

SCIENTIFIC LETTER

Hospital at home in pediatrics. An emerging model for the treatment of patients with acute diseases

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Hospital at Home (HaH) is a healthcare service that allows patients to receive hospital-level medical and nursing care at home. According to the definition proposed by the Scientific Committee of the World Hospital at Home Congress 2023⁽¹⁾, it is a clinical service for acute patient care that uses the personnel, equipment, technologies, medication, and techniques usually provided in hospitals and offers hospital care in the homes of selected patients. It is, therefore, a resource that replaces conventional hospitalization.

Its goal is to improve the lives of patients who need hospitalization by shifting the culture of hospitals to deliver hospital-level care in the comfort of patients' homes⁽¹⁾.

In Spain, HaH began in 1981, with the inauguration of the first unit of its kind at the Gregorio Marañón Hospital, formerly known as the Provincial Hospital of Madrid. Since then, over 100 units dedicated to the care for adult patients have been created⁽²⁾. Nevertheless, the development of pediatric units has been much slower, initially emerging as units for the care of specific conditions, such as the early discharge of premature newborns or the care of children with chronic and complex disorders⁽³⁾, palliative care or intravenous antibiotic therapy. It was not until 5 years ago that HaH units began to operate with the aim of caring for children with all types of acute conditions or exacerbation of chronic diseases⁽⁴⁾.

Implementation of HaH requires careful planning to ensure year-round care, prioritizing patient safety similar to conventional hospitalization practices. Factors to consider include which conditions will be managed and how, admission criteria (both general and disease-specific), allocation of human and material resources (transport, oxygen thera-

py, portable equipment, infusion pumps, telemonitoring), systematization of the pharmaceutical process (supply, preparation and administration of intravenous medication), documentation procedures (including informed consent, welcome guide, medical records), care plans and circuits (for admission, referral, discharge, and both scheduled and urgent care), integration into the hospital's electronic medical records, organization and training of staff and caregivers, care plans, costs, and quality control, among others. Furthermore, it is essential to establish agreements with other clinical departments, central services (radiology, laboratory), and pharmacy and out-of-hospital emergency services.

HaH provides numerous advantages for the child and their family, improving comfort, facilitating the maintenance of daily routines (play, meals, sleep, hygiene), favoring the compatibility of family and work, and encouraging greater involvement of parents in the care of their children, which leads to a high degree of satisfaction for the families⁽⁴⁻⁶⁾.

In November 2018, the first HaH Unit in Spain dedicated to the care of children with acute diseases was inaugurated at the Niño Jesús University Children's Hospital in Madrid, operating as a transversal department of the hospital, providing coverage for all medical and surgical services.

In the initial 4 years of operation, there were a total of 1711 admissions corresponding to 1489 patients. A total of 55.9% were male. The median age was 5 (IQR, 2-10) years. When excluding patients admitted for overnight polysomnography, the median length of stay in the unit was 4 (IQR, 3-6) days. Before admission to the HaH unit, the median hospital stay was 2 (IQR, 1-5) days. In total, 6982 hospital stays were avoided.

Overall, 57% of the patients were referred to HaH from the hospital ward, 34% from the outpatient clinics (mainly for sleep studies), and 7% directly from the Emergency Department (ED).

Inpatients were referred primarily from the general pediatric ward (n= 657; 67.6%), general surgery (n= 120; 12.3%), and the hematology-oncology ward (n= 71; 7.3%).

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The most frequent diseases treated were: sleep disorder for overnight polysomnography (568; 33.2%), bronchitis/asthma requiring oxygen therapy (216; 12.6%), skin and soft-tissue infection (139; 8.1%), ENT infection (124; 7.2%), intra-abdominal infection (119; 7%), osteoarticular infections (99; 5.8%), severe bacterial infection (87; 5.1%), pneumonia (82; 4.8%), urinary tract infection (74; 4.3%), and acute bronchiolitis (54; 3.2%).

Thirty-two percent of the patients had an underlying disease, predominantly consisting of severe neurological disorders (201; 11.7%), congenital syndromes (159; 9.3%), or cancer (94; 5.5%).

The three most frequently performed procedures were administration of intravenous antibiotic therapy (n= 729; 42.6%), polysomnography for the diagnosis of sleep-disordered breathing (n= 520; 30.4%), and oxygen therapy for acute respiratory distress (n= 306; 17.9%).

Six percent (n= 67) of the patients required hospital re-admission, with 5% being unscheduled and 1% scheduled. The primary cause for unscheduled hospital readmission was clinical deterioration, accounting for 43 cases (75%).

Regarding family satisfaction, in the survey conducted during 2021 and 2022 upon discharge from the unit, 98% responded that they were very satisfied and 2% were satisfied (response rate 45%, 238/530).

Based on the activity data from these initial years, HaH has demonstrated to reduce or, at times, avoid hospital stay in children with acute conditions that are usually managed in the hospital. Although the number of patients directly benefiting from admission to HaH from the ED is still low, it is conceivable that the implementation of disease-specific diagnostic and therapeutic protocols aiding in the selection of home admission candidates, along with a cultural shift regarding the necessity of traditional hospitalization in favor of HaH, among both healthcare professionals and the general population, will lead to a change in the future.

The procedures most commonly performed during conventional pediatric hospitalization (oxygen therapy and intravenous drug administration) can be performed at home with adequate parental training and support from healthcare staff and telemonitoring⁽⁷⁻¹²⁾. This requires accurate identification of eligible patients, provision of sufficient resources, and collaboration and coordination with all hospital departments. Each center must tailor its approach to its specific needs. Patient safety should always be a priority, establishing a functional organization that ensures 24-hour care and rapid and adequate response mechanisms in the event of clinical deterioration or emergency.

Our experience shows that HaH represents a viable alternative to traditional hospitalization for specific pediatric patients with acute conditions. It effectively reduces hospital stays and can even prevent hospital admissions from the ED. Furthermore, it demonstrates a good safety profile, as evidenced by a low rate of readmissions, and a high level of family satisfaction.

To enhance its future development, technological integration and interdepartmental and even interhospital collaboration should be promoted. This would enable more children to receive hospital-level medical care at home, undoubtedly improving the humanization of health care.

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