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Adapting a Hospital-at-Home Care Model to Respond to New York City's COVID-19 Crisis

The COVID-19 pandemic has strained hospital capacity and increased the risk of nosocomial infection worldwide. Surging demand for providers' time and shortages of personal protective equipment (PPE) threaten care quality and safety.[1] Yet decades before COVID-19, the hospital-at-home (HaH) model, which brings inpatient-level care to the patient's home emerged to tackle such challenges. Research demonstrates HaH exceeds usual hospital outcomes while improving the patient experience.[2,3] Our own HaH program has treated approximately 1,000 patients since 2014 and is no exception.[4,5]

As hospital care becomes precarious or even unavailable, COVID-19 brings new urgency to the HaH mandate and highlights how this care model is uniquely positioned to respond to the pandemic. We describe our experience adapting HaH care from March 19 to April 18, during the peak of the COVID-19 pandemic, at two hospitals in New York City.

METHODS

To relieve bed shortages from COVID-19, we augmented our HaH program, in which patients select home inpatient care instead of the hospital, with the Completing Hospitalization at Home (CHaH) model. CHaH permits patients already admitted to the hospital, and with ongoing hospital-level care needs, to complete their inpatient care at home. We developed CHaH in 2 weeks, collaborating with health system leadership, its legal team, a private home care partner, and the hospital pharmacy. Our team worked with inpatient clinicians and case managers to identify hospitalized patients with ongoing inpatient needs (such as intravenous medication) but not needing procedures or imaging unavailable at home (eg, computed tomography scans). Our hospitals billed insurers for a standard inpatient stay as per the admission's Diagnosis Related Group (DRG) and reimbursed the CHaH program a portion of that DRG payment, using the state's emergency regulations to facilitate inclusion of all insurances.

Following pilot testing in patients without confirmed COVID-19, we expanded the program to include patients with COVID-19 infection, either as their primary diagnosis or an incidental condition. Initially, we required patients with COVID-19 to be aged 65 and younger, afebrile for 48 hours or longer, and 8 days or longer since symptom onset, with improving inflammatory serologies. To prevent disease transmission, we excluded immunocompromised patients and those requiring extensive assistance with activities of daily living. However, 2 weeks after accepting COVID-19 patients, we waived these age and functional status criteria to expand care to older adults and/or those with increased care needs. We made this decision due to the higher risk of hospitalization-associated complications such as delirium and falls in this vulnerable population, and in response to the demographics of referrals to our service. Patients received twice daily in-person visits from nurses and daily telehealth visits from nurse practitioners or physicians.

RESULTS

We admitted 24 patients in total; 12 were COVID positive. Among persons without COVID, the most common diagnosis was pneumonia. The mean length of stay (excluding the hospital) was 3.1 days, representing 75 potentially averted hospital days overall. Further details of the patients' attributes and outcomes appear in Table 1.

Three patients did not complete CHaH care at home. The first, a 60-year-old man, developed acute fever and hypoxia on CHaH day 5, subsequently tested positive for COVID-19 at the hospital, and died from respiratory failure. The second, an 81-year-old woman with confirmed COVID-19, developed new hypoxia once home and returned to the hospital, but she was subsequently readmitted to CHaH care with oxygen support. The third, a 62-year-old man who tested negative for COVID-19, declined all care after arriving home and was discharged from CHaH against our advice, but he did not return to the hospital.

DISCUSSION

Our experience suggests that the CHaH model can viably care for inpatients both with and without COVID-19 in

Table 1 Clinical Characteristics of Patients Admitted to the CHaH Program

Total N	24 patients
Mean age (SD)	60.8 y (16.5)
Sex (%)	10 female (42%); 14 male (58%)
Mean CHaH length of stay (SD)	3.1 days (1.3)
Admitted for COVID-19 disease specifically (%)	12 (50)
Escalation of care (%)	2 (8.3)

Abbreviations: CHaH, Completing Hospitalization at Home; SD, standard deviation.

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one of the highest-prevalence regions of the world. Our care escalation rates were low.

Our new care model increased HaH enrollment substantially, by rapidly leveraging a previously unavailable financial model to increase insurance participation. Our clinicians more easily admitted patients to CHaH after several days of inpatient care, when diagnostic and interventional procedures were complete, than from an emergency department, where a patient's diagnosis and therapy plan may remain uncertain. Logistical barriers hampered our admission capacity. In particular, nurses and supplemental oxygen were not always immediately available, delaying or precluding some home admissions. However, an anticipated shortage in PPE for nurses did not occur.

The CHaH model discharged numerous patients from inpatient beds over a short span almost immediately after inception during the peak of New York City's COVID-19 crisis. To support an urgent effort to open hospital beds, we used emergency regulations to lift prior payor restrictions, thereby bringing home hospitalization to many previously inaccessible inpatients. The CHaH model could thereby ameliorate future bed surges from COVID-19, in lieu of field hospitals that were often underutilized.[6] Concurrently, positive developments in COVID-19 care, including improved PPE access and population immunity, may mitigate current capacity barriers.

Formal evaluation of the CHaH program outcomes, cost, and satisfaction remains. But our adaptation of an existing care model to respond to the COVID-19 crisis may also have a permanent place in the care of vulnerable older patients through expanded access to safer high-quality inpatient-level care-not only during care surges but as a standard for care at all times.

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