



Since January 2020 Elsevier has created a COVID-19 resource centre with free information in English and Mandarin on the novel coronavirus COVID-19. The COVID-19 resource centre is hosted on Elsevier Connect, the company's public news and information website.

Elsevier hereby grants permission to make all its COVID-19-related research that is available on the COVID-19 resource centre - including this research content - immediately available in PubMed Central and other publicly funded repositories, such as the WHO COVID database with rights for unrestricted research re-use and analyses in any form or by any means with acknowledgement of the original source. These permissions are granted for free by Elsevier for as long as the COVID-19 resource centre remains active.

Coronavirus Disease 2019 (COVID-19) and Your Radiology Practice: Case Triage, Staffing Strategies, and Addressing Revenue Concerns

Christoph I. Lee, MD, MS, Sabiha Raouf, MD, Samir B. Patel, MD, Robert S. Pyatt Jr, MD, David S. Kirsch, MD, Mahmud Mossa-Basha, MD, Michael Recht, MD, Ruth C. Carlos, MD, MS

INTRODUCTION

As our practices prioritize managing the acutely ill as an initial response to coronavirus disease 2019 (COVID-19), we begin to digest the management implications. The *JACR* invited six practice leaders to discuss current actions taken to address these downstream effects. Because COVID-19 is a rapidly evolving situation, these responses reflect the most current experience available at the moment. These practice leaders represent both private and academic practices across a broad range of practice types, sizes, and employment models. Each provided strategies in response to three issues: elective case management, workforce strategies, and revenue concerns.

THE PRACTICE LEADERS

Sabiha Raouf, MD, is chair of radiology and chief medical officer of Jamaica and Flushing Hospital Medical Centers in New York City, the hardest-hit city in the United States. Both safety net hospitals serve a diverse and challenging patient population, with 80% on government assistance. The radiology practice group is employed by the hospital and has 22 radiologists.

Samir Patel, MD, is an executive board member of Radiology, Inc in Mishawaka, Indiana, an independent private practice near the South Bend region. The group consists of 39

diagnostic and interventional radiologists, with a combination of multi-specialists and subspecialists that cover eight hospitals. The practice has its own billing operations and staff.

Robert Pyatt Jr, MD, is chair of the Department of Radiology, Wellspan-Summit Health in central Pennsylvania with eight radiologists representing both multispecialists and generalists. The independent private practice covers a population of about 175,000 people.

David Kirsch, MD, is a partner of Southern Radiology Consultants. The private practice has 17 radiology partners and 2 part-time employee radiologists. The group has about 40 contracts scattered throughout Louisiana and Mississippi.

Mahmud Mossa-Basha, MD, is vice chair of clinical operations in the Department of Radiology, University of Washington in Seattle, Washington, the location of the first reported case in the US mainland. The academic practice covers six hospitals and four outpatient imaging centers across western Washington. All 132 radiologists are salaried university employees.

Michael Recht, MD, is chair of the Department of Radiology, NYU Langone Health Systems. As a faculty group practice at an academic center, the department has approximately 230 salaried faculty radiologists. They provide services at five hospitals and several outpatient imaging centers.

ELECTIVE CASE MANAGEMENT

First and foremost, elective imaging was postponed to protect patients and staff. All practice leaders worked with referring clinicians and administrative leadership to determine which imaging procedures could be deemed medically nonurgent and rescheduled at a later date. Practices that serve multiple independent hospitals or systems may need to align their provision of medically urgent services with each health system's policies. The different rates at which each health system implements COVID-19-related practice changes can complicate a radiology group's efforts to efficiently reschedule elective cases. At least one private practice followed an incident command structure with radiology involvement at the departmental, hospital, and health system board of directors' levels.

All practice leaders noted suspending screening mammography cases. Others rescheduled all screening examinations, including lung cancer screening and bone densitometry, and eliminated all elective examinations at outpatient facilities affiliated with the practice. Most maintained diagnostic workup such as diagnostic mammography, oncologic staging, and interventional oncology treatment. Although overall volumes declined, with one practice leader reporting only one-third of normal volumes, diagnostic and

interventional case loads seemed only minimally affected, and portable radiography demand increased substantially.

All practices maintained close contact with their referring clinicians in determining the need for imaging for individual patients to ensure safe cancellation of ordered examinations. One academic practice requested that the ordering service indicate the time sensitivity of the imaging study and the requested time frame for completion. The same practice employed an existing automated text messaging system to inform patients about rescheduling outpatient elective examinations in consultation with their physicians.

WORKFORCE STRATEGIES

All leaders reported prioritizing the ability to work off-site or providing time away from the clinical schedule for those who have risk factors or have family members with risk factors or required childcare with school closures. All had at least some capability for reporting examinations from home workstations. Most of the practices had begun to provide remote PACS and reporting capability with the pandemic accelerating diffusion of home workstations. However, at least one private practice notes that it remained primarily on-site with some home workstation capacity. Both private and academic practices noted the importance of their IT staff in coordinating and supporting expansion of home workstation availability.

All practices maintained some on-site presence. For one practice, this was limited to interventional radiologists; for most, also diagnostic radiologists. At least one private practice that served multiple geographically separated hospitals noted that the availability of multispecialty radiologists facilitated the ability to reduce the number of radiologists physically

on-site. All have implemented workflow changes such as grouping interventional cases in the morning and interpreting diagnostic cases from home in the afternoon. To maintain physical distancing, practices reported limiting the number of radiologists in each reading room, providing additional on-site workspaces in which radiologists could work in isolation, and limiting switching from reading room to reading room. For the larger academic practices, within-section teams of individuals were created to minimize cross-team exposure and provide uninterrupted section-level coverage in case of infection. Workforce changes affected technologists as well with changes in shift duration and service assignment—for example, with CT and MRI technologists pulled to cover portable radiography. With closure of outpatient sites and low volumes, one academic practice consolidated hours and reassigned staff from the outpatient sites to the hospitals. Another consolidated support staff in response to decreased volume.

With other clinical service providers mobilized to expanded COVID-19 wards, interventional radiologists in both the critical access hospital and the academic practice in New York City have assumed more responsibility for central access device placement. Some of these interventional radiologists now deliver bedside services, which have supported their intensivists and hospitalists.

None of the private practice groups report any plans for redeployment of their radiologists to nonradiology activities. The academic practice in Seattle developed a list of radiology faculty and residents at average risk for COVID-19 infection who could cover emergency departments and acute care units with guidance (ie, functioning at an intern level). The academic practice in New York City reports radiologist

volunteers for nonradiology activities such as employee screening for COVID-19 or redeployment to clinical services; half of their residents were also redeployed to clinical services outside radiology.

One private practice accommodated the reduction in case load with part-time staff considered on vacation or temporary leave and full-time staff transferring future vacation weeks to coincide with the current period.

REVENUE CONCERNS

All practice leaders expressed concerns over the “new normal” and the rate and curve of the recovery in imaging volumes and revenue but differed on strategies for addressing these concerns. Critical access hospitals such as Jamaica and Flushing Hospital Medical Centers are overwhelmed and focused on providing care to the critically ill in the immediate period and thus cannot focus on specific radiology departmental revenue concerns.

In the immediate term, use of tele-radiology services and outsourcing or moonlighting has been curtailed to increase in-house volume and preserve revenue. As small businesses, private practice leaders have applied for federal loans and grants related to the CARES Act, such as Payroll Protection Program Loan, Medicare Advance Payments Program, and Public Health and Social Services Emergency Fund. In private practice, other maneuvers include withholding shareholder bonus payments or base pay reduction among the practice partners’ staff and attempting to maintain clinical and business support staff, increasing bank credit lines, and malpractice insurance deferral. In the academic practices, the goals include maintaining the research and educational missions in addition to clinical care. To reduce costs in the short term, faculty incentive payments and

temporary supplemental payments for excess shifts, overtime, or internal moonlighting for faculty and staff have been reduced or eliminated while maintaining base compensation. Consolidation of discretionary funds, reduction of educational allowances, closure of inefficient research cost centers, and hiring freezes have been implemented. No reports of furloughs or layoffs were reported by the practice leaders, at least in the short term.

In the longer term, although all project volume recovery, the perspectives are mixed regarding the shape of the recovery curve. One private practice anticipates a trough in billing receipts between mid-May and mid-June with a nearly fully booked imaging schedule in May. Another academic practice leader relays concern for a more prolonged recovery period, rather than the anticipated V-shaped recovery, with lingering public concerns about maintaining social distancing in the absence of a vaccine or effective antivirals. In his

estimation, the recovery may not normalize to pre-COVID conditions.

Regardless of the anticipated rate of recovery, practices note a range of strategies to respond to the projected surge in imaging. Flexibility in the workforce may have already been built in some practices with the availability of “flex days” or internal moonlighting that can be increased to meet need. Part-time radiologists have been informed of the potential need for increased effort. One private practice will explicitly address the financial need among their patients with lost employment or insurance and imaging as a contributor to financial burden. Increased efficiency and throughput are anticipated with weekend and later evening appointment availability and shortened scan times. Reductions in capital budget expenditure, including holding new equipment purchases, were reported. One academic practice noted a focus on revenue generation through enterprise expansion such as increases in teleradiology contracts, contract research work, and new

stand-alone outpatient imaging centers with revenue-sharing models.

SUMMARY

The practice leaders shared common concerns with different approaches in the immediate and longer terms. By the time this information is available to the reader, the projections for the disease burden and the recovery will have changed again. Already, some states and institutions are reporting a plateau in COVID-19 cases, and non-COVID-related admissions are on the rise. Nevertheless, the practice-level maneuvers to manage extraordinary conditions remain salient as we, collectively, will be systemically stressed again. Heeding these lessons may lessen the impact of second waves of regional COVID-19 infections and future pandemics.

ACKNOWLEDGMENTS

We gratefully acknowledge Lyndsee Cordes and Jessica Siswick for organizing the webinar.

Christoph I. Lee, MD, MS, and Mahmud Mossa-Basha, MD, are from the Department of Radiology, University of Washington, Seattle, Washington. Sabiha Raoof, MD, is from the Department of Radiology, Jamaica and Flushing Hospital Medical Centers, New York, New York. Samir B. Patel, MD, is from Radiology, Inc, Mishawaka, Indiana. Robert S. Pyatt Jr, MD, is from the Department of Radiology, Wellspan-Summit Health, Chambersburg, Pennsylvania. David S. Kirsch, MD, is from Southern Radiology Consultants, Baton Rouge, Louisiana. Michael Recht, MD, is from the Department of Radiology, New York University Grossman School of Medicine, New York, New York. Ruth C. Carlos, MD, MS, is from the Department of Radiology, University of Michigan School of Medicine, Ann Arbor, Michigan.

Dr Carlos is Editor-in-Chief of *JACR* and Dr Lee is Deputy Editor of *JACR*. The other authors state that they have no conflict of interest related to the material discussed in this article.

Ruth C. Carlos, MD, MS: Department of Radiology, University of Michigan School of Medicine, 1500 E Medical Center Dr, Address, Ann Arbor, MI 48109; e-mail: rcarlos@med.umich.edu.