

## Adapting Radiology Operations to the COVID-19 Pandemic

- Social distancing recommendations in response to the COVID-19 pandemic have led to major changes in radiology department operations.
- In a significant change to its usual practice, the Mass General Department of Radiology has implemented work-from-home policies, enabling remote coverage through various technological solutions.
- A number of radiologists and technologists have been redeployed to help with Mass General's pandemic response, assisting internal medicine physicians on COVID floors as well as performing necessary interventional radiology procedures and helping with language translation efforts.
- Although interventional radiology continues to provide urgent and essential image-guided procedural care, the department has moved all clinic visits to virtual health visits to minimize social contact among both patients and staff.
- All Mass General Imaging locations have remained open during the pandemic, including satellite locations such as Mass General Waltham and Mass General/North Shore Center for Outpatient Care, which have continued to serve non-COVID patients while taking measures to limit the spread of the disease.
- The department has also been supporting efforts at the MGH Chelsea HealthCare Center to address the acute outbreak of COVID-19 in Chelsea and surrounding neighborhoods.

**I**n recent weeks and months, radiology departments across the United States have transformed their operations to mitigate the dangers of the COVID-19 pandemic while continuing to meet the needs of the populations they serve. The Mass General Department of Radiology is no different. This issue of Radiology Rounds looks at several of the ways the department has safely shifted its operations during the pandemic.

### Remote Coverage Minimizes Physical Interactions Among Clinical Staff

Following public health and the Centers for Disease Control and Prevention recommendations, the Mass General Department of Radiology's response to the COVID-19 outbreak necessarily involves a range of social distancing strategies to minimize the risk of radiologists contracting or spreading the virus. First, the department developed staffing plans accounting for the circumstances of the pandemic. Also, after the Commonwealth of Massachusetts issued a state of emergency due to the COVID-19 pandemic and the Massachusetts Department of Public Health issued mandated recommendations, Mass General decided to cancel elective procedures to encourage social distancing among both patients and staff. This decision coincided with the surge of patients with COVID-19 infection receiving treatment at Mass General.

As part of its transition in operations, the department implemented a new work-from-home policy. Historically, Mass General has not asked its radiologists to provide remote coverage since daily interactions and in-person consultations with other medical specialties are key components of the radiology care provided by the hospital. With the COVID-19 outbreak though, the department's Medical Imaging Informatics staff designed and implemented a limited interpretation cloud-based platform that integrated with its picture archiving and communications system (PACS), work-list management software, and electronic medical record and dictation software. In recent weeks, more than 100 distinct radiologists have accessed the new infrastructure in a single day, with a peak of more than 50 radiologists concurrently accessing the virtual desktop.

As detailed in a [recent Journal of the American College of Radiology article](#), adding these work-from-home options serves two goals: It decreases exposure to COVID-19 by minimizing physical interactions among clinical staff and it creates a reserve of radiologists who are less likely to have been exposed to COVID-19, who could be called upon should others fall ill.



**Figure 1:** To help maintain social distancing, a number of Mass General radiologists have been working from home during the COVID-19 pandemic. Shown here are the hospital's Jad Hussein, MD (left), and Kasra Mojtahed, MD (right).

## Radiologists Redeploy to Assist with Mass General's COVID-19 Response

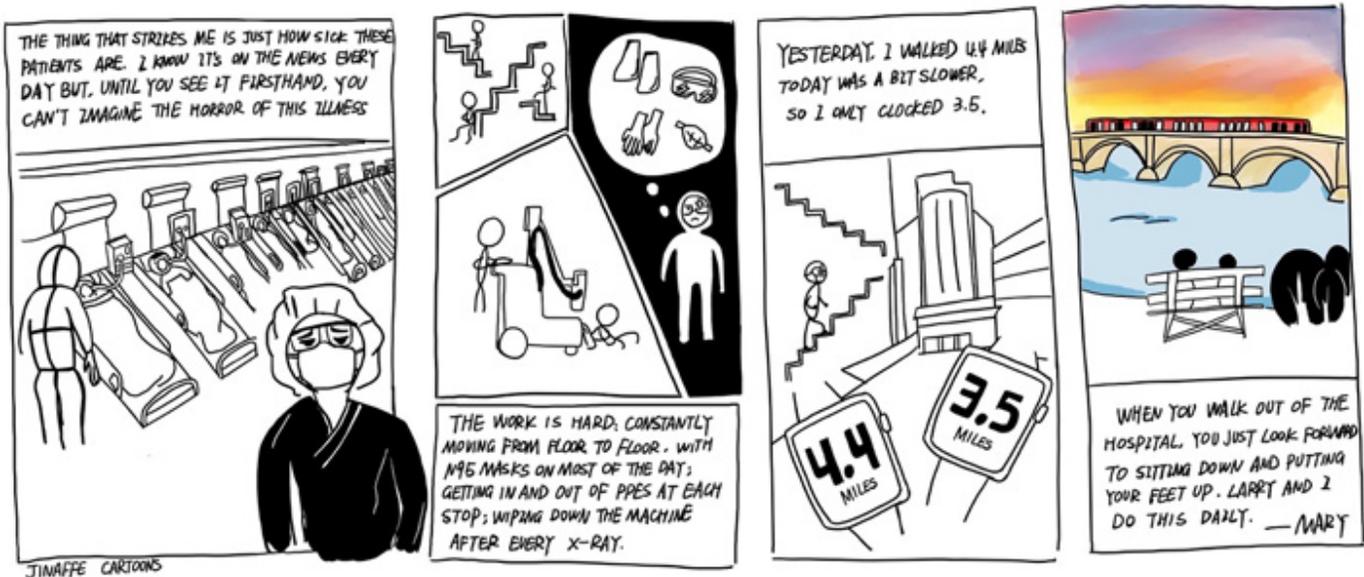
In March, as the number of COVID inpatients in the hospital continued to rise, the hospital and the Department of Medicine requested support from other departments to help care for COVID patients. By the end of the month, radiology residents and fellows were being assigned to one of the COVID "Tiger Teams" on Ellison 12, where they functioned as responding clinicians caring for COVID inpatients under the supervision of a medicine attending physician. By the latter half of April, radiology faculty were joining the trainees on the Ellison 12 Tiger Team. In addition, a "Cobra Team" of interventional radiologists assembled to perform IR procedures at bedside with COVID-19 patients while a Spanish language care team deployed to assist with translation for patients who were not comfortable communicating in English. At the same time, technologists from areas such as MRI, CT and Breast Imaging were redeployed to Emergency Radiology to support the demand for portable X-ray and emergency imaging.

The surge teams played an important role in helping the hospital weather the peak COVID inpatient census through April. By early May, they were being disbanded. May 11 was the final day for the radiology Tiger Team on Ellison 12.

## Virtual Health Visits and Additional Precautions at Mass General Imaging Locations Help Minimize Exposure

The radiology department was already exploring potential virtual health options when the COVID-19 pandemic hit Boston earlier this year. In late 2017, for example, researchers reported a study of virtual, video-based radiology consults at the point of care (see the [Nov/Dec 2017 issue](#) of Radiology Rounds) with [overwhelmingly positive findings](#). Now, though, with the onset of the pandemic and the ensuing need for social distancing, the department offers virtual telehealth options in clinical practice.

The department is enabling virtual clinic and follow-up visits in interventional radiology (IR), where continued engagement with patients is necessary. Providers in IR are now meeting virtually with 15 to 20 patients each week, either by phone or by web-based video conference calls. Despite the circumstances necessitating the move, providers and patients alike have been pleased with the results. Preliminary data from a study of the efficacy of the visits suggest providers feel they are as helpful as in-person visits; fewer than 5% said patients were better served by the latter. Similarly, anecdotal evidence suggests patients have been happy to virtually connect with providers since they have received the same level of care without the commute to and from the hospital (saving some patients up to two hours), paying for parking and so on.



**Figure 2:** As Mass General prepared for a surge of COVID-19 patients this spring, many non-clinical staff were redeployed to help with the efforts. Others found ways to contribute outside of the hospital, from [producing much-needed personal protective equipment](#) based on full-faced snorkel masks and 3-D printed parts to [working with a COVID-19 biospecimen repository study](#) at the Ragon Institute at MGH, MIT and Harvard. At the MGH Martinos Center for Biomedical Imaging, a research center in the Charlestown Navy Yard, the two streams came together when senior MR technicians Mary O’Hara and Larry White were redeployed to perform portable chest X-ray scans in COVID-19 ICUs. A postdoctoral research fellow, Jingyuan Chen, illustrated their story in a poignant cartoon (above). O’Hara also described her experiences in a [Mass General Imaging video](#).

Of course, not all radiology work can be done remotely. All Mass General Imaging locations have remained operational for patients who still need particular imaging procedures during the pandemic, including satellite locations such as Mass General Waltham and Mass General/North Shore Center for Outpatient Care. While the latter locations do not see patients who have tested positive for or who exhibit symptoms suggestive of COVID-19, their staff take extensive precautions to help mitigate the spread of the disease. Their efforts include maintaining social distancing in waiting areas, or even having patients wait in their cars and calling them on their cell phones when they can be seen. Staff members have also been sitting with patients and completing intake questionnaires for them on digital tablets, so the patients do not have to handle any paper forms that might have passed through others’ hands. Additionally, staff has been cleaning imaging equipment after every use.

Many radiologists hope the focus on virtual health, combined with visits to imaging centers when needed, will continue after the pandemic is over, so they can continue providing the same level of care more conveniently for patients without sacrificing the overall care quality.

## Radiology's Role in the COVID-19 Response in Chelsea

With more than 40,000 residents, 66% of them Latino, the city of Chelsea has emerged as the epicenter of the COVID-19 outbreak in Massachusetts. The infection rate in Chelsea, approximately 5% (2,030 confirmed cases as of April 30), is multitudes higher than in neighboring Boston. Already, the pandemic has been devastating to the city.

Mass General has taken important steps to address the outbreak in Chelsea. The hospital selected the MGH Chelsea HealthCare Center as the third location for the recently introduced Respiratory Infection Clinic (RIC). Opening on April 1, the Chelsea clinic is located on the second floor of the healthcare center. Anyone in the city or surrounding areas experiencing COVID-19 symptoms is encouraged to visit the clinic regardless of health insurance or Mass General patient status. The RIC has helped many people since it launched. Its staff saw 35 patients the day it opened. Within a couple of weeks, they saw nearly 150 patients per day, providing important care to the residents of the city of Chelsea and neighboring communities.

To help limit the spread of the disease, the MGH Chelsea HealthCare Center maintains separate areas for imaging COVID and non-COVID patients, respectively. All patients coming to the center with respiratory symptoms and suspected of COVID are seen in the second-floor RIC. In cases where a provider orders a chest X-ray, a

radiologic technologist scans the patient using portable equipment brought over from the main campus in Boston. Before each patient goes to the ad-hoc X-ray room, the technologist dons personal protective equipment (PPE) in a clean area. After the scan, the technologist cleans all the equipment in the room and doffs the PPE returns before they return to the clean area. Technologists repeat this process for every patient. The resulting images get routed to the hospital in Boston, where a radiologist interprets them and reports the findings to the MGH Chelsea HealthCare Center almost immediately.

In keeping with Mass General's mission to serve its many constituents even during these difficult times, the MGH Chelsea HealthCare Center continues to image patients for other practices and outside facilities. Its staff still performs routine X-ray exams on the first-floor X-ray suite separately from patients suspected of COVID-19, who are seen in the RIC on the second floor. Urgent care patients without respiratory symptoms who need imaging for extremities, belly pain or other concerns may also be imaged in the first-floor X-ray suite. The nearby MGH Revere HealthCare Center also remains open for X-ray imaging with reduced hours.



**Figure 3.** The MGH Chelsea HealthCare Center has played an important role in the hospital's response to the acute COVID-19 outbreak in Chelsea. Shown here are the center's Melitza Gomez, Karen Dumont and Katie Penza.

## Further Information

For more information about remote coverage during the COVID-19 pandemic, please contact [Tarik Alkasab, MD, PhD](#), Department of Radiology, Massachusetts General Hospital. For more information about radiologist and technologist redeployment, please contact [Michael Gee, MD, PhD](#), Department of Radiology, Massachusetts General Hospital. For more information about virtual health visits, please contact [Dania Daye, MD, PhD](#), Department of Radiology, Massachusetts General Hospital. For more information about the role of radiology in the COVID-19 response in Chelsea, please contact [Patricia Daunais, Operations Manager](#), Department of Radiology, Massachusetts General Hospital.

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