

OBSERVATIONS: BRIEF RESEARCH REPORTS

Medicalized Hotel as an Alternative to Hospital Care for Management of Noncritical COVID-19

Background: Since the first wave of COVID-19, alternatives to conventional hospitalization have been proposed for the provision of different levels of care, ranging from shelter during quarantine to hospital-level medical care (1, 2).

Objective: To describe the adaptation of a hotel by a hospital-at-home team to provide hospital-level care to patients with COVID-19 during the first wave of the pandemic in Barcelona, Spain.

Methods: Hospital Clínic de Barcelona (HCB) is a 750-bed, public, tertiary teaching hospital serving 560 000 persons in the metropolitan area of Barcelona, Spain. In March 2020, the hospital-at-home unit was instructed to medicalize a hotel ("health hotel" [HH]) in downtown Barcelona. The aim of this initiative was to help decongest hospitals in the area by admitting patients with low dependency (Barthel Index score >60) and mild to severe COVID-19 from emergency departments or COVID-19 hospital wards, according to Centers for Disease Control and Prevention clinical guidelines (3).

Catalonia Plaza Hotel, a 500-bed, 4-star hotel 2 km away from HCB, was transformed into a medicalized hotel and opened for patient care from 25 March to 25 May 2020. Staff from different HCB departments were recruited and distributed into 2 medical teams for every 4 floors. Thus, 8 medical teams were formed, each with 10 to 14 patients in their care. Day teams comprised 1 attending physician, 2 additional physicians, and 2 to 4 medical doctors who had recently graduated. Day teams worked from 9:00 a.m. to 5:00 p.m., and 2 doctors were on duty from 5:00 p.m. to 9:00 a.m. Nurse teams worked 8-hour shifts and consisted of 2 nurses and 1 nurse aide per 24 patients. In addition, pharmacy, physical rehabilitation, and social work teams were set up on site during weekdays. A dedicated coordination team that included experts in logistics, infrastructure, nursing, and clinical coordination was also created. Because family visits were not allowed for safety reasons, daily telephone calls after medical rounds were made by medical staff to keep families informed.

Every health care worker was trained in COVID-19 management and personal protective measures, including personal protective equipment, before deployment. To prevent contamination, "dirty" and "clean" circuits were established. The clean circuit included entrance and exit of staff, medical supplies, catering, and cleaning. The dirty circuit focused on entrance and exit of patients, clothing and catering for patients, disposable medical equipment, and transition chambers for donning and doffing personal protective equipment. According to HCB protocol, every frontline health care worker caring for patients with COVID-19 was screened weekly for SARS-CoV-2 infection by polymerase chain reaction testing (4). The institutional review board of HCB evaluated and approved the study protocol (HCB.2020.0443).

Findings: During the study, a total of 2410 patients with COVID-19 were admitted to HCB, of whom 516 (21.4%) were transferred to the HH (Figure and Table). A total of 304 patients (58.9%) were transferred from hospital wards, whereas 196 (38%) were admitted directly from the emergency department. The cumulative median length of stay (HCB + HH) was 15 days (interquartile range, 10 to 21 days); the median stay at the HH was 9 days (interquartile range, 6 to 13 days). A total of 28

Table. Patient Characteristics and Outcomes

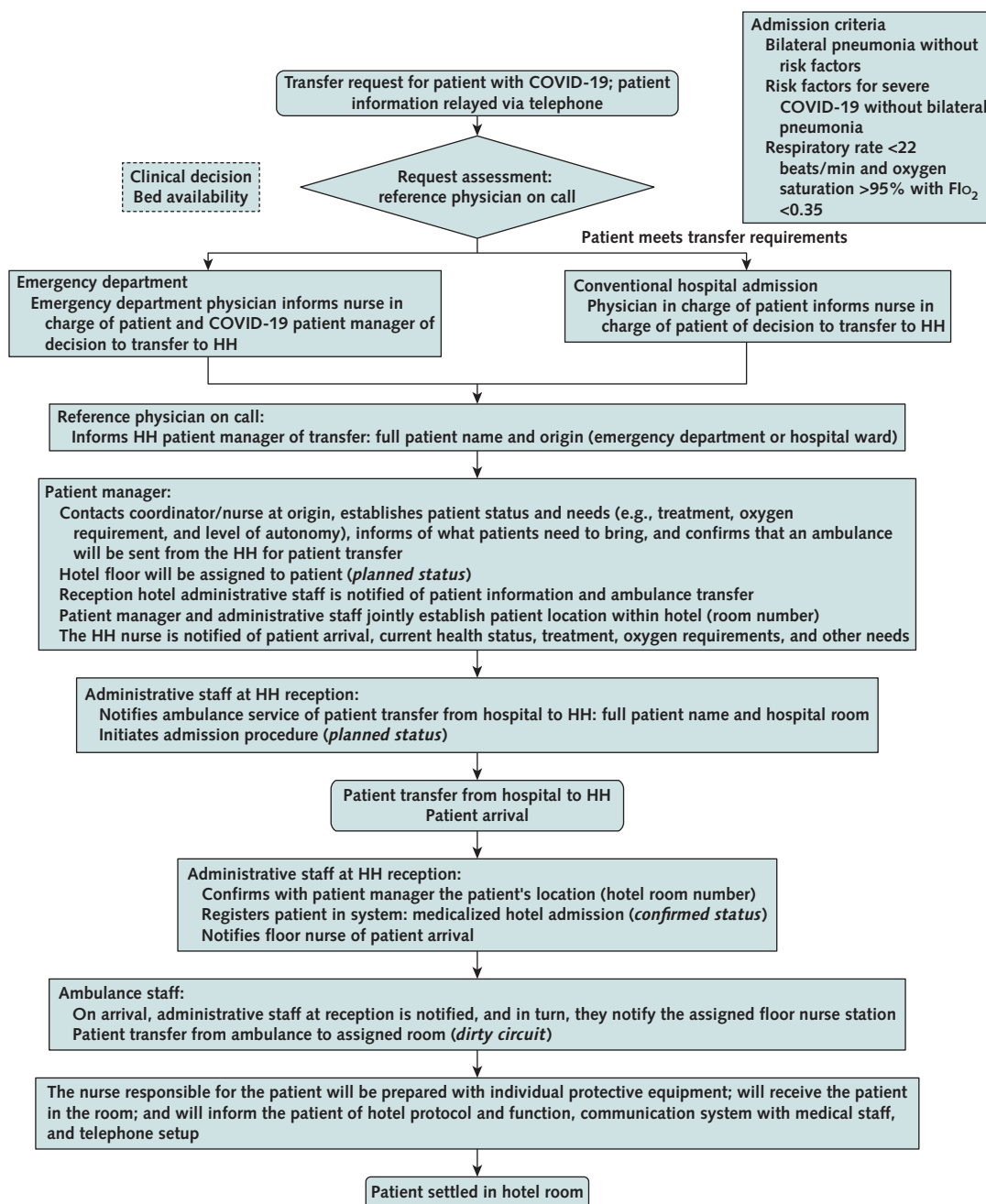
Characteristic	Value
Baseline characteristics	
Median age (IQR), y	57.5 (45-70)
Female, n (%)	273 (52.9)
Active smoker, n (%)	45 (8.7)
Diabetes mellitus, n (%)	59 (11.4)
Hypertension, n (%)	163 (31.6)
Chronic lung disease, n (%)	58 (11.2)
Ischemic heart disease, n (%)	35 (6.8)
Chronic kidney disease, n (%)	26 (5)
Cancer, n (%)	50 (9.7)
Department of referral, n (%)	
Emergency department	196 (38)
Hospital ward early discharge	304 (58.9)
Other	15 (2.9)
Critical care before health hotel admission, n (%)	
Admission to intensive care unit	53 (10.3)
Invasive mechanical ventilation	12 (2.3)
Noninvasive mechanical ventilation	39 (7.6)
Initial complementary tests	
Bilateral pneumonia on chest radiograph, n (%)	378 (73.2)
Blood test, n (%)	510 (98.8)
Median C-reactive protein level (IQR), mg/L	49.6 (22-99)
Median lymphocyte count (IQR), $\times 10^9$ cells/L	1000 (700-1400)
Median lactate dehydrogenase level (IQR), μ kat/L	4.61 (3.8-5.7)
Median D-dimer level (IQR), nmol/L	1250 (750-2250)
Median ferritin level (IQR), μ g/L	444 (220-1006)
Median aspartate aminotransferase level (IQR), U/L	33.53 (23.95-50.90)
Median γ -glutamyltransferase level (IQR), μ kat/L	0.85 (0.4-1.34)
Treatment, n (%)	
Continuation of hospital treatment	394 (79.7)
Initiated in health hotel	78 (15.1)
Lopinavir/ritonavir	416 (80.6)
Hydroxychloroquine	480 (98.1)
Azithromycin	473 (91.7)
Remdesivir	26 (5)
Tocilizumab	131 (25.4)
Corticosteroids	99 (19.2)
Antibiotics (other than azithromycin)	182 (35.3)
Main outcomes	
Median total length of stay (IQR), d	15 (10-21)
Median length of stay in health hotel (IQR), d	9 (6-13)
Hospital readmission, n (%)	28 (5.4)
Death, n (%)	2 (0.4)*
Oxygen requirement at discharge, n (%)	12 (2.3)

IQR = interquartile range.

* Both deaths occurred after transfer back to hospital.

patients (5.4%) required transfer back to the hospital because of clinical deterioration or other medical complications. Two patients died after transfer back to HCB.

Discussion: Our findings suggest that medicalized hotels are a safe alternative to conventional hospitals for the care of patients with noncritical COVID-19. In addition to shelter for patients requiring isolation, these venues can provide care for those with low dependency and moderate to severe COVID-19 who require monitoring and treatment. In effect, this approach reduces pressure on hospitals and allows them to focus on patients who are more complex and critically ill.

Figure. Flowchart of patient admission in the HH.

HH = health hotel.

Although the use of civil buildings as settings for quarantine is not new (5), to our knowledge, this is the first report of a medicalized hotel for hospital-level care. One advantage of using a hotel over field hospitals is that the primary infrastructure (that is, rooms, beds, and bathrooms) is in place. Given the absence of tourists and availability of facilities during the pandemic, such initiatives are also welcomed by economic authorities and the tourism sector.

Our findings provide preliminary guidance to support clinical and logistic decision making about adaptation of hotels and

admission criteria to select appropriate patients. Further studies are warranted to validate these results.

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† For members of the Hospital Clínic 4H Team (Hospital at Home-Health Hotel), see the Appendix (available at [Annals.org](https://annals.org)).

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