations that are applied as a mask layer on top of the original images. Because annotations are often unreliably applied to images during the initial interpretation, they are typically added later by volunteer or contracted radiologists (the latter at no small expense).

Because of the enormous number of images requiring annotation and their associated expense, it is in the interest of any algorithm development team to carefully weigh the various approaches to image-labeling and to choose a software tool that maximizes the efficiency of their work.

Plan Your Attack

By both defining and documenting the annotation task as objectively and descriptively as possible — and by piloting your project on a small set of images — you can best determine your needs from day one. Before embarking on an image-labeling project, it's important to pin down several key decisions in advance.

- **Web-based vs. local image annotation**

Where images will be stored, rendered, and annotated is a big factor in deciding on the best tool for

labeling. Some labeling tools require the radiologist to download images to a local computer to perform the annotations. For the annotator, this model allows working offline, without an internet connection. For the researcher, this approach requires only a cloud storage service from which the annotator downloads images.

By contrast, a newer generation of cloud-based annotation services perform all of the computing on the server side and allow annotations through a web client. For the researcher, this model might require more work to develop a custom user interface, but it could also decrease the challenges faced by annotators who lack tech savvy or perform the work in a non-standard fashion (e.g., using a different color scheme that later needs to be re-mapped). In addition, software updates can more easily be pushed to users than locally based programs. On the downside, server or bandwidth lag can be a source of frustration when working with large images (high-resolution radiography and mammography in particular). Even small amounts of lag can have a major cumulative effect over the course of annotating thousands of images.

- **Standards-based vs. open-source**

Another important consideration is the distribution philosophy of the software provider. A company might choose to develop its own software for in-house annotation — to make it accessible only locally on its network — and use proprietary labels. This is a good paradigm for a well-funded company that wishes to maintain total control of its annotations, perhaps monetizing the annotations, the images, or the software itself through licensing. However, external users are at the mercy of the developer's internal logic for workflow, protocols, and labeling.

On the other hand, a company or individual researcher might choose open-source software to make its annotations. Those annotations could then be shared with everyone who uses that software. Alternatively, the annotations could be mapped to existing standards — such as the caBIG™ Annotation and Imaging Markup (AIM) project — and then imported to any software supporting the language. This has the advantage of using shared, nonproprietary lexicon and flexible workflows, though support might not be readily available.



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The ACR® Data Science Institute® (DSI) has introduced several COVID-19 resources for clinical radiologists and researchers fighting the spread of the virus. The AI-LAB provides free access to ACR DSI use cases for COVID-19, coronavirus learning cases, and a repository of AI algorithms available for local evaluation, including scenarios where AI could impact clinical care of COVID-19 patients. Learn more at acrdsi.org.

- **Traditional input devices vs. drawing tools**

Although most clinical image interpretation is done with a mouse and most reporting with a microphone or keyboard, these devices are not ideal for annotation work, such as drawing fine curves and pixel-level annotations. We find that draw pads or pen-enabled screens and tablets provide the most comfortable and efficient annotation experience.

What Influences Tool Selection?

While each tool has its own quirks, the process required for annotation work determines the best tool for a project. Here is a checklist to help you determine the right fit:

- Are you annotating a single structure or multiple non-overlapping structures? When breaking down complex, overlapping structures, the methodology (or steps in the segmentation) becomes increasingly important and should influence selection.
- Is annotation facilitated by a desktop computer with a 24" monitor and a mouse, or a laptop or tablet with pen/drawing ability? Select software that will function correctly with the hardware your annotators will use.
- How much bandwidth is available? This can be an issue for web-based platforms with larger studies. Even a few seconds of server lag can grind annotation to a halt, when images and/or software functions are not on a local machine or a system designed to minimize lag.

- For segmentation of lesions and organs in 3D datasets, does the software paste an annotation mapping from one slice to the next, making the next slice easier? Does it go a step further, allowing you to skip a few slices and interpolate the interposing slices?
- How will annotation drawing change the workflow? There are tradeoffs in speed and accuracy when you are drawing a line or placing interpolation markers around an object. Decide in advance which is more critical.
- How will you evaluate the algorithm output? How will editing machine output for iterative algorithm learning happen? How might the system you choose limit editing ability? For example, some systems with interpolation markers won't let you add more markers to what the computer has placed, making it difficult to redistribute markers around a complex structure.
- Is the amount of dexterity/control over fine annotations important for quality? The physical device for annotation matters. The right tool affords you enough detail for segmentation tasks.

By planning your project thoughtfully — asking the right questions from the beginning — you lay the groundwork for a successful image-labeling effort. Every project is different. **B**

By Prasanth M. Prasanna, MD, chief of imaging informatics at the University of Utah Health Science Center in Salt Lake City, and Arjun Sharma, MD, attending radiologist at Suburban Radiologists in Oak Brook, Ill.

Crisis Management

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And more help could be on the way if radiologists are allowed to begin billing for evaluation and management services, as ACR has been advocating. In a recent letter to CMS, William T. Thorwarth Jr., MD, FACR, ACR chief executive officer, requested that radiologists be granted more authority as “treating physicians.” If approved, such a move could put radiologists on equal footing with primary care physicians and other specialists, thereby allowing them to take on a larger role in patient care.

As Patel sees it, the approach could improve the standing of radiologists, making them even more crucial members of coordinated care teams. “Allowing radiologists to successfully bill for evaluation and management services, along with ordering exams in the outpatient setting through direct patient consultation, would enhance our visibility, increase our accessibility, and decrease the burden on primary care providers,” Patel says. Pyatt agrees: “The more that interested radiologists can help

fill gaps as treating physicians, the more it could help our specialty in many ways, including some potential degree of financial benefit.”

Looking Ahead

Whether or not radiology's responsibilities expand during this pandemic, ensuring that patients are at the forefront of all decisions and cultivating a strong, empathetic work culture are both of supreme importance. “It's imperative to maintain a longer horizon view that we'll get through this together,” suggests Pyatt. “Communicate often and work as a team. Every time I talk with staff, I ask how they are doing. I know every one of my staff and want them to know that I care about their safety and their important work for our patients, as well as for their families' safety at home. If you communicate well,” Pyatt concludes, “the group will be happier overall, and that will translate to quality patient care and future success for the group.” **B**

By Chris Hobson, Imaging 3.0® senior communications manager, ACR Press

FINAL READ

What does the future of radiology look like, post-pandemic?



“I see increased social distancing guidelines being implemented in our waiting rooms, as well as novel sanitation protocols for the safety of our patients. I see more flexibility from working from home with a shift in in-person consults and conferences towards a virtual platform. I can also see business going back to normal, but with active communication, teamwork, and leadership.”

– Kirang Patel, MD, chief resident at the University of Missouri at Kansas City



“Social distancing is here to stay until we have effective vaccines and/or treatments for COVID-19. As we reopen our practices, we must have proper PPE for our colleagues. Radiologists should be involved in promoting good public health habits. During the pandemic, some institutions were scrambling to implement telehealth measures. Many of these were overdue and will persist. Our colleagues are now used to meeting each other virtually. This can increase our involvement in patient care.”

– Nolan J. Kagetsu, MD, FACP, associate clinical professor at Mount Sinai Health System

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

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sky is our limit.
So keep exploring!*

José Morey, MD

AI and MedTech Advisor at NASA iTech

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