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FELLOWS-IN-TRAINING & EARLY CAREER SECTION

# Cardiology Fellowship During the COVID-19 Pandemic



## Lessons From New York City

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**T**he coronavirus disease-2019 (COVID-19) pandemic has had an impact on cardiology fellowships nationwide. This is particularly true in New York, which had more cases and more deaths per capita than any other U.S. state or country globally (1). Herein, we share the challenges and lessons learned by fellows facing the pandemic in New York City (Figure 1). We hope our early experience will provide guidance to fellows and programs facing new outbreaks in their respective regions.

### FELLOWS ON THE FRONT LINES

Many cardiology fellows are serving on the front lines of the pandemic in New York City. We were the first subspecialty recruited to increase hospital capacity for infected patients. Cardiology fellows were chosen because we have training in both internal medicine and critical care. In addition, we had the available time because elective procedures were cancelled.

At any given time, one-quarter of our fellows are deployed to COVID services, working 12-h shifts as critical care fellows in the intensive care unit or as medicine attendings on the floor. The remainder of our fellows continue on cardiology rotations, with several fellows rotating through a backup pool in case of an influx of admissions or fellows falling ill. Within

subspecialties like echocardiography or heart failure, there is a designated attending or team that sees patients with COVID-19 so that other fellows and faculty are not exposed. Our fellows have volunteered for COVID shifts according to their comfort level, so we have not had to require exposure.

COVID shifts present an opportunity for us both to learn from other specialties and to offer our unique skillset. We work as a team with pulmonologists, respiratory therapists, infectious disease specialists, palliativists, and other redeployed specialists from pediatrics, neurology, and elsewhere. Together, we are mastering proning and ventilator management, intubation and tracheotomy, nutrition and supportive measures, and end-of-life conversations. We are adapting to limited resources, using ventilator splitters or substitutes made from repurposed anesthesia machines. We also provide expertise on cardiovascular complications of COVID-19, including acute myocardial injury, thromboembolism, arrhythmia, and shock (2,3).

Assessment of COVID-19 patients is constrained by limited diagnostics. Common tests like the electrocardiogram or chest radiograph may not be readily available because they consume personal protective equipment (PPE) and place staff at risk of infection (4). More than ever, we are relying on the physical examination to establish a clinical baseline and monitor for deterioration. We have expanded our use of 12-lead telemetry to acquire electrocardiograms and monitor QTc intervals while minimizing clinician exposure. Point-of-care ultrasound has proven invaluable as a means to assess lung parenchyma, volume status, and hemodynamics. In deteriorating patients in prone position, for example, we now acquire diagnostic information using point-of-care ultrasound from apical windows.

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The authors attest they are in compliance with human studies committees and animal welfare regulations of the authors' institutions and Food and Drug Administration guidelines, including patient consent where appropriate. For more information, visit the [JACC author instructions page](#).

**FIGURE 1** Lessons From New York City During the COVID-19 Pandemic

## Lessons from New York City during the COVID-19 pandemic

### Allocation of labor

- Elective procedures cancelled
- Fellow availability increases
- Shifts filled dynamically according to need
- Fellows take new roles (e.g., intensivist)
- Exposures minimized by dividing into COVID and non-COVID teams
- Backup pool in case of a second wave

### Clinical challenges

- Bedside exam and diagnostic tests minimized to reduce staff exposures
- Limited data and therapies lead to greater reliance on clinical judgment
- Choosing treatment versus "do no harm"
- Frequent communication by leadership to address evolving needs and guidelines

### Educational challenges

- Social distancing limits didactics
- Fellows may need training extensions to meet requirements
- Applicants may be interviewed remotely
- Matriculating fellows need assistance finding housing and childcare
- Increased isolation, anxiety, depression

### Educational opportunities

- Manage cardiac complications of COVID
- Learn new skills (e.g., lung ultrasound, intubation, ventilator management)
- Work as part of an interdisciplinary team
- Build expertise in telemedicine
- Lower patient volumes create opportunities for research and electives

COVID-19 = coronavirus disease-2019.

Treatment of COVID-19 patients is similarly constrained by small numbers of published studies and limited therapeutic options. This is unfamiliar territory for cardiology fellows accustomed to randomized controlled trials and evidence-based decisions. Instead of guidelines, we follow recommendations generated by in-house expert committees. Still, we often encounter scenarios that fall outside of these guidelines. In these cases, we must rely only on our clinical judgement to choose between unproven therapies and our oath of *primum non nocere*. Here, we are learning to practice the art of medicine.

### IMPACT ON TRAINING

Social distancing has hindered fellowship training. Following the Centers for Disease Control and Prevention's recommendations, national meetings, grand rounds, lectures, journal clubs, bedside rounds, and quality improvement sessions are not conducted in-person (5). Instead, many fellowships have moved their curriculum to a Health Insurance Portability and Accountability Act-compliant teleconference format. On the one hand, this limits spontaneous discussion, face-to-face interaction, and the grasp of a patient

that comes only at the bedside. On the other hand, teleconferences provide geographic and temporal flexibility and reduce commutes and office space requirements. Sessions can be attended by fellows who are furloughed, post-call, quarantined, or home with young children. Also, in our experience, fellows attend lectures in other divisions (e.g., pulmonology, infectious disease), leading to new interdisciplinary initiatives. Resourceful programs can experiment with new ways to use teleconferences and online simulations to enhance fellow education in the years to follow. For example, a recent article in the *Journal* (6) describes a new virtual learning platform for education, mentorship, and research collaboration at a cardiology fellowship program.

Cardiology fellows are seeing reduced volumes of patients with primary cardiovascular diseases. Many centers have cancelled elective tests, procedures, and clinic visits in order to reduce coronavirus transmission and increase hospital capacity for infected patients (2,4,7). Additionally, many fellows must suspend planned rotations to manage COVID-19 patients or quarantine themselves if infected. To the extent that expertise is driven by volume, this reduction in caseload is a detriment to training.

Attendings have fewer opportunities to evaluate and advise fellows. Likewise, fellows may not meet requirements from the Accreditation Council for Graduate Medical Education and Core Cardiovascular Training Statement, particularly for 1-year procedural programs. Similar concerns are expressed by surgical fellowships (8). To manage these deficits, fellows graduating to attending positions may require a training extension or a formal mentorship program through their transitional year (9).

Despite these setbacks, fellows who are furloughed or experiencing low caseloads are using this time productively. Fellows are conducting and publishing research, organizing quality improvement initiatives, studying for board examinations, or applying for post-fellowship positions. Additionally, many are using telemedicine to connect with their clinic patients. When shared with preceptors, these telemedicine visits provide additional opportunities for feedback and self-assessment (9). Programs that use these experiences to develop their telemedicine infrastructure will likely reap long-term benefits in disease prevention and value-based care (10).

The pandemic is creating complications for incoming fellows and applicants. Fellows matriculating from elsewhere have been unable to travel to find housing. We have paired these incoming fellows with current fellows to help them find an apartment, sometimes visiting the unit on their behalf. Looking ahead to interview season, applicants may be unwilling or unable to travel, particularly to areas with higher infection rates. Programs may find themselves conducting interviews by video conference rather than in-person. Additionally, programs in affected areas may see a drop in applicants from outside institutions. To ensure fairness, we support the development of national guidelines regarding applicant travel and interviews for the upcoming season. We also recommend that programs include fellow-applicant-only teleconferences to allow applicants to ask questions and build rapport with current fellows.

## PRIORITIZING WELLBEING

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The pandemic is taking an emotional toll on trainees in New York City. Many feel vulnerable or powerless as coworkers and family members have contracted the virus. Anxiety is heightened by a perceived scarcity of PPE and fear of passing the virus to loved ones. Fellows become exhausted and disheartened after long shifts caring for patients who worsen despite best efforts. As hospitals freeze hiring and furlough employees (11), uncertainties persist about when we

will return to normalcy and what employment opportunities will exist after fellowship.

Similar sentiments have been reported elsewhere. A cohort of clinicians in China exhibited significantly elevated rates of depression, anxiety, and insomnia attributed to the current pandemic (12). Similarly, in the 2003 severe acute respiratory syndrome outbreak, health care workers frequently reported anxiety, depression, and stigmatization (13,14). These mental health issues may hinder clinicians' decision-making ability and have a lasting effect on their overall wellbeing (15).

Fellows are accustomed to working through these feelings with their family and peers, but social distancing constrains these sources of community and support. Many fellows have chosen to protect family and friends by moving to separate apartments. Spouses of fellows with children find themselves with increased childcare responsibilities but limited childcare services. Disruption of educational activities also has a negative impact on trainee wellness (16).

In response to this isolation, fellows are finding ways to build community at a distance, using group chats, video conference calls, and social media to share their experiences and reconnect with their peers and loved ones (9). Additionally, organizations are providing increased access to mental health services. In New York alone, 6,175 mental health professionals have volunteered their services to essential workers (17).

Fellowship programs also are taking the initiative to protect and advocate for trainees. Program leadership provides daily updates to fellows on the state of the pandemic, new diagnostic and therapeutic strategies, and implications for fellows. These conversations are transparent, bidirectional, and incorporate fellow feedback. Some programs are offering hazard pay and financing for childcare or mental health services. Additionally, programs have taken special care to protect trainees by ensuring adequate access to PPE, laboratory testing, and pertinent training.

In the face of these challenges, the pandemic also has brought out the best of us. We admire the courage, compassion, and resilience of our coworkers: the nurses, respiratory therapists, and emergency department workers putting themselves repeatedly in harm's way; the palliativists defending humanism at the end of life; the housekeeping, transportation, and support staff keeping the hospital running; and the countless others providing essential services. We feel satisfaction at having played a small part in mitigating this crisis. When this pandemic wanes and the 7:00 PM cheering through the streets of

New York ceases, we will not forget the sacrifices made, lessons learned, and sincere gratitude to our community.

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# RESPONSE: From Cardiology to COVID

## The Impact of a Pandemic on Fellowship Training

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*In the middle of every difficulty lies an opportunity for growth.*

—Dalai Lama

No doubt that the past few months have had a major impact on the health care community, and the effects of coronavirus disease-2019 (COVID-19) will be with us for years to come. Trainees in graduate medical education programs, by the very nature of their positions, typically in large, city-based, teaching hospitals, have

played and continue to play a critical, front-line provider role during this pandemic (1). There are approximately 230 general cardiovascular disease fellowship programs in the United States, translating into about 3,000 3-year trainees, not to mention numerous subspecialty cardiology fellows. COVID-19 has changed training paradigms, and it is incumbent upon the academic cardiology community to learn from the crisis to ensure trainees have the necessary opportunities to become competent cardiologists.

## IMPACT ON FELLOW CLINICAL EXPERIENCES

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Many cardiology fellows, given their skillset and expertise in treating critically ill patients, have been redeployed during the pandemic. Ventilator management, supportive care, telemedicine, and end-of-life discussions are now all too common. Cardiology fellows have risen to the occasion and expanded their clinical repertoire to become integral members of the COVID-19 care team. Fellows have also had the opportunity to focus on enhancing nonclinical competencies, such as leadership, professionalism, communication, and systems-based practice. These novel training experiences, however, come at a cost: loss of time focused on cardio-centric education, disrupted schedules, and a decrease in performed cardiac procedures, to name a few. The Accreditation Council for Graduate Medical Education suggested that, due to the impact of COVID-19 on traditional training pathways, program directors should focus on evaluating fellow clinical competency rather than on traditional metrics of time and procedural numbers (2).

## IMPACT ON FELLOW EDUCATION AND RESEARCH

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Given social distancing, in-person learning has changed dramatically during the pandemic. While many traditional educational experiences have been displaced, including extended bedside teaching, face-to-face conferences, and on-site grand rounds series, new educational opportunities have evolved. Virtual education is becoming more commonplace, not only for local education, but for the global sharing of information. COVID-19 also has presented new opportunities for discovery and research during fellowship. While many cardiology protocols were placed on hold during the virus surge, new ideas, databases, and

proposals have evolved, and the medical community has benefited from this type of COVID-19 interest and investigation.

## IMPACT ON FELLOW WELLBEING AND FUTURE

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Training is a stressful period during the life of a clinician. The addition of the pandemic has certainly added to trainee stress for a multitude of reasons: personal and family health, physical exhaustion, intensity of clinical work, exposure to excess morbidity and mortality, concerns about meeting training requirements, and worries about the future, including job opportunities. Training programs have also had to adapt with rapid changes in fellow schedules, educational platforms, and recruiting.

## MOVING BEYOND COVID-19

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The global cardiology community should use the lessons learned from COVID-19 to innovate and improve fellowship training. This is an opportune time to further develop a truly competency-based education and evaluation system for fellows (3). A continuation of multi-modality education, including telelearning, seems inevitable, with creative solutions for trainee and lifelong learning. The virtual learning platform has proven to be a useful tool to share knowledge and can even be interactive. In addition, the excitement for fellow-initiated research should be supported and expanded. Finally, enhanced emphasis on trainee wellbeing and burnout is now more important than ever.

The recent cardiology fellow experiences described by Hadley and colleagues remind us that training requires continuous evolution, nimbleness, and creativity, especially during difficult times. The next generation of cardiologists depends on it.

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