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Primer for intensive care unit (ICU) redeployment of the noncritical care surgeon: Insights from the epicenter of the coronavirus disease 2019 (COVID-19) pandemic

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Introduction

On April 6, 2020, our 7-person team of nonintensivists was redeployed to run a coronavirus disease 2019 (COVID-19) intensive care unit (ICU).

ICU capacity surged from 48 to 180 beds. Inpatient admissions and emergency department visits soared. To meet the demands of the pandemic, health care workers from most specialties needed to assume roles far beyond their typical scope of practice. Our team, consisting of 2 surgical oncologists, 2 pediatric surgeons, 1 pediatrician, a general surgeon, and a colorectal surgeon, was approached about ICU redeployment at Long Island Jewish Medical Center (LIJMC) in Queens, New York. Some of us had not set foot in an ICU in several years. Others had not taken care of an adult patient in decades. Despite some discomfort and uncertainty, we all shared a strong commitment and sense of moral obligation to contribute whatever we could. The purpose of this paper is to share our observations and delineate some strategies that made our 4-week redeployment successful.

Preparation for redeployment

On April 1, our group was notified that ICU redeployment was imminent. As with any activity, preparation is the backbone for success.

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Observe morning rounds

In preparation, we participated in morning rounds with both medical and surgical run COVID ICUs. This “training” provided insights into treatment strategies, as well as how to lead and motivate an ICU team.

Be thoughtful about structure

Several models for redeployment were considered. We agreed that it would be most effective to deploy as a single team to assume complete responsibility for 1 unit, the surgical intensive care unit (SICU). Under normal circumstances, the SICU at LIJMC is a 13-bed unit with individual rooms and glass sliding doors. It was the second designated COVID unit in the hospital and was renamed “COVID-2.” By the time we took over, many of the patients had already been intubated for a prolonged period, and although all patients were critically ill, many were relatively stable. A surgical resident and a surgical advanced care provider were assigned to the unit at all times. These providers already had 2 to 3 weeks of experience in COVID-19 management and were excellent resources.

Guided individual study

The health system provided institutional and Society of Critical Care Medicine guidelines¹ and resources for treatment of acute respiratory distress syndrome² and COVID-19. We studied as much as possible. Several Microsoft Teams groups were created to share

information and updated treatment guidelines. Regularly scheduled calls and chat boards within Microsoft Teams (Microsoft, Redmond, WA) allowed rapid sharing of information and best practices across the system.

Set up for success

On April 6th, we assumed 24-hour, 7 day per week coverage of the unit. All 13 beds were occupied by ventilated COVID-19 patients. In addition to thoughtful preparation, several factors contributed to a successful redeployment.

Adequate physician staffing

To ensure adequate moral and intellectual support, 2 attendings were scheduled for daytime coverage and 1 for overnight. The initial proposal was to follow the typical SICU model and have a single attending round and cover during the day and another at night. Two-physician staffing for rounds and during the day allowed for a much higher and more detailed level of care.

Critical care backup

There are 5 board-certified surgical intensivists at LIJMC. They were redeployed to cover a 30-bed COVID unit in what was once the surgical post-anesthesia care unit and a 13-bed non-COVID unit for traditional SICU patients. Despite their high workload in other units, they remained available to address any questions. It was beneficial that these were colleagues with whom most of us had worked in the past, so it was easy to communicate informally.

Stick to the basics

Institutional guidelines were provided for COVID-19 ICU management, including mechanical ventilation, fluid management, and sedation. As the institutional experience grew, additional guidelines for thromboprophylaxis, tracheostomy, and clinical trial enrollment were developed. Treatment guidelines for COVID-19 continued to evolve with respect to steroids, hydroxychloroquine, azithromycin, antiviral therapy, IL-1/IL-6 inhibitors, and convalescent plasma. These guidelines are critical and were followed closely. Similar guidelines existed for inpatient and emergency department care. Redeployment is not the time to deviate from standard recommendations.

Utilize the resources around you to maximize efficiency

We used dry erase markers to post ventilator settings, PaO₂:FiO₂ ratios, plateau pressures, drips, and critical lab values on the doors. A team of pediatric neurosurgeons volunteered to attend rounds and provide daily updates to patients' families.

Engage multidisciplinary team

ICU redeployment forces the physician to gain experience managing new problems well beyond their typical scope of practice. For example, the 3 pediatric physicians in our group had not managed atrial fibrillation since medical school. A low threshold for formal or "curbside" consultation with cardiology, nephrology, infectious disease, and neurology specialists is necessary.

Personal safety and personal protective equipment

We were fortunate to always have sufficient personal protective equipment. This is mandatory for success. Our uniform included

scrubs and surgical cap, an N95 mask under a typical surgical mask, and a face shield or goggles. Gown and gloves were donned when entering a patient's room and changed between patients. Fortunately, we all remained healthy throughout the pandemic.

Teaching

It is important not to lose sight of the importance of teaching, especially in the academic setting. Residents are also working outside of their comfort zone,³ and time should be made for teaching.

Celebrate success

At the height of the pandemic, the hospital started playing the Beatles song "Here Comes the Sun" overhead every time a patient was extubated. This served as a reminder for everyone in the hospital to celebrate success in real time and helped offset what would otherwise be relentless heartbreak and tragedy.

Offsetting challenges

Stretched nursing ratios

Nursing ratios were stretched significantly to 1:3 and sometimes 1:4. Respiratory therapists were also stretched to cover multiple units. This required that the physician and advanced care provider team to assist in new ways. Also, a dedicated prone team was extremely effective.

Limited resources

We always had enough ventilators and dialysis machines but were forced to use unfamiliar models. There were at least 6 different ventilator models used in our unit, each with subtle idiosyncrasies. Medication shortages required us to address sedation regimens accordingly.

Obligations to specialty practice

Nonemergency surgeries were cancelled,⁴ but the needs of our specialty practices persisted.⁵ This required careful communication with outpatients and office staff to ensure that we continued to provide a high level of care to outpatients. Days off allowed us to catch up on our professional and family obligations outside of the ICU.

The patients

The patients are what we will remember most from this time. Now that our redeployment has ended, we continue to follow their progress. The patients for whom we cared range in age from 23 to 83 years old. We cared for several patients from our medical community, including the mother of a surgical medical assistant, the wife of a surgeon, the father of a surgeon, and the brother of an anesthesiologist. This created unique challenges and required that we reassure medical colleagues that we had sufficient knowledge, skill, and dedication to care for their loved one. Preliminary reports from our hospital have not found any worse outcomes associated with treatment in a nonintensivist-staffed unit. The worst part of the pandemic has been the isolation of patients from their families. No amount of technology can replace the comfort of a loved one's presence during illness and death.

The surgeons

This experience highlighted the privilege of providing surgical solutions to patients. We dedicated our lives to the practice of surgery, and within a short period of time, this was taken away. Redeployment was emotionally draining and rejuvenating at the same time. We are proud of the care we provided. The decision to participate in redeployment is complex.^{6,7} Hopefully, our experience provides some insight on what to expect and how to succeed.

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Conflict of interest/Disclosure

None.

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