

Sixty-Day Outcomes Among Patients Hospitalized With COVID-19

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Background: Although characteristics and in-hospital outcomes for persons with coronavirus disease 2019 (COVID-19) have been well described, less is known about the longer-term outcomes of hospitalized patients.

Objective: To describe 60-day postdischarge clinical, financial, and mental health outcomes of patients with COVID-19.

Methods: This observational cohort study looked at patients hospitalized with COVID-19 (discharged between 16 March and 1 July 2020) at 38 hospitals participating in the MI-COVID19 initiative. The aim of MI-COVID19, a Michigan statewide collaboration sponsored by Blue Cross Blue Shield of Michigan (BCBSM) and Blue Care Network, is to improve care for patients hospitalized with COVID-19. Trained quality abstractors (often registered nurses) collect data from patient medical records using structured templates. For hospitals unable to abstract all COVID-19 hospitalizations, a sample is selected for inclusion by using a pseudo-randomization procedure (minute of hospital discharge).

At 60 days after discharge, abstractors review the medical record to collect data on clinical events, including readmission (to the index hospital or any hospital viewable in the medical record) and postdischarge death. In addition, for all patients alive and not residing in a health care or correctional facility, abstractors contact patients by telephone to complete a survey about primary care follow-up, ongoing cardiopulmonary symptoms, return to normal activity, financial impact, and emotional and mental health outcomes. At least 3 attempts are made to contact patients. The study was deemed “not regulated” by the University of Michigan institutional review board (HUM 00179611).

Findings: Of 1648 patients with COVID-19 admitted to 38 hospitals, 398 (24.2%) died during hospitalization and 1250 (75.8%) survived. Of 1250 patients discharged alive, 975 (78.0%) went home whereas 158 (12.6%) were discharged to a skilled nursing or rehabilitation facility (Table 1). By 60 days after discharge, an additional 84 patients (6.7% of hospital survivors and 10.4% of intensive care unit [ICU]-treated hospital survivors) had died, bringing the overall mortality rate for the cohort to 29.2%, and 63.5% for the 405 patients who received treatment in an ICU. Within 60 days of discharge, 189 patients (15.1% of hospital survivors) were rehospitalized.

Table 1. Demographic and Clinical Characteristics of 1250 Survivors of COVID-19 Hospitalization

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Characteristics	Value*
Patient characteristics	
Median age (IQR), y	62 (50–72)
Male	648 (51.8)
Race	
Black	645 (51.6)
White	466 (37.3)
Other/unknown	139 (11.1)
Ethnicity	
Hispanic	55 (4.4)
Non-Hispanic	1079 (86.7)
Unknown	116 (9.3)
Residence before hospitalization	
Home	1034 (82.8)

Congregated living facility†	190 (15.2)
Subacute rehabilitation facility	8 (0.6)
Other/unknown	18 (0.4)
Chronic conditions	
Hypertension	800 (64.0)
Diabetes	436 (34.9)
Cardiovascular disease	301 (24.1)
Moderate/severe kidney disease	287 (23.0)
Asthma	168 (13.4)
Congestive heart failure/cardiomyopathy	145 (11.6)
Chronic obstructive pulmonary disease	130 (10.4)
Cerebrovascular disease/paraplegia	130 (10.4)
Dementia	96 (7.7)
Cancer‡	89 (7.1)
No chronic conditions	179 (14.3)
Hospitalization characteristics	
Treated in an ICU	165 (13.2)
Treated with invasive mechanical ventilation	75 (5.9)
Treated with supplemental oxygen	865 (69.2)
Median length of hospitalization (IQR), d	5 (3–8)
Discharged to a health care facility	158 (12.6)

COVID-19 = coronavirus disease 2019; ICU = intensive care unit; IQR = interquartile range.

* Values are numbers (percentages) of patients unless otherwise indicated.

† Includes assisted living, group home, and skilled nursing facilities; homeless shelters; correctional facilities; community living facilities; and inpatient psychiatric facilities.

‡ Includes leukemia, lymphoma, hematologic cancer, and any cancer.

Of patients alive 60 days after discharge, 488 (41.8%) were successfully contacted and completed the 60-day postdischarge telephone survey. Of these, 265 reported seeing a primary care physician within 2 weeks (Table 2). Most follow-up visits (304 of 382) occurred virtually by videoconference (161 of 382) or telephone (143 of 382), whereas 77 occurred in person and 1 was of unknown format.

Table 2. 60-Day Outcomes Among 1250 Survivors of COVID-19 Hospitalization, 488 of Whom Completed the Telephone Survey

Outcome	Value*
Mortality and rehospitalization	
Died in the 60 d after discharge, n (% of hospital survivors)	84 (6.7)
Rehospitalized, n (% of hospital survivors)	189 (15.1)
Primary care follow-up	
Any follow-up primary care visit in the 60 d after discharge	382
Established PCP	352
New PCP	30
Visit type	
Clinic	77
Telephone	143
Videoconference	161
Days from discharge to visit	
<15	205
15–30	74
>30	37
Home health services	98
New/worsened symptoms	
Persistent symptoms related to illness†	159
New or worsening symptoms related to illness	92
Continued loss of taste and/or smell	64
Cough	75
Shortness of breath/chest tightness/wheezing	82
Difficulty ambulating due to chest problems	44
Breathlessness walking up stairs	112
Oxygen use	32
New use of CPAP or other breathing machine when asleep	34
Return to normal activity	
Unable to return to normal activity	188
New or worsening difficulty completing activities of daily living‡	58
Return to employment	
Employed full- or part-time before COVID-19 hospitalization	195
Able to return to work by 60 d after discharge	117
Median days from discharge to work return (IQR)	27 (13–42)
Reduced hours and/or modified duties upon return to work due to health	30
Unable to return to work	78
Because of health	45

Because of job loss	23
Emotional impact	
Emotionally affected at least mildly by health conditions	238
Emotionally affected at least moderately by health conditions	124
Health care use related to mental health	28
Financial loss/impact	
Financially affected at least mildly by health conditions	179
Financially affected at least moderately by health conditions	124
Specific financial effects	
Used up all or most of savings	47
Unable to pay for necessities, such as food, heat, and housing	29
Contacted by a collection agency	17
Skipped or delayed getting medical care because of cost	35
Took less medication than was prescribed because of cost	33

COVID-19 = coronavirus disease 2019; CPAP = continuous positive airway pressure; IQR = interquartile range; PCP = primary care physician.

* Values are numbers of patients unless otherwise indicated.

† Include cough, shortness of breath, chest tightness, wheezing, difficulty getting around the house due to chest trouble, breathlessness walking up stairs, oxygen use, and CPAP or other breathing machine use when asleep.

‡ Include dressing, eating, bathing, toileting, transferring in/out of bed, and walking across a room.

Cardiopulmonary symptoms (such as cough and dyspnea) were reported by 159 patients, including 92 with new or worsening symptoms and 65 with persistent loss of taste or smell. Fifty-eight patients reported new or worsening difficulty completing activities of daily living. Among 195 patients who were employed before hospitalization, 117 had returned to work whereas 78 could not because of ongoing health issues or job loss. Of the 117 patients who returned to work, 30 reported reduced hours or modified duties due to health reasons.

Nearly half of all patients (238 of 488) reported being emotionally affected by their health, and 28 sought care for mental health after discharge. Moreover, 179 patients reported at least a mild financial impact from their hospitalization, with 47 reporting use of most or all of their savings and 35 rationing food, heat, housing, or medications due to cost.

Discussion: In this multihospital cohort of patients hospitalized with COVID-19 in Michigan, nearly 1 in 3 patients died during hospitalization or within 60 days of discharge. For most patients who survived, ongoing morbidity, including the inability to return to normal activities, physical and emotional symptoms, and financial loss, was common (1). These data confirm that the

toll of COVID-19 extends well beyond hospitalization, a finding consistent with long-term sequelae from sepsis (2) and other severe respiratory viral illnesses (3). Although most patients saw a primary care provider after discharge, 1 in 5 had no primary care follow-up visit within 60 days of discharge. Collectively, these findings suggest that better models to support COVID-19 survivors are necessary (4).

Our study has limitations. Although postdischarge chart review was completed for all patients, telephone contact occurred in fewer than half. Loss to follow-up may be nonrandom; thus, the proportion of patients who had adverse outcomes may be biased. We therefore report numbers of events, which should be interpreted as the minimum known number of patients with a given outcome. Despite these limitations, our study conveys that adverse events after COVID-19 hospitalization are common. Policies and clinical and research programs targeting these aspects are needed.

This article was published at Annals.org on 11 November 2020

Comments

1 Comment

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Steve Caritas, Professor Emeritus of Maternal Fetal Medicine, Magee-Women's Hospital, University of School of Medicine • University of Pittsburgh School of Medicine • 16 November 2020

Pennsylvania licensed physician

My comment is quite short. After reviewing all charts and grafts for treatment: There is absolutely no documentation of all the various OUTPATIENT treatments available prior to hospitalization that may well have precluded becoming an inpatient. I find this totally unacceptable.

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