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The Future of Endoscopic Operations After the Coronavirus Pandemic



Klaus Mergener, MD, PhD, MBA

KEYWORDS

- Coronavirus
 COVID-19 pandemic
 Gastroenterology
 GI endoscopy
- Practice management

KEY POINTS

- Modern GI practices have a high overhead structure and are thus vulnerable to sudden interruptions in cash flow.
- Professional management and constant vigilance are necessary to respond quickly to new developments and adapt expense and revenue structures as needed.
- Procedure backlogs from COVID shutdowns have resulted in delayed GI care that needs to be addressed in a structured fashion, with higher-risk patients prioritized for examinations.
- The pandemic accelerated the implementation of telemedicine programs, and these services will continue to be used in the postpandemic era.
- A crisis presents challenges but also opportunities, and the sense of accomplishment from having navigated this crisis will result in a strong culture of teamwork.

INTRODUCTION

The coronavirus disease 2019 (COVID-19) pandemic represents an unprecedented global health crisis that has challenged GI practices and endoscopy operations in major and unforeseen ways. As of March 1, 2021, there were 115 million confirmed cases of COVID-19 and more than 2.5 million deaths globally, with almost 30 million cases and more than 527,000 deaths in the United States alone.¹

Rapidly implemented global shutdowns of everyday life and business, including medical operations, resulted in sudden delays in our ability to diagnose and treat Gl illnesses and perform cancer screening. As the country is moving toward a full reopening supported by rapidly evolving vaccination programs and scientific discoveries related to the prevention and management of COVID-19, medical practices are wrestling with the challenge of a complete retooling of their operations with the goal of

Division of Gastroenterology, University of Washington, 1917 Warren Avenue North, Seattle, WA 98109, USA *E-mail address:* klausmergener@aol.com

Twitter: @kmergener (K.M.)

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quickly returning to providing high-quality care to large numbers of patients safely and effectively.

At the same time, assessment has begun of the long-term impact that the current pandemic may have on future practice operations: What will postpandemic GI care look like, and how soon will we get there? Will we return to prepandemic operations in all aspects of our work, or will some elements of GI practice be changed forever? If so, what are those elements, and what are the implications for GI leaders as they look to position their groups for continued success? This chapter provides an overview of the impact of the pandemic on US-based GI practices and discusses some key "lessons learned" that may affect future operations.

THE PREPANDEMIC STATE OF GI PRACTICE

Before discussing the ongoing impact of COVID-19 on GI groups and endoscopy operations, it is useful to briefly take stock of the recent history and challenges encountered by GI practices prior to 2020.

Gastroenterologists have enjoyed great success due to the large burden of GI disease and thus high demand for GI services. In our health care system, with its predominantly fee-for-service reimbursement, procedural specialties have fared well economically. Still, there have been considerable and mounting challenges to the current GI practice model²: Reimbursement for endoscopic procedures has declined significantly in recent years while practice costs have continued to skyrocket. Many primary care providers have become employed by payers or large health systems, thereby affecting patient referral patterns for specialty services. Hospital and payer consolidation has resulted in a rapidly changing landscape where small practices often lose leverage in contract negotiations. Disruptive technologies such as nonendoscopic tests for cancer screening and advances in radiology have the potential to further challenge a specialty that is now heavily reliant on revenue from endoscopic procedures.

At the same time, gastroenterologists have been resilient in meeting current challenges. Moving many endoscopic services from the hospital to physician-owned ambulatory endoscopy centers has allowed physicians to increase efficiencies and capture income from facility fees. Adding ancillary revenue streams such as pathology, anesthesia services, infusion, and imaging centers has allowed some groups to compensate for the continued decline in professional fees.²

As a result, the prepandemic GI practice had evolved from a low-overhead hospitalbased operation to a high-overhead business with high capital investments and thus a significant dependence on efficient, high-throughput endoscopy services to generate constant cash flow in support of its cost structure. While this potential vulnerability was not lost on astute practice managers, there was no reason to believe that smoothly running endoscopy services would experience a sudden interruption and downturn in procedure volumes.

THE COVID-19 PANDEMIC

Such was the situation in late December 2019 when the first report arrived at the World Health Organization (WHO) from Wuhan, China, about a new type of pneumonia of unknown cause.³ The ensuing weeks and months brought the most rapid progress of science ever accomplished in the history of infectious diseases: The responsible agent for COVID-19 was identified as a novel beta-coronavirus, now termed severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2).⁴ The virus was isolated on January 7, the full genome sequence was published on January 10, and the first fully validated polymerase chain reaction (PCR) testing protocol was shared with the WHO on January 13, 2020. Since then, the molecular structure of this virus has been determined, PCR, antigen, and antibody tests have been developed, and numerous studies have been performed to elucidate the mechanism of viral transmission, the immunologic response of the host, disease characteristics, treatment options, and vaccine development. Several key findings from this research provide important insights into the anticipated impact of COVID-19 on GI practices and endoscopic operations going forward.^{4,5}

Virus Structure and Transmission

The genetic sequence and structure of SARS-Co-V-2 are similar to those of other human coronaviruses. A lipid bilayer envelope makes the virus particle susceptible to regular detergents, thereby facilitating virus deactivation with standard cleaning procedures such as those used during regular endoscope reprocessing. The spike glycoprotein (S-protein) is embedded in the viral envelope and mediates host cell binding and entry. S-protein has been identified as the main target in current vaccine development efforts,⁶ and monoclonal anti-S antibodies have been produced as one of the first therapeutic agents to combat COVID-19 illness.⁷ The 30 kb single-strand RNA genome of SARS-CoV-2 encodes several other structural and nonstructural proteins, including a replication proofreading apparatus. While this might be expected to reduce the rate of virus mutations compared with other RNA viruses, there have been numerous reports in recent months of emerging virus variants that appear to confer higher transmissibility.⁸ The full impact of these mutations on the epidemiology of COVID-19 and the effectiveness of vaccination programs remains incompletely understood, but this will be a major determinant of what GI practice operations will look like in the near to medium term.

SARS-CoV-2 infects epithelial cells in the respiratory and GI tracts and possibly other target cells. The incubation period ranges from 2 to 14 days, and symptomatic individuals are most contagious immediately before and within the first 5 days of symptom onset with a rapid decline of viral load thereafter.⁹ A key determinant of the high transmissibility is that an estimated 40% to 50% of all COVID-19 infections are transmitted by individuals who are either presymptomatic or remain entirely asymptomatic during the course of their own infection.^{10,11} This has important implications for the implementation of safety measures in the endoscopy unit because simple screening for COVID-19 symptoms will miss a large percentage of SARS-CoV-2 carriers. Virus transmission occurs at close range (within 2 m) via respiratory droplets expelled during coughing or sneezing but also via aerosol transmission, that is, microdroplets small enough to remain suspended in the air for 30 minutes or longer and expose individuals at distances beyond 2 m, often in poorly ventilated indoor settings without sufficient air exchange.¹² Infection via contaminated surfaces appears to play only a minor role, and the relative contributions of these different modalities are not fully known at present.¹³ The role of fecal-oral transmission received considerable attention during the early stages of the pandemic but appears to be minimal if it occurs at all.^{14,15} Although SARS-CoV-2 infects GI epithelial cells, and viral RNA can be identified in stool specimens via PCR testing, studies using viral culture have not consistently identified infectious particles in stool, and no credible reports exist in the English literature of clinically relevant fecal-oral transmission.

Propagation of the Pandemic and Initial Impact on Endoscopy Centers

Since its initial appearance in late 2019, COVID-19 has spread around the globe at an alarming pace. The first US case was reported in a Washington state resident who

returned from Wuhan, China, on January 15, 2020. On January 31, 2020, WHO issued a global health emergency, and on March 11, WHO declared COVID-19 a pandemic. With cases rising rapidly, travel restrictions, business shutdowns, and stay-at-home orders followed within a few days. By the end of March 2020, endoscopy volumes for elective procedures had fallen to less than 10% of baseline volumes.^{16–18}

At that point, endoscopy unit managers were confronted with a sudden and profound decrease in cash flow for these very cash-dependent operations. Strategies had to be developed quickly to (1) reduce expenses and (2) repair revenues. For the rapid reduction of expenses, the main cost drivers had to be identified and addressed: (1) staff costs needed to be reduced via layoffs and furloughs; (2) accounts payable such as rent and other contracts needed to be renegotiated as much as feasible; and (3) efforts to reduce operational costs/waste needed to be intensified. Revenue repair focused on the following items: (1) rapid implementation of telehealth capabilities, including training of patients and staff on IT platforms; (2) procurement of sufficient personal protective equipment (PPE) and retooling of workflows in the endoscopy center to allow at least partial resumption of elective operations as soon as state regulations allowed; (3) development of communication tools to (a) inform patients of the steps taken to maintain a safe environment in GI practice and endoscopy unit and (b) to keep staff up to date on the rapid implementation of these changes.

Since April 2020, the pandemic has progressed in a typical manner through phases of deceleration and acceleration. On April 7, daily case numbers reached the first peak of 35,000 before decreasing and then rising again to well over 80,000 cases per day in late July.¹ Another decrease was followed by an even larger third wave that peaked at more than 250,000 daily cases in early January 2021. At the time of this writing in March 2021, daily case numbers have again decreased and leveled off at a still concerningly high trough level of 45,000 to 50,000/d, with the direction of the next trend yet to be determined. Significant variability of this dynamic from state to state and the lack of a standardized federal approach to reopening and shutdown orders have resulted in a varied approach to and timing of reopening of endoscopy centers depending on their geographic location and local circumstances. At the 1-year mark of the COVID-19 pandemic on March 10, 2021, there is hope that the end of the pandemic can be reached by the end of summer 2021, mainly thanks to the rollout of a comprehensive vaccination program that has now begun.¹⁹

The Promise of COVID Vaccines

Initial COVID containment efforts focused on nonpharmacologic interventions to include social distancing, contact tracing, and isolation, the use of personal protective equipment (PPE) to include face masks, and handwashing and environmental cleaning. These efforts have now been significantly augmented by the development, approval, and rollout of COVID-19 vaccinations. Vaccines typically require years of research and testing before reaching clinical practice, but in early 2020, almost immediately after the identification of the molecular virology of SARS-CoV-2, scientists embarked on a race to produce safe and effective coronavirus vaccines in record time. By fall 2020, more than 150 vaccine candidates were in various stages of development.^{6,20}

In the United States, 3 vaccines have now received emergency use authorization from the Food and Drug Administration.²¹ While storage requirements and the number of necessary inoculations vary between products, all 3 vaccines result in a humoral and T-cell-mediated immune response against epitopes of the viral S-protein. Clinical trials to date have shown surprisingly high efficacy rates upwards of 85% to 94% for all 3 products,²² with "efficacy" defined as a reduction in the rate of acquiring severe

COVID-19 disease. Importantly, and relevant to the risk of vaccinated individuals to still carry and transmit SARS-CoV-2 virus in endoscopy units, there is now emerging evidence that vaccinations also result in a marked decrease in viral load of up to 20fold and therefore a projected lower risk of infection transmission.^{23,24} While many details remain to be worked out, including the duration of protective immunity after vaccination and thus the need for and timing of possible future booster immunizations, the more immediate hope relates to continuing with rapid vaccine administration, currently occurring at a rate of 2 million individuals per day in the United States,²⁵ in order to reach "herd immunity." This term refers to the percentage of a population that must acquire immunity to an infectious agent in order for the transmission of the agent to slow and eventually seize. In the case of SARS-CoV-2, many experts predict that "herd immunity" requires that at least 70% of the population has become immune to COVID-19 through either vaccination or natural infection.²⁶ It is important to note that the "end of the COVID-19 pandemic" should not be envisioned as flipping a switch but rather as a stepwise process whereby, after reaching herd immunity, nonpharmacologic interventions to prevent COVID-19 transmission may be gradually lifted but could remain in effect in some areas or be implemented again at a later time depending on local disease prevalence. In addition, because not all individuals will have received or agreed to receive COVID vaccination, endoscopy units may still have to consider testing protocols or contact safety measures in nonvaccinated individuals in the event of persistently high case numbers in some geographic areas.

INITIAL REOPENING STRATEGIES AND SHORT-TERM IMPACT ON ENDOSCOPY OPERATIONS

The rapid spread of the COVID-19 pandemic in spring 2020 forced GI practice leaders to quickly develop contingency plans for their operations in order to provide uninterrupted GI care wherever feasible, maintain the solvency of the practice, and plan for a return to prepandemic patient volumes as soon as possible.^{17,27} Many of these strategies have a budgetary impact, as they either require a financial investment or result in lower endoscopy unit throughput. Planning for the gradual resumption of services began during the first pandemic wave and was periodically updated as states proceeded through reopening and repeated shutdown mandates over the course of the pandemic. The American Society for Gastrointestinal Endoscopy (ASGE)²⁸ and several other professional organizations have produced guidance documents to provide gastroenterologists with recommendations to employ to mitigate infection risk and optimize endoscopy operations under these unique circumstances.^{29–31}

Changes in Workflow

Creating a safe environment in the endoscopy unit for patients, staff, and providers should always remain the top priority for GI leaders. Preprocedure screening now includes a COVID symptom questionnaire, which should be mandatory for patients before any endoscopy and for staff at the beginning of each workday.²⁸ Symptom screening will miss asymptomatic and presymptomatic carriers, but positive responses in these questionnaires should prompt removal of the individual from care areas and self-quarantine or hospital referral as needed. Many practices have now included similar COVID-related questions in the postprocedure questionnaires typically used to assess patient satisfaction. Such questionnaires can be distributed and returned before and after endoscopy appointments, avoiding delays in workflows on the day of the procedure. Lobby, admittance area, and recovery bay capacities, as well as foot traffic, in the endoscopy center have been altered to accommodate the

need for physical distancing, including fewer chairs in waiting areas, physical barriers (eg, plexiglass partitions) where physical distancing cannot be accomplished, and the implementation of unidirectional flow through the endoscopy unit wherever possible. Wearing a face mask that covers both mouth and nose has become mandatory for all patients, providers, and staff at all times, as it has been clearly shown to reduce the risk of COVID transmission.³² A significant investment of both time and money is required for training patients and staff on the unit's COVID-19 protocols including new workflows, proper hand hygiene and disinfection procedures, timing of patient arrivals, discharge procedures, pickup by family members, etc.²⁸ Preprocedure office visits, generally poorly compensated but sometimes necessary in higher-risk patients referred for open-access procedures, are now commonly conducted via telemedicine.

Changes in the Endoscopy Room

Significant changes have been implemented in the endoscopy room as well in an attempt to minimize the risk of infection transmission.³³ All members of the endoscopy team need to wear a full set of PPE (gown, gloves, hair cover, eye protection), and the appropriate donning and doffing of PPE requires diligent training and frequent reinforcement.²⁸ Although the evidence supporting the use of a face mask to reduce the risk of infection is irrefutable, the decision regarding the choice of mask for endoscopy team members-specifically, whether to use N95 respirators versus regular surgical masks in the procedure room-is complex and not well supported by high-quality evidence. Some studies have shown surgical masks to be noninferior to N95 respirators in the prevention of viral infections like influenza,³⁴ but a recent systematic review and meta-analysis showed a benefit in using N95 respirators over standard masks in protecting health care workers from SARS-CoV-1.35 While these devices are more costly than regular surgical masks, they should therefore be strongly considered (assuming no supply shortage) for team members in the endoscopy room, given that upper endoscopies are known to generate aerosols. While the advantage of N95 masks over surgical masks will diminish with decreasing prevalence of SARS-CoV-2, endoscopy units are well advised to err on the side of safety until vaccination efforts and testing can provide assurance of negligible COVID risk.

Some authors have suggested additional time for room aeration between individual endoscopic procedures even in ambulatory endoscopy settings, a recommendation that remains a topic of intense debate and has not been widely adopted. The rationale for increasing the number of air exchanges between cases rests on the notion of SARS-CoV-2 being transmitted via aerosols and thus remaining airborne for prolonged periods in indoor settings with poor ventilation. ASGE guidance notes that "rooms lacking negative pressure benefit from additional aeration time for adequate clearance of droplets/aerosols,"28 and some authors have suggested that this extra time between procedures should be as long as 30 to 60 minutes per case, an approach that is economically prohibitive for busy endoscopy units. In the absence of definitive scientific evidence specific to the endoscopy unit, different centers have taken very different approaches, and more studies are required to inform these decisions. Because of the high susceptibility of coronaviruses to standard disinfectant solutions, no changes are recommended to established reprocessing procedures for endoscopes and accessories.²⁶ While infection transmission via contaminated surfaces may play a comparatively minor role in the spread of SARS-CoV-2, professional organizations recommend deep cleaning of high-touch surfaces in procedure rooms after each case.^{28,29} No changes are recommended to "terminal cleaning" procedures for cleaning and disinfecting the endoscopy unit at the end of the day.³⁶

Testing Strategies

Because asymptomatic SARS-CoV-2 infections are a frequent source for transmission, a preprocedure symptom-screen of all individuals presenting for endoscopy is insufficient to eliminate the risk of infection transmission in the endoscopy suite. Ideally, efforts to mitigate this risk require all patients (and staff) to demonstrate either the presence of convalescent antibodies to SARS-CoV-2 or a negative molecular test within 48 hours of a scheduled procedure (or in the case of staff, with some regularity-eq, weekly). Many endoscopy units have implemented a universal testing strategy for patients, especially because the cost of testing is currently borne by government agencies in most states. Performing such a test close to the date of a procedure is important to avoid a negative test result during the early incubation period with subsequent high viral loads at the time of the procedure. While a well-timed universal testing strategy may be desirable, several obstacles have made widespread implementation of such an approach difficult. First, sufficient test capacities were not available during the early stages of the pandemic, and reports persist of periodic test shortages in some geographic areas. Second, test results need to be available at the time of the procedure, as cancellations will result in a significant number of unused endoscopy slots and thus considerable inefficiencies. In addition, test accuracies are not perfect. The Infectious Diseases Society of America suggests against universal testing when PPE is readily available, noting significant rates of false-negative tests and thus lower negative predictive value in areas of high disease prevalence.³⁷ Testing is favored if PPE is limited. The American Gastroenterological Association has published a detailed decision-making guide related to preprocedure testing, taking into account the test used, prevalence of the disease, and several other factors.³⁸ While this guide provides a detailed framework for decision-making, its algorithm is complex, and its application in everyday GI practice is therefore somewhat limited. With the increasing availability of point-of-care (POC) antigen tests and the development of new rapid turnaround molecular tests, and with the pandemic beginning to recede, the approach to preprocedure testing can be expected to undergo further changes. It appears likely that testing will eventually be employed in a more focused and targeted manner-for example, POC testing for individuals who are unable to produce proof of up-to-date vaccination or immunity to SARS-CoV-2.39

LONG-TERM IMPACT OF COVID-19 ON ENDOSCOPY OPERATIONS Macroeconomic Considerations

The COVID-19 pandemic has led to record job losses. In April and May 2020 alone, more than 36 million Americans filed for unemployment benefits, levels not seen since the Great Depression.⁴⁰ While some unemployed individuals will have switched to an employed spouse's coverage, gotten on a parent's plan, or stayed covered by their previous employer through a COBRA package, many likely turned to coverage through health insurance exchanges, got on a Medicaid plan, or became uninsured. The end result of these shifts in the insurance market is projected to be an overall increase in the percentage of individuals who lose coverage or have to switch to insurance products that reimburse providers at lower rates for some services. What's more, financial hardships encountered during the pandemic may motivate people to postpone elective medical services such as screening exams or forgo them altogether, resulting in decreased practice revenues.

The federal government has enacted several pieces of legislation to provide relief to individuals and corporations affected by the COVID-19 pandemic. These provisions have been largely financed through borrowing, thereby increasing the US national

debt. While these interventions were thought to be necessary to stimulate the economy and avoid a depression, the resulting increase in the national debt will put additional pressure on future annual budgets, including allocations for Medicare, Medicaid, and other health insurance programs. The prepandemic changes related to decreasing reimbursements for physician and facility services can therefore be expected to accelerate further. At the same time, costs will continue to increase. While innovations in care delivery or new endoscopic techniques or technologies may result in as yet unpredictable paradigm shifts and open new opportunities for GI endoscopists, the more immediate change will relate to the need to manage ever-decreasing profit margins. Hospitals and health systems have some ability to navigate this situation by shifting costs among their diversified services or pursuing further consolidation to gain negotiating clout and demand higher pricing. On the other hand, singlespecialty GI groups have only limited ways to respond. They will need to intensify prepandemic efforts to contain costs, reduce waste and optimize efficiencies.² Paradoxically, practices that entered the pandemic year with suboptimal management and a low efficiency/high-cost structure may be expected to have the most room for improvement, provided that they recognize the need to quickly adopt professional management. One approach to cost containment relates to sharing resources across a larger organization, that is, merging with other GI practices. This trend had already begun prior to the pandemic and was partially fueled by private equity-funded practice roll-up models. It is anticipated that these mergers into ever larger, often multistate practices will continue and that other partners, such as payers and/or health systems, will also demonstrate an increasing interest in practice partnerships or opportunities to acquire GI practices outright. As was the case before COVID-19, there will not be a "one-size-fits-all" solution, and the best way forward for an individual practice will vary by region and market.²

Minimizing the Impact of Delayed GI Care

One critically important issue with long-term impact relates to the procedure backlog that has accumulated as a result of endoscopy center shutdowns. Colonoscopy is the most commonly performed GI endoscopy procedure, and its widespread use has been a major factor in the decline of colorectal cancer (CRC) in this country.⁴¹ It is well documented that the risk of being diagnosed with CRC in general, and with advanced-stage CRC in particular, increases significantly if screening is delayed or is not completed in a timely manner after an initial positive stool test.⁴²⁻⁴⁴ For example, Corley and colleagues⁴⁵ reported a 3.2-fold increase in CRC detected in fecal immunochemistry test (FIT)-positive patients when colonoscopy was delayed for more than 12 months. Modeling studies to estimate the potential impact of COVID-19-related disruptions to screening on CRC incidence and mortality have found that this disruption will have a marked and prolonged impact on CRC incidence and deaths between 2020 and 2050 attributable to missed screening.⁴⁶ Early reports of "real-world data" match the near-term predictions from these modeling studies. Using data sets from the National Health Service in England, Morris and colleagues⁴⁷ calculated a relative reduction of 22% in the number of CRC cases detected and referred for treatment in that country for the April to October 2020 time frame compared with the prior year.

With endoscopy units shut down for several weeks in 2020, some practices have accumulated procedure backlogs of several thousand procedures. It is crucial for these practices to explore ways to increase procedure capacities, for example, by extending work hours or offering weekend endoscopy times. Higher-risk patients, such as those with symptoms or a positive FIT test should be prioritized to minimize the risk of delayed cancer diagnoses. Efforts need to be increased to minimize vacant procedure slots due to last-minute cancellations or poor colon preparation and to avoid nonindicated procedures in order to preserve valuable procedure time for examinations on individuals with a higher risk of harboring GI pathology. Importantly, because patients may still be reluctant to return to medical facilities because they may perceive a continued high risk of contracting COVID-19, enhanced communication efforts are necessary to inform patients and referring providers of the safety of GI endoscopic services and the benefits of undergoing potentially life-saving procedures. Ongoing monitoring of screening participation rates will demonstrate the effects of changing patient behaviors and will identify needs for further patient education. Previous studies have shown that mass media campaigns can improve screening participation, have positive effects on long-term health impacts, and are highly cost-effective.⁴⁸

The Role of Telemedicine

The pandemic accelerated the implementation of telemedicine programs by many vears.⁴⁹ Before COVID-19, most practices had barely begun experimenting with virtual visits, and most payers provided very low reimbursement rates for these services, if they paid at all. When telehealth in a typical practice suddenly grew from a few visits to many thousand visits per month, physicians, patients, and payers became increasingly aware of its significant benefits. Patients appreciate the option of a virtual visit, especially those individuals who live far away or have mobility issues. Physicians can more easily conduct interactions with patients who do not always require physical examinations-for example, follow-up discussions after procedures or certain preprocedure screening assessments.⁵⁰ Additional services such as professional translators can be provided with greater ease in the virtual world. Provided that reimbursement for such virtual visits will remain adequate, it can be anticipated that a significant percentage of physician-patient visits will continue to be conducted via telemedicine. Practices are therefore well advised to continue to invest in their IT infrastructures. The leap to telemedicine in spring 2020 was fast-tracked and could not always include the level of "at-the-elbow" support that is typically employed for this level of change. Practices will need to continue to optimize workflows and staff and provider training to provide patients with the best possible experience in these virtual encounters.

Pandemic Disruption as an Opportunity

Winston Churchill is credited with the quote "Never let a good crisis go to waste."⁵¹ For GI groups, the COVID-19 pandemic of 2020–2021 was an unprecedented crisis that challenged all aspects of practice operations in unforeseen ways and brought some practices to the brink of insolvency. At the same time, after an initial phase of stress and struggle, the majority of GI practices have been able to pivot and adjust to the new realities, often with a massive team effort. Going forward, this should create a sense of shared mission and be reflected on by the entire team as a proud accomplishment. The most successful groups will have used this crisis to question restrictive routines and identify opportunities for creative change and innovation, an effort that may well leave them better positioned for the challenges of the future.

There are valuable lessons to be drawn from the pandemic: First, despite being wellpositioned and in demand, our specialty is not immune to sudden and unexpected calamities. While COVID-19 represents the first global pandemic of our professional careers, it may not be the last. As noted in a recent review by Morens and Fauci,⁵² our modern way of life, with increased global travel, crowded cities, and a changing environment, promotes the emergence of new infectious diseases and lays the foundation for rapid global spread. Practices should continue to expect the unexpected, remain on alert, and invest in professional management and an infrastructure that allows them to respond rapidly to new developments. Second, the basic tenets of practice management hold as true in calm as they do in crisis. Groups that enter a difficult period with a solid organizational infrastructure and sound financial health are likely to fare better than those who fail to continuously improve and optimize their operations. A solid foundation is most useful in times of earthquake. Third, and most importantly, although GI represents a specialty with a strong procedural focus, and the modern endoscopy unit is geared toward throughput and efficiency, the pandemic has provided a powerful reminder that at its core, GI endoscopy, and the entire practice of gastroenterology, is a team sport. GI leaders are well advised to invest in their staff at all levels of the organization, creating a sense of coherence and shared mission and a culture of teamwork. The most successful GI practices are taking great care of people, and they do so in large part by taking care of the people who take care of people! With these learnings incorporated into the postpandemic GI practice, the future of our specialty continues to be bright!

CLINICS CARE POINTS

- Continue to monitor and follow GI society guidelines for changes in practice workflows and endoscopic operations during the COVID pandemic to keep patients and staff safe.
- Prioritize higher-risk patients and develop additional procedure capacities to quickly reduce procedure backlogs and avoid long waiting times for patients with potential significant GI diseases.
- Invest in IT and telemedicine capabilities and continue to offer this service to patients postpandemic to support timely medical care.

DISCLOSURE

The author has nothing to disclose.

REFERENCES

- 1. Worldometer COVID-19 tracker. Available at: https://www.worldometers.info/. Accessed March 1, 2021.
- 2. Mergener K. Impact of health care reform on the independent GI practice. Gastrointest Endosc Clin N Am 2012;22(1):15–27.
- 3. Zhu N, Zhang D, Wang W, et al. A novel coronavirus from patients with pneumonia in China, 2019. N Engl J Med 2020;382:727–33.
- 4. Cevik M, Kuppalli K, Kindrachuk J, et al. Virology, transmission, and pathogenesis of SARS-CoV-2. BMJ 2020;371:m3862.
- 5. Hu B, Guo H, Zhou P, et al. Characteristics of SARS-CoV-2 and COVID-19. Nat Rev Microbiol 2021;19:141–54.
- 6. Krammer F. SARS-CoV-2 vaccines in development. Nature 2020;586:516–27.
- Cohen MS. Monoclonal antibodies to disrupt progression of early COVID-19 infection. N Engl J Med 2021;384:289–91.
- 8. Baric RS. Emergence of a highly fit SARS-CoV-2 variant. N Engl J Med 2020;383: 2684–6.
- 9. Meyerowitz EA, Richterman A, Gandhi RT, et al. Transmission of SARS-CoV-2: a review of viral, host and environmental factors. Ann Intern Med 2021;174:69–79.

- Buitrago-Garcia D, Egli-Gany D, Counotte MJ, et al. Occurrence and transmission potential of asymptomatic and presymptomatic SARS-CoV-2 infections: a living systematic review and meta-analysis. PLoS Med 2020;17(9):e1003346.
- 11. Meyerowitz EA, Richterman A, Bogoch II, et al. Towards an accurate and systematic characterisation of persistently asymptomatic infection with SARS-CoV-2. Lancet Infect Dis 2020;21(6):e163–9.
- 12. Leung NHL, Chu DKW, Shiu EYC, et al. Respiratory virus shedding in exhaled breath and efficacy of face masks. Nat Med 2020;26(5):676–80.
- 13. Kissler SM, Tedijanto C, Goldstein E, et al. Projecting the transmission dynamics of SARS-CoV-2 through the postpandemic period. Science 2020;368:860–8.
- 14. Gu J, Han B, Wang J. COVID-19: gastrointestinal manifestations and potential fecal-oral transmission. Gastroenterology 2020;158:1518–9.
- 15. Repici A, Aragona G, Cengia G, et al. Low risk of COVID-19 transmission in GI endoscopy. Gut 2020;69:1925–7.
- Parasa S, Reddy N, Faigel DO, et al. Global impact of the COVID-19 pandemic on endoscopy: an international survey of 252 centers from 55 countries. Gastroenterology 2020;159:1579–81.
- 17. Forbes N, Smith ZL, Spitzer RL, et al. Changes in gastroenterology and endoscopy practices in response to the COVID-19 pandemic: results from a North American survey. Gastroenterology 2020;159:772–4.e13.
- Repici A, Pace F, Gabbiadini R, et al. Endoscopy units and the coronavirus disease 2019 outbreak: a multicenter experience from Italy. Gastroenterology 2020; 159:363–6.
- 19. Available at: https://news.harvard.edu/gazette/story/2020/12/anthony-fauci-offersa-timeline-for-ending-covid-19-pandemic/. Accessed March 7, 2021.
- 20. Krammer F. Pandemic vaccines: how are we going to be better prepared next time? Med 2020;1:28–32.
- 21. Available at: https://www.fda.gov/emergency-preparedness-and-response/ coronavirus-disease-2019-covid-19/covid-19-vaccines. Accessed March 4, 2021.
- 22. Forni G, Mantovani A. COVID-19 vaccines: where we stand and challenges ahead. Cell Death Differ 2021;28:626–39.
- Levine-Tiefenbrun M, Yelin I, Katz R, et al. Decreased SARS-CoV-2 viral load following vaccination. MedRxiv 2021. https://doi.org/10.1101/2021.02.06. 21251283.
- Petter E, Mor O, Zuckerman N, et al. Initial real-world evidence for lower viral load of individuals who have been vaccinated by BNT162b2. MedRxiv 2021. https:// doi.org/10.1101/2021.02.08.21251329.
- 25. Available at: https://www.nytimes.com/interactive/2020/us/covid-19-vaccine-doses. html. Accessed March 8, 2021.
- 26. Omer SB, Yildirim I, Forman HP. Herd immunity and implications for SARS-CoV-2 control. JAMA 2020;324:2095–6.
- 27. Repici A, Maselli R, Colombo M, et al. Coronavirus (COVID-19) outbreak: what the department of endoscopy should know. Gastrointest Endosc 2020;92:192–7.
- 28. American Society for Gastrointestinal Endoscopy. Guidance for resuming GI endoscopy and practice operations after the COVID-19 pandemic. Gastrointest Endosc 2020;92:743–7.
- 29. British Society of Gastroenterology. Endoscopy activity and COVID-19: British Society of Gastroenterology and Joint Advisory Group Guidance 2020. Available at: https://www.bsg.org.uk/covid-19-advice/endoscopy-activity-and-covid-19-bsg-and-jag-guidance/. Accessed March 7, 2021.

- **30.** Gralnek IM, Hassan C, Beilenhoff U, et al. ESGE and ESGENA position statement on gastrointestinal endoscopy and the COVID-19 pandemic. Endoscopy 2020; 52:483–90.
- American Society for Gastrointestinal Endoscopy. Gastroenterology professional society guidance on endoscopic procedures during the COVID-19 pandemic 2020. Available at: https://www.asge.org/home/resources/key-resources/covid-19-asge-updates-for-members/gastroenterology-professional-society-guidanceon-endoscopic-procedures-during-the-covid-19-pandemic. Accessed March 7, 2021.
- **32.** Chu DK, Akl EA, Duda S, et al. Physical distancing, face masks, and eye protection to prevent person-to-person transmission of SARS-CoV-2 and prevent COVID-19: a systematic review and meta-analysis. Lancet 2020;395:1973–87.
- **33.** Cennamo V, Bassi M, Landi S, et al. Redesign of a GI endoscopy unit during the COVID-19 emergency: a practical model. Dig Liver Dis 2020;52:1178–87.
- 34. Long Y, Hu T, Liu L, et al. Effectiveness of N95 respirators versus surgical masks against influenza: a systematic review and meta-analysis. J Evid Based Med 2020;13:93–101.
- **35.** Offeddu V, Yung CF, Low MSF, et al. Effectiveness of masks and respirators against respiratory infections in healthcare workers: a systematic review and meta-analysis. Clin Infect Dis 2017;65:1934–42.
- **36.** Petersen BT, Cohen J, Hambrick RD, et al. Multisociety guideline on reprocessing flexible GI endoscopes: 2016 update. Gastrointest Endosc 2017;8:282–94.
- IDSA guidelines on the diagnosis of COVID-19: molecular diagnostic testing. Available at: https://www.idsociety.org/COVID19guidelines/dx. Accessed March 1, 2021.
- **38.** Sultan S, Siddique SM, Altayar O, et al. AGA Institute rapid review and recommendations on the role of pre-procedure SARS-CoV-2 testing and endoscopy. Gastroenterol 2020;159:1935–48.
- **39.** Brown RCH, Kelly D, Wilkinson D, et al. The scientific and ethical feasibility of immunity passports. Lancet Infect Dis 2020;21(3):e58–63.
- US Department of Labor. Unemployment insurance weekly claims. 2020. Available at: https://www.dol.gov/sites/dolgov/files/OPA/newsreleases/ui-claims/20201122. pdf. Accessed March 6, 2021.
- 41. Nishihara R, Wu K, Lochhead P, et al. Long-term colorectal-cancer incidence and mortality after lower endoscopy. N Engl J Med 2013;369:1095–105.
- 42. Lee YC, Fann JC-Y, Chiang T-H, et al. Time to colonoscopy and risk of colorectal cancer in patients with positive results from fecal immunochemical tests. Clin Gastroenterol Hepatol 2019;17:1332–40.
- Rutter CM, Kim JJ, Meester RGS, et al. Effect of time to diagnostic testing for breast, cervical, and colorectal cancer screening abnormalities on screening efficacy: a modeling study. Cancer Epidemiol Biomarkers Prev 2018;27:158–64.
- 44. Meester RG, Zauber AG, Doubeni CA, et al. Consequences of increasing time to colonoscopy examination after positive result from fecal colorectal cancer screening test. Clin Gastroenterol Hepatol 2016;14:1445–51.
- **45.** Corley DA, Jensen CD, Quinn VP, et al. Association between time to colonoscopy after a positive fecal test result and risk of colorectal cancer and cancer stage at diagnosis. JAMA 2017;317:1631–41.
- **46.** De Jonge L, Worthington J, Van Wifferen F, et al. Impact of the COVID-19 pandemic on faecal immunochemical test-based colorectal cancer screening programmes in Australia, Canada and the Netherlands: a comparative modelling study. Lancet Gastroenterol Hepatol 2021;6:304–14.

- **47.** Morris EJA, Goldacre R, Spata E, et al. Impact of the COVID-19 pandemic on the detection and management of colorectal cancer in England: a population-based study. Lancet Gastroenterol Hepatol 2021;6(3):199–208.
- **48.** Worthington J, Lew J-B, Feletto E, et al. Improving Australian National Bowel Cancer Screening Program outcomes through increased participation and cost-effective investment. PLoS One 2020;15:e0227899.
- **49.** Keihanian T, Sharma P, Goyal J, et al. Telehealth utilization in gastroenterology clinics amid the COVID-19 pandemic: impact on clinical practice and gastroenterology training. Gastroenterology 2020;159:1598–601.
- **50.** Dobrusin A, Hawa F, Gladshteyn M, et al. Gastroenterologists and patients report high satisfaction rates with telehealth services during the novel coronavirus 2019 pandemic. Clin Gastroenterol Hepatol 2020;18:2393–7.
- 51. Available at: https://realbusiness.co.uk/as-said-by-winston-churchill-never-waste-a-good-crisis/. Accessed March 7, 2021.
- 52. Morens DM, Fauci AS. Emerging pandemic diseases: how we got to COVID-19. Cell 2020;182:1077–92.