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REDESIGNING FELLOWSHIP CURRICULUM AMIDST THE COVID-19 PANDEMIC: OUR SHARED EXPERIENCES

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The COVID-19 pandemic has created innumerable challenges for medical professionals, including the need to balance clinical obligations with the continued need to provide a valuable and well-rounded educational experience for our medical trainees. Indeed, trainees at all levels have expressed concerns regarding the impact of COVID-19 on their education (1,2). Given the uncertain duration of this pandemic, it is important to begin sharing best practices to optimize trainees' educational experiences during this time. Here, we describe curricular changes implemented in spring 2020 in response to COVID-19 within our Endocrinology, Diabetes, and Metabolism Fellowship programs pertaining to clinical care, didactic sessions, and mentorship structure, as well as our fellows' feedback regarding the educational value of these changes. At the time of publication of this article in August 2020, our fellowship structure has again been modified to enable more in-person clinical and learning experiences. However, the regional variability in COVID-19 cases and dynamic response to infection control measures underscore the importance of adaptability in fellowship programs.

Our divisions provide inpatient and outpatient consultative services for patients with diabetes and endocrine disorders but do not typically function as primary admitting services. This allowed for quick adaptation to the remote assessment of patients, given the need to preserve the supply of personal protective equipment on inpatient units and to minimize exposure risk. For inpatient consultations, the nature of the consult was determined by the need for in-person physical examination. If deemed necessary, the fellow and attending together, or the attending alone, examined the patient to minimize the need for use of personal protective equipment with each entry into the patient's room. When an in-person examination was not deemed essential for medical decision making, the fellow and attending utilized telephone and video conferencing with patients, families, and primary inpatient teams to collect the necessary data and communicate recommendations. Daily video conference table rounds with the fellow, attending, and advance practice providers maintained thorough and efficient supervision of patient care while preserving a collaborative environment. For outpatient clinical care, our divisions rapidly adopted telemedicine capabilities, thereby enabling faculty and trainees to work remotely. The virtual meeting platforms allow fellows to independently interview the patient using video conferencing, present separately with the supervising attending and reconvene with the patient and faculty in a virtual exam room for completion of the visit. Utilization of a virtual "physician's workroom" by the outpatient attending and fellows, through either video conferencing or electronic medical record group chat function, maintains an environment where collaboration and group discussion are possible. Although this process notably de-emphasizes the bedside physical examination, it enables a balance between the continuation of fellows' ambulatory clinical education and the provision of necessary clinical care, while minimizing risk of viral exposure to our patients and trainees.

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It also allows for a unique opportunity for direct observation of the trainees' communication skills, which can be challenging in a busy ambulatory practice. Notably, while some patients did not have access to video conferencing for telemedicine visits (most often due to lack of access to internet, an electronic device, or technological expertise), assistance from office staff, as well as close communication with family members, greatly facilitated access for those with limitations. When video conferencing was not possible for return visits, telephone visits were utilized. Ultimately, this allowed broader access for some patients with barriers to in-person visits, such as a lack of child care and transportation issues, and enabled our trainees to continue to care for a diverse patient population.

Online video conferencing platforms similarly provided a valuable alternative to in-person educational conferences, regardless of the conference size. Indeed, all journal clubs, grand rounds, didactics, and other educational conferences were converted to an online platform. This enabled seamless continuation of our existing educational conferences, and the inclusion of additional conferences, including a fellow-led/faculty-precepted 'Endocrine Board Review' and a faculty-led 'Endocrine Guidelines Review.' These curricular additions were well received and will be continued in future years. Indeed, there were several additional unanticipated benefits of converting conferences to an online platform. First, it enabled increased attendance of faculty/staff who would have otherwise been unable to attend due to an off-site location. Second, remote conferencing facilitated collaboration with colleagues at peer institutions to share our educational offerings, thereby maximizing fellows' educational opportunities and the impact of faculty expertise. Finally, it allowed adjunct faculty currently working in other parts of the world to continue with fellow teaching.

The psychological impact of practicing medicine during a pandemic is an underestimated challenge wrought

by COVID-19. Many of us providing direct patient care have experienced anxiety in contracting COVID-19 and potentially spreading it to family, friends, and patients (1,3,4). However, even those of us who have been able to provide patient care via telemedicine have not been immune to its psychological effects: many have encountered professional isolation while trying to remotely practice a profession fundamentally grounded in humanism. Importantly, this consequence may be felt even more strongly by our trainees, who have dedicated a finite time period to learning the discipline and have now experienced a complete upending of their former curriculum. In response to this concern, we encouraged faculty members to hold video rounds, rather than telephone rounds. We additionally instituted weekly group meetings for the fellows and program directors to meet in an informal office hours video "meeting" to discuss and quickly address concerns as they arose. We note the importance of an adaptable curriculum during this time, as some trainees may face additional challenges working from home due to childcare and other differences in home life. We cannot overestimate the importance of relying on video to visualize trainees when in-person interactions are not possible, in order to identify potential changes in mental health and to ensure fellows feel supported within their program's community.

In spite of the challenges inherent in rapidly converting educational curricula to an online format, fellows' feedback at our institutions was overall positive. On an internal assessment of educational quality, most of our fellows felt that remote conferences were an effective way to deliver educational content and that the quality of conferences was maintained when delivered in virtual format. Seventy-eight percent 'agreed' or 'strongly agreed' that telemedicine inpatient visits were educationally valuable (the remaining 22% were 'neutral'), though only 67% 'agreed' or 'strongly agreed' that telemedicine outpatient visits were educationally valuable (the remaining 33% were 'neutral')

Table 1
Fellow Assessment of Curricular Changes in Response to COVID-19

Statement	Strongly Disagree, n (%)	Disagree, n (%)	Neutral, n (%)	Agree, n (%)	Strongly Agree, n (%)
The COVID-19 pandemic has impacted my fellowship training. (n = 11)	0 (0)	0 (0)	1 (10)	5 (45)	5 (45)
Remote conferences have been an effective way to deliver educational content. (n = 12)	0 (0)	2 (17)	0 (0)	4 (33)	6 (50)
Quality of educational conferences have been maintained when delivered virtually. (n = 12)	0 (0)	0 (0)	1 (8)	4 (33)	7 (59)
Quantity of educational conferences have been maintained since onset of the COVID-19 pandemic. (n = 12)	0 (0)	0 (0)	1 (8)	3 (25)	8 (67)
Telemedicine outpatient visits have been an educationally valuable experience. (n = 12)	0 (0)	0 (0)	4 (33)	3 (25)	5 (42)
Telemedicine inpatient visits have been an educationally valuable experience. (n = 9)	0 (0)	0 (0)	2 (22)	3 (33)	4 (45)

(Table 1). Fellows also identified many advantages to their virtual curricula, including the ability to access lectures at other institutions, ease in attending lectures regardless of their clinic location, and introduction of the board review and guidelines review sessions. Fellows also noted the perceived importance of telemedicine in their future careers and were grateful for a supervised learning experience during training.

The restrictions imposed by COVID-19 nonetheless resulted in some limitations for our fellows' experience. Ongoing limitations of virtual educational conferences identified by our fellows included less robust discussions and distraction from lack of microphone muting by some participants. Limitations identified for virtual patient encounters included limited or absent interval data (such as lab and radiology results), wasted time troubleshooting technical and logistical issues with patient video conferencing, and missed opportunities to learn from co-fellows' cases. Additionally, some procedural competencies were affected; although the ability to remotely access continuous glucose monitor and insulin pump data prevented a disruption in training in these areas, thyroid fine-needle aspirations were interrupted for several weeks. Close monitoring of procedure logs and careful planning to provide additional opportunities with resumption of these procedures is essential, especially for graduating fellows. We performed competency assessments 1 month earlier than usual to identify areas in need of additional supervised training prior to independent practice. Fellows often anticipate national meetings as an opportunity to broaden their exposure to educational content and engage in peer networking. However, it is possible that these meetings may be curtailed in the upcoming year. Finally, for fellows engaged in research, close communication with mentors

was encouraged, with time refocused on completion of analyses and manuscripts, where feasible.

We welcome the opportunity to resume some in-person conferences and mentorship to our fellows. However, the translation of our educational curriculum to an online format allowed fellows to continue their clinical learning experiences, educational conferences, and personal connection within our division, while maintaining requisite social distancing and infection control practices. Although this brought many challenges, it also allowed us to revitalize some aspects of our educational curricula to enable wider attendance of conferences, sharing of resources among different institutions, and utilization of faculty experts working abroad, which will undoubtedly enhance our programs in the future. Looking forward, we are eager to collaborate on future initiatives to share resources across training institutions at regional and national levels.

DISCLOSURE

The authors have no multiplicity of interest to disclose.

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