



Adapting a GI Fellowship to a Pandemic: Novel Approaches to Accommodating a Novel Virus

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Introduction

In the midst of the current Coronavirus Disease of 2019 (COVID-19) pandemic, residency and fellowship training programs throughout the country have re-evaluated their training structure [1, 2]. As part of an academic medical center in an area that was highly impacted by COVID-19, our gastroenterology (GI) fellowship program was faced with a myriad of new challenges. As with other Accreditation Council for Graduate Medication Education (ACGME)-accredited programs, the early course required a quick response that minimized exposure of trainees to the virus while maintaining adequate clinical coverage. As a GI training program, we had the additional goals of meeting learning objectives and also the technical aspects of a procedural-based specialty.

Here, we describe our local response as a GI training program to the COVID-19 pandemic, lessons learned, and future directions.

Our Steps for GI Training Program Redesign

Briefly, our program is located within a large, tertiary-care academic medical center and includes 6 fellows per year, where 5 of the 6 are supported by National Institute of Health training grants (T-32). As a result, the majority of inpatient clinical exposure is during the first year of fellowship, with more focus on outpatient procedures and protected research time in the latter 2 years. Our fellows rotate at 3 hospitals: our primary hospital, the Hospital of The University of Pennsylvania, is an 806-bed facility in which we are responsible for staffing luminal and hepatology consult

teams and an inpatient hepatology primary service with residents and fellow involvement; fellows also rotate at the Veterans Administration (VA) and a 300-bed hospital, Penn Presbyterian Medical Center. Attendings and fellows are on call 24/7 for emergent procedures at all 3 teaching hospitals. Within this structure, we set out with the following priorities and steps:

Step 1: Prioritize Safety of Patients and Trainees

Dealing with new data detailing the high degree of infectivity of COVID-19, our program quickly became concerned for the safety of our patients and trainees. In coordination with division leadership, we made the decision to limit trainee exposure to the clinical environment by removing trainees from our VA during the daytime and decreasing the number of fellows covering our primary teaching hospital from four to two. In addition to reducing team size, we also worked with the primary services to limit the number of consults to those deemed most necessary. Any remaining cognitive consultations that did not require direct patient evaluation were converted to virtual consults (either voice or video) as appropriate. Patients with confirmed or suspected COVID-19 who did require direct evaluation for consultation were seen only by the service attending.

Regarding the inpatient hepatology service, a main concern was the structure of rounds, which involves residents rotating in many parts of the hospital, and is traditionally conducted in highly populated patient care areas. In the beginning of the epidemic, 30 residents were quarantined, many due to exposures from fellow healthcare workers. Therefore, we conducted rounds on a virtual platform for discussion, which minimized direct contact and avoided congregating in patient care areas.

In the absence of clear society guidelines, we made the decision to not have any trainees involved in endoscopy, given high risk of exposure to the virus via aerosolization and limited access to personal protective equipment (PPE).

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As was in line with institutional policy, research laboratories were closed and outpatient procedures were substantially reduced, impacting the schedule of senior fellows.

Step 2: Revise the Clinical Schedule

There were several key principles we considered in recreating the inpatient coverage schedule, summarized in Fig. 1.

Minimizing Exposure

Per above, of utmost importance was to provide appropriate clinical coverage while minimizing fellows’ exposure to the hospital and fellow providers. Hospital policy dictated that any provider exposed to a COVID-positive patient without appropriate PPE was to undergo a period of quarantine. Moreover, the number of asymptomatic carriers for COVID-19 and the high concern of exposure had already resulted in quarantine for team members seeing the same patients, per above. Thus, we aimed to minimize overlapping of team members. While our standard is a staggered weekly schedule between attendings and fellows that minimized team handoffs, we decided to assign a fellow to an attending at each site and have them switch in tandem. In case of an exposure or team member who would test positive, a necessitated team quarantine would only impact two providers at a time in this new system. We also created a schedule wherein each fellow was on service for only a week at a time with a week break, in order to minimize cumulative exposure per

fellow, given that cumulative exposure increases the risk of infection [3].

This new schedule also necessitated a change in our night/weekend call system. Our standard was for two fellows to be on call every night to cover the three hospitals, with duties including answering all outpatient and inpatient calls as well as going into the hospital for urgent cases as needed. This system exposed up to 8 fellows per week to one of the three hospitals. We addressed this by separating the call duties into two tracks: one fellow is on ‘tele-call,’ where they answer all calls from all three hospitals from home, and triage appropriately; the fellow on service for the week is on ‘travel call’ on nights in tandem with partnering service attending, only to be called if there is an urgent case requiring hospital exposure. The tele-call triaging allows the travel-call fellow to rest most of the nights, given they are on call for more nights of the week in this system. To date, we have not had any overnight cases, providing the travel-call fellows with adequate rest.

Distributive Justice

Especially at a time of high anxiety and many unknowns, it was vitally important for all of our fellows to perceive the distribution of service time as fair and equitable. With the understanding that those not on GI consultative services may be redeployed to other areas of medicine during a surge of hospital needs, we chose to keep our first-year fellows on GI consultative services as much as possible in order to

Day	Hospital 1	Hospital 1	Hospital 1	Hospital 2	Hospital 2	Hospital 3	ALL hospitals
	Gut Day	Liver Day	Travel-call Night	GI Day	Travel-call Night	GI Day	tele-call PM
Monday	A	B	A	C	C	attending	upper-year
Tuesday	A	B	B	C	C	attending	upper-year
Wednesday	A	B	A	C	C	attending	E
Thursday	A	B	B	C	C	attending	D
Friday	A	B	A	C	C	attending	F
Saturday	B	B	B	C	C	attending	upper-year
Sunday	A	A	A	C	C	attending	upper-year
Monday	D	E	D	F	F	attending	upper-year
Tuesday	D	E	E	F	F	attending	upper-year
Wednesday	D	E	D	F	F	attending	B
Thursday	D	E	E	F	F	attending	A
Friday	D	E	D	F	F	attending	C
Saturday	D	E	E	F	F	attending	upper-year
Sunday	D	E	D	F	F	attending	upper-year

Fig. 1 Schedule diagram. Hospital 1 is our primary hospital, the Hospital of the University of Pennsylvania, where we have separate luminal (Gut) and hepatology (Liver) services. Hospital 2 is a nearby hospital within the system and has one consultation service (GI).

Hospital 3 is the VA. First-year fellows are labeled as A–F. Fellows follow the same schedule for Travel-call Night as the site attending. The fellow on Tele-call answers and triages calls from all three hospitals from home

maintain clinical exposure. We included upper-year fellows for tele-calls as a means to decrease burden on first year fellows. Upper years were then able to maintain focus on research activities and classwork as per T-32 requirements, while awaiting redeployment assignments.

Care for the Vulnerable

All fellows were urged to report if they had any specific concerns about exposure in the hospital (pregnancy, immunocompromised states, childcare issues), as a factor that would be considered when assigning weeks on service and tele-call.

Step 3: Continue Fellows' Education

We first converted our pre-existing didactic activities into virtual sessions similar to those in use by other training programs [4]; these included the fellow core lecture series, journal club, case conference, and grand rounds. The chat box and voice features of the virtual platform ensured that sessions were interactive. An appointed moderator guided discussions regarding differential diagnoses through participant comments in the chat box. Particular care was made to ensure that the moderator engaged the speaker during their presentation in order to minimize interruptions. Our weekly journal club was open to all faculty; while we maintained our scheduled topics, we additionally introduced COVID-related articles as per the interest of the presenting fellows. We maintained the schedule of topics for weekly didactics, in which fellows also engaged with questions through the chat forum. Our attendance was higher for these online forums than it was when conferences were in person, attributed to a combination of fewer fellows engaged in clinical activity and the ease of joining from any location.

The above strategies to limit direct patient interaction significantly decreased consult volume and time spent on consult rotations per fellow. To address these challenges, we utilized virtual platforms to provide alternative forms of education. To increase patient exposure so as to enhance cognitive learning, fellows were encouraged to join the daily hepatology service and consult virtual rounds. Following rounds, formalized teaching by the service attending and participating fellows consolidated concepts from the hospitalized patients. The luminal consult service attending facilitated virtual afternoon sessions where fellows led consult case discussions and board review. Utilizing a resource available for fellowship programs through the American College of Gastroenterology (ACG), fellows were assigned ACG Universe questions on a weekly basis.

For direct outpatient exposure, we were able to continue some continuity clinics through telemedicine, including the continuity clinic at the VA for third year fellows. While we

could not address the technical aspects of endoscopy, we focused on cognitive aspects by assigning videos provided on the website of the American Society of Gastrointestinal Endoscopy (ASGE).

Step 4: Ensure Wellness in a Time of Increased Stress

Given the fast-paced nature of the pandemic and the multitude of directives from division and hospital leadership, our program aimed to limit anxiety for trainees through the following means: first, we set up daily tele-conferences with all fellows to review all recently-announced policies and directives as well as to address any questions raised by trainees; second, we established a separate weekly meeting with first year fellows in order to address any special needs of the cohort offering most of the clinical inpatient coverage. Our Graduate Medical Education Council (GMEC) developed other resources for all trainees to address coping with anxiety and stress.

Other Considerations

Specifics for Procedural Fellowships

Of course, endoscopic procedures require hands-on training and cannot be achieved virtually. Since fellows were not allowed to participate in endoscopic procedures due to exposure risk, we provided fellows ASGE videos that reviewed common technical aspects of endoscopy. For third-year fellows still looking to meet requirements for less commonly performed procedures such percutaneous endoscopic gastrostomies, we reached out to our surgical colleagues with the hope of gaining access to a greater volume of these procedures when able to participate in procedures again. Continued endoscopic training remains a chief concern for our fellows.

Maintaining Productivity of Non-clinical Activities (Research and Coursework)

For trainees supported by the basic science T-32 training grant, in-person research activities have ceased. T-32 course directors have engaged T-32 trainees with the conduct of other scholarly work including grant writing, writing of review articles, and career planning. The School of Medicine has also made available a number of virtual educational seminars to which T-32 trainees have access.

Importance of Communication and Transparency

Since the first-year fellows were to remain as the backbone of inpatient consultation services, it was necessary to have

their input while constructing the new schedule. We held a brainstorming session with the first-year fellows alone to hear their concerns and thoughts, from which we were able to all agree upon the above changes. We asked upper-year fellows to volunteer to take tele-calls before assigning any fellows or creating the schedule, in order to demonstrate their commitment as well.

We made a special effort to ask frontline providers in our daily huddle for any updates and questions, in order to ensure that all fellows were aware of concerns. Since we remained transparent when we did not have the answer and turned the question into an action item with a deadline, all were assured of a pending conclusion.

Non-GI Training

We anticipate our fellows being redeployed to non-GI services, mainly in general internal medicine and intensive care units. Thankfully, our institution was offering virtual sessions and tools to refresh providers on clinical knowledge, and we collected these resources for our fellows.

Impact of Our Changes

Undoubtedly, COVID-19 has expedited a move towards telemedicine and remote learning. While these changes were made to maintain access to care and education for patients and learners, respectively, we may find that these techniques provide useful even after COVID-19 restrictions are lifted. Medical schools have embraced virtual learning forums for many years [5]; this experience led us to embrace similar formats in graduate medical education.

We have also re-adapted inpatient cognitive consults to be conducted through virtual medicine, enabling consultative services to provide input from afar and more readily. Especially for large hospital systems with geographic constraints, this may be appropriate in the future for a subset of patients as well.

Conclusion

To date, this summary represents our experience and lessons learned in adapting our program to the new reality of conducting a training program during an exposure-limiting

pandemic. We are continuously evaluating our strategies with the primary goal of prioritizing the safety of patients and trainees while maintaining the educational mission of our program. We continue to strive for superior solutions for addressing endoscopic procedural skills and ongoing research activity given the limitations imposed by the virus. We will adopt these strategies as the course of COVID-19 response continues and hope this approach will be useful for pandemics in the future. The strategies employed thus far provide a framework that can act as a starting point for programs of similar size and COVID-19 caseload, recognizing that pandemic response requires a tailored approach from all.

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Compliance with Ethical Standards

Conflict of interest All authors declare that they have no conflict of interest.

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