Where Does the Hospital Belong? Perspectives on Hospital at Home in the 21st Century

Payal Sharma, DNP, MSN, RN, FNP-BC, CBN, Grace Walker, MSHA, BSN, RN, SQIL, and Jessica Yang, DNP, RN, ACNS-BC

Brick-and-mortar hospitals in the United States have historically been considered the dominant setting for providing care to patients. The coordination and delivery of care has previously been bound to physical hospitals largely because multidisciplinary services were only accessible in an individual location. While the fundamental make-up of these services remains unchanged, these services are now available in alternate settings. Some of these services include access to a patient care team, supplies, diagnostics, pharmacy, and advanced therapeutic interventions. Presently, the physical environment is becoming increasingly irrelevant as the core of what makes the traditional hospital—the professional staff, collaborative work processes, and the dynamics of the space—have all been translated into a modern digitally integrated environment. The elements necessary to providing safe, effective care in a physical hospital setting are now available in a patient's home.

Impetus for the Model

As hospitals reconsider how and where they deliver patient care because of limited resources, the hospital-at-home model has gained significant momentum and interest. This model transforms a home into a hospital. The inpatient acute care episode is entirely substituted with an intensive at-home hospital admission enabled by technology, multidisciplinary teams, and ancillary services. Furthermore, patients requiring post-acute support can be transitioned to their next phase of care seamlessly. Given the nationwide nursing shortage, aging population, challenges uncovered by the COVID-19 pandemic, rising hospital costs, nurse/provider burnout related to challenging work environments, and capacity constraints, a shift toward the combination of virtual and in-home care is imperative. The hospital-at-home model has been associated with superior patient outcomes, including reduced risks of delirium, improved functional status, improved patient and family member satisfaction, reduced mortality, reduced readmissions, and significantly lower costs.[1] COVID-19 alone has unmasked major facility-based deficiencies and limitations of our health care system. While the pandemic is not the impetus for the hospital-at-home model, the extended stress of this event has created a unique opportunity to reimagine and transform our health care delivery system so that it is less fragmented and more flexible.

Nursing in the Model

Nursing is central to the hospital-at-home model. Virtual nurses provide meticulous care plan oversight, assessment, and documentation across in-home service providers, to ensure holistic, safe, transparent, and continuous progression toward care plan milestones. The virtual nurse monitors patients using in-home technology that is set up at the time of admission. Connecting with patients to verify social and medical needs, the virtual nurse advocates for their patients and uses these technologies to care and deploy on-demand hands-on services to the patient. Service providers such as paramedics, infusion nurses, or home health nurses may be deployed to provide services in the patient's home. By bringing in supplies, therapeutics, and interdisciplinary team members, the capabilities of a brick-and-mortar hospital are replicated in the home. All actions that occur wherever the patient is receiving care are overseen by professional nursing staff; in short, virtual

From Medically Home Group, Boston, MA.

Table. **Benefits of the Hospital-at-Home Model**

Alternate setting to receive care
Cost savings
Reduced risks of delirium
Improved functional status
Improved patient and family member/caregiver satisfaction
Reduced mortality
Reduced readmission
Eliminates risk for in-hospital injuries and hospital-acquired infections
Increased mobility status
Increased access

nurses are the equivalent of bedside nurses in the brick-and-mortar health care facilities.

Potential Benefits

There are many benefits to the hospital-at-home model (**Table**). This health care model can be particularly helpful for patients who require frequent admission to acute care facilities, and is well suited for patients with a range of conditions, including those with COVID-19, pneumonia, cellulitis, or congestive heart failure. This care model helps eliminate some of the stressors for patients who have chronic illnesses or other conditions that require frequent hospital admissions. Patients can independently recover at home and can also be surrounded by their loved ones and pets while recovering. This care approach additionally eliminates the risk of hospital-acquired infections and injuries. The hospital-at-home model allows for increased mobility,[2] as patients are familiar with their surroundings, resulting in reduced onset of delirium. Additionally, patients with improved mobility performance are less likely to experience negative health outcomes.[3] There is less chance of sleep disruption as the patient is sleeping in their own bed—no unfamiliar roommate, no call bells or health care personnel frequently coming into the room. The in-home technology set up for remote patient monitoring is designed with the user in mind. Ease of use empowers the patient to collaborate with their care team on their own terms and center the priorities of themselves and their families.

Positive Outcomes

The hospital-at-home model is associated with positive outcomes. The authors of a systematic review identified 10 randomized controlled trials of hospital-at-home programs (with a total of 1372 patients), but were able to obtain data for only 5 of these trials (with a total of 844 patients).[4] They found a 38% reduction in 6-month mortality for patients who received hospital care at home, as well as significantly higher patient satisfaction across a range of medical conditions, including patients with cellulitis and community-acquired pneumonia, as well as elderly patients with multiple medical conditions. The authors concluded that hospital care at home was less expensive than admission to an acute care hospital.[4] Similarly, a meta-analysis done by Caplan et al[5] that included 61 randomized controlled trials concluded that hospital at home is associated with reductions in mortality, readmission rates, and cost, and increases in patient and caregiver satisfaction. Levine et al[2] found reduced costs and utilization with home hospitalization compared to in-hospital care, as well as improved patient mobility status.

The home is the ideal place to empower patients and caregivers to engage in self-management.[2] Receiving hospital care at home eliminates the need for dealing with transportation arrangements, traffic, road tolls, and time/scheduling constraints, or finding care for a dependent family member, some of the many stressors that may be experienced by patients who require frequent trips to the hospital. For patients who may not be clinically suitable candidates for hospital at home, such as those requiring critical care intervention and support, the brick-and-mortar hospital is still the appropriate site of care. The hospital-at-home model helps prevent bed shortages in brick-and-mortar hospital settings by allowing hospital care at home for patients who meet preset criteria. These patients can be hospitalized in alternative locations such as their own homes or the residence of a friend. This helps increase health system capacity as well as resiliency.

In addition to expanding safe and appropriate treatment spaces, the hospital-at-home model helps increase access to care for patients during nonstandard hours, including weekends, holidays, or when the waiting time in the emergency room is painfully long. Furthermore, providing care in the home gives the clinical team valuable insight into the patient's daily life and routine. Performing medication reconciliation with the medicine cabinet in sight and dietary education in a patient's kitchen are powerful touch points.[2] For example, a patient with congestive heart failure who must undergo diuresis is much more likely to

meet their care goals when their home diet is aligned with the treatment goal. By being able to see exactly what is in a patient's pantry and fridge, the care team can create a much more tailored approach to sodium intake and fluid management. Providers can create and execute true patient-centric care as they gain direct insight into the patient's lifestyle, which is clearly valuable when creating care plans for complex chronic health issues.

Challenges to Implementation and Scaling

Although there are clear benefits to hospital at home, how to best implement and scale this model presents a challenge. In addition to educating patients and families about this model of care, health care systems must expand their hospital-at-home programs and provide education about this model to clinical staff and trainees, and insurers must create reimbursement paradigms. Patients meeting eligibility criteria to enroll in hospital at home is the easiest hurdle, as hospital-at-home programs function best when they enroll and service as many patients as possible, including underserved populations.

Upfront Costs and Cost Savings

While there are upfront costs to set up technology and coordinate services, hospital at home also provides significant total cost savings when compared to coordination associated with brick-and-mortar admission. Hospital care accounts for about one-third of total medical expenditures and is a leading cause of debt.[2] Eliminating fixed hospital costs such as facility, overhead, and equipment costs through adoption of the hospital-at-home model can lead to a reduction in expenditures. It has been found that fewer laboratory and diagnostic tests are ordered for hospital-at-home patients when compared to similar patients in brick-and-mortar hospital settings, with comparable or better clinical patient outcomes.[6] Furthermore, it is estimated that there are cost savings of 19% to 30% when compared to traditional inpatient care.[6] Without legislative action, upon the end of the current COVID-19 public health emergency, the Centers for Medicare & Medicaid Service's Acute Hospital Care at Home waiver will terminate. This could slow down scaling of the model. However, over the past 2 years there has been enough buy-in from major health systems and patients to continue the momentum of the model's growth. When setting up a hospital-at-home program, it would be wise to consider a few factors: where in the hospital or health system entity structure the hospital-at-home program will reside, which existing resources can be leveraged within the hospital or health system, and what are the state or federal regulatory requirements for such a program. This type of program continues to fill gaps within the US health care system, meeting the needs of widely overlooked populations and increasing access to essential ancillary services.

Conclusion

It is time to consider our bias toward hospital-first options when managing the care needs of our patients. Health care providers have the option to advocate for holistic care, better experience, and better outcomes. Home-based options are safe, equitable, and patient-centric. Increased costs, consumerism, and technology have pushed us to think about alternative approaches to patient care delivery, and the pandemic created a unique opportunity to see just how far the health care system could stretch itself with capacity constraints, insufficient resources, and staff shortages. In light of new possibilities, it is time to reimagine and transform our health care delivery system so that it is unified, seamless, cohesive, and flexible.

Corresponding author: Payal Sharma, DNP, MSN, RN, FNP-BC, CBN; psharma@medicallyhome.com.

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