


Primary and Specialist-Level Palliative Care during the spring 2020 COVID-19 Surge: A Single-Center Experience in the Bronx

American Journal of Hospice & Palliative Medicine®
2022, Vol. 39(5) 598–602
© The Author(s) 2021
Article reuse guidelines:
sagepub.com/journals-permissions
DOI: 10.1177/10499091211034416
journals.sagepub.com/home/ajh


Kaleena Zhang, BA¹, Marc Shi, MD², Tia Powell, MD³,
and Elizabeth Chuang, MD, MPH⁴ 

Abstract

Introduction: The COVID-19 pandemic surge necessitated a rapid increase in provision of goals of care communication for patients with respiratory failure and high risk of death. We aimed to describe the outcomes and incidence of code status changes for mechanically ventilated patients in an acute care hospital after deploying strategies to enhance primary palliative care, including provision of goals of care communication scripts to front-line physicians. **Methods:** This is a retrospective cohort study including all patients admitted with COVID-19 disease and requiring mechanical ventilation during a 2-week period in March and April of 2020. **Results:** Of the 440 total patients, 327 (74.3%) died. 162 patients received a documented attempt at cardiopulmonary resuscitation (CPR) and only 4 (2.5%) of them survived. No patient above the age of 64 survived a CPR attempt. On admission, 404 patients (92.8%) were Full Code. 165 patients (37.5%) had a code status change. Almost half of the patients ($n = 219$) had a palliative care consult. Patients with a palliative care consult were more likely to have a code status change (56.6% v. 18.6%, $\chi^2 = 68.0$, $p < 0.01$). **Discussion:** Mechanically ventilated patients had a high mortality, and CPR did not result in survival to discharge in patients over 65. Palliative care specialists are needed to guide goals of care discussions during the COVID-19 pandemic, as there are numerous barriers to equipping primary care teams to lead such discussions. The COVID-19 pandemic has underscored the vital role of palliative care in disaster response.

Keywords

Sars-CoV-2, COVID-19, disaster preparedness, palliative care, communication, code status, cardiopulmonary resuscitation.

Introduction

The emergence of COVID-19 in New York City drove hospitals to reconsider their usual protocols to adapt to abruptly growing demand. COVID-19 placed pressure on hospital supply, caused swift increases in patient volume, and prompted staff to exercise extreme caution in order to keep patients and staff safe. These surge conditions and infection precautions, along with the unpredictability of any individual COVID-19 hospital course, challenged existing workflows pertaining to code status in dying patients.

Governor Andrew Cuomo issued an Executive Order on March 23 to scale-up hospital capacity, expanding clinical workforce and granting clinical staff immunity from civil liability provided that there was no gross negligence (NYS Executive Order 202.10 2020). However, there remained gray areas regarding managing triage and resuscitation.

New York State law requires provision of life-sustaining treatment unless authorized otherwise (Family Health Care Decisions Act, 2010, Public Health Law Ch. 29-CC). However, at the height of the COVID-19 pandemic there was discussion over whether or not Cardiopulmonary Resuscitation (CPR) is

life-sustaining. CPR is a high-resource procedure that places demand on Intensive Care Unit (ICU) capacity and ventilator supply while also risking further spread of infection through aerosolization.¹ Weighed against these risks are the benefits of CPR, particularly the possibility of successful resuscitation in patients with COVID-19 and multiorgan failure where oxygenation is impossible despite optimal mechanical ventilation.² An ethical argument can be made that CPR should not be offered under circumstances where it cannot achieve *any* goal; however, narrow interpretation of local laws may preclude

¹ Albert Einstein College of Medicine, Bronx, NY, USA

² Department of Medicine, Montefiore Medical Center, Bronx, NY, USA

³ Montefiore-Einstein Center for Bioethics, Bronx, NY, USA

⁴ Department of Family and Social Medicine, Albert Einstein College of Medicine, Bronx, NY, USA

Corresponding Author:

Elizabeth Chuang, MD, MPH, Department of Family and Social Medicine, Albert Einstein College of Medicine, 3347 Steuben Avenue, 2nd Floor, Bronx, NY 10467, USA.

Email: echuang@montefiore.org

clinicians withholding arguably futile CPR, relegating this framework to theory rather than practice. Of note, NYC hospitals during the pandemic peak varied markedly in whether they interpreted local laws to permit withholding CPR in cases deemed futile.³

Even under the existing legal framework, targeted advanced care planning became one means to incorporate these risk-benefit discussions into patient care. However, advising patients and their families is challenging when there is insufficient data on outcomes in our population, as was the case during the initial surge of the pandemic. Data available at that time included a study of 136 Wuhan COVID-19 patients with cardiac arrest, return of spontaneous circulation was achieved in 18 (13.2%) patients that had undergone CPR, and of those only 4 (2.9%) survived past day 30.⁴ However, outcomes specifically for ventilated patients were not reported separately, and the Wuhan data have limited generalizability due to our different population demographics and underlying comorbidities.

Another barrier to providing code status discussions is the limitation of existing palliative care staff. Initially at our institution, the palliative care interdisciplinary team was deployed to the emergency room to provide early consultation among high-risk COVID-19 patients. Despite these efforts, staffing shortages prevented specialized palliative care staff from meeting the demand for goals of care discussions. Given the unpredictable decline seen with many COVID-19 patients that necessitated urgent code status discussions, some of the responsibility falls on primary teams.⁵ Our palliative care department widely deployed communication scripts to front-line clinicians via email and in shared online COVID-19 guidelines. The scripts used the informed assent model to recommend against attempts at CPR in high-risk patients who were already receiving mechanical ventilation. The informed assent model, which involves assessing the patient's values, summarizing the role of CPR, and presenting a definitive statement on why CPR is not aligned with the patient's stated goals of care,^{6,7} was deemed appropriate for use in COVID-19 when utility of CPR is unclear because it shifts the psychological burden of responsibility to decide from patient/family to the clinician.

The following study has 2 primary goals. First, it examines the survival rates of COVID-19 patients in an urban academic medical center who sustained cardiac arrest while on mechanical ventilation. These data can serve to guide goals of care discussions, specifically regarding code status changes, because a more objective estimate of prognosis will substantiate recommendations against non-beneficial care to patients and their families. Second, we will explore the effect of having primary teams take the lead in goals of care discussions as another option to arranging a formal palliative care consultation.

Methods

The study was conducted at 3 large acute care hospitals in a single academic medical center located in an urban, low-

income setting in the Bronx, NY. The institutional review board of the Montefiore Medical Center/Albert Einstein College of Medicine approved the study protocol (IRB #2020-11324). The study is a retrospective chart review examining outcomes of patients with COVID-19 infection confirmed with PCR testing or with clinical syndrome consistent with COVID-19 without other explanatory diagnosis on mechanical ventilation due to respiratory failure.

Study Population

The study population consisted of adult patients who were mechanically ventilated for COVID-19 infection. Patients were identified from a database of all patients admitted during the 2-week period from 3/29/2020 to 4/12/2020 with an order of mechanical ventilation in the chart. Patients were excluded if they were not suspected of having COVID-19.

Study Design

The electronic health record was screened and patients meeting the inclusion criteria underwent detailed review. Chart review was performed by 3 independent reviewers, and the data collected were cross-verified upon completion. Two researchers both reviewed a subset of 10% of the charts to ensure consistent coding.

Data Collection

The following demographic markers were extracted from the electronic health record: patient medical record number, age, gender, race/ethnicity, insurance, comorbidities, smoking history, and whether patient was a known health care worker. Outcomes included complications during hospitalization, hospital length of stay, and duration of mechanical ventilation. Code status on admission, code status changes during the hospital course, and date of any completed palliative care consults were recorded. The data collection protocol and data collectors remained consistent throughout the study to preserve accuracy of data abstraction.

Statistical Analysis

We used descriptive statistics to compare groups including percent survival between age groups, proportion of patients receiving palliative care consultation, mean duration of mechanical ventilation, proportion of patients receiving palliative care and percent surviving after a CPR attempt for each age group. The chi-squared test of association was used to assess the relationship between palliative care consultation and code status change.

Results

A total of 440 patients met inclusion criteria during the study period. The average age was 65.5 years, 41% were female, and 77% had 2 or more comorbid conditions (Table 1). Most

Table 1. Patient Characteristics (N = 440).

Demographic information	No. (%)
Age, mean (SD)	65.5 (14.2)
Gender	
Female	179 (40.7)
Male	261 (59.3)
Race/Ethnicity	
Asian	21 (4.8)
Black/African American	153 (34.8)
White	32 (7.3)
Hispanic	162 (36.8)
Other/Unknown/Missing	72 (16.4)
Insurance*	
Commercial	126 (28.6)
Medicare	226 (51.4)
Medicaid	251 (57.1)
Self Pay	2 (0.5)
Health care worker	44 (13.6)
Comorbidities	
Cancer	51 (11.6)
Cardiovascular disease	
Hypertension	318 (72.3)
Hyperlipidemia	193 (43.9)
Peripheral vascular disease	29 (6.6)
Coronary artery disease	73 (16.6)
Congestive heart failure	43 (9.8)
Chronic respiratory disease	
Asthma	61 (13.9)
Chronic obstructive pulmonary disease	50 (11.4)
Obstructive sleep apnea	31 (7.1)
Kidney disease	
Chronic kidney disease	101 (23.0)
End-stage renal disease	31 (7.1)
Liver disease	15 (3.4)
Metabolic disease	
Diabetes Mellitus	230 (52.9)
Obesity (BMI > 30)	183 (41.9)
Comorbidities, mean (SD)	3.1 (2.0)
≥2 comorbidities	338 (76.8)
Smoking history	
Current smoker	17 (4.0)
Former smoker	119 (28.1)

*Percentages sum to greater than 100% because some individuals had multiple forms of insurance.

patients experienced acute kidney injury (81%) and many (20%) experienced a thromboembolic event (Table 2). Mortality was 74.3% (327 patients). Of the 113 survivors, 9 (8.0%) remained ventilation-dependent on discharge. Of the 162 patients who received a documented attempt at cardiopulmonary resuscitation, only 4 (2.5%) survived. One remained ventilator-dependent on discharge. No patient above the age of 64 survived a cardiopulmonary resuscitation attempt.

On admission, 404 patients (92.8%) elected Full Code status, 14 (3.2%) elected DNR and DNI status, 21 (4.8%) elected DNR but not DNI and 1 (0.2%) elected DNI but not DNR. During the hospital stay, 165 patients (37.5%) had a code status

Table 2. Clinical Characteristics and Outcomes (N = 440).

Clinical measures on triage	No. (%)
SpO ₂ , mean (SD)	85.2 (13.6)
SpO ₂ < 90	233 (53.0)
Temperature, mean (SD)	99.3 (4.6)
Complications during hospitalization	129 (29.3)
Acute kidney injury*	355 (80.7)
Renal replacement therapy	125 (28.4)
Acute hepatic injury**	43 (9.8)
Thromboembolic event	87 (19.8)
Hypotension requiring Vasopressors	360 (82.8)
Hospital length of stay in days, median (IQR)	13 (5, 24)
Duration of mechanical ventilation in days, median, IQR)	7 (2, 15)
Palliative Care	219 (49.8)
Code Status Change	
Palliative Care	124 (56.6)
No Palliative Care	41 (18.6)
Received CPR	162 (36.8)
Survived to discharge after CPR	4 (2.5)

*Acute kidney injury was defined as an increase in serum creatinine by ≥0.3 mg/dL (≥26.5 mol/L) within 48 hours or an increase in serum creatinine to ≥1.5 times baseline.

**Acute hepatic injury was defined as an elevation in aspartate aminotransferase or alanine aminotransferase of >15 times the upper limit of normal.

change, and 35 (8.0%) had multiple code status changes. On discharge or at the time of death, 278 patients (63.2%) remained Full Code, 76 (17.3%) had elected DNR and DNI and 86 (19.6%) had elected DNR but not DNI. Almost half of the patients (n = 219) had a palliative care consult during admission. Patients with a palliative care consult had a higher mortality (81% v. 68%, $\chi^2 = 9.7$, $p < 0.01$) and were more likely to have a code status change (56.6% v. 18.6%, $\chi^2 = 68.0$, $p < 0.01$). Patients with a palliative care consultation had a longer average duration of mechanical ventilation (14.9 days v. 8.3 days, $p < 0.01$). Average time from admission to palliative care consultation was 9 days (SD = 12). The average time to first code status change was 10.3 days (SD 11.9). Outcomes by age group are shown in Table 3.

Discussion

This study had 2 primary aims: 1) to identify outcomes of CPR in mechanically ventilated patients in an adult population in the Bronx and 2) to explore the role of primary team compared to specialized palliative care services in complex goals of care and code status discussions. Provision of CPR for adults over the age of 64 with respiratory failure due to COVID-19 did not result in survival to discharge. The overall survival rate of patients with cardiac arrest in the setting of COVID-related respiratory failure was 2.5% across all age groups, consistent with a Wuhan study that reported a 2.9% survival past day 30 in patients that had undergone CPR.⁴ In contrast with that study, our study included only mechanically ventilated patients. Mechanical ventilation more likely necessitates a code status discussion because it signals severe disease; the intubated state

Table 3. Outcomes by Age Group (N = 440).

Age group	Died, no. (%)	Palliative care among deceased, no. (%)	Length of mechanical ventilation among deceased, mean (SD)	Survived, no. (%)	Palliative care among survivors, no. (%)	Length of mechanical ventilation among survivors, mean (SD)
<40	15 (60.0)	8 (53.3)	13.1 (3.4)	10 (40.0)	4 (40.0)	21 (3.6)
40-49	20 (57.1)	7 (35.0)	7.0 (1.4)	15 (42.9)	5 (33.3)	18.8 (5.8)
50-64	101 (66.9)	39 (38.6)	10.8 (1.1)	50 (33.1)	12 (24.0)	16.5 (2.1)
65-74	85 (74.6)	54 (63.5)	9.1 (1.1)	29 (25.4)	14 (48.3)	25.0 (4.5)
75-84	80 (92.0)	52 (65.0)	6.1 (0.9)	7 (8.1)	5 (71.4)	30.6 (4.6)
>84	26 (92.9)	17 (65.4)	4.7 (1.0)	2 (7.1)	2 (100.0)	9.5 (3.5)

also does not allow for patients to make individual health decisions. Furthermore, having survival statistics for the racially and economically underrepresented population in the Bronx may allow for more accurate prognostication⁸ in the context of goals-of-care discussion in such communities.

In our study we also examined the impact of primary medical teams leading goals of care discussions during COVID as an alternative to a formal palliative care consult. The retrospective nature of the study precludes us from identifying which interventions played a causative role in patient code status changes, however some preliminary conclusions and avenues for further study are raised. Our study revealed that patients with a palliative care consult were more likely to have a code status change than those without, even in a setting where standardized communication scripts were provided to primary teams. This suggests that palliative care may guide complex decision-making in ways other fields cannot match via practiced expertise in communication and counseling skills.⁹ This outcome could be explained by the limitation of using a script as a medium without more involved communication training. A qualitative study by Aaronson et al surveyed front-line opinions on having embedded palliative care providers in the ED during COVID. Survey respondents noted that the time constraints usually faced by ED providers were only amplified during COVID; they appreciated that palliative care specialists could afford longer, higher-quality discussions that more fully elicited patient and family goals.¹⁰ The style of questioning promoted by a script, exacerbated by overwhelming patient volume in disaster circumstances, risks removing the sensitivity essential in approaching end-of-life matters. In addition to time, palliative care encompasses allied care workers that provide spiritual, psychological, and bereavement support.¹¹ A script cannot replicate the value of having an interdisciplinary team to address the emotionally difficult aspects of a patient's illness. Of note, it is unclear from our study the degree of uptake of our scripts. Increased provider uptake and comfort with communication scripts may reduce the gap between the care provided by specialty palliative care teams and primary teams. Future iterations can include measures of uptake and use to address this question.

In addition, only about half of study patients had a palliative care consult, and the average time to consult was on day 9 of the hospital stay. These data point to an underutilization of palliative care even in patients with severe disease, despite the

observed benefit of early palliative care involvement. In addition to staffing shortages or the diversion of resources away from specialty care⁹ one reason for this underutilization may be an unclear algorithm for triaging cases that would benefit from a consult. Developing a palliative care screening tool for COVID-19 is an area for further study.

Limitations

Our study timeframe was during the initial peak of the COVID-19 pandemic, which decreases the relevance of our survival data to our patients in present time. The high mortality in the earlier days can be partly explained by inexperience with treatment and severe resource strain. Mortality has decreased across the country and at our institution as better treatment protocols have emerged. Our population of higher risk patients with multiple comorbidities also precludes the generalizability to other states that may eventually or are currently experiencing surges of similar caliber. In addition, we were only able to track outcomes of CPR attempts that were documented. At the time of the surge, documentation requirements were waived, and documentation of CPR was not always complete.

Regarding the role of palliative care involvement in goals of care discussions, the retrospective nature of the study prevents us from drawing causative conclusions about the impact of specialized palliative care management. Patients who received a palliative care consult may have differed systematically from those who did not. Furthermore, as discussed this study did not allow us to quantify whether the communication scripts were followed in practice. As such, we are unable to make definitive conclusions about the role of the scripts compared to formal palliative care consultation. Future work can involve surveying front-line clinicians on their knowledge of the scripts and experiences with their use.

Conclusions/Future Directions

We found that specialized palliative care services play a necessary, but underutilized role in public health disaster responses associated with high mortality such as COVID-19. To address underutilization, next steps include clarifying a triage protocol for palliative care involvement in COVID-19, perhaps adapting existing tools that are designed for patients with chronic life-limiting illness.¹² A screening tool may be especially useful given COVID-19's acute presentation and potential to cause

rapid, unpredictable deterioration. The tool can be narrowly focused, accounting for factors such as comorbidity status and social functioning, or as recommended by Haydar et al., all patients with severe COVID-19 could by default receive a palliative care consult at triage.⁹ Simultaneously, we can invest in strengthening primary team capacity for foundational goals of care conversations. Tools that have been successful at other institutions include a web application, communications skills videos, a 24/7 palliative care nurse hotline,¹³ and quick-reference materials in the form of pocket cards.¹⁴ Future disaster preparedness planning must include more involved training of front-line staff on goals of care communication as well as more robust capacity to deploy palliative care teams to the front lines.

Declaration of Conflicting Interests

The authors declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

Funding

The authors disclosed receipt of the following financial support for the research, authorship, and/or publication of this article: The authors received financial support from National Center for Advancing Translational Sciences.

ORCID iD

Elizabeth Chuang  <https://orcid.org/0000-0002-2505-8159>

References

1. Kramer DB, Lo B, Dickert NW. CPR in the Covid-19 era—an ethical framework. *New Engl J Med.* 2020;383(2):e6.
2. Powell T, Chuang E. COVID in NYC: what we could do better. *Am J Bioeth.* 2020;20(7):62-66.
3. Powell T. Personal communication. 2021.
4. Shao F, Xu S, Ma X, et al. In-hospital cardiac arrest outcomes among patients with COVID-19 pneumonia in Wuhan, China. *Resuscitation.* 2020;151:18-23.
5. Fausto J, Hirano L, Lam D, et al. Creating a palliative care inpatient response plan for COVID-19—The UW medicine experience. *J Pain Symptom Manage.* 2020;60(1): e21-e26.
6. Curtis JR. The use of informed assent in withholding cardiopulmonary resuscitation in the ICU. *Virtual Mentor.* 2012;14(7): 545-550.
7. Curtis JR, Kross EK, Stapleton RD. The importance of addressing advance care planning and decisions about do-not-resuscitate orders during novel coronavirus 2019 (COVID-19). *JAMA.* 2020;323(18):1771-1772.
8. Newport KB, Malhotra S, Widera E. Prognostication and proactive planning in COVID-19. *J Pain Symptom Manage.* 2020; 60(2):e52-e55.
9. Haydar A, Lo KB, Goyal A, et al. Palliative care utilization among patients with covid-19 in an underserved population: a single-center retrospective study. *J Pain Symptom Manage.* 2020;60(2):e18-e21.
10. Aaronson EL, Petrillo L, Stoltenberg M, et al. The experience of emergency department providers with embedded palliative care during COVID. *J Pain Symptom Manage.* 2020;60(5):e35-e43.
11. Costantini M, Sleeman KE, Peruselli C, Higginson IJ. Response and role of palliative care during the COVID-19 pandemic: a national telephone survey of hospices in Italy. *Palliat Med.* 2020;34(7):889-895.
12. George N, Phillips E, Zaurova M, Song C, Lamba S, Grudzen C. Palliative care screening and assessment in the emergency department: a systematic review. *J Pain Symptom Manage.* 2016;51(1): 108-119.e2.
13. de Lima Thomas J, Leiter RE, Abraham JL, et al. Development of a palliative care toolkit for the COVID-19 pandemic. *J Pain Symptom Manage.* 2020;60(2):e22-e25.
14. Bowman BA, Back AL, Esch AE, Marshall N. Crisis symptom management and patient communication protocols are important tools for all clinicians responding to COVID-19. *J Pain Symptom Manage.* 2020;60(2):e98-e100.