Hospital at Home

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In 2006, national health expenditures in the United States of $2.1 trillion represented 16% of the gross domestic product. Of that, 31% was spent on acute hospital care, with Medicare paying the hospital bill for nearly 30%.[1] Despite these massive and ever increasing expenditures, a number of reports, including the seminal ''To Err is Human, Building a Safer Health Care System'' from the Institute of Medicine (IOM), highlight the fact that health care quality and patient safety are a significant concern during acute hospital care.[2,3]

Iatrogenic events occur commonly in acute care hospitals. The Harvard Medical Practice Studies found that approximately 4% of hospitalized patients suffered an adverse event; more than two-thirds of these were due to errors. These events were more common among older patients, even after adjustment for comorbid medical conditions.[4–6] Using these and other data, the IOM estimated that at least 44,000 people die in US hospitals each year due to medical mistakes at a cost between $37 and $50 billion. Many studies suggest that the elderly are at especially high risk and frequently experience adverse events, such as functional decline, pressure sores, nosocomial infections, and delirium.[7–9] In addition, preventable adverse events also occur during the transition from hospital to home at hospital discharge, the result of deficiencies in health system design and poor communication.[10,11]

Other secular trends favor alternatives to traditional acute hospital care. These include expectation of patients as consumers of health services for more personalized and safer care;[12,13] creation of safe, portable, advanced hospital-type technologies; equally rapid development in domestic technologies that enhance information transfer and personal care; access to hospitalization for an increasing number and range of interventions; and attempts by funders of health care to examine alternatives to traditional hospitalization.

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Improving the quality and safety of care in acute care hospitals is critically important, as hospitals are an essential component of the health care system. However, as the population continues to age and grow frail, and as hospitals evolve into the setting for the delivery of increasingly high-technology critical care, developing alternative systems to provide treatment of acute medical illness is vital.

Hospital at home (HaH) is one such alternative. HaH is generally defined as the clinical activity that administers therapy and technology usually associated with acute inpatient care, but in a community setting. HaH patients are those who, without the provision of the HaH service, would require inpatient care.

In this article, we define the HaH model of care and describe the scope of HaH in terms of the types of health conditions and patients that can be treated and the role of the HaH physician. We then review the evidence base on the outcomes of HaH and describe the dissemination of the HaH model into widespread practice. Finally, we discuss recent advances in the related issue of high-tech home care.

DEFINING HOSPITAL AT HOME CARE

Clearly defining a health service delivery intervention has been too often overlooked in the measurement and development of effective or innovative health services. Defining a service clearly can be especially difficult when dealing with a new service whose properties may be in dispute or in evolution. HaH is one such example.

A variety of care models have been included under the broad HaH definition, including programs that substitute entirely for an inpatient hospital admission and, more commonly, those that facilitate early discharge from the acute care hospital. Some programs have focused solely on patients following surgery, while others have targeted patients with medical conditions. Nurses deliver the bulk of care in most models; few have included substantial physician presence. Some models have focused on distinct populations, such as children. The wide variety of models claiming HaH status probably reflects the fact that most published models developed in countries with national health care systems in which the HaH model fills a particular clinical niche.

There are 4 main types of HaH models documented in the literature. The first is the outpatient infusion center where patients receive an intravenous infusion or other treatment.[14] Next is the physicians' office intravenous infusion service where patients usually self-infuse their medications and are supervised in physicians' offices.[15–17] The third type is at-home delivery by hospital, hospital contracted staff, or, in the United States, by a home health agency of care, mostly for surgical patients, in which patients are sent home early in the postoperative period and receive postoperative nursing supervision and skilled therapies at home with little or no organized input from physicians.[18–29] The final model is a substitutive HaH that delivers acute hospital-level care in a patient's home in lieu of acute hospital admission—in these models nursing care is always provided, and physician inputs are often available but have been variably used.[30–41]

This variety of models has engendered controversy over the definition of HaH as well as the perceived overall effectiveness of the concept.[42,43] The Cochrane Collaboration Review of HaH[44] includes articles on models that have little in common with each other and little adherence to a common set of underlying principles, other than that the disparate services provide ''active treatment by health care professions, in the patient's home, of a condition that would require acute hospital inpatient care, always for a limited period.''