

Curricular Change and Resiliency in the Era of Coronavirus (COVID-19): The Uniformed Services University of the Health Sciences (USU) Experience

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ABSTRACT

Introduction:

The Coronavirus (COVID-19) pandemic has presented a myriad of organizational and institutional challenges. The Uniformed Services University of the Health Sciences, like many other front line hospitals and clinics, encountered a myriad of challenges in fostering and sustaining the education of students enrolled at the nation's only military medical school. Critical to the function of any academic medical institution, but particularly one devoted to the training of future physicians for the Military Health System, was the ability to rapidly adapt, modify, and create new means of keeping medical students engaged in their core curricula and progressing toward full and timely attainment of established educational goals and objectives.

Methods:

This article highlights some of the particular challenges faced by faculty and students during the first 6 months of the COVID-19 pandemic and describes how they were managed and/or mitigated.

Results:

Six key "lessons learned" were identified and summarized in this manuscript. These lessons may be applicable to other academic institutions both within and outside of the Military Health System.

Conclusions:

Recognizing and embracing these key tenets of academic change management can accelerate the generation of a cohesive, organizational response to the next pandemic or public health crisis.

INTRODUCTION

The COVID-19 pandemic continues to impact the global educational community in a myriad of untold ways. Flexibility, resourcefulness, creativity, and resiliency have become universal requirements. However, one aspect of the pandemic that may not be well appreciated is the exceptional innovation demonstrated by students, faculty, and staff at the USU over the past 6 months. Thus, the purpose of this article is

to highlight some of the key curricular innovations that have been implemented in a highly compressed time period as a result of COVID-19. More specifically, we will discuss the guiding principles, the changes made to the preclinical and clinical curriculum, and some of the lessons that have shaped the USU's ongoing approach to curricular change in the era of COVID-19.

By the end of February 2020, it was clear that COVID-19 had the potential to impact virtually all phases of the USU medical educational program. The USU Academic Affairs team, which includes the Associate and Assistant Deans for Curriculum, Faculty Development, Medical Education, and Student Affairs, envisioned three possible scenarios. First was the onset of a mild transient illness with the need to develop customized remediation plans for a limited number of students. Second was the development of a more serious, influenza-like illness with a need to shift to the partial delivery of online education. Third was the need to completely cease the delivery of all live, in-person teaching in anticipation of an outbreak akin to the influenza pandemic of 1918.

As mid-March arrived and as clinical cases across the United States started increasing at exponential levels, it became apparent that preclinical education would need to be

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doi:10.1093/milmed/usaa491

Published by Oxford University Press on behalf of the Association of Military Surgeons of the United States 2020. This work is written by (a) US Government employee(s) and is in the public domain in the US.

shifted into the virtual space and that clinical rotations would need to cease. A myriad of associated questions and concerns, ranging from how to safely return students from their away rotations to the local area (a major undertaking given that over 50% of our clinical students were on rotations outside of the local area), to questions regarding the health and safety of associated local and national faculty, to the impact on graduation plans for the senior class, soon ensued. Additional considerations involved issues of how best to implement a rapid transition from traditional classroom education to online modalities, as well as what could be done to advance the clinically oriented education of the three classes of students who had been abruptly withdrawn from required and/or advanced clinical activities.

As such, we identified and implemented two key, overarching principles that would serve as foundational touchstones for all curricular activities. First was the need to safeguard the health and safety of the campus community. Second was the need to foster the continuity of our academic programs that directly support the Military Health System mission and the military's physician pipeline. These principles provided both clarity and focus, allowing rapid determinations as to whether a proposed change incorporated the needed safety measures while allowing for the advancement of key academic programs.

Changes Made to the Preclerkship Curriculum

As a result of our accelerated 18-month preclerkship curriculum, only one class (Class of 2023) was engaged in the preclerkship curriculum, in March 2020. At the time, these students were partway through the fourth of seven organ system-based integrated modules—one focused on neuroscience and behavior.

Fortuitously, the majority of the didactic content in this module had been converted to high-quality prerecorded lectures, the year before, and each of the recordings had been produced with professional audiovisual support. As a result, the two module directors overseeing the implementation of this module were well positioned to accelerate a full-scale shift to distance learning in a highly compressed time frame. One week after this module began, the decision to shift to 100% distance learning was made. This in turn led to a series of virtual meetings with faculty and students, in order to explain the rationale for the decision, to establish expectations for students and staff, and to begin to address issues pertaining to child care, physical distancing measures, and academic support.

To help address the potential need to rapidly transition from face-to-face to online instruction, the distance learning laboratory (DLL) that was initially charged with helping to transition face-to-face to online instruction in the School of Medicine's graduate school (e.g., helping programs build online certificates and degrees) pivoted to providing more

expansive support of the medical student curriculum of the School of Medicine (SoM).

With the assistance of multiple consultations, workshops, and webpage resources from the DLL, small-group learning was quickly reformatted in order to conform to online delivery. Faculty quickly met the challenge of developing creative adaptations for activities that had traditionally been conducted in an interactive, face-to-face setting. Anatomical teaching rapidly transitioned to a greater reliance on the use of prosections and virtual imagery. Student access to the anatomy laboratory was retained, but was regulated by the use of an online registration system, which allowed students to select and reserve blocks of time that could be used for hands-on, supplemental learning, with physical distancing and appropriate personal protective equipment (PPE) in full use. Multidisciplinary, weekly, synchronous review sessions were also used to reinforce knowledge and keep students on track and engaged with the presented material.

In addition to these curricular changes, individual and small-group advisory meetings, which are normally conducted at regular intervals by the Office of Student Affairs, were all converted to online videoconferencing. These sessions, coupled with an ongoing series of regularly scheduled virtual town hall meetings with each class of students, allowed for the conveyance of regular updates and bidirectional communication. Surveys were conducted approximately 3 and 9 weeks into the shift to virtual learning, with results being used to guide further academic adjustments.

As the pandemic continued, further adaptations were made to the curriculum. Although initially curtailed, clinical skills training with simulated patients was reinstated by May, albeit with the creative leverage of telemedicine. There were, however, some essential clinical skills (e.g., learning how to perform an abdominal examination) that simply could not be effectively accomplished via distance learning, so a 3-day COVID-19 "academic recapture" period was planned and implemented in early July. This was made possible by a notable decline in local cases, as well with the increased availability of PPE for student use.

The pandemic also precipitated the need for some larger scale curricular adjustments, one of the most notable being the need to reposition and restructure the annual full-scale military field practicum known as Operation Bushmaster. Doing so actually provided a unique opportunity to pilot several new curricular elements—particularly those pertaining to Health Systems Science, health disparities, social determinants of health, systems thinking, value-based care, and interprofessional empathy.

Determining When Students Should Return to Full-time Clinical Work

The Academic Affairs team engaged leadership at clinical sites early and regularly to maintain lines of communication and develop the overarching guidance that would assist with

TABLE I. Criteria for Returning Students to Clinical Work

Domain	Key Considerations
Clinical criteria	Clinical criteria identified included determining whether (1) the resumption of routine clinical care was associated with the presence of adequate patient volume, (2) a sufficient number of teaching faculty were back on-site, to provide appropriate supervision and teaching, and (3) appropriate PPE supplies was available for all providers of patient care, as per local policies. USU provided training on the proper use of PPE before students' returning to direct patient care, but did ask individual facilities to provide N-95 masks and fit testing for students at their particular site, if this type of PPE was deemed necessary, based on local conditions. Shortly after students resumed clinical work, the CDC issued updated recommendations for universal eye protection during clinical encounters, so protective eyewear was subsequently ordered and shipped to each of the clinical students at their rotational sites.
Support criteria	Support-related criteria for returning students to clinical rotations involved ensuring that adequate housing and food resources were available for students, that explicit guidance would be provided to students as to how and when to seek care for any COVID-19 related symptoms at their site, that provisions for COVID-19 testing and follow-up be available, if needed, and that a local, contingency plan was in place in the event that a student became ill and required isolation. Should that occur, plans needed to be in place to allow for the appropriate notification of the student's local and USU chain of command, as well as for the delivery of food, welfare checks, and other support-related items.
Military criteria	From a military standpoint, a vital step involved the willingness of senior leaders to quickly recognize and designate and travel to clinical rotations as being mission essential. The requirement for a 2-week, preemptive quarantine—even for clinically well students—soon became a major factor, requiring further adjustments to the overall curriculum. Back on campus, the USU Department of Occupational Health established a plan to closely monitor students with confirmed/suspected COVID-19 and was ready to evoke consideration of a temporary suspension of hands-on clinical education at specific sites, should a cluster of COVID-related cases emerge.

the transition of clerkship students back into clinical settings as soon as safe to do so. It was readily acknowledged that in addition to adhering to new and emerging DoD policies regarding the institution of mandatory quarantine periods and limitations on individuals embarking on temporary duty, conditions for return would require coordination between multiple stakeholders, taking into account the unique situation of each of the 20 + clinical teaching facilities across the United States used by the USU, state/regional guidance, as well as a consideration of available resources.

Given the high prevalence of asymptomatic and presymptomatic cases of COVID-19, we decided that all patients should be seen as potential exposures for our students. As such, we opted to explicitly leave the decision as to whether students would be involved in direct care of patients with a known COVID-19 diagnosis to the discretion of each clinical site and department as dictated by local conditions and availability of appropriate PPE.

Developing criteria for returning to full-time clinical work involved consideration of three main categories: clinical criteria, support-related criteria, and logistical/military considerations (Table I). Additionally, it was clearly established that when students returned to clinical work, representatives from Academic Affairs, Student Affairs, Brigade, and Student Health would be available as a resource for student assistance at all hours.

Changes Made to the Core Clerkship Curriculum (Class of 2022)

Students engaged in their core clerkships (Class of 2022) had just started their initial rotations in January 2020. As the weeks progressed, it soon became evident that our

partner hospitals would need to pause their focus on the delivery of clinical teaching and education, in order to shift vital resources to address the pandemic. This in turn led to the decision to suspend clinical training at each of our clinical sites and arrange for the return of all clerkship students to the local area. Coincidentally, this turned out to be the same day that the Association of American Medical Colleges issued formal guidance¹ recommending that U.S. medical schools pause all student clinical rotations for these same reasons.

When students were withdrawn from their clinical rotations, they had all completed two 5-week rotations. After completing assessments for those rotations, students were required to engage in a program of salient, distance learning, which included completion of the Institute for Healthcare Improvement Open School Basic Certificate in Quality and Safety. Students were also provided with online training specific to COVID-19, which included instruction on properly donning and doffing PPE. When it became evident that the provision of hands-on clinical instruction would be postponed by more than a few weeks, students were subsequently enrolled in a 5-week, clinically focused, distance learning module known as the Clerkship COVID-19 Interim Module or CCIM.

As negotiations were ongoing to return students to our partner hospitals, multiple iterations of alternate calendars for clerkship students were drafted based on all the epidemiological data that were known at the time, while still allowing for the likely need to accommodate a 2-week prerotational restriction of movement (ROM) before the beginning of each new clerkship block. After considering the pros/cons of each variation, the Executive Curriculum Committee of the SoM ultimately decided that the best course of action for the SoM Class of 2022 was to shorten the clinical portion of each

core rotation from 5 to 4 weeks and eliminate the selective rotation.

Given the extenuating circumstances associated with the pandemic, three specialties (Pediatrics, Family Medicine, and Psychiatry) chose to convert their traditional end-of-clerkship, Objective Structured Clinical Examinations (OSCEs) to a series of remotely administered tele-OSCEs that were conducted via a virtual meeting platform. The Surgery, Internal Medicine, and Obstetrics/Gynecology clerkships decided to eliminate the use of an OSCE-based assessment for this particular cadre of students.

Given the requirement to allow for three 2-week ROM periods, a diverse “menu” of 2-week distance learning electives was subsequently designed, developed, and offered during each of the ROM periods. The distance learning electives were innovative and creative, spanning dermatology, general surgery, emergency medicine, and health disparities—just to name a few (Table II). Other ROM options included opportunities for students to initiate early work on an advanced research (Capstone) project.

With the continued need for prerotational ROM provisions, it also became necessary to adjust the clerkship year for the Class of 2023. This included delaying the start of the core clerkships so as to avoid overlap with the Class of 2022, restoring the length of the core rotations to 5 weeks, and aligning the clerkships into a series of two 20-week blocks, each comprised of four rotations. Although this allowed for the mandatory, 2-week ROM periods, it also necessitated elimination of the 4-week selective opportunity for this class of students.

Changes Made to the Postclerkship Curriculum (School of Medicine Classes of 2020 and 2021)

When the impact of COVID-19 began to peak in mid-March, there were two sets of students engaged in our postclerkship curriculum: Students in the Class 2020 who were approximately 6 weeks away from the completion of their medical school curriculum and students in the Class 2021 who were about to embark on their senior rotations. Each class was managed uniquely.

Class of 2020

Following the suspension of in-person clinical training, the class was withdrawn from their clinical training. This was followed by an individualized assessment to determine which students had already completed all of the core graduation requirements and for whom an early (on 1 April versus 16 May) graduation could be implemented. The few students who were identified as not having completed these requirements had the totality of their academic record reviewed by leadership to determine whether the student(s) had attained the required objectives through alternate means. Selective waivers were considered and granted for students for whom

documented attainment of essential goals and objectives could be ascertained. Although the majority of these learners were able to have their final requirements waived, several students were identified as still needing to complete specific educational activities before graduation.

Although these reviews were taking place, the entire Class of 2020 was enrolled in one of the 25 clinically relevant, 4-week distance learning electives in lieu of what would have been their final round of clinical rotations. In addition, a series of Health Professions Education (HPE)-related course offerings were developed, which allowed senior students to enroll in and complete coursework leading to the award of a graduate-level certificate in HPE.

Class of 2021

This class had recently completed a period of advanced didactics and had been scheduled to resume clinical training. Instead, they were enrolled in one of the previously noted distance learning electives courses of their choosing (Table II). As the pandemic evolved, it became evident that a return to hands-on clinical work would likely not occur until on/after June.

Upon return to the clinical environment, this cohort of rising seniors were required to complete nine advanced clinical rotations, all of which involved hands-on clinical care. The only exceptions were those made for students applying to specialties such as pathology and radiology who were permitted limited rotations in these specialties to support their Graduate Medical Education (GME) application and specialty selection. Limits were placed on attendance at military unique, operational courses. All other professional military education requirements were deferred until after graduation.

With the return to clinical rotations, hybrid modules of education were developed in order to meet the clinical requirements for emergency medicine, neurology, and anesthesia. These allowed for the provision of up to 2 weeks of virtual learning to be coupled with 2 weeks of hands-on patient care. For subinternships, the Executive Curriculum Committee determined that at a minimum, at least 3 weeks of a planned 4-week subinternship must be completed in-person, with hands-on clinical training and observation.

Other Changes

One of the most notable changes during the pandemic was the decision to graduate the Class of 2020 six weeks early. In the weeks immediately before and following graduation, a substantial cohort of students volunteered to assist with COVID-19 support and screening at military treatment facilities across the National Capital Region. Meanwhile, traditionally large, celebratory events, including Commencement and our Graduation Awards program, were converted to digital platforms, with live streaming. In addition, the White Coat Ceremony for first-year medical students was converted to a

TABLE II. Distance Learning Electives Created in Response to the COVID-19 Pandemic

Title of Distance Learning Elective	Offered to SoM Class of	Description
Arts, Health & Wellbeing	2020, 2021	Through a variety of focused readings, students distinguish the role and scope of practice of providers who work in the field of Arts in Health. Students discover ways that art and art therapies influence a service member's experience.
Capstone Research	2020, 2021, and 2022	Research in support of an existing Capstone project (including writing up results or creating a poster) or in preparation for a future/emerging project.
Culinary Medicine "Health Meets Food" Course	2020, 2021, and 2022	Trains medical professional to have more meaningful conversations with their patients about food and health, including the following modules: Obesity; Portion Control; Fats; Food Allergies/Intolerance; Protein and Vegetarianism; Renal/Sodium; Carbs/Diabetes.
Dermatology	2020, 2021, and 2022	Core Curriculum of 40 online modules/videos created by the American Academy of Dermatology encompassing the basic principles of dermatology; includes medical, procedural dermatology, management of common skin disorders, and teledermatology.
Diagnostic Radiology	2020, 2021, and 2022	Students use resources to better understand the basic principles and terminology of diagnostic radiology, including exposure to neuroradiology, cardiothoracic or chest radiology, abdominal or body radiology, and musculoskeletal radiology.
Disaster Psychiatry: Stress, Coping and Intervention in the Time of COVID-19	2022	Psychological impact of disasters (including pandemics) on individuals, communities, and populations can be pervasive and long-lasting on; learners explore the principles of disaster behavioral health within the context of the COVID-19 pandemic.
Emergency Medicine Case Studies + Emergency Management Course	2020, 2021, and 2022	Covers basic and advanced emergency medicine topics and case presentations, focusing on developing a differential diagnosis to first address emergent conditions; second half includes an 8-hour self-paced online disaster medicine curriculum.
Ethics, Legal Aspects of Medical Care	2020, 2021, and 2022	Six 90-minute discussions with leading experts in ethics, exposure to IRB meetings, and ethics committee meetings, supplemented with readings and independent study about areas of individual interest for participants.
Exobiology 101: Designing a Curriculum.	2021 and 2022	Using iconic science-fiction movie, students explore what a military medical officer might encounter upon meeting an alien being who may be injured or ill and discuss ethical issues inherent in determining sentience; includes study of curriculum design.
Forensic Anthropology	2020 and 2021	Students learn how anthropologists apply scientific principles and processes to the collection and analysis of skeletal evidence; includes forensic investigations, human skeletal biology, research methods, analyzing bone trauma, pathology, and taphonomy.
Fundamentals of Military Medicine	2021 and 2022	An opportunity to systematically review the fundamentals of military medicine using the Borden textbook "Fundamentals of Military Medicine," and incorporating a distance learning-based seminar, read and discuss, format.
General Surgery	2021 and 2022	Students work through 3-5 cases focused on H&P questions, differential diagnoses, work-up, and discussion of surgical interventions; includes acute abdomen, initial trauma evaluation, fluid management, surgical infections and bleeding, and cancer.
Internal Medicine DL Elective—Focus on COVID-19	2020, 2021, and 2022	Independent study and online learning to further prepare students for internship, with a focus on COVID-19 and its impact on healthcare delivery.
Intro to Research & Scholarly Skills for Med Student	2022	Self-directed series of modules introducing students to scholarly work, project selection, planning/execution, and research skills including utilizing the library, statistics, and preparing research proposals, abstracts, posters, and manuscripts.
Medical Professionalism Project	2020, 2021, and 2022	Developed at Duke University, covers behavioral economics; social norms; distance from money; testing and treatment; burnout; disclosing mistakes; conflicts of interest; research; inequities in healthcare; communication; shared decision-making.
Military Health System by the numbers: Population Health	2020 and 2021	Adapted from NYU's "Healthcare by the Numbers" curriculum, the course is structured around a population health project in which an actual health disparity outcome is identified and investigated within a real military population.
Military Medicine History	2020, 2021, and 2022	Opportunity to read and think about medicine, including history of a specialty, medical care in some past conflict, or a social issue like vaccination or medical costs, perhaps about past pandemics; independent study mentored by our expert medical historian.
Military Medicine in Space	2022	Using military medical principles, students plan the medical support needed for the crew on a 7-month flight to Mars and the establishment of a colony on Mars. We will discuss how to respond to a pandemic in the Mars colony caused by an alien microbe.
Neurology	2020, 2021, and 2022	Covers neuroanatomic pathways and clinical application, including taking a history and correct and incorrect performance of a standard neurologic examination; focus on the following neurologic conditions: headache, stroke, dizziness, and neuropathy.

TABLE II. (Continued)

Title of Distance Learning Elective	Offered to SoM Class of	Description
Operation Bushmaster Patient Guide Development	2022	Students helped craft a series of one-page summaries pertaining to one or more of the 30 presentations used in support of Operation Bushmaster. The products of this activity will be used to help train next year's class of students.
Operational Anesthesia	2022	Introduction to anesthesia in austere and operational environments; covers topics such as blood utilization, regional anesthesia, CCATT, anesthesia capabilities in different operational settings, and the opportunities that can await students after graduation.
Ophthalmology	2022	Provided an introduction to the surgical subspecialty of Ophthalmology; includes basic eye, orbital, and ocular adnexal anatomy and diagnosis of common ocular and periocular diseases and their medical and surgical management.
Orthopedic Surgery	2022	The course focused on bolstering the third-year medical student's core knowledge base in preparation for audition rotations and Orthopedic intern year, using the USU core orthopedic surgical subspecialty goals and objectives.
Pediatric Endocrinology Core Topics	2020 and 2021	Students work through 10 core Pediatric Endocrinology cases with suggested and supplemental reading attached to each case.
Preventive Medicine Elective	2020 and 2021	Introduction to clinical preventive medicine, including outbreak investigation, operational medicine, vaccine healthcare, risk communication, clinical informatics, critical appraisal of literature, and DoD role in COVID-19 surveillance and research.
Primary Care Journal Club	2021 and 2022	Students operationalize the use of selected medical information "hunting" and "gathering" resources to find high impact material that answers a clinical question or changes practice; demonstrated the use of provided critical appraisal tools.
Procedures in Family Medicine	2022	Covers common procedures in Family Medicine with robust video offerings for the "see one" experience in see one-do one-teach one experiential learning; includes informed consent and ascertaining best practices from the procedural literature.
Qualitative Analysis of Operation Bushmaster Essays	2020	Students participated in an IRB-approved qualitative research study of essays written by students during Operation Bushmaster, examining themes that emerged from qualitative coding; each student created a poster from their method and themes.
Risk Communication	2021 and 2022	Deepens understanding of risk communication deals around physical hazards such as pandemic illness, natural disasters, and toxic chemicals; particular attention to communication about harms such as hazardous worksites, radiation risk, and cancer.
"SET for Success" APA Program	2020 and 2021	Using the APA "SET for Success" syllabus as a foundation, interested students work through content and draft an abstract that could serve as a template for 2021 Meeting of the APA.
Telemedicine Care During a Pandemic—Pediatrics & Medicine	2020 and 2021	Students worked with USU Peds and Internal Medicine staff to complete telemedicine encounters at Walter Reed National Military Medical Center clinics.
Urology	2022	The course focused on bolstering the third-year medical student's core knowledge base in preparation for audition rotations and Urology intern year, using the USU core urology surgical subspecialty goals and objectives.
USU HPE Courses	2020 and 2021	Students had an opportunity to complete courses, such as Getting Started in HPE, Teaching with Technology, Curriculum Development, and Teaching methods, among others. Students who successfully completed nine credits were eligible to receive a HPE certificate.

Abbreviations: APA, American Psychiatric Association; HPE, Health Professions Education; PPE, Personal Protective Equipment; COVID-19, Coronavirus (COVID-19); IRB, Institutional Review Board; H&P, History & Physical; DL, Distance Learning; NYU, New York University; CCATT, Critical Care Air Transport Team; SET, Supplemental Education and Training.

virtual ceremony. In all cases, senior military and government healthcare leaders took time to provide virtual keynote addresses. For both the White Coat and Graduation ceremonies, students were able to provide pictures with their newly commissioned rank (in the case of graduation), or with their newly earned White Coat, while each individual student's name was read aloud with their photo. These events became large virtual community gatherings with congratulatory messages from faculty, family, and friends being delivered in real time.

DISCUSSION

Critical to the success of this pivot to distance learning was the increased frequency of communication between students and SoM leaders. Major curricular changes were announced via town halls and coordinated with student leaders. Class leadership met with Student Affairs Deans and Deans within the Office of Medical Education on a weekly basis. This communication was vital in both eliciting student input and communicating curricular changes to the student body. Fortunately, as of 1 October, we have had zero confirmed case

of COVID-19 in clinical students despite returning nearly 350 students back to clinical work on 22 June.

Although the coronavirus pandemic has certainly had had some significant negative effects, it is important to think about some of the positive impacts on education in general. As an overarching benefit, the pandemic has provided students with experiences that lead to increased adaptability, flexibility, and resilience—essential skills for medical personnel in all specialties and domains. It has also stimulated a tremendous amount of creativity on the part of our faculty and, even more importantly has contributed to even more collegiality and collaboration. The limitations on in-person learning required implementing a rapid shift to virtual environments in an exceedingly short period of time. This could not have been possible without frequent and clear communication and an unwavering focus on sustaining the academic mission of the University. The accelerated means of exploring and utilizing alternative learning modalities with the support of consultation with the DLL has had the effect of allowing even the least technically savvy faculty to become comfortable with their use.

Another intangible benefit of the pandemic was the opportunity to provide students first-hand exposures to the immediate, operational, and humanistic impacts of uncontrolled infectious disease and the importance of contact tracing and risk mitigation strategies on the same. Although our curriculum already contained some extensive content related to infectious disease and the potential for operational impact, the impact of the pandemic allowed students to gain an increased appreciation for the importance and tactical applicability of epidemiology, biostatistics, contact tracing, and risk communication. It also provided students with first-hand insights into the realities of disease transmission and the importance of robust mechanisms to preserve and protect community health.

Clerkship and postclerkship students benefited from an accelerated introduction to telemedicine. Because telemedicine will likely remain a key component of the future clinical landscape, the experiences of these classes will help refine the telehealth curriculum moving forward.

Lessons

Considering all the challenges encountered over the past few months, the following items emerged as “lessons” that could be applied in future situations as well:

1. Establish a core set of overarching principles: Establishing a foundational set of overarching principles is critical as they will serve as the foundational touchstones against which new and/or emerging proposals will be evaluated. In our case, the need to safeguard the health and safety of the campus community and the need to foster the continuity of academic programs were our two foundational touchstones.

2. Acknowledge knowns and unknowns: The adage that one cannot communicate too often or too well, was borne out in the current pandemic. Using multiple modalities while also acknowledging uncertainties was particularly important in maintaining trust with a geographically dispersed community.

3. Contingency/parallel planning: In a situation with ill-defined, unknown, and rapidly changing variables producing multiple potential solutions versus a singular one allowed for quick adjustments in an ever-changing environment and was instrumental to our success.

4. Embrace innovation: Change is rarely easy, but it is important to recognize that curricular elements that “had always been taught that way” can often be modified to incorporate new modalities without sacrificing educational value.

5. It takes a community: Recognizing and actively eliciting innovations and contributions from the entire academic community can make a real difference. From preparing enhanced video recordings to flipping classrooms, to creating novel distance learning activities, and deliberately reaching out to our entire network of local and national educators allowed for the development of a far more diversified array of distance learning opportunities than initially anticipated. Moreover, the deliberate and extensive outreach provided some novel opportunities for faculty who may have had difficulty engaging in a more conventionally delivered curriculum, partly since the timing and time commitment associated with a distance learning offering tended to be much more flexible (to include allowing for differing time zones).

6. Focus more on what is possible versus what is impossible: Actively focus on creating new options and possibilities as opposed to overemphasizing elements that are (temporarily) impossible to execute.

ACKNOWLEDGMENT

The authors would like to acknowledge the exceptional cadre of the USU-affiliated local and national faculty whose enduring support and “can-do” attitudes made these curricular revisions both effective and successful.

FUNDING

None declared.

CONFLICT OF INTEREST STATEMENT

None declared.

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