

## OBSERVATION: BRIEF RESEARCH REPORT

## Acute Hospital Care at Home in the United States: The Early National Experience

**Background:** Hospitalization is the standard of care for acute illness, but hospital care is often expensive, unsafe, and uncomfortable (1). Acute hospital care at home (AHCaH) provides hospital-level care in patients' homes as a substitute for brick-and-mortar care. Prior research has shown that compared with traditional inpatient hospital care, patients cared for in AHCaH have improved experiences and physical activity levels, with lower rates of mortality, readmission, and discharge to skilled-nursing facilities (2, 3). However, there are few data describing the experience of AHCaH at the national level. In November 2020, the Centers for Medicare & Medicaid Services issued the AHCaH waiver, creating a regulatory and payment pathway for hospitals to deliver AHCaH, with more than 300 hospitals in 37 states approved (4, 5).

**Objective:** To report on the early national experience of the AHCaH waiver.

**Methods:** Effective 1 July 2022, the National Uniform Billing Committee established occurrence span code 82 to identify patients who received AHCaH. We used 100% Medicare fee-for-service Part A claims reflecting care delivered between 1 July 2022 and 30 June 2023 to identify all patients with an inpatient admission for a medical diagnosis that included span code 82. We report their sociodemographic (directly from claims and extrapolated from 5-digit ZIP codes) and clinical characteristics and clinical outcomes. To estimate patient complexity, we calculated the hierarchical condition category (HCC) score with a 1-year lookback. To estimate acuity, we calculated case-mix index by summing the diagnosis-related group weights and dividing by the number of patients. We report mortality and escalation (returning to the hospital for  $\geq 1$  midnight) during hospitalization and skilled-nursing facility use, mortality, and readmission 30 days after discharge. We stratified these outcomes by disabled, dual-eligible, and Black or Latin@ patients. Because many programs were initially launched to serve patients with COVID-19, we initially stratified analyses by COVID-19 as the primary diagnosis. We did not find substantial differences and so describe findings for all patients. This study was approved by the Centers for Medicare and Medicaid Services Privacy Board and the Harvard Medical School Institutional Review Committee. Analyses were performed in SAS, version 7.15 (SAS Institute).

**Findings:** We identified 5132 patients with a medical diagnosis who received AHCaH, representing 5551 admissions (out of 5858 total patients and 6345 total admissions). Fifty-four percent were female, 85.2% were White, 41.7% were aged 80 years or older, 13.8% were dual-eligible, 18.1% had a disability, and 1.7% lived in a rural area (Table 1). Mean household income was \$83 932. Patients receiving AHCaH were medically complex: The mean HCC score was 3.15 (SD, 2.06), 42.5% had heart failure, 43.3% had chronic obstructive pulmonary disease, 22.1% had cancer, and 16.1% had

**Table 1.** Characteristics of Patients Who Received Acute Hospital Care at Home ( $n = 5132$ )

Characteristic	Value
<b>Sex, n (%)</b>	
Male	2364 (46.1)
Female	2768 (53.9)
<b>Age, n (%)</b>	
18–64 y	391 (7.6)
65–74 y	1577 (30.7)
75–84 y	1959 (38.3)
$\geq 85$ y	1205 (23.5)
<b>Race and ethnicity, n (%)</b>	
White	4371 (85.2)
Black	346 (6.7)
Latin@	219 (4.3)
Asian	77 (1.5)
Other/unknown	119 (2.3)
<b>Mean household income (SD), \$</b>	83 932 (28 241)
<b>Geography, by RUCA code, n (%)</b>	
Metropolitan	4807 (93.8)
Microropolitan	235 (4.6)
Small town/rural/not coded	89 (1.7)
<b>Reason for Medicare eligibility, n (%)</b>	
Old age	4136 (80.6)
Disability	930 (18.1)
End-stage renal disease	45 (0.9)
Disability and end-stage renal disease	21 (0.4)
Dual eligibility	705 (13.8)
<b>Census region, n (%)</b>	
Northeast	1610 (31.4)
Midwest	747 (14.6)
South	2439 (47.5)
West	335 (6.5)
<b>Mean HCC score (SD)*</b>	3.15 (2.06)
<b>Mean case-mix index (SD)†</b>	1.31 (0.49)
<b>Comorbidities, n (%)</b>	
Heart failure	2175 (42.5)
Chronic obstructive pulmonary disease	2219 (43.3)
Asthma	1306 (25.5)
Diabetes	2375 (46.4)
Cancer	1132 (22.1)
Stroke/transient ischemic attack	977 (19.1)
Dementia	822 (16.1)
COVID-19 diagnosis (primary)	564 (11.0)

HCC = hierarchical condition category; RUCA = rural-urban commuting area.

\* Score used by the Centers for Medicare & Medicaid Services as part of a risk adjustment model that identifies persons with serious conditions and allows Medicare to project the future annual cost of care. A score of 1.0 indicates average complexity and spending. Higher scores indicate greater complexity.

† Calculated by summing the Medicare Severity-Diagnosis Related Group weight for each discharge and dividing the total by the number of discharges. This index reflects the diversity, complexity, and resource needs of hospitalized patients. A higher index represents greater complexity and resource needs.

dementia. The 5 most common discharge diagnoses were heart failure, respiratory infection (including COVID-19), sepsis, kidney or urinary tract infection, and cellulitis (data not shown). The mean case-mix index was 1.31 (SD, 0.49). The mean length of stay was

**Table 2.** Acute Hospital Care at Home Outcomes Stratified by Disadvantaged Characteristics

Outcome	Overall	Disability	Dual Eligibility	Black or Latin@
Discharges, <i>n</i>	5551	1063	796	609
Mortality during admission, %	0.5	0.3	0.1	0.2
Mortality 30 d after discharge, %	3.2	2.1	1.9	1.5
Skilled-nursing facility use 30 d after discharge, %	2.6	2.4	2.1	2.1
Readmission 30 d after discharge, %	15.6	18.3	18.8	18.4

6.3 days (SD, 4.7). During hospitalization, the escalation rate was 6.2% and the mortality rate was 0.5%. At 30 days after discharge, the mortality rate was 3.2%, the rate of skilled-nursing facility use was 2.6%, and the readmission rate was 15.6%. These outcomes were similar in stratified analyses (Table 2).

**Discussion:** Early national experience in providing AHCaH shows that a diverse group of medically complex patients received care with low rates of mortality (0.5% during hospitalization and 3.2% at 30 days), escalation (6.2%), skilled-nursing facility use (2.6%), and readmission (15.6%). Among the patients receiving AHCaH were those with dual eligibility, a disability, or dementia, with similar outcomes for socially vulnerable patients.

Our study has limitations. First, the results are generalizable only to AHCaH within traditional Medicare. Second, we identified patients by using a new span code, which may not identify all AHCaH patients. To verify the code's validity, we estimated monthly volume using publicly available data (which suggested <3% missingness) and analyzed our own hospital-level data. Third, we lacked a comparator. Finally, this analysis did not distinguish patients who were directly admitted to AHCaH from an emergency department versus those who were transferred to AHCaH after initial treatment in a brick-and-mortar hospital.

The current AHCaH waiver will expire in December 2024. Our data provide preliminary evidence on national uptake and suggest that AHCaH is an important care model to manage acute illness, including among socially vulnerable and medically complex patients. These data should help inform ongoing policy deliberations.

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**Note:** Dr. Levine and Mr. Souza had full access to all of the data and take responsibility for the integrity of the data and the accuracy of the data analyses.

**Disclosures:** Disclosures can be viewed at [www.acponline.org/authors/icmje/ConflictOfInterestForms.do?msNum=M23-2264](http://www.acponline.org/authors/icmje/ConflictOfInterestForms.do?msNum=M23-2264).

**Reproducible Research Statement:** *Study protocol:* Not available. *Statistical code:* Available from Dr. Levine (e-mail, [dmlevine@bwh.harvard.edu](mailto:dmlevine@bwh.harvard.edu)). *Data set:* Available with an approved data use agreement from the Research Data Assistance Center (<https://resdac.org>).

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