The Journal of Education in Perioperative Medicine

Original Research

# Anesthesiology Training in the Time of COVID-19: Problems and Solutions

*Agathe Streiff, MD*
*Sujatha Ramachandran, MD, MACM*
*Curtis Choice, MD, MS*
*Glenn E. Mann, MD, MA*
*Michael E. Kiyatkin, MD, MS*
*David C. Adams, MD*
*Ellise Delphin, MD, MPH*
*Naum Shaparin, MD, MBA*

## Introduction

As one of the largest academic hospital systems in New York City, Montefiore Medical Center faced a severe, acute surge in hospitalization and critical illness as a result of the novel coronavirus disease 2019 (COVID-19) pandemic. Although Montefiore typically maintains a 106 intensive care unit (ICU) bed capacity, at its peak, there were 258 ICU beds, with COVID-19 positive patients occupying approximately 90% of these beds. In addition, our institution converted nonclinical space, such as conference halls, into patient care areas, developed a surge plan, and pooled critical care resources. Scheduled elective surgeries were cancelled to free up resources and staff. The newly created central deployment office placed the anesthesiology residents' scheduled rotations on hold. The Department of Anesthesiology closely collaborated with this office to deploy anesthesiology residents as residents in the ICUs based on need. Adaptations our department made included changing the resident rotation structure to biweekly, converting didactics online, ensuring adequate case numbers for residents, actively pursuing wellness interventions, and ensuring safety. In this article, we discuss the unique challenges faced by the department and solutions used to continue high-quality resident education, training, and well-being while meeting urgent patient care needs during the COVID-19 outbreak in the New York City area in March and April of 2020.

## Discussion

### Deployment of Residents to ICUs

The central deployment office and our department made the decision to postpone the residents' subspecialty rotations and instead redeployed the 48 first-year postgraduate (PGY-1) to fourth-year postgraduate (PGY-4) anesthesiology residents in our residency program due to COVID-19 patient needs. Beginning clinical anesthesiology residents (CA-0) reported to the inpatient wards. First-year clinical anesthesiology residents (CA-1) to third-year clinical anesthesiology residents (CA-3) residents rotated in 6 new ICUs in addition to our pre-COVID-19 era ICUs where they held responsibilities expected on an ICU rotation. Anesthesiology residents are required by the Accreditation Council for Graduate Medical Education (ACGME) to rotate in at least 4 months of critical care during residency.[1] This training in learning to care for critically ill, complex patients made them strong educators and advocates during the pandemic. Furthermore, residents synergistically combined their workflow proficiency and protocol familiarity with the clinical experience of nonintensivist anesthesiologists.

### Surgical Case Requirements

The department prioritized well-rounded clinical experiences for the residents, including meeting their case requirements despite a March 18, 2020, announcement by the ACGME suspending accreditation-related activities.[2] Fortunately, most of the CA-3 residents had already achieved or exceeded the minimum case numbers to graduate. Although this deployment did not affect the ability to meet their minimum case numbers, it did shorten their clinical experience in the rotations they had missed, and the possibility that index cases have been missed or delayed at this point in training for CA-1 and CA-2 residents cannot be excluded. The anesthesiology attendings were responsible for scheduling specifically assigned emergency operating room (OR) cases, such as craniotomies and open heart surgeries, that met criteria for resident case requirements whenever possible.

### Personal Protection and Resident Learning

Anesthesiology residents, compared with those of other specialties, may be at particularly high risk of severe acute respiratory syndrome coronavirus 2 virus transmission due to their direct participation in endotracheal intubation and other aerosol-generating procedures and assignment in COVID-19 dedicated ICUs.[3] All hospital employees with direct clinical care, including residents, received personal protective equipment including N-95 respirators, face masks, and gowns, and training in donning and doffing. In pandemics, personal protective equipment supplies and fit-testing of masks may be limited. In dire circumstances, solutions such as reusing of N-95 masks

*continued on next page*

*continued from previous page*

and sourcing alternative supplies may need to be considered. Anesthesiology residents received training in departmental intubation protocols for patients with COVID-19.

The Anesthesia Patient Safety Foundation[4] issued perioperative considerations for patients with COVID-19, including avoidance of trainee intubations. To reduce viral transmission, it is desirable to achieve intubation on the first attempt by assigning an experienced professional for the intubation and using modalities such as video laryngoscopy. This goal also must be balanced with the commitment of graduate medical education programs to resident experiential learning. In practice, anesthesiology residents were often the most experienced intubators in the ICUs due to the frequency and difficulty of intubations they perform in the OR and non-OR locations. The authors emphasize the importance of approaching each airway and assigned anesthesiology resident on a case-by-case basis, carefully balancing patient care, airway difficulty, safety, educational experience, and institutional policy.

### Didactics

The American Board of Anesthesiology announced the cancellation of several board certification exams including the Basic Exam typically administered at the end of the CA-1 year.[5] Due to the pandemic and the redeployment of residents, the existing didactic structure required significant modification. Within the department, ICU-trained anesthesiologists worked closely with quality and residency education committees to provide didactics on COVID-19 and other ICU topics. Our department converted the lecture hall format to exclusively online sessions via Zoom (Zoom Video Communications, San Jose, California) to avoid large gatherings and facilitate social distancing. Lectures remained on the same days of the week and times as before the pandemic because of scheduling convenience. The CA-1 lectures remained on Friday mornings before OR start time, and advanced year lectures remained at noon during the week. The content was revised to suit current needs, such as wellness and self-care, COVID-19, and updates in ICU management. The online format allowed residents to participate pre-call, on different rotations, and when off-duty. Attendance remained similar to the pre-pandemic, in-person attendance of approximately 83%. Residents were regularly called on to confirm their active participation.

### Scheduling

Due to the sudden onset of the COVID-19 patient surge in our hospital and the rapid redeployment of anesthesiology residents, the existing rotation schedule also underwent major changes. A pattern that allowed for continuity of care was deemed ideal. In addition, coverage was needed for when residents fell ill or required a 2-week quarantine period. Last, vacation time that was previously granted needed to be upheld. Our department found that scheduling anesthesiology residents for 2 weeks of ICU followed by a 2-week rest period satisfied all of these goals. During the 2 weeks of ICU, residents completed 12-hour day shifts and 12-hour night shifts, similar to their ICU rotations. The schedule was created such that any previously granted vacations coincided with the 2-week rest period. During 1 of the 2 rest weeks, residents completed 1 OR overnight call with the exception of residents who were previously granted vacations and were not scheduled for calls. This unique schedule allowed for built-in quarantine time if it became necessary by switching only 1 call and reminding residents to follow Occupational Health Service directives. The distribution of obstetric calls remained unchanged from the pre-COVID-19 schedule. Anesthesiology attendings always supervised residents and adhered to the ACGME supervision and work hour rules.

### Wellness

Residents caring for patients with COVID-19 often experienced mental and emotional challenges, including facing worsening clinical courses, a lack of established knowledge regarding best treatments, personal health risk, and facing the anguish of patient family members who were unable to visit their loved ones due to infection control policies. To address these threats to well-being, our department took several actions. We created and maintained a centralized departmental Web site updated with wellness resources within and outside of our institution. Examples included NYC Well[6] and the NYC COVID Care Network.[7] Anesthesiology faculty members debriefed residents ad hoc at the end of their assignments in the newly formed ICUs and relayed their feedback to departmental leadership. In addition, a psychiatry faculty member with expertise in health care worker wellness debriefed all residents in small groups. Debriefing sessions allowed for an opportunity for residents to share their thoughts, emotional responses, and overall experiences of the deployment strategy. The sessions also allowed departmental and residency leadership to express their gratitude and appreciation for the high level of commitment and professionalism exhibited by the residents. Residents were asked about and encouraged to share feelings of burnout and assessments of their workloads. They voiced feelings of sadness for their patients and their families, as well as their own fears of contracting COVID-19 and transmitting it to those around them. In the future, debriefings could be used in disaster scenarios to modify responses in real-time as a part of continuous quality improvement efforts.

## Conclusion

The COVID-19 outbreak in New York City necessitated a rapid and comprehensive restructuring of clinical, educational, and administrative duties within our department. Departments that must rapidly reorganize face challenges in resident work hour restrictions, challenges in bedside teaching and in-person didactics, and challenges in wellness and personal safety. Advanced planning should account for procedure and policies, equipment, and personnel required to keep the workforce safe and able to both care for patients and carry out the educational mission. During any similar crisis in which patient mortality and morbidity are high, organizations must also consider and protect the mental health of the staff. The authors hope that a similar pandemic will not reoccur; however, academic centers should prepare for the challenges that may arise when addressing acute patient care needs while remaining

*continued on next page*

*continued from previous page*

committed to anesthesiology resident education and training (Table 1).

## References


1. Accreditation Council for Graduate Medical Education. ACGME program requirements for graduate medical education in anesthesiology. https://www.acgme.org/Portals/0/PFAssets/ProgramRequirements/040_Anesthesiology_2020_TCC.pdf?ver=2020-06-18-133042-890. Accessed August 23, 2020.
2. Accreditation Council for Graduate Medical Education. ACGME response to the coronavirus (COVID-19). https://acgme.org/Newsroom/Newsroom-Details/ArticleID/10111/ACGME-Response-to-the-Coronavirus-COVID-19. Accessed May 15, 2020.
3. Centers for Disease Control and Prevention. Coronavirus disease 2019 (COVID-19). https://www.cdc.gov/coronavirus/2019-ncov/hcp/faq.html. Accessed December 7, 2020.
4. The Anesthesia Patient Safety Foundation. An update on the perioperative considerations for COVID-19 severe acute respiratory syndrome coronavirus-2 (SARS-CoV-2). https://www.apsf.org/article/an-update-on-the-perioperative-considerations-for-covid-19-severe-acute-respiratory-syndrome-coronavirus-2-sars-cov-2/. Accessed September 5, 2020.
5. The American Board of Anesthesiology. COVID-19 update: APPLIED exams week 7 cancelled. http://www.theaba.org/ABOUT/News-Announcements/COVID-19-Update-APPLIED-Exams-Week-7-Cancelled. Accessed May 15, 2020.
6. NYC Well. Chat with a counselor now. https://nycwell.cityofnewyork.us/en/get-help-now/chat-with-a-counselor-now/. Accessed December 20, 2020.
7. NYC COVID Care Network. Connect to support. https://nyccovidcare.org/request. Accessed December 20, 2020.


*The following authors are in the Department of Anesthesiology, Montefiore Medical Center, Albert Einstein College of Medicine, Bronx, NY:* ***Agathe Streiff*** *is an Assistant Professor of Anesthesiology;* ***Sujatha Ramachandran*** *is an Associate Professor of Anesthesiology;* ***Curtis Choice*** *is Director, Division of Ambulatory Anesthesia, and Assistant Professor of Anesthesiology;* ***Glenn E. Mann*** *is an Assistant Professor of Anesthesiology;* ***Michael E. Kiyatkin*** *is an Assistant Professor of Anesthesiology and Medicine;* ***David C. Adams*** *is Executive Vice Chair, Department of Anesthesiology Clinical Operations and Quality Assurance, and Professor of Anesthesiology;* ***Ellise Delphin*** *is France F. Foldes Professor and Chair of Anesthesiology; and* ***Naum Shaparin*** *is an Associate Professor of Anesthesiology and Director, Multidisciplinary Pain Program.*

***Corresponding author:*** *Agathe Streiff, MD, Montefiore Medical Center, Albert Einstein College of Medicine, 111 East 210th Street, Bronx, NY 10467. Telephone: (718) 920-4316, Fax: (718) 920-2245*

***Email address:*** *Agathe Streiff: astreiff@Montefiore.org*

*Attribute work to Department of Anesthesiology, Montefiore Medical Center.*

***Conflicts of interests and financial disclosures:*** *C.C. was a paid attendee of a consultant meeting for Merck in December 2019 to discuss Sugammadex and received renumeration by MedEdicus to develop a continuing medical education module for residual neuromuscular blockade in November 2019. N.S. is a consultant and was on the advisory board for Acel Rx Pharmaceuticals and Averitas Pharma. He has received research funding from Grunenthal and Heron therapeutics. For both authors, these funding activities are declared here; however, are not in conflict with their roles and opinions in this publication. There are no funding sources supporting the submitted work to declare.*

**Abstract**

From March to June of 2020, Montefiore Medical Center faced one of the most acute surges in hospital admissions and critical illness ever experienced in the United States due to the severe acute respiratory syndrome coronavirus 2 pandemic. The pandemic had not yet spread to most of the country, and there was a relative deficit of knowledge regarding treatments, prognosis, and prevention of the virus, making this experience relatively unique and challenging. As part of a surge plan, our institution converted nonclinical spaces, such as conference rooms, to inpatient care settings and placed elective surgeries on hold to free up resources. A central deployment office suspended anesthesiology resident rotations and instead assigned them to intensive care settings based on need. For the Montefiore Medical Center Department of Anesthesiology, preserving its academic mission and commitment to Graduate Medical Education was essential. Adaptations included changing the residency rotation structure to biweekly, converting didactics online, ensuring adequate case numbers for graduating residents, actively pursuing wellness interventions, and prioritizing the safety of the residents caring for patients with coronavirus disease 2019 (COVID-19). In this brief report, the authors discuss solutions devised to maintain the quality of anesthesiology resident education and training as much as possible during the COVID-19 surge.

**Keywords:** Anesthesiology residency, graduate medical education, COVID-19, SARS-COV-2, pandemic, curriculum design, wellness, well-being

*continued on next page*

*continued from previous page*

# Table

***Table 1.*** *Summary of Recommendations for Anesthesiology Residencies During a Coronavirus Disease 2019 (COVID-19) Surge*

| Category | Description |
|---|---|
| Patient care duties | • Assign CA-0s to hospital wards COVID-19 patient care, CA-1 to CA-3s to COVID-19 intensive care units, as well as subspecialties requiring constant staffing such as obstetrics and nonelective operating room cases<br>• Determine clinical assignments such as intubations on a case-by-case basis to optimize learner experience |
| Accredited Council of Graduate Medical Education requirements | • Identify and prioritize senior residents who require case numbers for graduation<br>• Maintain work hour limits<br>• Assess downstream impacts in case exposure shortfalls in CA-1 and CA-2 classes<br>• Consider competency-based graduation over case number or time-based (number of months) factors |
| Didactics | • Convert to online format to comply with social distancing<br>• Modify topics to pertain to COVID-19 patient care |
| Scheduling | • Build in 2-week rest blocks to allow for quarantining of residents who may fall ill<br>• Preserve established vacation schedules as much as possible |
| Wellness | • Conduct periodic debriefing sessions by departmental leaders in partnership with experienced counselors<br>• Communicate thoroughly and often |

Abbreviation: CA, clinical anesthesiology year.