Pandemic Response

Awareness, preparation, and planning are key to mitigating the ongoing crisis.

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> "As radiologists, we have the responsibility to equip ourselves with knowledge and information. It's critical in taking care of patients."
>
> —Adam Bernheim, MD

April 10, 2020

In the fall of 2019, Adam Bernheim, MD, assistant professor of diagnostic, molecular, and interventional radiology, and a team of researchers from Icahn School of Medicine at Mount Sinai in New York, traveled to China to meet with radiology colleagues in Chengdu and formed a research partnership. That meeting laid the groundwork that led Bernheim and his team to the leading edge of research into the previously undocumented illness that emerged from China shortly thereafter.

In the early stages of the COVID-19 outbreak in Wuhan and other Chinese cities, physicians used chest CT routinely to diagnose and track the disease, scanning some patients multiple times. In crisis mode, they lacked the time and the sub-specialty expertise to analyze the images systematically on their own, Bernheim says, and they partnered with his team.

"We were the first in the West to have access to large numbers of COVID-19 chest CTs — well before there were significant cases in Europe and the U.S.," says Bernheim. The team systematically tabulated the findings and published papers in *Radiology* that described the characteristic patterns and correlated them with early, intermediate, and late stages of disease based on symptom time course.[1,2]

"We learned about the evolution and progression of disease and the time course of how coronavirus infection unfolds," he says. He urged all radiologists to familiarize themselves with the characteristic imaging patterns — ground-glass opacity through the lungs often with a rounded morphology and peripheral and lower lung distribution — of COVID-19 cases on CT. "If you haven't encountered it yet, you probably will," he says, even on studies conducted for reasons other than diagnosis of COVID-19.

Preparing for Pandemic

"Awareness, preparation, and planning are key to responding to this crisis," says Suzanne T. Chong, MD, MS, chair of the ACR Commission on General, Small, Emergency and/or Rural Practice, and associate professor, who recently joined the division of emergency radiology at Indiana University (IU). IU has three Level I trauma centers and 26 additional sites, ranging from tertiary care hospitals to community-based clinics. "The more prepared you are, the more lives you will save and the faster you'll rebound," she says. "We have been lucky in the Midwest; we have had more time to prepare than areas hit with early outbreaks."

As she watched the pandemic hit China, Europe, and the U.S. coasts, Chong says this global pandemic mass casualty incident (MCI) is unlike most trauma MCIs in that healthcare professionals themselves are at risk for getting sick and dying and the timeline could extend for weeks and months.

According to Chong, opening all lines of communication is critical. "We tend to be siloed in medicine, but that doesn't work with a situation like this," she says. "Sharing information can save lives."

Ella A. Kazerooni, MD, MS, FACR, chair of the ACR Lung Cancer Screening Registry® and the Lung-RADS® Committee, agrees. Her institution, the University of Michigan/Michigan Medicine, had recently established a strong system of clinical communication with a tiered huddle structure that feeds information up and down the chain quickly and helps create bonds within and among teams. Put in place in 2019, that enhanced communication has helped the institution prepare for the ongoing pandemic.

"The key thing the institution did — and radiology played a role on the diagnostic side — was to prepare to have capacity set aside very early on," says Kazerooni. Drawing on plans developed to respond to earlier Ebola and H1N1 outbreaks, they quickly set up a respiratory ICU that was already half full at the end of March as the Detroit area witnessed a surge of cases.

Like most hospitals, Michigan Medicine also immediately worked to cancel non-urgent procedures, including imaging. Kazerooni says the radiology department used a multipronged approach to defer non-urgent procedures, beginning with deferral of screening exams, like mammography and lung cancer screening. Referring clinicians looked for any diagnostic testing that could be deferred. Radiologists listed all tests that could be safely postponed, and radiology staff communicated via their EHRs to referring providers about rescheduling patients into the future, when possible. Approaching deferrals as a partnership between radiology and referring clinicians, along with strong physician leadership, have been key, Kazerooni says.

Adjusting Policies and Procedures

In a crisis, Chong points out, it is not business as usual. In addition to canceling non-urgent appointments, other policies and procedures must be adapted to the current environment.

Most radiology departments are taking steps to reduce risk of exposure by minimizing the number of people in the reading rooms and moving to remote reading when possible. Those not already set up for remote reading have stepped up plans to equip radiologists with home equipment or moved staff to reading rooms in satellite clinics to reduce personnel at the hospital. Even those continuing to work onsite are reducing face-to-face consultations with colleagues or radiologists — opting to videoconference even if the person is in the next room.

At most facilities, staff reporting for shifts are checked for symptoms when they arrive and wear masks and personal protective equipment (PPE) throughout their shifts. Shortages of this safety equipment are a concern, especially at smaller facilities that may have more difficulties obtaining needed supplies.

Because asymptomatic patients can spread the virus, RTs are advised to assume everyone is infected —even someone coming in for an X-ray of a broken leg — and wear PPE, says Chong. "Our RTs are on the frontlines; they are the ones who risk exposure," she says. Chong has been tracking how other facilities have changed policies and procedures, looking for ideas of how to maintain efficiency and ensure safety in the face of COVID-19.

Kazerooni notes that the University of Michigan Medicine worked with its infection control and environmental services departments to evaluate and reduce the cleaning time for their machines, while still adhering to CDC standards. In some cases they were able to reduce the cleaning time by half, depending on the airflow in the room and the time it takes to recirculate — significantly reducing downtime and increasing throughput, especially for CT scanners and radiography suites.

Adapting Approaches

ACR and other radiological associations have issued guidelines for using CT scans and reporting results in the diagnosis of COVID-19, recommending against routine use of CT and highlighting the importance of using standard language in reports. But sometimes things don't play out as planned, notes Daniel Ortiz, MD, a general radiologist with Summit Radiology Services, PC, an independent private practice of 20 radiologists serving eight hospitals in rural northwest Georgia.

Ortiz found himself on the frontlines of an early outbreak in one of the communities served by Summit Radiology. After a large church event where people gathered from around the area, patients started showing up at the local ED in early March with a mixture of lower respiratory symptoms and atypical presentations. Several of these patients were imaged and had atypical pneumonia appearance. There was no history of travel to China or northern Italy, making it difficult to connect the dots to COVID-19. Even once physicians made the connection, patients did not meet the then-current CDC criteria for testing. And those who were tested often waited up to two weeks for PCR results.

In this situation, Ortiz says, CT was a viable and accessible means of assessing patients — even though a large portion of patients who have negative scans may still be infected. In the absence of PCR test results, the CT helped physicians stratify patients and adjust their level of suspicion — helping to build a story that pushed the treatment in that direction, Ortiz says. Once the outbreak was recognized, ED staff added an item to their screening questionnaire asking about attendance at large gatherings — and specifically the identified church — to speed up the identification of COVID-19 cases and increase pretest probability.

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Covering topics relevant to the practice of radiology

A New Normal

Practices plan for a future with little resemblance to the past.

> "We cannot schedule the same way we did before."
>
> —Sabiha Raoof, MD, FACR

June 24, 2020

In the spring, while ICUs were overwhelmed with COVID-19 patients, many radiology departments were eerily quiet. As a result of focusing healthcare resources on the crisis and canceling non-urgent care to curb the spread of the disease, volumes were down 50, 70, even 80% in some places.

But the need for radiology procedures has not gone away. Procedures that were non-urgent in March were likely urgent in May or June. The evidence for screening mammograms has not changed; women over 40 will still need regular checks. Cancer, chronic disease, and injuries don't stop for a pandemic.

Whether by sudden surge or gradual uptick, radiology volumes will increase. But this is not a return to normal. COVID-19 has changed things — at least until an effective vaccine is widely available and maybe even longer than that.

Radiologists were key to the pandemic response earlier this year. But are they ready for the "new normal"?

Responding to Demand

With referrals from screening programs down 60–80% and cancer diagnoses down 30–40%, radiology procedures at the University Medical Center Groningen decreased by half to a third of normal, says Thomas Kwee, MD, radiologist and vice chair of the radiology department at this large academic medical center in the Netherlands.

Kwee and his colleagues likened the drop in exams earlier this year to what he calls "the tsunami phenomenon, in which the sea water recedes before the actual wave comes." Kwee is expecting a surge "considerably above the volume our department handles under normal circumstances." He took advantage of this lull to think through the implications for the future — and write an article for the *JACR*® on the topic. By preparing now, he hopes his department will be better prepared to meet the challenge of that surge.

They expect a considerable rise in oncologic care, especially procedures on the abdomen, chest, and neuro/head and neck. But he also expects other types of care, including a return to cancer screening programs. Their plan — which they've dubbed Optimizing Efficiency in Radiology, or OPERA — involves cross-training for radiologists, self-educational materials for medical students completing their radiology rotation, and transitioning to "abbreviated MRI protocols" when clinically indicated.

Predicting a Quiet Summer

As chief medical officer and chair of radiology for Jamaica and Flushing Hospitals, Sabiha Raoof, MD, has had little time to breathe, let alone plan for a return to a new normal. "We saw our first COVID-19 patient on March 3 and it's been a blur every day since then," she says.

By mid-May, COVID-19 cases were declining enough to start focusing on other aspects of care. In the radiology department, a team of radiologists started looking at cancelled appointments, conferring with referring physicians, and determining who should be seen first.

After experiencing extreme shortages at the height of the crisis, the department and hospital are now prepared with PPE and access to testing, prior to interventional procedures. They're also mandating masks and temperature screenings for all staff and patients. They're ready to extend hours to meet the demand and ensure that they can maintain social distancing in waiting rooms. "We cannot schedule the same way we did before," she says.

Raoof is working with other hospitals in the New York area to develop educational materials for a diverse patient population that has been traumatized by the pandemic. She hopes that by standardizing and publicizing measures to keep patients and staff safe, patients will start feeling more comfortable seeking the care they need at the hospital that's easiest for them to get to.

Even so, she's not sure when patients will be ready to return. "Even if they are comfortable coming to the hospital, how will they get here?" she points out. Most of the hospitals' patient populations do not have cars and rely on public transportation. People are even less eager to get on the subway than they are to come to the hospital.

So instead of a surge, she predicts a gradual increase over the summer, with volumes well below normal for the next few months. She's actually asking staff to take vacation over the summer, so that they are ready for a possible second wave in the fall.

Increasing Confidence

On the other side of the country, at University of Washington School of Medicine in Seattle, Mahmud Mossa-Basha, MD, vice chair of clinical operations for the department of radiology says his department has opted to ramp up services slowly

to ensure safety precautions to protect the health of both patients and staff.

In partnership with ordering physicians, they are going through the backlog of procedures. “During this time of crisis everyone has come together, resolved to do what’s best for the patients and the system as a whole,” he says, adding that he’s seen increased cohesiveness both within the department and across departments during the pandemic. Because the health system has been upfront about the financial implications of the pandemic, staff understand the financial difficulties and the reasons behind schedule changes, furloughs, and salary reductions.

To increase efficiencies, they have moved volume (and staff) among facilities, staggered shifts, and expanded hours to increase efficiencies and spread patients and staff out. In addition to reducing the number of chairs in the waiting room and instituting hourly cleaning procedures, they have also set up an area in the parking lot where patients can wait in their cars until their appointment. Some procedures will require more precautions than others, he says. They are staggering appointments for their two MRI scanners to minimize overlap among patients. All patients are required to wear a mask, hospital-supplied, if necessary.

The radiology department is using the automatic texting system they already had in place to let patients know about safety measures. They’re also creating videos that will be posted on social media to the general public in July.

So far, he says, patients have reacted positively. “My sense is that patients appreciate the precautions, and their confidence is coming back,” he says, noting that patients are starting to return — ED volumes are almost up to pre-COVID levels.

Safety as Recurring Theme

As an interventionalist treating emergent or semi-emergent cases, David Kirsch, MD, has continued close to normal workloads in his private practice serving hospitals and clinics in Louisiana and Mississippi. “You can’t really defer emergent or semi-emergent care, especially in a hospital setting,” he explains. But that doesn’t mean he hasn’t been affected by the pandemic.

From a financial/volume perspective, outpatient clinics have taken the financial brunt. “Volumes are down across the board, but outpatient clinics have been hit hardest. April was by far the worst,” he says. Inpatient volumes were down 50% in April, he says, and outpatient as much as 90%.

Kirsch’s practice currently has about 40 contracts in place with facilities. That means that he has 40 different plans for how to ramp services back up again safely and efficiently. “Every location is slightly different,” he says. But any patient coming into the hospital for a non-emergent procedure has to have a COVID test 48–72 hours before their procedure. Patients coming to the ER receive a rapid test when they get there.

Letting patients know about the precautions is key to getting volumes back up, he says. “If the patients do not feel comfortable or if they feel we don’t value their safety, they’re not going to use the services, whether it be in retail or in medicine.”

So far, the message seems to be getting across. After the first week of May, volume has gradually increased, with a nearly 50% recovery from April lows. Kirsch predicts a big uptick in June, with volumes back to “reasonable levels” in July. One of the clinics is currently trying to reschedule 4,000 mammograms. The practice accelerated plans to increase remote reading by buying home workstations for all radiologists back in March. This will allow them to expand hours and continue with specialization studies without overtaxing their physicians.

One consideration in rescheduling procedures is not only reauthorization but also changes in patients’ financial or insurance situations because of layoffs or furloughs. He says his practice has worked with patients on payment plans or

insurance situations because of layoffs or furloughs. He says his practice has worked with patients on payment plans or coordinating with insurance.

Kirsch says radiology practices have to think strategically about how to manage cash flow through the ups and downs of this pandemic — and crises to come. The Paycheck Protection Program (a loan program that originated from the Coronavirus Aid, Relief, and Economic Security Act to provide a direct incentive for small businesses to keep their workers on the payroll) was "a godsend," allowing the practice to restore full salaries to their IT and support staff despite the volume drops. Kirsch warns against making rash decisions that will affect the practice's future, pointing out, "You don't want to do anything that's going to impair your ability to react to future challenges and opportunities."

ENDNOTES

1. https://www.jacr.org/article/S1546-1440(20)30407-5/fulltext (https://www.jacr.org/article/S1546-1440(20)30407-5/fulltext)

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A Mental Toll

Radiologists and staff are coping with the emotional fallout from COVID-19.

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> "COVID-19 has affected everyone in every phase of life. Nobody's been hidden from it."
>
> —David Kirsch, MD

June 29, 2020

Whether on the frontlines, on furlough, or continuing to work in staggered shifts or empty hallways, radiology staff have been through a lot over the past few months. And this comes on top of suffering high rates of burnout even before the pandemic.[1] While readying their departments for the return of non-urgent procedures, radiology leaders realize that a critical aspect involves ensuring all members of their departments — clinicians, technicians, and administrative staff — are comfortable and ready to return, mentally as well as physically.

This is top of mind for Sabiha Raoof, MD, chief medical officer and chair of radiology for Jamaica and Flushing Hospitals. Serving a diverse urban population, her hospitals have been the epicenter of the pandemic in New York, and her staff have witnessed intense suffering. At the height of the crisis, her hospital had 550 COVID-positive patients, 150 of whom

were on ventilators. This is four times the normal inpatient volume. They increased capacity by 50% by the middle of March; a week later, they doubled capacity again. The pediatric, OB/GYN, and psychiatric wards all became COVID-19 units.

Meanwhile, non-COVID patients stayed away. “We usually have 2 to 3 appendectomies a week. We’ve had none since the pandemic,” says Raoof. “People are so afraid that they have delayed calling the ambulance until too late.” Her ambulance crews were pronouncing 20, even 40 deaths a day at people’s homes, a rare occurrence before the pandemic.

To deal with the onslaught of COVID-19 inpatients, the hospital closed all ambulatory sites and called all outpatient staff to work on in-patient units. Staff who usually spent their days in the radiology department performing routine X-rays found themselves suddenly on the frontlines of COVID-19 wards, providing portable X-rays for desperately ill patients. The RTs saw much more suffering and death than they were used to, says Raoof. Seeing patients dying alone without family is difficult for anyone, but RTs may be even less prepared for the sight.

In the first intense days of the pandemic, with recommendations for PPE constantly changing and so many unknowns regarding presentation of the illness, Raoof's department dealt with an avalanche of patients. "Many staff got sick themselves, including radiology staff, especially US and X-ray techs," she says. “The staff have been patients themselves. They know how their patients felt when they could hardly breathe.”

Raoof also points out pre-existing mental health needs that have gone unmet and have also increased because of the trauma of the pandemic, both in the community and among her staff. Many staff have experienced trauma at work and at home, caring for patients, getting sick themselves, and also losing friends and family members to the disease. The hospital has opened up a wellness line for employees to seek support and is setting up in-person sessions. Staff are also reaching out to family members of patients who have died to extend their sympathy and help connect them to counseling or other resources.

Even without high rates of illness among staff, radiologists and staff members at University of Washington School of Medicine are concerned about returning to “normal,” says Mahmud Mossa-Basha, MD, vice chair of clinical operations for the university’s department of radiology. Administrative staff and RTs have been furloughed or moved to different facilities, which has been disruptive and stressful for many. The hospital had already established a peer-to-peer support program before COVID, and it has seen an increase in use lately, he says. Staff can access the program to talk to a co-worker who has been trained to provide informal counseling. If the person appears to need additional support, the co-worker can bring in a professional counselor.

“Communication is key,” Mossa-Basha says. “The more communication and transparency the better.” Increasing communication had been a focus at UW before the pandemic, he says, and they are seeing the benefits of that now. Weekly faculty meetings have become virtual town halls, offering an opportunity to ask questions and understand not only what changes are being made, but why. Twice-weekly faculty and leadership huddles by section also help.

David Kirsch, MD, an IR with Southern Radiology Consultants in Louisiana, agrees that consulting with staff and listening to their concerns helps address the stress of practicing during a pandemic. Initially, he admits, he and his staff were nervous about continuing to see cancer patients and others whose care couldn’t wait during the early days of the pandemic. However, they worked together to ramp up their protocols, increase use of PPE, and adjust procedures. For example, they completed tasks with the greatest exposure risk — such as placing gastric tubes — in the patients’ room before transferring them to the IR department for the rest of the procedure. With these modifications, he and his staff have felt relatively safe and comfortable knowing they’re taking necessary precautions for their patients and themselves.

The pandemic has also accelerated the move to telemedicine and teleradiology, Kirsch points out, which has enabled his practice to expand hours and increase access to care while also avoiding exacerbating burnout among radiologists.

Reading from the comfort of their own homes reduces worry about infection control and enables radiologists to work for an hour or two without adding a commute.

Even as Kirsch feels his practice and staff have taken adequate steps to prepare, he worries about the lingering effects of the pandemic on his community. “COVID-19 has affected everyone in every phase of life,” he says. “Nobody’s been hidden from it. A second outbreak or shutdown would be pretty devastating to everyone, including most of the healthcare system. We have to continue social distancing and other practices to mitigate that.”

ENDNOTES

1. https://www.healthcareitnews.com/news/europe/radiology-staff-report-alarming-levels-stress-burnout-new-philips-stud (https://www.healthcareitnews.com/news/europe/radiology-staff-report-alarming-levels-stress-burnout-new-philips-study)

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According to Bernheim, the positive swab reverse transcriptase polymerase chain reaction (RT-PCR) test is the cornerstone of diagnosis at Mount Sinai, with chest imaging serving as a complementary tool. “It’s not practical to scan large numbers,” he says. “Patients are scanned selectively when there are complications or there is suspicion for other processes such as pulmonary embolism in COVID-19 patients.”

Brent P. Little, MD, assistant professor of radiology at Massachusetts General Hospital (MGH), points out that even though PCR testing is the gold standard for diagnosis, the testing can take time and more than one test may be required to confirm the diagnosis. He notes that in mid-March chest radiography was still MGH’s first-line diagnostic tool for selected patients presenting at the hospital with respiratory symptoms, just as it was before the pandemic hit. Although he underscores that normal radiographs cannot exclude infection, findings suspicious for COVID-19 on chest radiography can elevate clinical suspicion and help guide clinical decisions while lab testing is underway. He notes that while COVID-19 can have a range of appearances at radiography, many of the cases have a bilateral, peripheral distribution. Radiographs can also provide valuable information about severity of lung findings, or suggest alternative diagnoses.[3]

Meanwhile, at Michigan Medicine — which has developed its own in-house rapid turnaround testing for COVID-19 — outpatients who suspect they may have COVID-19 contact a specialized nurse triage line. Depending on the severity of their symptoms, patients are either escalated to video triage or sent to a drive-up testing site set up as an extension of a clinic facility. People with milder symptoms are sent home to quarantine; those with more serious symptoms are sent to the ED. Chest CT scans are not a routine part of the diagnostic process, while chest X-rays may be used up front to differentiate COVID-19 infection from other causes of respiratory syndrome, Kazerooni says. In February, few U.S. radiologists had any experience with COVID-19. Now, many are finding it’s their main focus.[4]

“This is a fluid situation that is changing rapidly,” Bernheim says. “As radiologists, we have the responsibility to equip ourselves with knowledge and information. It’s critical in taking care of patients.”

ENDNOTES

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