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FELLOWS-IN-TRAINING & EARLY CAREER SECTION

Adapting the Educational Environment for Cardiovascular Fellows-in-Training During the COVID-19 Pandemic



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The coronavirus disease 2019 (COVID-19) pandemic has prompted unprecedented physical and emotional challenges in the lives of our health care community. Fellows-in-training (FITs) are at the frontlines of the medical response, balancing programmatic changes to meet urgent patient care demands with the additional pressures to meet training requirements for cardiovascular disease fellowship. Medical centers must synchronize institutional workforce needs with trainee safety, education, and wellbeing. Given the imperatives for social and physical distancing, innovative educational methods should supplement experiential learning. From this perspective, we discuss strategies to support FITs in the early stages of the COVID-19 pandemic and the anticipated challenges as we navigate its course in the United States.

EXPERIENTIAL LEARNING

The exponential growth in COVID-19 cases has forced a major reorganization of traditional inpatient team structures. FITs are at the forefront of care delivery, although with roles that are perhaps different than those typically practiced to meet American College of Cardiology (ACC) Core Cardiovascular Training

Statement (COCATS 4) and Accreditation Council for Graduate Medical Education (ACGME) Common Program Requirements (CPR) (1,2). In hotspots and areas preparing for COVID-19 surges, cardiovascular care units have been refashioned into COVID-19 wards. Programs are trialing weeklong inpatient rotations for FITs on essential cardiology services to minimize COVID-19 occupational exposures. The ACGME is allowing institutions to self-declare Pandemic Emergency Status, which ensures that despite the reorganization of inpatient care systems, adequate resources, training, supervision, and work hour policies must remain in place. This declaration permits FITs in cardiology to function as attending physicians in internal medicine, if needed, up to 20% of each academic year (3).

This restructuring provides opportunities for experiential learning. FITs are enthusiastically learning about cardiovascular manifestations of COVID-19, including myocardial injury, myopericarditis, heart failure, arrhythmias, and thrombophilias in real-time and through international reports (4). Our critical care experience, gained through rotations in cardiovascular intensive care and stepdown units, will be helpful as current data suggest that COVID-19 and cardiovascular disease are intimately linked (5-7). FITs reassigned to noncardiology services will be challenged with infection control, airway management, and appraisal and use of experimental therapies. FITs should be encouraged to participate in the design and implementation of clinical, research, and quality-improvement protocols involving COVID-19. These experiences are valuable, so long as settings ensure proper personal protective equipment and supervision.

The local and global responses to COVID-19 are unique situations in which FITs can engage in disaster medicine. FITs can learn skills in the ACGME

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TABLE 1 Educational Components, Challenges, and Potential Adaptations for Cardiovascular Fellows-in-Training During the COVID-19 Pandemic

Educational Component	Challenges	Potential Adaptations
Experiential learning	Reorganization of classical inpatient team structures	Trial 1-week inpatient rotations for FITs on essential cardiology services to minimize occupational exposure
	Social and physical distancing imperative	Use virtual platforms for multidisciplinary inpatient team rounding
	Reassignment of traditional roles	Create shared online resources for faculty/fellows regarding COVID-19 care by leveraging furloughed trainees or those not on clinical service
	Urgent needs for critical-care-trained clinicians	Leverage skills of trainees interested in critical care cardiology and consider expanding formal critical care cardiology training programs in the future
	Postponement of pre-pandemic research, quality improvement projects	Encourage FITs to participate in design and implementation of clinical care, research, quality improvement protocols
Procedural experience	Need for rapid generation of knowledge regarding COVID-19	Include FITs in post-pandemic COVID-19-specific clinical care and research
	Postponement of elective procedures leading to decreased FIT exposure	Restructure rotations to redistribute procedural exposure
	FITs scheduled to graduate without achieving all planned curriculum experiences	Simulation training
Telemedicine	Institutional and/or medical center hiring freezes	Assess FIT competency without achievement of all planned curriculum experiences via program director/clinical competency committee mechanisms
	Social and physical distancing imperative	Extend fellowship training on limited term basis with similar pay and benefits
	Complex and rapidly changing workflows	Establish formal mentorship program at the start of new faculty positions
	Decreased access to routinely available diagnostics and therapeutics	Implement attending "buddy system," making senior clinician available to proctor and assist new faculty with complex procedures
Virtual education	Inpatient visitor limitations	Design workflows to incorporate FITs
	Critical illness and end-of-life conversations held remotely	Include time for feedback after each telemedicine visit
	Social and physical distancing imperative	Record visits with patient consent to allow FITs to self-evaluate
	Suspension of pre-pandemic learning experiences (e.g., national meetings, grand rounds, case conferences, lectures, journal clubs, research roundtables)	Create didactics, simulations for FITs to practice end-of-life scenarios
Leadership	Need to incorporate COVID-19 education and continue pre-pandemic fellowship education	Invite palliative care colleagues to perform targeted instruction on these topics
	Fewer in-person interactions with faculty	Use HIPAA-compliant video teleconferencing platforms to continue didactics in live or asynchronous formats
	Rapidly changing care standards	Provide FIT-focused teaching remotely with faculty support
	Uncertainty, anxiety, fear	Collaborate on COVID-19-specific teaching topics with other critical-care-focused specialties (e.g., pulmonary/critical care, anesthesia)
Trainee wellbeing and safety	Personal protective equipment shortages	Make virtual teaching conferences broadly available across specialties and within and across institutions
	Protection of pregnant, immunocompromised, and medically higher risk patients, and trainees	Virtual inpatient team rounding
		Use social media to facilitate rapid transcontinental exchange of information
		Include FITs in internal meetings
Leadership		Debrief with FITs frequently and regularly
		Model leadership and communication styles, strategies to lead teams under pressure
		Reinforce ACGME commitment to maintaining adequate resources, supervision, work-hour policies
		Facilitate knowledge acquisition of new skills (e.g., PPE donning/doffing)
Trainee wellbeing and safety		Inquire about trainee level of comfort regarding reassignments
		Create, advertise, and make widely available psychological health resources
		Ease cognitive and emotional burden of occupational infection risk by sharing strategies to minimize risk to self and family members

ACGME = Accreditation Council for Graduate Medical Education; COVID-19 = coronavirus disease 2019; FIT = fellow-in-training; HIPAA = Health Insurance Portability and Accountability Act; PPE = personal protective equipment.

Core Competencies of systems-based practice, professionalism, and communication through performing rigorous evaluations of new data involving COVID-19, troubleshooting inpatient and outpatient

care workflows for COVID-19 patients, and providing interprofessional team-based care in collaboration with clinicians outside internal medicine specialties (8). We encourage health system and program leaders

to include FITs in their pandemic planning meetings, to role model leadership and managerial skills, and to regularly debrief with FITs. In the future when, we hope, cases are fewer, FITs may care for patients with COVID-19-related cardiopulmonary complications. Participating in post-pandemic COVID-19 care will provide additional learning experiences for FITs in clinical and research domains (Table 1).

PROCEDURAL EXPERIENCE

Elective procedures have been postponed at many medical centers, and as a result, general and subspecialty FITs will have less exposure and training in competencies like the performance of echocardiograms, right and left heart catheterizations, endomyocardial biopsies, and device implantations. Because subspecialty training is time-limited, a few months without procedural experience may have a significant impact on skill development and achievement of graduation and employment milestones. In 1-year procedural subspecialties, a 10% to 25% reduction in volume could occur in regions where elective procedures decrease for 1 to 3 months. Although there is more flexibility in 2-year programs, a restructuring of rotations might be required to redistribute volume to graduating FITs while maintaining younger FITs' exposure. Programs may consider using simulation to bolster FIT readiness, which is also an opportunity to further investigate the effectiveness of simulation in achieving competency in cardiovascular medicine (9).

For institutions that self-declare Pandemic Emergency Status, all other program requirements (besides those mentioned above) are suspended for at least 30 days (3). The ACGME guides programs through the circumstances when a FIT's planned curriculum experiences are not completed and advises that program directors and clinical competency committees adjudicate graduation decisions (10). FITs graduating in 2020 may benefit from a formal mentoring relationship when joining faculty, one that serves to nurture young attending maturity. For proceduralists, identifying mentors who are available to proctor and assist in complex cases, especially in the initial transitional months, will be important.

The ACGME advises that a training extension may be necessary if the program director determines that a FIT is not ready for independent practice (10). Many centers may institute hiring freezes during this time, leaving FITs with uncertain post-graduation prospects and possibly with fellowship extension as an employment substitute. How this will ultimately impact FITs in the fellow-to-faculty transition

remains unclear, and we recommend that program directors and FITs proactively discuss these issues (Table 1).

TELEMEDICINE

Due to the epidemiological necessity for distancing, medical centers are increasingly using telemedicine to care for new and established patients. These workflows are complex, based on personnel, technology, and billing capabilities, but incorporating FITs into these care delivery models is important. FITs will be challenged to make decisions without a traditional physical examination and previously routinely available diagnostics and therapeutics. Therefore, this kind of medical decision-making may provide important lessons in providing high-quality, high-value, and cost-effective care. Preceptors can deliver feedback on medical history taking and decision-making directly to FITs after joint telemedicine visits. This opportunity for targeted, skill-based evaluation is one that FITs have likely not enjoyed since medical school or residency. With patient consent, audio and video telemedicine visits can be recorded on secure platforms, allowing FITs to review, self-evaluate, and improve their interpersonal and communication skills competencies.

As medical centers limit inpatient visitation, FITs will have to communicate with patients' family members by telephone or virtual platforms and will lead end-of-life conversations without the guidance of in-person cues. Program leaders should collaborate with palliative care clinicians to create didactics that develop FITs' remote care transition skills.

FITs can provide additional capacity to remotely manage the increased number of patients in ambulatory and inpatient care in the midst of the pandemic. Our trainee generation is likely to be more adept at using virtual platforms, and institutions should leverage FIT and early career expertise to launch telehealth activities (Table 1).

VIRTUAL EDUCATION

In-person conferences, spanning national to department/division to FIT-focused meetings, have largely been suspended. Programs have substituted these live experiences with teleconferences and continue teaching standard FIT curricula while adding COVID-19-specific topics. Virtual learning provides structures for FITs who have been furloughed (i.e., pulled from nonessential rotations, awaiting reassignment, or in self-isolation or quarantine) to learn in live or on-demand formats. This innovation has facilitated the rapid circulation of information across divisions,

allowing FITs to participate in programs for pulmonary/critical care and anesthesia trainees, for instance, and forge partnerships across programs that will hopefully persist. These platforms are also helping inpatient clinicians practice simultaneous and multidisciplinary team rounding without requiring physical proximity to other team members. Platforms like Zoom (Zoom Video Communications, San Jose, California), BlueJeans (BlueJeans Network, Mountain View, California), and WebEx (Cisco Webex, Milpitas, California) allow sharing of patient-level data through Health Insurance Portability and Accountability Act-compliant services.

Professional societies have created alternate platforms for the dissemination of research. For example, the ACC held its 2020 annual meeting virtually, permitting both real-time and asynchronous viewing. Robust discussions in the sessions' chat rooms and on social media provided opportunities for FITs to critically assess presented trials and learn from specialists around the world. The "Stump the Professor" session was specifically designed for online case-based learning for FITs (Table 1).

SOCIAL MEDIA

During the COVID-19 pandemic, social media has enabled the rapid transcontinental exchange of critical information, cultivation of relationships, and other benefits previously described (11). Twitter (San Francisco, California) facilitated the creation of advocacy campaigns for providers (i.e., #GetMePPE) (12) as well as COVID-19 patient cohorts for education and research (e.g., #COVIDSTEMI) (13). WhatsApp (Facebook, Inc., Menlo Park, California) is being used by FIT groups, many of whom are connected through ACC-sponsored activities like the Teaching

Tomorrow's Teachers program (14) and Leadership Academy (15), to foster solidarity and community in this uniquely challenging time. The ACC's Member Hub is serving as a repository of COVID-19 experiences and protocols and connecting cardiovascular team professionals with each other, as FITs are exemplifying in the FIT Section and Chief Fellow Network discussion groups.

CONCLUSIONS

The COVID-19 pandemic has resulted in a rapid transformation of medical education. Now, more than ever, FITs can collaboratively lead their training programs. Programs should harness the skills and perspectives of FITs as we collectively navigate this pandemic and implement expedient innovation and feedback cycles to maximize trainee safety, well-being, and education under the current circumstances. With these systems in place, we are confident we can provide the best care possible for all of our patients.

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