

**NON-SYSTEMATIC REVIEW****GASTROENTEROLOGY**

# Current and future implications of COVID-19 on gastroenterology training and clinical practice

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**Abstract**

The novel coronavirus disease 2019 (COVID-19) pandemic has affected almost every country on the globe, affecting 185 countries with more than 2.6 million cases and 182,000 deaths as of April 22, 2020. The United States (US) has seen an exponential surge in the COVID-19 patients and has become the epicentre with more than 845,000 confirmed cases and 46,000 deaths. The governments and healthcare providers all over the world are racing with time to reduce the rate of increase in active cases by social distancing to flatten the curve of this pandemic. Practicing gastroenterologists are facing multiple challenges in the safe practice of medicine because of patient's inability to visit physicians' offices, endoscopy centers and the threat of potential virus spread through gastrointestinal secretions by endoscopies in emergent cases. The gastroenterological associations from Europe and North America have made position statements to guide gastroenterologists to navigate through the clinical practice during the COVID-19 pandemic. Gastroenterology fellows are on the frontlines during the COVID-19 pandemic, experiencing personal, physical and economic stresses. They had to balance the programmatic changes to meet the demands of the patient care with the additional pressure to meet training requirements. Given the imperatives for social and physical distancing, training programmes have to implement innovative educational methods to substitute traditional teaching. Healthcare organisations must synchronise institutional workforce needs with trainee safety, education and well-being. In this perspective, we have discussed the challenges that can be anticipated and implementing strategies to support fellows during the times of the COVID-19 pandemic.

**1 | INTRODUCTION**

The Coronavirus Disease 2019 (COVID-19) outbreak caused by the novel severe acute respiratory syndrome coronavirus 2

(SARS-CoV-2), began in December 2019 and has rapidly spread throughout the world.<sup>1,2</sup> COVID-19 predominately affects the respiratory system with pneumonia, acute respiratory distress syndrome (ARDS) and multiorgan failure. In addition to respiratory symptoms,

**Abbreviations:** AASLD, American Association of Study of Liver Diseases; ACG, American College of Gastroenterology; ACGME, Accreditation Council for Graduate Medical Education; AGA, American Gastroenterological Association; ASGE, American Society for Gastrointestinal Endoscopy; BSG, British Society of Gastroenterology; COVID 19, Coronavirus Disease 2019; DDW, Digestive Disease Week 2020; ESGE, European Society of Gastrointestinal Endoscopy; GME, graduate medical education; HCW, Health Care Worker; PPE, Personal Protective Equipment; RNA, Ribonucleic acid; SARS, Severe Acute Respiratory Syndrome; SARS, Severe Acute Respiratory Syndrome; US, United States; WHO, World Health Organization.

non-respiratory manifestations such as dysgeusia, anorexia, nausea, vomiting, diarrhoea, and abdominal pain are increasingly recognised.<sup>3-5</sup> World Health Organization (WHO) initially declared the outbreak as a public health emergency of international concern on January 30, 2020, and eventually declared it as a pandemic on March 11, 2020.<sup>6,7</sup> This pandemic is unprecedented in terms of rapidity and magnitude of spread throughout the world, including the United States (US). As of April 23, 2020, there are more than 2.7 million confirmed COVID-19 cases worldwide affecting 185 countries, with approximately 190,000 deaths.<sup>8,9</sup> Despite significant efforts to decrease the spread of infection, the US has seen a drastic surge in the COVID-19 patients, becoming the epicentre with >900,000 cases and >50,000 deaths.<sup>7,10</sup>

The COVID-19 pandemic has tremendously impacted the clinical, educational, research and community responsibilities in many academic programmes.<sup>11-13</sup> Residents and Fellows-in-training are on the frontlines and are experiencing personal, physical and economic stresses. Gastroenterology (GI) fellowship is one of the training programmes where fellows have a high risk of exposure because of the need to perform aerosolising procedures. Furthermore, they had to balance the programmatic changes to meet the demands of the primary patient care at some hospitals. Given the imperatives for social and physical distancing, training programmes have to implement innovative educational methods to substitute traditional teaching.

There is a considerable need for optimal patient care, but the mitigation efforts have made it more challenging as it has impacted the in-person patient-physician encounter. GI practice is heavily dependent on elective outpatient procedures. All elective and non-urgent procedures have been cancelled to curb exposure and preserve personal protective equipment (PPE). On the other hand, with the remarkable advances in the field of communication technology, the pandemic has created an opportunity to harness this technology to accomplish both educational and clinical activities. Healthcare organisations must synchronise institutional workforce needs with trainee safety, education and well-being. In this article, we have discussed the impact of COVID-19, anticipated challenges and strategies implemented to support fellows during these unprecedented times.

## 2 | METHOD OF LITERATURE SEARCH

We utilised articles published in the English language from Ovid MEDLINE, Google Scholar and CINAHL (via EBSCOhost) databases to find the articles of interest published between January 1, 2020 and April 22, 2020. The following search strategy was used with words: Search 1 ('novel coronavirus' OR 'COVID-19' OR 'SARS-CoV-2' OR 'severe acute respiratory syndrome coronavirus 2') AND ('endoscopy' OR 'gastroenterology' OR 'clinical practice guidelines' OR 'telemedicine' OR 'telehealth' OR 'virtual visit' OR 'Personal Protective Equipment' OR 'policies'); Search 2 ('novel coronavirus' OR 'COVID-19' OR 'SARS-CoV-2' OR 'severe acute respiratory

syndrome coronavirus 2') AND ('gastroenterology' OR 'fellowship' OR 'training' OR 'ACGME' OR 'didactics' OR 'teaching' OR 'wellness').

### 2.1 | Impact on gastroenterology fellows and training

GI fellowship training is significantly impacted during the COVID-19 pandemic. There is a growing concern among the GI fellows as the endoscopy and clinic patient volumes, and didactic structure have significantly compromised.<sup>13</sup> Depending on the location, as much as 3 or more months of the training time has been lost. Because of an unprecedented state of the current pandemic with a highly unpredictable and dynamic trajectory, it requires a constant effort to restructure the training. However, it has also provided a unique opportunity for the programmes to develop a curriculum as a preparation for the future. Table 1 provides a brief outline of the challenges faced by the GI fellows and suggests possible solutions to managing these challenges.

#### 2.1.1 | Gastroenterology clinical rotations

The traditional clinical teaching has been disrupted because of several factors. Broadly, the clinical experience for GI fellows can be stratified into inpatient consults, outpatient clinics and endoscopy training.

1. Inpatient Clinical Rotations: Many hospitals have placed restrictions on patient care by trainees to limit exposure and limited supply of PPE. The traditional teaching paradigm of fellows' prerounding, followed by the team rounds with attending physicians, has been replaced by other strategies. Mostly, the patients are being examined by a single provider daily who updates the rest of the teams about the patient's progress and shares the remaining information. Some hospitals have also implemented electronic, or telephone consults to avoid direct patient encounters.<sup>14,15</sup> Other strategies to minimise patient contact include conducting only chart review and discussion with the nurse. Based on the patients' chart evaluation, a decision is made whether a physical examination will change the management. The communication between the GI team and the primary hospitalist team is crucial to address the consult and communication of the therapeutic plan. Also, necessary outpatient follow-up after discharge should be set up for virtual telemedicine visits.
2. Outpatient Clinical Rotations: There has been a drastic decrease in the number of outpatient visits because of cancellations of non-essential visits. It has adversely impacted the clinical experience of the fellows, especially for those in inflammatory bowel disease and hepatology clinics. On the other side, this should be utilised as an opportunity to become acquainted with telemedicine, which has enormous potential in the future.

**TABLE 1** Challenges and Potential Solutions for GI Fellows-in-training during the COVID-19 Pandemic

Domains	Challenges	Solutions
Clinical training		
Outpatient clinics	A decrease in the patient volume could affect the clinical experience for the fellow	Incorporating other aspects of training such as research, simulation laboratory training and deferring clinical rotations to the future could be considered Rapid training of fellows on virtual visits
	Lack of experience with telemedicine	
Inpatient consults	Avoiding large team-based rounds as a result of social distancing imperative	Triage inpatient consults based on the risk of exposure and need for the physical exam
	Complex and rapid change in workflow	Use of virtual platforms for multidisciplinary inpatient team rounds
	Decreased availability of routinely ordered diagnostics	Shared online resource to communicate changes in workflow structure
	Inpatient visitor limitations, critical illness, and end-of-life conversations held remotely	Order only high-yield tests to minimise exposure. Involvement of the palliative care team
Outpatient endoscopy	Cancellation of elective-procedures	Using endoscopy videos as a learning tool available on ASGE
	Minimal participation of fellows	Simulation training. Future goal-directed endoscopy curriculum for impacted fellows
	Unknown effect on the development of procedural skills	Review and reassess endoscopic skill competency, on a case to case basis
Inpatient endoscopy	Limited fellow involvement because of potential exposure to COVID-19	Selecting low-risk and high-yield procedures for fellows to perform. Strict adherence to PPE
	Postponing non-urgent procedures and determining appropriate follow-up	Developing a Triage protocol based on urgency
Educational experience		
Didactics	Cancellation of traditional didactic sessions. Lack of experience in using telecommunication software	Web-based educational meetings. Training in utilisation of the telecommunication technology. Peer-coaching, board reviews
	Participation and interaction limitations in virtual meetings	Utilisation of video streaming technology and synchronous engagement tools
Scientific meetings	Cancellation of national and regional conferences. Negative impact on networking. Inability to present and disseminate the research	Virtual conferences. Converting abstracts to manuscripts. Social media networking Guidance from GI societies on the effective use of social media
Research	Suspension of clinical and laboratory research. Collaboration with co-investigators can be challenging	Consider increasing the time spent on manuscript writing. Plan for future projects and grants. Research using chart review or survey studies or meta-analysis
	Back up clinical coverage can limit research time	Virtual meeting with the collaborators
Credentials	A decrease in endoscopy volume	Assess competency without achievement of all planned curriculum experiences via clinical competency committee
Interviews for training positions and Jobs	Cancellation of in-person interviews and meetings.	Phone or Videoconferencing interviews
Trainee well-being and safety		
Wellness	Shortage of PPE, protection of higher risk trainees (pregnancy, immunocompromised)	Provide clear communication related to infection control and occupational health guidelines. Reinforce ACGME commitment to maintain adequate resources, supervision, work hour policies. Adequate training on PPE donning and doffing. Provide online resources for wellness and personal resilience. Provision of paid leave for COVID-19 related quarantine/illness

Abbreviations: COVID-19, Coronavirus Disease 2019; PPE, personal protective equipment; ESGE, American Society of Gastrointestinal Endoscopy; ACGME, Accreditation Council for Graduate Medical Education

## 2.1.2 | Accreditation Council for Graduate Medical Education

The Accreditation Council for Graduate Medical Education (ACGME) has developed a new conceptual framework for graduate medical education (GME) at sponsoring institutions and their participating sites, with the safety of patients and trainees as the highest priority.<sup>16</sup> They have developed a stage-based model to guide institutions during the COVID-19 pandemic. Stage 1 includes programmes where the business is as usual.<sup>9</sup> Stage 2 includes programmes with increased but manageable clinical demands.<sup>9</sup> Stage 3 includes programmes that have declared pandemic emergency status.<sup>9</sup> As per ACGME, fellows can function as attending physicians within their core specialty by up to 20% per academic year if approved by the programme director and the designated institutional official (DIO). However, they need to be board-eligible or board-certified in the core specialty and should have an appointment with the medical staff.<sup>9</sup> The training programmes should ensure that the fellows have adequate resources and training, have adequate supervision and adhere to work-hour requirements. ACGME also allows faculty members to provide direct supervision via telecommunications.<sup>17</sup>

## 2.1.3 | Didactic learning

The amount of didactic learning has decreased substantially to maintain social distancing. Training programmes have been asked to reduce and discontinue assembly of trainees during morning reports, noon conferences, journal clubs and grand rounds.<sup>9,17</sup> During the times of epidemics or pandemics, it is important to utilise the pedagogical innovations that allow didactic learning to occur without the traditional classroom model of teaching.<sup>18</sup> Programmes can also elect to conduct regularly scheduled conferences and lectures by videocast and have supplemental educational resources for independent study. Many programmes have started utilising e-learning platforms such as board review courses, virtual conferences, endoscopic videos and social media such as Twitter (@MondayNightIBD, @GiJournal, @ScopingSundays) for CME/non-CME activities. To better engage trainees in remote locations, faculty are encouraged to integrate audience response systems, promote audience participation, and active learning.<sup>16,18</sup> American Gastroenterological Association (AGA) has started GI Distance learning and is also providing DDSEP-9 question bank for free through 1 August 2020, which is an excellent resource for learning and board review preparation for fellows.<sup>19</sup>

COVID-19 pandemic has also resulted in the cancellation of international GI conferences such as *Digestive Disease Week 2020 (DDW) and 2020 AGA Tech Summit*, which would prevent the researchers from showcasing their work, impact networking and collaboration with other researchers.<sup>10</sup> An alternative to this issue is the virtual conferences that would allow the authors to present their work through e-Posters and e-Papers.<sup>10</sup> Also, online portals such as GI Leap from ASGE, American College of Gastroenterology (ACG) Education Universe and DDW on-demand will allow access to procedure videos,

recorded courses and webinars (Table 2). The limitations of the virtual conferences are limited participation, limited audience interaction and lack of hands-on experience. The fellows should regularly log-in their learning activities, which then can be reviewed by the programme director at a later date.

## 2.1.4 | Training of endoscopic skills

Most GI training programmes have cancelled elective procedures, and trainee participation in urgent or emergent endoscopic procedures is restricted to conserve already limited supply of PPE, reduce the risk of exposure and duration of endoscopy. It has created a significant gap in learning opportunities for GI fellows. As gastroenterology is a procedure-driven specialty, in-person learning is an essential and most crucial element of training. One of the solutions to this problem is to develop a goal-directed endoscopic curriculum and to encourage the fellows to reflect on their endoscopic skills by watching training videos and by utilising the simulator laboratory. The endoscopic videos are also available through *VideoGIE* and American Society for Gastrointestinal Endoscopy (ASGE). Also, fellows should be allowed to participate in high-yield endoscopic cases such as foreign body removal or GI bleeding, if the patient is not suspected of having COVID-19. Previous experiences in GME during calamities such as severe acute respiratory syndrome (SARS) in 2003 and hurricane Katrina in 2005 showed that medical services and educational activities return to normal quickly. Increased patient volume and procedures after these calamities provided the required procedural experiences to GI fellows. Performing the required number of procedures needed for competence was achieved during the period of the fellowship. However, short-term adjustments need to be made for educational activities during this pandemic.<sup>20</sup>

One of the severely affected sub-specialty fellowships with GI during the COVID-19 pandemic is the fourth year training (advanced endoscopy and transplant hepatology) since these advanced fellowship trainings are usually 1 year in length with steep learning curve present. The procedural volume and the fellows' direct involvement have been impacted tremendously for a minimum of 2-3 months, which is almost 25% of their fellowship time. The clinical competency committee should assess the competency of the fellows who did not complete all the planned curriculum experiences. Further determination has to be made if they need to extend the training period to accomplish goal-oriented procedural competence. Also, it is essential to consider the impact that might have on joining the future employer.

## 2.1.5 | Research

The COVID-19 pandemic has impacted research activities both in positive and negative directions, depending on the type of research conducted by the GI fellows. In programmes where the clinical activities have been reduced, the fellows have an opportunity to perform and publish retrospective data collection research. However,

**TABLE 2** Online educational resources for gastroenterology fellows

Organisation	Resource and Website
ACG	ACG Education Universe <a href="http://www.universe.gi.org">www.universe.gi.org</a>
AGA	DDW on demand <a href="https://ddw.ondemand.org">https://ddw.ondemand.org</a>
ASGE	GI Leap <a href="https://www.asge.org/home/advanced-education-training/online-learning-gi-leap/gi-leap-lp">https://www.asge.org/home/advanced-education-training/online-learning-gi-leap/gi-leap-lp</a>
RSNA	RSNA Online learning center <a href="http://education.rsna.org/diweb/catalog">http://education.rsna.org/diweb/catalog</a>
Wellness resources	
ACGME	AWARE Well-Being Resources. <a href="https://www.acgme.org/What-We-Do/Initiatives/Physician-Well-Being/AWARE-Well-Being-Resources">https://www.acgme.org/What-We-Do/Initiatives/Physician-Well-Being/AWARE-Well-Being-Resources</a>
Headspace	Headspace Meditation ( free for healthcare workers during COVID-19 pandemic). <a href="https://www.headspace.com">https://www.headspace.com</a>
American Medical Association (AMA)	AMA guiding principles for trainees <a href="https://www.ama-assn.org/delivering-care/public-health/guiding-principlesprotect-resident-fellow-physicians-responding">https://www.ama-assn.org/delivering-care/public-health/guiding-principlesprotect-resident-fellow-physicians-responding</a>
Indeed, MedicPortal	Video Interview Tips <a href="https://www.indeed.com/career-advice/interviewing/video-interview-guide">https://www.indeed.com/career-advice/interviewing/video-interview-guide</a> . <a href="https://www.themedicportal.com/blog/how-to-approach-a-skype-medicine-interview/">https://www.themedicportal.com/blog/how-to-approach-a-skype-medicine-interview/</a>

Abbreviations: ACG, American College of Gastroenterology; AGA, American Gastroenterology Association; ASGE, American Society for Gastrointestinal Endoscopy; RSNA, Radiological Society of North America; ACGME, Accreditation Council for Graduate Medical Education; COVID-19, Coronavirus Disease 2019.

research activities have been suspended at many institutions because of laboratory closures and Institutional Review Board (IRB) mandating to stop in-person research participant visits.<sup>21</sup> These restrictions can adversely affect trainees' ability to continue and complete research projects. It is challenging to recruit patients into clinical trials, and the unavailability of non-clinical research personnel during this period can severely impact the progress of scholarly activities.<sup>22</sup> On the other side, it is an opportunity to augment the research based on database studies, systematic reviews, meta-analysis, chart review and survey-based studies, which do not require direct patient interaction. Also, it is an opportunity for the fellows to learn new skills in research methodologies. Some programmes take advantage of collaboration, use crowdsourcing and artificial intelligence.<sup>23</sup> Fellows are encouraged to meet with their mentors to have discussions regarding the projects that can be completed during their downtime, securing grant funding for future studies, and publishing the manuscripts of the completed projects. Furthermore, accelerated research related to COVID-19 itself can provide opportunities for the trainees during this pandemic.<sup>24</sup>

### 2.1.6 | Educating trainees on disaster preparedness

Ensuring trainee health and safety during the pandemic is a priority for any training programme. All trainees must be mentally prepared to take care of COVID-19 patients if required, must be trained in appropriate infection protection, such as donning and doffing of PPE and handwashing techniques. These safety protocols, along with video instructions, should be made available in the institutions'

webpage and should be easily accessible. The programme directors should actively advocate for the availability of PPE for the fellows who are in clinical rotations and performing endoscopies. The programmes should also consult with the institutions' infection control staff to survey the workspace areas and provide recommendations on spacing to minimise the risk of transmission. The programme should maintain a live online document for contact information and protocols for illness, self-quarantine and procedures for self-testing. There should be a backup call team if the on-call GI fellow falls ill, and the programme should have a standardised sick notification system in place that will be sent to the programme director, programme coordinator, chief fellow, the attending physician on the service and the backup fellow.

While physical distancing is crucial, it is also essential to maintain a social connection via other means. Social media, such as Twitter, WhatsApp, Instagram and Slack, can help fellows to stay in communication with each other and form peer-support groups.<sup>25</sup> Social media can be used as a powerful tool for sharing ideas on how to respond creatively to the pandemic.<sup>26</sup>

### 2.1.7 | Effects on personal life

The COVID-19 pandemic has created a lot of anxiety and uncertainty among the GI fellows not only professionally but in their personal life. The trainees' main concern is not to contract the illness and expose their family members and kids at home.<sup>27</sup> Many trainees have moved out of their homes or isolated themselves in a separate room

or stayed in hotels to keep their families safe. Some of the indirect effects are increased demands for babysitting, pet care, transportation and grocery shopping. Overall, this has increased the stress level among the trainees.

Another area of growing concern is the effect of the pandemic on future employment opportunities for graduating fellows. Because of a low patient volume and cancellation of elective procedures, the revenues have been critically affected. As a result, many organisations are observing hiring freeze creating difficulties with the execution of job contracts. The hiring freeze and the travel restrictions have also decreased the available job opportunities for graduating fellows who are still hunting for a job. The third and fourth (advanced) year fellows who have signed up for jobs in a different city are experiencing problems with finding accommodation and are facing logistical issues with moving.

The training programme should come up with strategies to assist the trainees to help them through these challenging times. To combat the stress and to promote well-being, training programmes are encouraged to have wellness programmes structured for the current pandemic, and all trainees should enroll in them. There should be an option for a virtual wellness programme by the wellness coaches and the counselors.<sup>28</sup> There are a variety of online resources that are focused on physician wellness.<sup>29</sup> A volunteer programme should be formulated to assist the trainees who need help with babysitting, pet care, transportation and groceries. A backup coverage system needs to be in place, in case fellows need to be quarantined or get sick, to make sure that patient care does not get interrupted. The programme director should also contact the incoming fellows to address any of their concerns, and make sure that they transition into the fellowship without any significant issues. The third year fellows who have issues with future employment should also discuss with their programme director to come up with solutions related to the employment.

## 2.2 | Gastroenterology practice during COVID-19 pandemic

As a result of the COVID-19 pandemic, many states in the US have issued 'stay-at-home' orders and have also prohibited elective procedures to reduce transmission and preserve PPE.<sup>30</sup> As diarrhoea is one of the most common GI manifestations of COVID-19, there is a theoretical risk of faecal-oral transmission.<sup>31,32</sup> This risk of transmission can increase from GI procedures because of the inherent risk of contact with GI secretions and colonic contents.<sup>33,34</sup> Gastroenterologists should also be aware of the GI manifestations of COVID-19 as some patients could also present with only GI symptoms even before they manifest pulmonary symptoms. Also, the Centers for Disease Control (CDC) issued guidance to delay elective ambulatory provider visits and recommended implementing service delivery models such as telemedicine to provide patient care.<sup>18</sup> Overall, this has not only resulted in a decrease in patient volume and but also changed the traditional paradigm of healthcare delivery. In the following section, we discuss the impact of these changes on different facets of the GI practice. Table 3

provides a brief outline of the challenges in GI practice and suggests approaches to manage these difficulties.

### 2.2.1 | Staffing for clinical coverage and redistribution of work

The disaster-related resource shortage has impacted the routine clinical work in the GI departments.<sup>35</sup> Hence, it is crucial to have a disaster preparedness and a contingency plan for adequate staffing in situations when healthcare workers (HCW) had to be quarantined and/or if there is a surge in the COVID-19 cases.<sup>36</sup> Also, when there is an increasing demand to manage critically ill COVID-19 patients, there should be a planned strategy to redistribute medical resources (personnel and equipment) from other subspecialties, including GI.

### 2.2.2 | Personal Protective Equipment (PPE) and decontamination measures

SARS-CoV-2 is transmitted through direct exposure (via droplet from person to person) and also presumed to spread through indirect contact (contaminated objects, airborne transmission, faecal-oral route).<sup>37,38</sup> Hence, it is of paramount importance for the HCW involved in endoscopic procedures to follow strict PPE use recommendations (Table 4). The PPE for COVID-19 typically includes gloves, goggles, face shields, gowns and respirators. The respirators such as N-95, N-99, filtering facepiece 2 (FFP 2), FFP 3 are incredibly efficient in filtering airborne particles up to 0.3 µm and also designed to provide tight sealing around nose and mouth.<sup>39</sup> The CDC has provided detailed and graphic instructions on the proper use of PPE.<sup>25</sup> The ASGE and the European Society of Gastrointestinal Endoscopy (ESGE) have provided guidelines for infection control in the endoscopy unit.<sup>40,41</sup> It is essential for the endoscopic units and the hospitals to have an adequate supply of PPE and also have a contingency plan in situations where PPE supply is inadequate or if they run out of PPE.

Endoscopy facilities around the world are typically not designed with negative-pressure rooms. However, during the COVID-19, it is advisable to urgently equip at least one endoscopic room with a negative-pressure system for patients with confirmed or suspected COVID-19. Both ASGE and ESGE guidelines recommend that all endoscopes and reusable accessories should be reprocessed with a uniform, standardised reprocessing procedure.<sup>40,41</sup> The endoscopic procedure room cleaning process should be performed according to the ASGE guideline, which includes cleaning of all surfaces to remove all soiled and biofilms, followed by proper disinfection.<sup>40</sup> The non-critical environmental surfaces which are frequently touched by hands, such as bedside tables and bed rails, should also be thoroughly disinfected.<sup>42</sup> A delay of about 30 minutes in negative pressure rooms and a delay of 60 minutes for non-negative pressure rooms, is suggested before allowing a new patient to enter the room.<sup>43</sup>

**TABLE 3** Challenges and potential solutions for gastroenterology practice during the COVID-19 pandemic

Domains	Challenges	Solutions
Outpatient clinics	<p>Cancellation of 'non-essential' clinic visits.</p> <p>Challenges in triaging patients into 'non-essential' vs 'essential'. Lack of internal experience with telemedicine</p> <p>Determining appropriate follow-ups. Increased phone calls from patients with COVID-19 concerns. Need for COVID-19-specific patient communication</p>	<p>Effective utilisation of telemedicine</p> <p>Protocols to triage the patients who need in-person clinic visits. Creating a phone call pool through an algorithm</p> <p>Sending standardised letters to patients describing COVID-19 symptoms and when to call. Creating templates for COVID-19-specific letters for quarantine and work from home excuse</p>
Inpatient consults	<p>Shortage of personal PPE. Fear of detrimental patient care because of lack of experience with this style of practice</p> <p>Increased need for covering inpatient medicine team during a surge in patient volume</p>	<p>Rational use of PPE. Communication and collaboration with the hospitalist teams</p> <p>Solicit faculty or fellow volunteers for inpatient medicine teams</p>
Endoscopy	Risk of transmission of SARS-CoV-2. Postponing non-urgent procedures	Adherence to PPE compliance. Developing a triage protocol based on urgency
Economic impact	Loss of revenue as a result of cancellation of elective procedures	Assess and eliminate unnecessary expenses. Utilisation of key federal programs (Paycheck Protection Program, CMS Accelerated and Advanced Payment Program, CARES Act Provider Relief Fund)

Abbreviations: COVID-19, Coronavirus Disease 2019; SARS-CoV-2, severe acute respiratory syndrome coronavirus 2; PPE, personal protective equipment; CMS, Centers for Medicare & Medicaid Services; CARES Act, Coronavirus Aid, Relief, and Economic Security.

### 2.2.3 | Patient interactions and workplace safety

Based on the data from the Chinese Center for Disease Control and Prevention, the COVID-19 infection rate among HCW was 3.8%, among which 14.8% had a severe or critical infection.<sup>44</sup> However, in Wuhan, the infection rate among HCW was alarmingly high at 63%.<sup>44</sup> Hence, the hospitals need to have a goal-oriented strategy to aim for a 'zero infection rate' among HCW.<sup>45</sup> The strategies that have been adopted by the hospital systems to reduce cross-infection include online consultation, region separation, epidemic priority, suspension of all outpatient and non-urgent activities.<sup>45</sup>

### 2.2.4 | Endoscopic procedures

Several gastroenterological societies, including the AGA, ASGE, American Association of Study of Liver Diseases (AASLD), ACG, ESGE and British Society of Gastroenterology (BSG) have published position statements and recommendations for GI practice during COVID-19 outbreak.<sup>46-53</sup> All of these societies have urged gastroenterologists to reschedule any non-urgent endoscopic procedures to future dates and classify them as 'non-urgent/postpone', and 'non-urgent/perform'.

Indications for emergent endoscopic procedures include acute gastrointestinal bleeding, foreign body, acute biliary obstruction, acute cholangitis, infected pancreatic collections and obstruction requiring decompression and stenting.<sup>54</sup>

### 2.2.5 | Patient care: the emergence of telemedicine

Although COVID-19 has adversely affected multiple facets of clinical operations, it certainly has been a catalyst for bringing telemedicine to the forefront.<sup>29</sup> Most of the outpatient clinics are temporarily limiting patient visits to limit exposure. Only the 'essential' clinic visits should be allowed, and the 'non-essential' visits should be cancelled. If the patients need to come to the clinic, then they should be screened by if they have symptoms, had contact with a COVID-19 patient, or travelled to an endemic area. In addition, patients who come in for the clinic visits should undergo screening for COVID-19, including fever checks at the entrance.<sup>35</sup>

Telemedicine is an excellent alternative to the actual in-person visit as it allows for the patients to interact with the physician using the latest communication tools and to maintain the patient-physician rapport. The telemedicine allows the patients to receive continued

**TABLE 4** Recommendations preventive measures for COVID-19

- a. Patients should be prescreened for COVID-19 symptoms
- b. PPE must be worn by all endoscopy staff (gloves, face shield, eye-shield/goggles, N95/FFP2/FFP3 respirator, hairnet and gown) with consideration given to conservation and reuse of because of severe shortage. Double gloves should be used by the healthcare worker performing the procedure
- c. Only essential personnel should be allowed in the endoscopy suite
- d. Maintain at least 6 feet distance between patients while on the endoscopy suite
- e. Endoscopic procedures in patients with confirmed or suspected cases should be performed in negative pressure rooms with the droplet, airborne and contact isolation. Follow any patient with pending or confirmed COVID-19 for at least 7-14 days
- f. Avoid concomitant exposure of personnel with unique skills/similar skillset and utilise personnel who are not required in the endoscopic procedure for other patient care delivery such as triaging and virtual visits
- g. Family members and visitors should be avoided in the endoscopy area
- h. All patients requiring endoscopic procedures wear a surgical mask before entering the endoscopy room. The mask should be removed just before beginning the procedure. The mask should be replaced immediately after the patient recovered from sedation and able to maintain O<sub>2</sub> saturations more than 90% on room air<sup>41,59</sup>
- i. Patients with any symptoms of COVID-19, or contact with COVID-19 cases or travel to endemic areas in the last 14 days, would be considered high risk. ESGE recommend standard use of N95 or equivalent high filter respirators and two pairs of gloves for all patients who are considered to be high risk. The use of a surgical mask is advised during endoscopy in low-risk patients<sup>41</sup>
- j. It is recommended to have a separate pre- and postendoscopy area for infected or suspected COVID-19 patients
- k. Maintaining excellent hand hygiene by washing hands with soap and water or alcohol-based rub is mandatory before and after the procedures. Any contaminated waste and endoscopic instruments should be disposed of as per standard high-risk waste management<sup>60</sup>

Abbreviations: COVID-19, Coronavirus Disease 2019; PPE, personal protective equipment; ESGE, European Society of Gastrointestinal Endoscopy.

care and also comply with social distancing.<sup>55</sup> Still, there is a disadvantage of not performing a physical examination, which has to be taken into account.<sup>56</sup>

In 2018, only 7.9% of the gastroenterologists reported the use of telemedicine in their practice.<sup>57</sup> The low utilisation of telemedicine in gastroenterology was because of multiple challenges, including technological issues, poor patient participation, need for credentialing and licensing in multiple states.<sup>58</sup> However, it has changed in the context of the COVID-19 pandemic, when telemedicine has become an essential mode of healthcare delivery. An increasing number of gastroenterologists have started utilising telemedicine for most clinic visits.<sup>59</sup> Telemedicine has been well studied in the inflammatory bowel disease (IBD) population, which has shown cost-effectiveness, a decrease in hospitalisations, improving disease activity and improving disease-related knowledge.<sup>60-63</sup> It is essential to learn from shared experience in this situation and understand how telemedicine can become an

integral part of the healthcare delivery even after the pandemic ends. These measures could potentially change the gastroenterology practice for years to come and will improve access for the patients.

### 2.2.6 | Updates in governmental policies

The US Congress enacted the Coronavirus Preparedness and Response Supplemental Appropriations Act to provide emergency funding to combat COVID-19 on March 6, 2020. Some of the key federal programmes to provide economic relief to GI practices include the paycheck protection program, accelerated and advanced payment program and the CARES Act Provider Relief Fund. The Centers for Medicare & Medicaid Services (CMS) has implemented Section 1135 waiver, which has expanded access to telemedicine services for all Medicare beneficiaries, not just those that have novel coronavirus.<sup>64</sup> It has allowed Medicare beneficiaries to have services from their doctors without travelling to a healthcare facility. Waivers have been granted for originating site requirements and other previous restrictions, to allow for increased utilisation of telehealth services.<sup>65</sup> Telehealth services would be reimbursed at the same rate as in-person services, and this payment parity is considered to be the linchpin for its successful nationwide adoption. Also, physicians using telehealth will not be penalised under the Health Insurance Portability and Accountability Act (HIPAA), in the event of inadvertent noncompliance while using telehealth. It is also essential to stay current on the latest provisions at the local and national level, as a result of the changing nature of this pandemic.

### 2.2.7 | Long-term effects of COVID-19 on GI practice

COVID-19 pandemic has adversely impacted the GI practice and has simultaneously opened new avenues of training and practice gastroenterology. The pandemic has taught us the cautious use of PPE, hand etiquettes and increased use of telemedicine. While the list of disorders might increase, a hybrid technique of face to face and telehealth visits might shape our practice in the future. Preparedness to the COVID-19 pandemic will only increase our capability to target, mitigate and prevent future pandemics. Gastroenterologists should adapt to these changes as our practice of medicine would change permanently after this pandemic.

## 2.3 | Conclusion

The impact of COVID-19 on the GI practice and the GI training programmes has been profound and continues to increase. While pandemics are self-limited, there are no apparent signs of an end to this one yet. However, we can learn from countries that have gone through the early phase of this pandemic to contain the spread and reduce the mortality. Rescheduling the elective procedures is a temporary



measure and eventually will have pent up demand. Therefore, advanced planning and adhering to society guidelines may help to provide appropriate care during this pandemic. Preventing the nosocomial spread of the COVID-19, while protecting the HCW and caring for COVID-19 patients is key to success. All trainees need to stay compliant without complacency and follow recommended measures to contain COVID-19. Trainees should take this pandemic as an opportunity to adapt to new changes, including telemedicine, teleconferences for learning and dedicate more time towards research. Trainees should use the e-learning platforms provided by different societies and their programmes. Trainees should not worry about the temporary decrease in procedure exposure as the pent up demand after this pandemic would provide them adequate exposure to the procedure training. Collaborative work will create sustainable solutions and promote education, safety and well-being in these unprecedented times.

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## CONFLICT OF INTEREST

The authors report no conflict of interest.

## AUTHOR CONTRIBUTIONS

Conception and design: Abhilash Periseti, Hemant Goyal. Literature review: All authors. Drafting manuscript: Hemant Goyal, Mahesh Gajendran, Umesha Boregowda. Critical revision and editing: All authors. Final approval: All authors.

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