Stroke

InterSECT

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Stroke Fellow Redeployed

My Fellowship in COVID in the Epicenter of a Pandemic

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He was by far the sickest patient in our unit. He also happened to be the youngest. He was admitted early on, when the virus was first breaking out in the city, and in the ensuing weeks, he had been completely ravaged by his illness. Proning, nitric oxide, multiple vent strategies, hydroxychloroquine, and steroids—nothing had helped his course. His chest radiograph was atrocious, and his arterial blood gas seemed incompatible with life. Conversations with his family every day were a struggle. In the field of stroke, we are used to having difficult conversations with families. The neurological insults are often devastating and unexpected. As a result, the discussions can be met with quite a bit of incredulity. But what complicated conversations with families of patients deteriorating from coronavirus disease (COVID) was not only their inability to be present for the course, but our inability to make sense of any of it. In early March, a previously healthy young man said goodbye to his family and walked into the emergency department alone. Now 3 weeks later, having gone through the gamut, he was languishing in our intensive care unit (ICU), dying alone. How could we get this family to accept what has happened to him when we could hardly believe it ourselves?

In my prepandemic life, I was a stroke fellow in New York City, winding down the first of a 2-year program that combined clinical training in Vascular Neurology with academic training in research methods with a masters in epidemiology. My time was divided between hours in the classroom and clinical weeks on the Stroke service and neuro-ICU. But with the growing number of confirmed cases in the city and the swell of critically ill COVID patients in our ICUs, our hospital, and everyone working in it, flipped into crisis mode. Seemingly overnight PACUs, ORs, step-down units, and even outpatient procedural clinics were emptied out and converted into makeshift ICUs, and nearly all floors were repurposed for the tsunami of COVID patients projected to come our way. To staff these new units, physicians were enlisted across all specialties and within the Neurology department, the Neurocritical Care and Stroke Fellows were redeployed to join the collection of COVID Fellows in one of our hospital's 15 COVID ICUs.

During the transition, I had a little bit of time to prepare for my new role and spent it brushing up on some long-forgotten concepts—lung protective vent strategies, the mechanics of ECMO, continuous renal replacement physiology, and of course brushing up on ACLS protocols. These patients were horribly sick. On my first day in our COVID ICU, repurposed from our old neuro-ICU, the halls were hardly recognizable. The unit was eerily quiet aside from the chorus of vent alarms and the warning chirps of emptied infusion pumps dangling off IV poles now situated outside of patient rooms (to minimize our exposure). Typically in the neuro-ICU families are a familiar presence—at the bedside, in the family room, or pacing the halls. But families had long since been barred from the hospital, and their absence from this unit in particular was the most striking change of all.

It was high-acuity, high-intensity work in the unit and the trajectory of the individual patient difficult to predict. It seemed like anyone ill enough to make it into a COVID ICU could potentially be struck down by the disease, quite dramatically, and any point in time. That menacing reality created a persistent hum of anxiety throughout the unit. We were constantly refreshing our screens for new pieces of data, constantly pacing back and forth from

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room to room, peeking at cardiac monitors and vent settings behind tightly sealed glass doors. Though patients could take weeks to improve, their actual management was a very dynamic process. "Is that last blood gas back? Do we know his last plateau pressure? Has the urine output picked up? And where have his blood pressures been sitting?" In the war on COVID, battles were won and lost seemingly on the hour with these little pieces of data, and we were constantly reassessing our plan and reconsidering our next steps.

It is believed that for most who contract the virus, the course is fairly benign—maybe some low-grade fevers, a nagging headache, dry cough, and myalgias. But as we have seen in enough of these patients over the last few weeks, this coronavirus also has the propensity to touch off a much more frightening scenario—a diffuse inflammatory cascade with multiorgan system involvement setting off a whirlwind of escalating care. In the lungs, the inflammatory process often requires intubation with aggressive vent settings. These aggressive settings then require the use of large amounts of sedation to keep the patient calm and tolerant. The high doses of sedation often then in turn require the use of vasopressors to prevent circulatory collapse. In addition, although all the patients in our unit were on ventilators, nearly half of them at any point were also on renal replacement therapy. We have seen an excess burden of clots, highly resistant polymicrobial infections, and many patients arriving to the unit in florid diabetic ketoacidosis. At times, the complexity of their care was overwhelming and the work in the unit often felt exhausting and, sometimes, futile. The novelty of the virus, its ease of transmission, and its widespread destructive capabilities have limited the development of formal recommendations on management and instead have given way to experimental practices and anecdotal solutions. Empiric anticoagulation for all? Who gets antimalarials? Plus or minus steroids? Plus or minus azithromycin? What about antivirals or monoclonal antibodies? Our options seemed both limited and endless at the same time.

In the day to day, however, it was difficult to tell if any of these practices were changing anything for anyone. A patient's COVID course seemed largely dictated by the patient himself, with our primary role mostly being to support him through it. But even this was difficult work, and with the long hours and very little distraction, it was all-consuming. However, with the city shutdown all around us and with many of us opting to live in isolation and apart from our families out of fear of transmission, the work became a place of refuge. A place that kept us from feeling powerless and bored and afraid. Despite the stress of the work and the fear of exposure, we were glad to have something important to offer in all of this and to be around people who felt the same.

At the end of each workday, it is always pitch-black outside. Although I go through the whole ritual of changing my sneakers, getting out of my scrubs, and switching out my N95 mask for my street mask, stepping out of the hospital, I always still feel a bit radioactive. In this part of town, at this hour, the streets have never been so quiet. They speak of these ovation hours: the 7-AM and 7-PM city-wide cheers of appreciation for health care workers on change of shift. But we get in so early in the unit and leave so late, I can't say I've ever noticed. On my way back to my car, my mind circles back to my family. I call my father every night. He lived through the Nigerian-Biafran Civil War of the late 1960s, which through famine and warfare claimed hundreds of thousands of lives in his region of the country. And in the 1980s, he immigrated to the United States during another period of economic destabilization and political unrest. He has been especially horrified about what has been happening both back home and around the world. "I've never seen anything like this," he frequently punctuates our conversations, "never anything like this." And although I know he has seen suffering and has witnessed atrocities in his life, the fear and unsteadiness in his voice makes me believe him.

It is difficult to think about the future right now, and there is never really much time for introspection. But at some point, I imagine, things will slow down, all of these COVID ICUs will dismantle, and I will be back to exclusively managing patients with cerebrovascular disease. But the pandemic will undoubtably define my fellowship experience here in New York City and shape my perspective as a physician moving forward. Several months ago, I and over 130 other entering stroke fellows began our journey into cerebrovascular medicine, excited about its changing landscape and the opportunity to be a part of efforts to move the field forward. We have spent the months since learning the clinical nuances of acute stroke care while transitioning into our role as leaders of highly specialized, highly coordinated stroke care teams. But in the last several months, as case numbers began to rise throughout the country, many of us have been recruited to help care for the swelling number of patients succumbing to COVID. We were chosen because of our skillset and our comfort with managing the critically ill. But as trainees in vascular neurology—a fluid field with still so much unknown—we are equally comfortable thinking abstractly and managing ambiguity. We are used to not having the luxury of absolutes and know how to work in the gray. We learn to be intellectually dexterous, keeping our ear to ground and our eye on the literature, and learn how to handle major shifts in our understanding. And it is this part of our training that makes us uniquely qualified and uniquely capable of dealing with the uncertainty of this emerging public health crisis.

In working and learning alongside pulmonologists, intensivists, and infectious disease experts for the last several months, the COVID ICU reinforced old skills, expanded my knowledge of critical care medicine, and raised my capacity to work in crisis—none of which I think

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is wasted in a vascular neurologist. What has been made clear with the advent of COVID-19, however, is that regardless of our background or our specialty, any one of us could be called into action again. With the understanding that not everyone can work on the frontlines, the nature of our profession (not just as vascular neurologists but as physicians) assumes a responsibility and a willingness to continue to care and to serve wherever we are needed. As we have seen during this pandemic, strokes will continue to occur, and it will be important for stroke experts to remain available and make sure our patients continue to present and receive appropriate and timely care. But as has happened at my hospital and in hospitals throughout the city, in the event of the next pandemic, or natural disaster, or man-made catastrophe, we might all also need to be ready to adapt and assume new responsibilities should the needs of the people in our community shift so seismically once again.

ARTICLE INFORMATION

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