


# Virtual Hospitalization at Home After the Covid-19 Pandemic: Time to Consider Our Future Community Healthcare Options

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## Abstract

The concept of acute hospitalization at home has been described for over 3 decades. Its scope, however, was largely limited to small experimental trials and pilot studies. The Covid-19 pandemic changed these circumstances. The convergence of the critical need for acute hospital beds along with the growing sophistication and comfort in virtual monitoring facilitated the rapid deployment of hospitalization at home throughout many communities in the United States. Now in the waning times of the pandemic, community health leaders and health systems are questioning what the future role of home virtual hospitalization might be. Might this concept be relegated to only future times of critical bed shortage, or might it be part of a true change in community healthcare delivery.

## Keywords

hospital at home, virtual hospitalization at home, new models of community healthcare, aging in place, value-based care

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## Introduction

The notion of acute hospital care at home is not new; its concept has been widely described by Leff and others dating back more than 30 years.<sup>1</sup> Theoretically, providing Hospital at Home (HaH) was envisioned as patient-centered, cost-effective, and with potentially better outcomes. But early pilot attempts lacked the depth and sophistication to become broadly adopted. Without current virtual monitoring methods, physician services and home testing options, HaH was often perceived by providers and patients alike as inferior. And regardless of the potential benefits in quality of care, outcome or cost savings, there were few reimbursement models available.

## Acute Hospitalization at Home During the Covid-19 Pandemic

In 2020, the concept of HaH became instantly pertinent when the Covid-19 pandemic roared through New York. As Bruce Leff, MD, a pioneer in the hospital at home concept was quoted, “crises have a way of making things happen.”<sup>2</sup> Not only were hospital beds severely limited, but the ability

to monitor patients’ physiological parameters were in short supply.<sup>3</sup> Covid provided the motivation and urgency for hospitals to rapidly consider implementation of virtual home hospitalization for the care of acutely ill patients.

Many hospital systems quickly developed HaH offerings for patients with Covid-19 and other conditions.<sup>2,4,5</sup> For the most part, 2 types of HaH became quickly prominent: Admission Avoidance and Early Supported Discharge. Commercial entities, such as Vilify, Contessa, and Medically Home partnered with health systems to develop remote care command centers and promote rapid implementation of virtual home hospitalization.<sup>6,7</sup> Many health systems were able to rapidly create a “virtual floor” staffed by hospitalists, consulting specialists, advanced practice providers, registered nurses, pharmacists, social workers, and supported by visiting in-home nursing and paramedical services.<sup>5</sup>

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During Covid-19, other new offerings of virtual care also blossomed for both medical and post-op surgical conditions, tele-neurology, mental health, hospice, and home dialysis.<sup>6</sup> Among many elderly patients at high risk for pandemic-related complications, the offering of acute hospital type care in their own home represented a preferable alternative that had not been previously available. Perhaps as important, a change in the culture of care rapidly occurred. The sudden transition to virtual ambulatory visits created a paradigm shift for doctors and patients alike—that virtual care was convenient and possible.<sup>6</sup>

Many hospital systems had success with deploying a range of unique solutions.<sup>8</sup> For example, 2 published studies describe how unhoused patients were matched with suddenly vacant hotel rooms to allow the provision of acute hospital services in these now “medicalized hotels.”<sup>9,10</sup> Despite the rapid evolution of virtual HaH, this pandemic ultimately opened the door to virtual options and technologies that could address care delivery in ways that traditional inpatient acute care might not.

While a current uniform definition does not exist, HaH is generally perceived to represent the delivery of acute hospital type care in the patient’s home, with real-time 24/7 virtual oversight by healthcare staff through audio, video, and physiologic monitoring.<sup>11</sup> In addition, hospitalists, specialists, and primary care providers round virtually with the patient, with documentation ideally contained within the hospital system’s electronic medical record. Methods to deliver appropriate medication, infusions, oxygen, DME, physical, and occupational therapy and nutrition can be arranged to support the patient’s home hospital stay.<sup>4,7</sup> In the command center, nurses and others follow the patient’s status in real-time. Bi-directional audio/visual connections to the command center make nursing and physician rounds not dissimilar from the brick and mortar model.

In addition, there is the need for unscheduled medical home response, evaluation, and treatment on a 24/7 basis. Companies such as Dispatch Health arose to meet this need in a cost-effective way that would be difficult for each healthcare system to build themselves.<sup>12</sup> A team, including an APP and EMT drives to the patient’s home as needed for more urgent evaluations and treatment. In the absence of this type of medical capacity, the reliance upon a 911 response is more likely, and the chance of the HaH patient ending up in a non-system health facility is higher.<sup>13</sup>

Depending upon the subset of HaH patients studied, results include better clinical outcomes, higher quality metrics of care, fewer iatrogenic complications, higher patient and family satisfaction, and greater cost savings.<sup>13,14</sup> In addition, trials have reported HaH care to be associated with lower utilization of healthcare resources, lower readmission rates, and higher rates of return to functional/physical activity status.<sup>15-17</sup> The majority of patients under HaH perceive a timely recovery.<sup>18,19</sup> Additionally, HaH patients

did not perceive a continuity gap unlike many patients who transition from the inpatient hospital setting to home.<sup>20</sup>

Many hospital systems offering HaH during Covid-19 have garnered other benefits. Home visits by hospital branded vehicles have been noticed by the communities in which they participate. This has allowed hospital systems to extend their perceived healthcare footprint.<sup>21</sup> In many areas, competing hospital systems not offering HaH services have expressed fear that they might be deemed irrelevant to a potentially important trend in healthcare.<sup>22</sup>

As the bed capacity pressures of the viral pandemic wane, those in community health are asking themselves the next question: What is the future of HaH? Will this be a relic of our recent very unusual times? Or will it be a limited offering for focused populations of patients and/or brand expansion, or a generalizable future health care delivery alternative to include more diverse community patient populations?

## The Possible Future Role of Acute Home Hospitalization in Community Health

### *HAH as a Very Limited Future Offering*

Some are pessimistic about HaH’s continued growth and development. Perhaps the greatest impediment will be the lack of a sustainable financial reimbursement model. The lack of continuing critical bed access will not support further justification for special waivers or guarantees of reimbursement. Currently, there is no sustainable reimbursement model by CMS for traditional Medicare patients. In the absence of future sustainable and viable payment models, the justification for continued spending on HaH infrastructure will not exist. Even if a persistent reimbursement model is created, at what pricing level? Healthcare systems have hoped to realize a financial margin through providing HaH services at a lower total cost of care.<sup>23,24</sup> Payers, however, may demand a blended inpatient care rate, whether provided in the traditional or home settings. Payers might ask the question, “Why should we pay hospitals more to take care of particular conditions in the inpatient hospital setting, when they have proven they can do it cheaper and with similar outcomes in the HaH setting?”

As important, hospitals will be unlikely to endorse the use of HaH when they have excess bed capacity. It may not make financial sense to send patients to HaH when they could be covering the fixed costs of the existing traditional hospital setting. In the absence of financial margin, the drive to create greater scale may be lessened. And in the absence of scale, the justification for additional capital and infrastructure development may not be sufficient.<sup>23,24</sup> Under this scenario, HaH could be relegated to future pandemics or other narrow circumstances producing significant surge needs.

### *Possible Focused Community Health Offering*

It is possible that HaH might fill focused community health care needs of the future. Many hospitals that strategically depend upon highly specialized service lines often are constrained by bed access. HaH allows for possible reduction of basic medical and surgical bed utilization to create capacity for these strategic and margin-producing hospital admissions and procedures. In hospital systems in which inpatient demand is routinely already at capacity, HaH may provide an alternative to very costly new hospital capital spending. Under this scenario, however, the risk of exacerbating health inequities exists when the primary rationale of deploying patients into HaH, is to achieve other hospital fiscal or strategic rewards.

Additionally, healthcare systems nationally are struggling to meet the increased needs and costs associated with an aging demographic. As the population continues to age, HaH may provide a desirable option. Research has shown that seniors overwhelmingly wish to receive care at home whenever possible.<sup>25,26</sup> Many companies are developing multi-tiered systems which predict impending change in clinical status, long before other traditional means might be possible.<sup>6,27</sup> These types of innovations will continue to advance the concept of “aging in place with virtual patient care.”<sup>26</sup>

The true financial benefit of HaH may be a change in the perspective of senior care.<sup>15</sup> For Medicare-aged patients, HaH could lessen the possibility of futile end of life care through easier transitions from inpatient hospital care to virtual home hospitalization, palliative care, and potentially hospice. This would be especially true if palliative HaH and hospice HaH were reimbursable options under Medicare.<sup>28</sup> And ultimately, the HaH model might be better aligned with the patient’s true advanced care wish of avoiding interventions that yield no improvement in the quality of life.

Mastering these sorts of transitions are particularly embraced by integrated value-based care organizations that manage a larger portion of the health care dollar.<sup>24</sup> Coverage options such as Medicare Advantage retain the flexibility to design cost-effective offerings best suited for the geography, clinical setting, and the needs of patient populations including those with adverse social determinants of health (SDOH). HaH may be part of a movement in senior care that not only realizes the immediate savings in costs of acute hospitalization, but subsequent costs seen with holistic reductions in readmissions and ultimately low-value medical endeavors.

### *Hospitalization at Home as a Broader Community Possibility*

Some believe that HaH could and should be a care strategy available for greater numbers of community patients.<sup>1</sup>

Perhaps the most important aspect limiting the widespread deployment of virtual home hospitalization is anticipating the potential barriers to success. It should not be surprising that lack of attention to these adverse determinants of health greatly impacts the broad adoption of HaH.<sup>6</sup> Without this fundamental knowledge, it will be impossible to design and implement variations of HaH design which optimize outcomes.<sup>6,23</sup> Since virtual HaH care occurs in settings that are individually unique, additional layers of investigation are needed to anticipate and meet the various SDOH that might impede its success.

In the absence of these evaluative resources, utilizing HaH for patients with adverse SDOH creates uncertainty of success. It is often in these cases perceived safer to admit the patient to the traditional inpatient hospital status, than try and understand, measure, and overcome any perceived barriers to home hospital care.

Studies on current HaH have shown that family members and home caregivers play an important role in the successful outcome of HaH.<sup>20,29,30</sup> For patients of families with adverse SDOH, this might be particularly true.<sup>20,30</sup> A discussion with the patient’s family or others assisting in care is necessary to uncover concerns regarding their roles, skills, financial status, and general ability to provide valuable home assistance.<sup>20</sup> This is the case when those helping at home felt a sense of responsibility for monitoring, care, and safety of the patient—a role they may not be prepared for emotionally, logistically, or economically. While HaH may be deemed more comfortable, desirable, and preferred for the patient, it may trade this for increased stress, responsibility, and hardship for family members with limited resources.<sup>31-33</sup>

Patients who achieved greatest success in HaH have a home environment that is safe, secure, environmentally suitable, and conducive to recovery.<sup>18,19,24,26</sup> Home settings that are cramped or unsafe are considered less ideal HaH settings.<sup>18,19,24</sup> A home hospital environment associated with adverse health behaviors such as smoking, consumption of alcohol or illicit substances, fared more poorly.<sup>18,19,24</sup> Accordingly, optimal outcomes will be achieved when a prospective inventory of home barriers to success is conducted, with potential supportive solutions implemented.

Given virtual HaH’s dependence upon broad-band connectivity and technological literacy, not all home environments will be eligible for participation.<sup>23,24,34</sup> In many areas of the U.S., reliable access to high-speed internet is not always the case. And even when it is available, the communities themselves do not always have the digital literacy necessary.<sup>35</sup> This may be particularly true in rural or tribal regions. It is hoped by many that virtual home hospitalization may bring a level of access and sophistication of healthcare resources not currently available in these communities.

For successful HaH outcomes in patients with adverse SDOH, additional resources other than just IT access may

be beneficial. Supplemental benefits such as dietary support, transportation aid, financial compensation for family and neighbors aiding in caregiving, and more comprehensive case management and social services engagement, might increase the likelihood of successful transition from home hospitalization to prolonged recovery. Under current payment methodologies, these services may not be available. It would be hoped that adding these resources to the benefit design will not only allow HaH to succeed, but improve patients' health status, lower readmissions, and reduce future costs of care. This addition of benefits will require recognition that increased front-loaded costs of HAH in patients with adverse SDOH, will be balanced with the later health and societal cost savings. A simple per treatment payment model may not be sustainable.

Additionally, new treatment adjuncts will be needed for broader adoption of HaH among all communities. The presence of a medical house call program might be particularly important for patients whose adverse social determinants of health might be associated with increased complications, costs, poorer outcome, and readmissions.<sup>21</sup> And to the extent this type of home treatment model decreases unnecessary emergency room visits and hospitalizations, those savings will need to be captured by these broader models of coordinated healthcare.<sup>10</sup> Without some way of achieving the financial benefits of improved healthcare outcomes, HaH will not be prepared or financially incentivized to deal with the broader subsets of challenging patients.<sup>23</sup> However, for those that care for patients with adverse social determinants of health, HaH represents a great potential return on investment. Tightly integrated value-based health systems could realize the return seen when creative approaches to utilize the entire healthcare dollar are applied to those with poorly coordinated care. Home hospitalization with virtual care could fit well into that model.

## Conclusion

The Covid-19 pandemic necessitated many new and accelerated options in virtual healthcare. Acute hospitalization at home is one concept that jumped from a theoretical option to something useful under challenging healthcare circumstances. Now, as most hospitals approach post-Covid normality, the question being raised is what is the future of HaH? Will it return to something reserved for the emergency healthcare toolbox or does it hold inherent value to be continued and developed further?

There are many reasons to believe that there are circumstances in which virtual home hospitalization may have much to offer patients, health systems, and payers alike; but barriers remain. Broader adoption will require an understanding of how optimal outcomes might be attained among all patients, including those in whom social determinants of health are not ideal. From a

financial standpoint, greater legislative and private payer support will be necessary if HaH is to sustain itself and grow. Encouraging future payer reimbursement for virtual home hospitalization will depend upon evidence that it can be of equal or better quality, with the same or lower costs compared to traditional hospital care. Regardless, it appears that the pandemic inspired new approaches to virtual care that will continue in one form or another, and possibly change the delivery of community healthcare in ways not currently envisioned.

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