

How the COVID Crisis Changed Our Lives in the ICU

O’Neil Green, Department of Medicine, Division of Pulmonary and Critical Care
Medicine - UMass Chan Medical School of Medicine/Baystate Health

Mohammad Abu-Hishmeh, Department of Medicine, Division of Pulmonary and
Critical Care Medicine - UMass Chan Medical School of Medicine/Baystate Health

Thomas L. Higgins, Department of Medicine, Division of Pulmonary and Critical
Care Medicine - UMass Chan Medical School of Medicine/Baystate Health

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Abstract

COVID-19 has changed the face of medicine and forced us to the limits of our adaptive capacity. There are some positive aspects of this pandemic but the negative impact on patients and caregivers must be recognized. We remain hopeful that the lessons learned will sustain us for years to come.

Background

The COVID-19 pandemic has become the defining illness of this generation of physicians. Physicians in mid to late career faced the HIV/AIDS epidemic.¹ However, the clinical trajectory of that disease even in untreated patients typically spanned months, except for patients who had severe *Pneumocystis carinii* pneumonia. Since then, critical care physicians have contended with SARS, H1N1 swine flu, chikungunya, Ebola and zika.² This current pandemic bears closest resemblance to the so-called Spanish flu pandemic of 1918 -1919 in it’s

unparalleled devastation to the social and economic fabric, the challenges it poses to the medical infrastructure, and its toll on healthcare workers. ³ The Spanish flu is estimated to have infected 500 million people and killed 50 million of which 675,000 occurred in the United States.⁴ As of 2/8/2022, global COVID-19 cases stand at 396.6 million with deaths approaching 6 million, of which 895,389 deaths occurred in the United States. This is stunning considering the advances in biomedical technology over the last 104 years.

Interventions

Our institution, as a contributor to ARDSNet (acute respiratory distress syndrome network), was already familiar with prone positioning, but rarely more than one or two patients at a time. With the increased numbers of patients with COVID-19 related ARDS, we became far more comfortable with proning patients; often more than half of the patients in the dedicated COVID-19 unit. The nursing team developed a ‘proning packet’ which included skin protective devices, leads for monitors and emollients needed. Obesity, identified quite early as a risk factor for severe COVID-19 pneumonia, posed a technical challenge to proning. Some centres had a BMI cut-off of 35, but we did not explicitly set a cut-off and left the decision to the treating physician given insufficient data to support this target, and we felt it would unnecessarily exclude patients who might benefit. ^{5,6,7}

ICU (intensive care unit) capacity more than tripled during the first wave and during subsequent waves has more than doubled. We therefore had to rapidly develop new ICU processes, streamline others, and deploy them to new areas. Firstly, we expanded the MICU service to the cardiovascular, neurocritical care, and surgical ICUs. We then had to incorporate the post anaesthesia care units including 30 beds in the adjacent surgical day care centre. Happily, we did not have to conform general floor spaces to intensive care units, although two intermediate care units were used to cohort patients requiring COVID care short of intubation and mechanical ventilation. Increased personnel requirements required the assistance of anaesthetists, cardiologists, surgical intensive care colleagues and hospitalists as well as multiple advanced practice providers. The critical care division met daily to discuss the burgeoning data on the disease, develop and fine-tune protocols and give feedback to leadership and hospital administration regarding weaknesses in processes and how to combat those. These discussions helped formulate rational strategies for management until guidelines began to emerge.⁸ Meetings also provide an outlet for discussing the moral distress, anguish and burnout that providers were experiencing. The ICU had to more frequently triage patients to stepdown units in order to preserve critical care beds, and expanded the intensivists’ role to round and provide ongoing support to the hospitalists serving as attending physicians on these critical patients. We

rounded twice daily in the step-down units in the first wave, and daily on subsequent waves once treatment algorithms were established. This helped to identify early patients who would need intubation and avert respiratory crises. Avdeev et al reported that patients with high minute ventilation and low baseline PaO₂/FiO₂ ratio were more likely to fail NIV when used to treat ARDS and early intubation reduced the incidence of peri-intubation complications.⁹ The experience of the COVID-19 pandemic has crystallized this decision point for us.

Particularly in the first wave, it became apparent that the COVID-19 patients were not only at higher severity-adjusted mortality risk, but also demonstrated lung physiology and sedation needs different than with pre-pandemic ARDS. ¹⁰ In concert with others, we felt that some patients had higher compliance than is typically seen and that many patients had quite high sedation requirements. Many of these patients who were difficult to sedate were younger with single organ disease. We iteratively adopted the following approaches: reducing inappropriate early intubations with cautious use of non-invasive ventilation (NIV), monitoring of patients on NIV and utilizing the consensus to decide when to initiate intubation, adopting steroids, remdesivir, baricitinib and tocilizumab while abandoning hydroxychloroquine and routine use of azithromycin and managing patients using the validated ARDSnet protocol. Our utilization of veno-venous ECMO (extracorporeal membrane oxygenation) has increased from 4-5 annually to an average of 18 patients annually over the first 2 years of the pandemic, and our providers have become more facile with this technology.

There is a lag between the peak of the ICU census and the rest of the system due to the prolonged time on ventilator and the higher numbers of non-COVID related illness due to delayed care. Like most other institutions, we struggled with the balance of pulling staff from other areas and the reduction or cessation of ambulatory care services in order to continue to care for the critically ill patients who have a prolonged time on the ventilator. The sustained workload in the ICU has not always been offset by pandemic level staffing and our critical care team has disproportionately felt the strain of caring for these patients. To accommodate staffing needs in the ICU, fellow elective rotations were cancelled, the outpatient pulmonary clinic was closed, and elective procedures were postponed. High census has affected the pace of rounds, the ability to teach our trainees, and contributes to their burnout, as well as that among attendings. One change that was keenly felt by attendings and trainees was the reduction and often prolonged cessation of in-person meetings.

A few of our fellows and attendings became ill with COVID-19 and for the rest of us, this heightened our sense of anxiety working with patients. For attending physicians, it was heartening to see the dedication displayed by our trainees, and we often remarked on the altruism and selflessness displayed. As the institution responded to the surges by employing more travelling nurses and respiratory therapists, the group dynamic was altered. This challenged

us to improve communication skills and setting clear expectations. While it has been fun to work with nurses and therapists from other facilities, it takes time to develop trust to the same degree that we have with our long-term colleagues. Many intensivists tend to be unobtrusive but we were suddenly under the spotlight and became the most in-demand physicians within our institutions and nationwide.

Our interactions with patients and families have been affected by the pandemic. There is the well documented sense of isolation that patients and families feel during this period. We have attempted to breach that gap by utilizing technology such as mobile videocams to allow families to interact with the patients and with us, personalizing patients by having families bring us pictures and a board with details about the patient that they wish us to know such as occupation, hobbies, pet names and what music to play in their room. Despite that, both providers and relatives miss the in-person discussions and the ability of relatives to have prolonged interaction with patients. The frequent adjustments in visitor policies as the various waves crested and receded have been particularly difficult for families. For the team, it meant having extended remote conversations describing aspects of the clinical status that would be far more easily described if one was present at bedside. During times when visitation was limited to pre-terminal patients, there was often a jarring change in family impressions and willingness to discuss end-of-life issues when they could finally see in person just how sick their loved one had become.

Conclusions

Space limitations do not permit discussion of other important issues, such as less bedside teaching with physical examination due to infection control requirements or increased payroll attending costs that were not offset with billing for daily care. Procedures, particularly intubation, line and chest tube placement, were markedly more common, and have resulted in greater experience for our ICU fellows. There is some preliminary evidence that severity-adjusted outcomes deteriorate for non-COVID ICU patients during pandemic surges in COVID-19 admissions¹¹. In the past few weeks, patient volume has decreased markedly, but remains above pre-pandemic levels, largely as the result of neglected routine medical care and an increase in diabetic ulcers, decompensated heart failure, renal and hepatic failure and especially alcohol and drug overdoses. We remain optimistic that “this too shall pass” and that in time this pandemic will be seen as building character and capability among all members of our ICU team: nurses, respiratory therapists, patient care technicians, residents, fellows and attending physicians.

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