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.

Donning a New Approach to the Practice of Gastroenterology: Perspectives From the COVID-19 Pandemic Epicenter

Amrita Sethi,[*] Arun Swaminath,[‡] Melissa Latorre,[§] Daniel S. Behin,[‖] Daniela Jodorkovsky,[*] Delia Calo,[¶] Olga Aroniadis,[#] Anjali Mone,[‡] Robin B. Mendelsohn,[¶] Reem Z. Sharaiha,[**] Tamas A. Gonda,[*] Lauren G. Khanna,[§] Juan Carlos Bucobo,[#] Satish Nagula,[‡‡] Sammy Ho,[‖] David L. Carr-Locke,[**] and David H. Robbins,[‡] on behalf of New York Society for Gastrointestinal Endoscopy

[*]New York Presbyterian–Columbia University Irving Medical Center, New York, New York; [‡]Lenox Hill Hospital, Northwell Health, New York, New York; [§]New York University Langone Health, New York, New York; [‖]Montefiore Medical Center/Albert Einstein College of Medicine, Bronx, New York; [¶]Memorial Sloan Kettering Cancer Center, New York, New York; [#]Stony Brook University Hospital, Stony Brook, New York; [**]New York Presbyterian Weill Cornell, New York, New York; [‡‡]Mount Sinai Hospital/Icahn School of Medicine at Mount Sinai, New York, New York

The COVID-19 pandemic seemingly is peaking now in New York City and has triggered significant changes to the standard management of gastrointestinal diseases. Priorities such as minimizing viral transmission, preserving personal protective equipment, and freeing hospital beds have driven unconventional approaches to managing gastroenterology (GI) patients. Conversion of endoscopy units to COVID units and redeployment of GI fellows and faculty has profoundly changed the profile of most GI services. Meanwhile, consult and procedural volumes have been reduced drastically. In this review, we share our collective experiences regarding how we have changed our practice of medicine in response to the COVID surge. Although we review our management of specific consults and conditions, the overarching theme focuses primarily on noninvasive measures and maximizing medical therapies. Endoscopic procedures have been reserved for those timely interventions that are most likely to be therapeutic. The role of multidisciplinary discussion, although always important, now has become critical. The support of our faculty and trainees remains essential. Local leadership can encourage well-being by frequent team check-ins and by fostering trainee development through remote learning. Advancing a clear vision and a transparent process for how to organize and triage care in the recovery phase will allow for a smooth transition to our new normal.

Keywords: COVID-19; PPE; NYSGE; Guidelines; Consults; Experience.

By April 10, 2020, the number of COVID-19 cases in New York reached nearly 160,000 (with >92,000 cases in the metropolitan region alone), a staggering and grim state statistic that alone exceeded that of any country. On March 16, 2020, approximately 1 week before New York was labeled the epicenter of the pandemic, the New York Society for Gastrointestinal Endoscopy issued guidelines that built on those from national societies and published narratives from other global epicenters.[1–4] The urgent communication strongly emphasized prioritization of endoscopic procedures, outlined operational practices of the endoscopy suite, and defined personal protective equipment (PPE) standards to be followed during endoscopy. However, our growing experience and variability in regional rates of infections, availability of resources, and institutional guidance necessitates tailoring of national recommendations. Most guidelines have yet to address practical changes to management of gastroenterology (GI) consults and common GI issues in response to the pandemic.

This review describes how GI consultative services and management of some disease-specific illnesses such as inflammatory bowel disease (IBD) have been redesigned throughout hospitals in the New York metropolitan area, not unlike how practicing (and in some cases previously retired) gastroenterologists have been redeployed as COVID hospitalists and endoscopy suites have been repurposed as COVID care units. These modifications follow several guiding principles that are listed in Table 1 and focus on rethinking methods for the assessment of patients with gastroenterology diseases, modifying strategies for intervention, and working in tandem with other services to achieve acceptable outcomes. An unexpected consequence of this virus's attack is the hijacking of our standards of excellence and coercion to change our practice in ways that contradict our sensibilities. This review describes some of our

Abbreviations used in this paper: **ASC, ambulatory surgical center; EN, enteral nutrition; ERCP, endoscopic retrograde cholangiography; EUS, endoscopic ultrasound; GI, gastrointestinal; IBD, inflammatory bowel disease; ICU, intensive care unit; NGT, nasogastric tube; OR, operating room; PPE, personal protective equipment.**

Most current article

1542-3565/$36.00
https://doi.org/10.1016/j.cgh.2020.04.032

Table 1. Minimizing Endoscopy Utilization and Conserving Resources

First consider noninvasive testing (ie, radiography)
Maximize medical therapies before procedural intervention
Consider interventional radiology, if resources allow
Prioritize procedures that reduce length of stay (percutaneous endoscopic gastrostomies, but favor interventional radiology G-tube over percutaneous endoscopic gastrostomy)
Encourage procedures that avoid surgery (ie, colonic stenting)

proposed solutions to these unfamiliar challenges. By sharing our collective experiences we hope that regions of the country that have yet to endure the full brunt of this contagion will be better informed to implement similar strategies and mitigate what has proven to be a relentless and sustained attack on us all.

Repurposing of Endoscopy Units and Gastrointestinal Services

Nothing about the practice of endoscopy was unscathed as the pandemic inundated the city. By the third week of the pandemic, the large hospital systems were 40% to 80% filled with COVID patients, with up to 25% requiring intensive care unit (ICU) care in some locations. On average, GI services in these hospitals decreased their procedural volume by 80% to 90%, and the consultative volume by 50%. By the time of this writing, repurposing endoscopy suites to COVID care units has occurred in many of the hospital systems in the region. Procedures now largely are relegated to the operating room (OR) or to the bedside in ICUs, and approved indications remain sharply restricted. Anesthesiologists and their equipment are being used to furnish makeshift ICUs while endoscopy staff, including GI faculty and many of New York's 400 fellows, are redeployed throughout the hospital. Many institutions have created central OR committees to review all procedures and surgeries to ensure fair provision of resources across the hospital. GI procedures and consults are performed by only 1 to 2 faculty members, most often a general GI consult attending and an interventionist, who is not typically in the hospitalist redeployment pool. Undeployed fellows play supporting and non–patient-contact roles or staff virtual outpatient consults. Finally, some programs have consolidated all GI services, including subspecialty services such as pancreaticobiliary, IBD, and transplant hepatology into one consultative service for all consults.

Updates on Guidelines for Indications, Personal Protective Equipment, and Procedural Logistics

As indicated previously, early local guidelines followed national and international recommendations regarding indications of procedures, use of PPE, and endoscopy suite etiquette. However, over the few weeks that followed individual institutions went through volatile changes of PPE availability that mandated revised policies. By executive order, ambulatory surgical centers (ASCs) were mandated to stop performing elective procedures and as a result many have been forced to close entirely. Some centers, particularly those with hospital affiliations, have been repurposed as COVID care centers while others have redirected staff and equipment resources to assist in the COVID response. Sustained community transmission combined with still limited availability of testing, high false-negative rates (~40%), and a presumed high prevalence of asymptomatic carriers has forced revision of guidelines, including those listed in Table 2, to be followed for procedures regardless of venue or a patient's COVID status. Changes in indications for procedures are discussed separately later. Because most procedures now occur offsite, efforts should be made to perform them during the day when more resources and staff are available to manage intraprocedural modifications or complications.

Gastrointestinal Bleeding

Although some specialties have reported a decrease in their most common emergencies, such as heart attacks,[5] significant gastrointestinal (GI) bleeding remains prevalent and this includes complications from COVID-related illness (Mallory–Weiss tears, profound diarrhea, and hypovolemic-induced ischemic colitis). A recent regional survey showed that 70% of consults during this time are for GI bleeding.[6] Although overt GI bleeding typically prompts a rapid endoscopic evaluation, procedural parsimony is the new rule. Across institutions, our consensus found that urgent upper endoscopies rarely were performed within the first 24 hours. Similarly, procedures for lower GI bleeding nearly uniformly were deferred and have been postponed to the outpatient venue. Although these strategies were not driven by prepandemic studies regarding the timing of endoscopic intervention, this practice fortuitously has been reflected in emerging literature.[7,8]

Returning to basic principles of resuscitation, optimizing medical management, and exhausting alternative

Table 2. Guidelines to Be Followed for All Endoscopic Procedures

Manage all patients as if COVID positive
Use negative-pressure rooms whenever possible (endoscopy, OR, ICU)
Limit in-room staff to critical personnel only
All personnel to don full PPE, including N95 masks
Consider endotracheal intubation or procedural oxygen mask for all upper endoscopies
Exclude trainees from procedures as much as possible

ICU, intensive care unit; OR, operating room; PPE, personal protective equipment.

diagnostic modalities allows us to focus only on the procedures that are most likely to be therapeutic. COVID-19 infection can mimic or exacerbate the hemodynamic effects of GI bleeding and an effort should be made to discern between the two by administering acetaminophen, intravenous fluid, and blood products as indicated. Although aggressive medical management should be individualized, it is worth considering proton pump inhibitor infusions over intermittent intravenous administration; liberalized octreotide infusions for patients with suspected or known liver disease; scheduled antiemetics, platelets, and/or clotting factors to correct iatrogenic or acquired coagulopathies; and reversal agents if appropriate. Emerging experience in critically ill COVID patients suggests that they can develop a prothrombotic form of disseminated intravascular coagulation, placing them at a dramatically increased risk of thrombosis. Many of these patients therefore may be receiving newly prescribed anticoagulants that need to be considered when evaluating and managing GI bleeding issues in this cohort.

In hemodynamically stable cases in which active upper GI bleeding is in the differential but remains indeterminate, we propose pursuing alternative diagnostic modalities such as computed tomography angiography and bedside real-time viewer capsule endoscopy. Nasogastric tube (NGT) lavage in ventilated patients, a somewhat outdated maneuver, still should be considered a useful test if blood return is shown. This is not advised, however, in the unsedated patient because of the risk of gagging, vomiting, and aerosolization.

Established parameters for assessments of acuity and severity of GI bleeding remain unchanged. These include the volume of visualized blood loss, blood loss based on laboratory values (both absolute and relative to baseline), rate of blood loss, response to transfusion, and hemodynamics. Physical examination of inpatients now is discouraged unless the findings are expected to impart acute changes in management. We have found that photographic documentation of bleeding (emesis basin, bedsheets, and toilet bowls) by the patient or staff has been increasingly helpful in confirming symptoms and guiding remotely based decisions.

Inpatient GI consult services are deferring endoscopic evaluation in patients with anemia without overt bleeding, with reported/observed small-volume bleeding, self-limited bleeding, and, given the low therapeutic potential, this includes almost all lower GI bleeding. Once restrictions begin to lift and as the word *recovery* begins to appear in our institutional communications, these patients should be considered among the first group to receive endoscopic evaluation while further prioritizing patients with ongoing symptoms or the need for anticoagulation and/or antiplatelet therapy.

Dysphagia, Nausea, Vomiting, and Diarrhea

Inpatients or outpatients with symptoms of dysphagia should be assessed for their ability to tolerate sufficient oral intake to maintain proper weight and nutrition. Patients with mild to moderate dysphagia may need to defer evaluation and therapy. Data are lacking for testing, such as esophageal manometry, but given the prevalence of coughing during intranasal placement, New York City centers have postponed testing. Noninvasive radiographic studies such as barium esophagram may be useful to triage the need for endoscopy, however, the local availability of radiology services and department policies will need to be considered as well. We have found that very few patients have been sent for timed contrast studies for any indication. Consensus indications for prompt endoscopy include an inability to tolerate a sufficient liquid diet with ongoing dehydration/profound weight loss or foreign body or food impaction with an inability to tolerate secretions after intravenous glucagon has failed.[9] Options for nutritional management of patients with dysphagia are discussed later.

COVID-19 can present with nausea, vomiting, and diarrhea, and these can predate respiratory symptoms. In a recent report, up to 61% of outpatients who tested positive for COVID-19 experienced these GI symptoms.[10] During the peak of the epidemic, acute nausea, vomiting, or diarrhea should be considered COVID-related until proven otherwise. Outpatients should self-quarantine and minimize exposure to household contacts. For all inpatients and ongoing symptoms in outpatients, GI pathogen testing including *Clostridium difficile* should be considered, particularly in patients with signs such as leukocytosis or those with risk factors such as recent antibiotic use. In the absence of a bacterial pathogen, medical management with anti-emetics and antidiarrheals (eg, loperamide) can be optimized. Careful monitoring of the QTc is essential because many anti-emetics prolong the QT, particularly when combined with other agents being used for COVID-19 that also affect the QTc (hydroxychloroquine and azithromycin). Some institutions have hospital-wide protocols in place to monitor the QTc and reduce risk of Torsades de pointes.

Special circumstances may lower the threshold for endoscopic evaluation for nausea, vomiting, or diarrhea. This includes evaluation for graft-versus-host disease in bone marrow transplant patients and for immune-mediated colitis in patients receiving checkpoint inhibitors. If an infectious work-up is unrevealing and patients remain symptomatic after maximizing medical therapy, patients should proceed to endoscopy in efforts to avoid empiric immunosuppression.

Enteral Nutrition and Access

Consults for gastrostomy placement have decreased dramatically across institutions in New York, with fewer than 1 to 2 referrals per week for percutaneous endoscopic gastrostomy as per a recent New York–based survey.[6] Although prolonged intubation typically warrants gastrostomy placement, it is possible that the high associated mortality rate, and need to decrease invasive, aerosolizing procedures in COVID-19–infected patients, has resulted in infrequent gastrostomy placement.

The timing and method of gastrostomy placement should be largely individualized to the services and resources available at a particular location. It is recommended to bring all of the procedural services that place feeding tubes, along with ICU management, together to establish a workflow. Within the New York City area, most gastrostomies in patients testing positive for COVID-19 are being placed by interventional radiology, especially if the patient already has a NGT in place.

Finding the optimal timing for gastrostomy placement in COVID-positive patients is critical and must weigh the safety of staff with the associated potential for serious adverse events, such as bleeding, infection, and death. We propose a gastrostomy be considered once the patient has shown clinical improvement and a probable chance of discharge. This implies continuing enteral nutrition (EN) with an NGT until discharge seems likely. For patients requiring ICU level of care, the patient should be afebrile, in no need of pressor support, with stable hemodynamics, and all potentially complicating conditions (ie, disseminated intravascular coagulation, paralytic ileus, and so forth) be optimized before gastrostomy placement. Although we recognize that nutrition is important for recovery, rushing into invasive procedures can potentially hinder recuperation. Parenteral nutrition is not recommended for patients with COVID infection owing to the risk of infection and/or thrombosis.

Bedside percutaneous endoscopic gastrostomy placement in the ICU is the preferred venue if the room is outfitted with negative pressure. However, most patients will have a previously placed NGT (which may impede discharge) and an interventional radiology–placed gastrostomy may be preferred for such patients who are not intubated but continue to have respiratory symptoms and high oxygen requirements. Consideration should be given to the increasingly described hypercoagulable state seen in critically ill COVID patients. In patients who fit the criteria for anticoagulation, we recommend continuing to follow guidelines such as those outlined by the American Society for Gastrointestinal Endoscopy in 2016.[11]

Enteral Nutrition via Weighted Nasogastric Tube in the Prone Position

Many intubated patients with pulmonary disease consistent with acute respiratory distress syndrome from COVID are being placed in the prone position. Feeding in the prone position may lead to decreased gastric emptying, vomiting, and aspiration, but studies have shown mixed results. van der Voort et al[12] showed that EN can be continued when a patient is turned from supine to prone position (or vice versa) without consequence. The results indicated that patients with a clinically significant gastric residual volume in one position still are likely to have a clinically significant gastric residual volume in the other position. Reignier et al[13] later concluded that early EN is poorly tolerated in the prone position and use of a prokinetic agent should be considered. Subsequent meta-analyses have not suggested a substantial increase in complications when EN is administered in the prone compared with the supine position.[14] We suggest that EN via NGT while prone should be used with caution and patients should be watched for signs of intolerance or vomiting.

Interventional Endoscopy

Management of interventional services leading up to the peak of the crisis has been particularly challenging owing to the restrictions in allocated endoscopy space and resources in rooms not properly outfitted for interventional procedures. Within days, indications for interventional procedures dwindled down to those that needed to be performed within 48 hours to prevent admission, would enable discharge, or, less uniformly, enable neoadjuvant chemotherapy (Tables 3[15] and 4). On average, the interventional procedures saw a reduction of 30% to 40%, the majority of which were endoscopic retrograde cholangiography (ERCP). Throughout the region's institutions, interventional procedures are reviewed by either central committees or evaluated (remotely) by 2 members of the advanced endoscopy team to confirm appropriateness and obtain all endoscopy unit approvals (nursing, anesthesia, scheduling) before proceeding.

The most common indications for emergent interventional procedures have been cholangitis and obstructive jaundice. Although emergent ERCP remains

Table 3. Procedures Considered Indicated During the Pandemic

ERCP for cholangitis[15]
ERCP for gallstone pancreatitis
ERCP for symptomatic pancreatic or biliary disease
EGD/ERCP/EUS for palliation of luminal and pancreaticobiliary obstruction
EUS for infected, symptomatic/obstructing fluid collections ± necrosectomy
Any endoscopic procedure that will urgently change management

EGD, esophagogastroduodenoscopy; ERCP, endoscopic retrograde cholangiopancreatography; EUS, endoscopic ultrasound.

Table 4. Procedures Considered Suitable for Delay and Re-evaluation

ERCP for incidentally found/asymptomatic choledocholithiasis
ERCP for elective pancreatic or biliary stent change
ERCP for evaluation of nonobstructing pancreatic or biliary stricture
EUS for pancreatic cyst
EUS for subepithelial nonobstructing mass
EMR/ESD of benign lesions or superficial malignant cancers
ERCP/EUS for evaluation/surveillance/treatment of premalignant or malignant conditions, staging malignancy before chemotherapy or surgery
EGD for elective therapy of varices
EUS for asymptomatic fluid collections
EGD for upper GI tract stent exchange
ERCP for incidentally found or syndromic-related ampullary adenoma
All endobariatric procedures
Ablative techniques for LGD/HGD Barrett's esophagus

EGD, esophagogastroduodenoscopy; EMR, endoscopic mucosal resection; ERCP, endoscopic retrograde cholangiopancreatography; ESD, endoscopic submucosal dissection; EUS, endoscopic ultrasound; GI, gastrointestinal; HGD, high-grade dysplasia; LGD, low-grade dysplasia.

the treatment of choice, a lower threshold for percutaneous transhepatic cholangiography should be instituted for hemodynamically unstable patients, particularly if mobilization is difficult, such as in ICUs, or when endoscopy is performed in shared space and timely intervention cannot be performed. For patients with presumed malignant biliary obstruction, the decision to obtain both a tissue diagnosis via endoscopic ultrasound (EUS) with fine-needle aspiration and biliary decompression with ERCP is fairly straightforward.

There are no data defining the urgency of chemoradiotherapy for GI cancers and most centers have a short-term (ie, 4 weeks) deferral plan. However, if local resources are robust and curative cancer surgery similarly is deferred or is otherwise not appropriate, select cases have undergone tissue acquisition with EUS fine-needle aspiration or ERCP with the intent of initiating systemic therapy. However, if there is no immediate plan for medical oncologic treatment or if the patient is COVID positive and cannot yet begin such therapy, the decision to defer tissue acquisition is reasonable. It is especially important now to recall that interventional procedures should not occur in a silo, and decision making should be vetted through a multidisciplinary process or be presented at a virtual GI tumor board. Finally, some consideration should be given to therapeutic maneuvers performed or types of stents such that there is minimal risk of delayed complications and the subsequent need for reintervention in the near future.

Despite the reasonable assumption that alcohol intake has increased during the pandemic, far fewer patients have been admitted with acute pancreatitis during the COVID-19 crisis. Medical management of patients with acute pancreatitis should be optimized with the goal of deferring otherwise indicated procedures, such as ERCP and sphincterotomy in gallstone pancreatitis or drainage of pancreatic fluid collections. Intervention should be reserved for deteriorating clinical status and signs of impending sepsis.

Malignancy-related bowel obstruction is common, is not always amenable to surgical intervention, and can delay chemotherapy. Venting gastrostomies should be considered as urgent procedures for palliation of small-bowel obstruction if a patient will not be accepted to hospice with a nasogastric drainage tube. In the setting of COVID-19 and restricted access by surgeons to the OR, colonic and duodenal stenting for large-bowel and gastric outlet obstruction, respectively, should be prioritized as urgent procedures if in line with the patient's goals of care. Partial bowel obstructions should be managed medically for as long as possible.

Complex interventional procedures such as EUS-guided ERCP, third-space endoscopy, or tumor resection have been deferred at this time given the time constraints of available shared anesthesia time, increased risk associated with the procedures, decreased access to resources for management of complications such as surgical intervention, and need for potential postprocedure admission and prolonged hospital stay.

There are no guidelines for how to integrate radiation protection (lead-equivalent attire with a thyroid shield) into the required level of PPE. We recommend first donning the head and shoe covers before donning radiation protection, and then proceeding with the donning sequence for the remainder of PPE. Radiation-protective attire should be wiped down with disinfectant immediately after use.

Hepatology and Work-Up of Abnormal Liver Tests

Considerations for hepatology-related consults, such as increased liver function tests, complications of cirrhosis, and variceal bleeding, are not discussed in this review. Our consensus suggests most hepatology services defer to very recently published clinical insights released by the American Association for the Study of Liver Diseases.[16] We recommend readers reference this resource as well.

Inflammatory Bowel Disease

There are a myriad of logistical and clinical challenges that have disrupted IBD care during the pandemic. We present some of the most common scenarios encountered.

Fear of Exposure to COVID-19 When Presenting for Hospital-Based Infusions and the Concerns Associated With Using Public Transportation

Practices with a hospital-based infusion center should expect to receive a high volume of patient calls. Many patients expressed a great fear of coming to a hot zone to receive immunosuppressive therapies. In fact, we shared their concerns and worked with hospital administration to move the infusion center to a sister location that does not receive COVID-19 patients, allaying many fears on the part of the patients and the treating physicians.

By using published guidance from the national gastroenterology societies, we were able to reassure patients of the suggested benefit of continuing maintenance therapy and that staying in remission outweighed the risks of therapy discontinuation. Although most centers might reload the medication for the inevitable cases of delayed and deferred treatments, strong consideration should be given to avoiding repeat loading doses during the peak pandemic period. Unless there is a suggestion of flare symptoms, we prioritized obtaining and/or maintaining symptomatic control over achieving therapeutic target drug levels.

Expert consensus supports ongoing use of infusion centers, provided a COVID-19 screening protocol is in place.[17,18] Although electively switching to injectable therapies may seem attractive, and in some cases is the only option, this strategy has been shown previously to be associated with relapses.[19] It is appropriate to acknowledge both the patients' fears and the dearth of clear data on the outcomes of COVID-19 infection among a biologic-treated population. By using a shared decision-making model one can negotiate how long a patient may safely delay infusions.

Establishing Access to Therapies and Choosing Alternative Therapies

Some immunosuppressed patients have fled New York City because it is currently the epicenter of the pandemic. This creates challenges coordinating infusions because many offices are not seeing new patients, or have limited appointments, creating a long wait time for patients to see a new provider. Some patients cannot get alternative access to treatments and require remote care. Although potentially suboptimal, this may require switching to subcutaneously administered in-class therapies. In cases in which this option does not yet exist (anti-integrin therapy), consider delaying infusions or advocating with local physicians to transfer care seamlessly. Home infusions for patients in other states creates new logistical challenges. Unless the patient has established a relationship with a local physician who would be able to manage any complications, we are reluctant to support this strategy. Furthermore, home infusions may introduce a risk that a nurse provider traveling between multiple sites could become a virus vector.

This also gives rise to the question of whether small-molecule therapy may be considered a preferred option for moderate to severe ulcerative colitis among patients seeking an alternative to injection/infusion biological therapy. Current consensus opinion avoids initiating treatment with tofacitinib during the pandemic.[20] There is concern that tofacitinib might inhibit viral immunity in light of a clear association with the reactivation of herpes zoster virus.[18] Furthermore, despite a short half-life, studies in the general population found defects in immune function up to 1 month after the drug was stopped.[18]

Initiation of biologics is controversial across the various guidelines. Unlike Renmin Hospital in Wuhan, China, which decided to stop all biologics for their IBD patients,[21] the United States and European guidelines recommend continuing IBD medication regimens.[18,20,22–24] In the International Organization for the Study of Inflammatory Bowel Diseases guidelines, a patient with a new diagnosis or relapsing disease is recommended to be treated similar to pre–COVID-19 era, although this was not a high consensus recommendation.[18] We agree that delaying initiation of biologics in patients who have manageable symptoms is a preferred strategy. Although some published guidelines recommend avoiding initiation of steroids or monotherapy with biologics during the pandemic,[20] this must be weighed against the need to avoid an emergency room evaluation and hospitalization, locations that have become synonymous with the presence of COVID-19.

It will be increasingly important in IBD care to continually reassess whether patients treated with biologics have worse outcomes with concomitant COVID-19 infection. The Surveillance Epidemiology of Coronavirus Under Research Exclusion-IBD registry[25] may be best positioned to determine that in real time.

Immunosuppressed Patients Who Work in Health Care Settings

Available guidelines do not resolve whether health care workers with known COVID-19 exposure on immune-modifying medications should continue working. Given the possibility that immunocompromised patients will develop more severe COVID-19 illness, we are advising immunosuppressed health care workers to avoid COVID-19 patient interactions. Ustekinumab is considered to have less biological effect on viral immunity than anti–tumor necrosis factor in the COVID-19 guidelines.[17,18] However, in the absence of real-world data on outcomes of COVID infection among immunocompromised IBD patients, we have provided uniform recommendations to those on maintenance immunomodulators, anti–tumor necrosis factor therapies, anti-integrin therapies, anti-12-23 therapies, and prednisone-equivalent doses greater than 20 mg/d, to

avoid the hospital setting and avoid patient-facing duties. This simplified decision making also allowed a uniform response from fellows and nurse practitioners who are often the front line in managing the large volume of calls generated.

Is the Decision to Delay Surgery Always the Right One?

The decision to pursue surgery in patients with IBD already is consensus driven. However, during this pandemic, as discussed earlier regarding interventional procedures, there is a preference to delay surgeries and to try to stabilize patients with maximal medical management. For example, although not our standard practice, we have been able to manage perianal abscesses with temporizing measures including antibiotics and drainage by our surgical colleagues in the office setting rather than sending them for surgery. Conversely, complications for which we might ordinarily use conservative management such as total parenteral nutrition and antibiotics for Crohn's-related microperforation, have warranted more urgent surgical intervention because of uncertainty regarding access to medications, home care, and the time course for deferred surgeries.[26]

Emotional and Leadership Aspects of the Pandemic

All of the large academic medical centers in the New York City region have deployed surge teams to meet the demands of the massive influx of COVID-19 patients. Teams consist of attending physicians, fellows, residents, and other providers from a variety of specialties, ranging from internal medicine to dermatology. Many physicians, including gastroenterologists, express reluctance to take on these new responsibilities given their often long hiatus from internal medicine training. The main areas of care of COVID patients are following institutional protocols for medical management, helping to maintain close communication with patients and families, and navigating a complex and possibly entirely foreign inpatient electronic health record.

Successful strategies to care for these patients include ensuring there is one physician on each team (usually a resident or advanced care provider) who is adept with the inpatient electronic health record. Anxiety regarding the medical care of COVID patients usually is alleviated after onboarding, including reviewing protocols for PPE and those for disease management.

The emotional burden of the COVID-19 pandemic has been extraordinary, not only for patients, but also for physicians (including those who have not been deployed to the front lines) and training programs. Work–life balance takes on new meaning and challenges because physicians have to find ways of crafting telehealth practices and virtual meetings, while creating in-home classrooms, and continue to deal with daily household needs. Similar to our colleagues everywhere, reconciling our commitment to colleagues and patients with our obligation also to protect our families can be distressing. Successful coping strategies include acknowledgment of the true pandemic degree of the challenges that now exist, that one is not alone in managing this collateral damage, and practicing a learned optimism.[27] A renewed focus on communication within families, as well as ensuring proper time for self-care (including many now complementary mindfulness applications such as HeadSpace, Santa Monica, CA), is central to success.

Because telehealth and physical distancing have compounded the isolation, frequent division check-ups through teleconferences and telephone calls to trainees is critical. To prevent feelings of isolation, it is paramount to initiate early, sustained messaging that encourages trainees to feel safe sharing emotional and health concerns with faculty members. Early changes in fellows' educational curriculum include conversion to weekly teleconferences and webinars. To help foster a sense of regional community and honor the education goals of our society, the New York Society for Gastrointestinal Endoscopy quickly created a lecture series for fellows and members as well as informational webinars to assist with deployment to medicine. This connectivity helped boost morale and remind us that we as a community can weather these challenging times together.

It is not surprising that ethical and end-of-life considerations have featured prominently in the management of patients during this pandemic. Although we as gastroenterologists may not historically have been the primary teams leading goals-of-care discussions for consulted patients, the difficult decisions need to be addressed by all care team members. We suggest seeking early (likely virtual) palliative care team input, as well as becoming familiar with institutional policies that surround rationing of care. There are well-developed online resources, including sample scripts and video tutorials, to help get goals-of-care conversations started.[28]

Navigating the Road to Recovery

As inpatient procedures are deferred and new consults are managed with minimized assessments, a dedicated effort should be made to follow up these patients closely as outpatients and to complete thorough assessment and treatment as the surge retreats and resources are freed. Strategies include establishing dedicated outpatient clinics (both fellow and faculty, virtual and in-person) for patients seen as consults, fellow maintenance of consult registries to ensure close follow-up evaluation, and using a scoring or tiered classification system to help prioritize which patients should be brought back for re-assessment or for procedures, and in what time frame (2–3 weeks, 1–3 months, or 6 months).

In addition, hospital systems are considering using their ASCs or partnering with external ASCs to begin to address those patients discussed here, particularly whose evaluation was deferred during hospitalization or because of active infection. The role, availability, and accuracy of Food and Drug Administration–approved point-of-care testing will vary regionally and practices should follow institutional or regional guidance regarding the eligibility of patients to be treated. Ascertainment of convalescent antibodies may permit safe development of care teams to be deployed in the highest-risk environments. Although we will need institutional guidance regarding PPE during the recovery phase, we should be reminded that, although not adopted by all, universal precautions previously had been established as the standard of care during endoscopies, and that we should be returning to these principles as our new baseline.[29] The potential legal implications of minimized and delayed care have yet to be defined but will be another area in which physicians will need to work closely with local leadership to ensure establishment of effective policies.

Conclusions

The COVID-19 pandemic arguably may be the most difficult challenge many of us will face in our professional careers. For New Yorkers, the need to adapt quickly with fluidity, ingenuity, and resiliency is well ingrained as a result of the events of the past 2 decades. This pandemic is unique and has forced all of us to abandon our learned responses and standards of care to better protect our patients and ourselves. We need to defend ourselves from the moral injury that this contagion causes with a strategy that focuses on communication, collaboration, innovation, and humility. Early planning and implementation of these strategies can help minimize the collateral damage that may result and in fact may help to establish new norms going forward.

References

1. Repici A, Maselli R, Colombo M, et al. Coronavirus (COVID-19) outbreak: what the department of endoscopy should know. Gastrointest Endosc 2020 Mar 14:S0016-5107(20)30245-5. doi: 10.1016/j.gie.2020.03.019. Online ahead of print.
2. Joint GI Society Message: COVID-19 Clinical Insights for Our Community of Gastroenterologists and Gastroenterology Care Providers. Available from: https://www.asge.org/home/joint-gi-society-message-covid-19. Accessed March 16, 2020.
3. New York Society for Gastrointestinal Endoscopy. Guidelines for endoscopy units during the COVID-19 pandemic. Available from: https://www.nysge.org//Files/NYSGE%20Guidelines%20for%20Endoscopy%20Units%20During%20the%20COVID-19%20Pandemic.pdf. Accessed March 16, 2020.
4. Soetikno R, Teoh AYB, Kaltenbach T, et al. Considerations in performing endoscopy during the COVID-19 pandemic. Gastrointest Endosc 2020 Mar 27:S0016-5107(20)34033-5. doi: 10.1016/j.gie.2020.03.3758. Online ahead of print.
5. The Coronavirus Doctors. Available from: https://www.nytimes.com/2020/04/06/well/live/coronavirus-doctors-hospitals-emergency-care-heart-attack-stroke.html. Accessed April 6, 2020.
6. Available from: https://www.nysge.org/files/Impact%20of%20COVID-19%20NYSGE%20Survey%20Report%20Week%201. Accessed April 1, 2020.
7. Lau J, Yu Y, Tang R, et al. Timing of endoscopy for acute upper gastrointestinal bleeding. N Engl J Med 2020; 382:1299–1308.
8. Tsay C, Shung D, Frumento KS, et al. Early colonoscopy does not improve outcomes of patients with lower gastrointestinal bleeding: systematic review of randomized trials. Clin Gastroenterol Hepatol 2020;18:1696–1703.
9. Ikenberry SO, Jue TL, Anderson MA, et al. Management of ingested foreign bodies and food impactions. Gastrointest Endosc 2011;73:1084–1091.
10. Nobel YR, Phipps M, Zucker J, et al. Gastrointestinal symptoms and COVID-19: case-control study from the United States. Gastroenterology 2020 Apr 12. S0016-5085(20)30490-X. doi: 10.1053/j.gastro.2020.04.017. Online ahead of print.
11. Acosta RD, Abraham NS, Chandrasekhara V, et al. The management of antithrombotic agents for patients undergoing GI endoscopy. Gastrointest Endosc 2016;83:3–16.
12. van der Voort PH, Zandstra DF. Enteral feeding in the critically ill: comparison between the supine and prone positions: a prospective crossover study in mechanically ventilated patients. Crit Care 2001;5:216.
13. Reignier J, Thenoz-Jost N, Fiancette M, et al. Early enteral nutrition in mechanically ventilated patients in the prone position. Crit Care Med 2004;32:94–99.
14. Linn DD, Beckett RD, Foellinger K. Administration of enteral nutrition to adult patients in the prone position. Intensive Crit Care Nurs 2015;31:38–43.
15. Shah SL, Carr-Locke DL. ERCP for acute cholangitis: timing is everything. Gastrointest Endosc 2020;91:761–762.
16. aasld.org. Available from: https://www.aasld.org/sites/default/files/2020-04/AASLD-COVID19-ClinicalInsights-4.07.2020-Final.pdf. Accessed April 7, 2020.
17. Rubin DT, Wang AY, Cohen RD. AGA Clinical Practice Update on management of inflammatory bowel disease during the COVID-19 pandemic: expert commentary. Gastroenterology 2020. Epub ahead of print.
18. Rubin DT, Abreu MT, Rai V, et al. Management of patients with Crohn's disease and ulcerative colitis during the COVID-19 pandemic: results of an international meeting. Gastroenterology 2020 Apr 6:S0016-5085(20)30465-0. doi: 10.1053/j.gastro.2020.04.002. Online ahead of print.
19. Van Assche G, Vermeire S, Ballet V, et al. Switch to adalimumab in patients with Crohn's disease controlled by maintenance infliximab: prospective randomised SWITCH trial. Gut 2012; 61:229–234.
20. Mao R, Liang J, Shen J, et al. Implications of COVID-19 for patients with pre-existing digestive diseases. Lancet Gastroenterol Hepatol 2020;5:425–427.
21. An Ping JM, Ren Haixia, Su Juan, et al. Protection of 318 inflammatory bowel disease patients from the outbreak and rapid spread of COVID-19 infection in Wuhan, China. Lancet 2020. Epub ahead of print.
22. BSG expanded consensus advice for the management of IBD during the COVID-19 pandemic.

23. AASLD, AGA, ASGE (Joint Society Message on COVID-19). COVID-19 clinical insights for our community of gastroenterologists and gastroenterology care providers. 2020. Epub ahead of print.
24. Crohns and Colitis Foundation. Resources for IBD healthcare professionals: 2019 novel coronavirus (COVID-19). 2020. Epub ahead of print.
25. Kappelman M, Colombel J-F, Ungaro R. Coronavirus and IBD reporting database: Surveillance Epidemiology of Coronavirus Under Research Exclusion (SECURE-IBD). 2020. Epub ahead of print.
26. SAGES/COVID 19-Coronavirus Announcement Archives. Available from: https://www.sages.org/recommendations-surgical-response-covid-19. Accessed March 29, 2020.
27. Learned optimism. Available from: https://en.wikipedia.org/wiki/Learned_optimism. Accessed April 1, 2020.
28. FAQs about COVID-29 and Palliative Care. Available from: https://www.capc.org/faqs-about-covid-19-and-palliative-care.
29. Carr-Locke DL, Soetikno R, Sharaiha RZ. Whatever happened to universal/standard precautions?. Available from: https://www.giejournal.org/article/S0016-5107(20)34139-0/pdf. Accessed April 1, 2020.

Reprint requests
Address requests for reprints to: Amrita Sethi, MD, MSc, Columbia University Medical Center, 161 Fort Washington Avenue, Suite 852A Herbert Irving Pavilion, New York, New York 10032. e-mail: as3614@cumc.columbia.edu; fax: (212) 305-1081.

Conflicts of interest
The authors disclose no conflicts.