

Treating patients at home: A novel solution for old problems

Seok Ming Lim^{1,2} *FRACP*

Hospital-at-home (HaH) programmes deliver hospital-type treatments to patients located in their own homes, often in substitution for an acute inpatient admission or to support early discharge from hospitals. They are associated with high patient satisfaction rates, improved health outcomes and reduced risks of delirium and nosocomial infections.¹ HaH services have been established in Australia and various European countries for more than 20 years. HaH has recently undergone rapid growth worldwide due to a combination of consumer preference, bed access issues and increasingly sophisticated digital health technologies.² New models of HaH care have been reported in stem cell transplants and among geriatric cohorts.^{3,4} Infection control issues in the coronavirus disease 2019 (COVID-19) era have further driven HaH utilisation as a means of caring for people with COVID-19 at home.⁵ However, ongoing questions remain about the HaH service, given that it is distinct from other forms of outpatient care provided by hospitals—particularly its resourcing and funding.

In this issue of the *Annals*, Ko et al. describe the implementation of a HaH programme in the western part of Singapore, which is likely the first such report evaluating the feasibility of this care model in Asia.⁶ A multidisciplinary team of medical, nursing and allied health staff treated acute medical conditions such as skin and soft tissue infections, and fluid overload, using intravenous antibiotics, diuretics and other medications. The programme found a similar safety profile when compared with other reports, with inpatient mortality rate at 1.8%. High patient satisfaction scores were reported with 94% responding that they would opt for the programme again.

Interestingly, Ko et al. reported that most patients (72%) approached for enrolment into home hospitalisation refused the programme. This might be largely due to the novelty of this care model, and contrasts with another recent Singapore study,⁷ suggesting that most stakeholders would embrace HaH programmes provided patient safety and care were maintained via adequate resourcing and funding, timely medical interventions, and support from care providers. Lack of knowledge and experience of HaH programmes—either among patients and their

caregivers, or among primary care and hospital-based healthcare staff—can limit the expansion of HaH programmes despite potential benefits to the health service and individuals. It is important to address this knowledge gap, which has been found to impact hospital staff's ability to identify and refer suitable patients for HaH care in a timely fashion.⁸ This highlights the importance of HaH services developing close relationships with community- and hospital-based healthcare staff, and providing targeted education and referral pathways for teams that utilise HaH care. It is also possible that HaH services that clearly identify as being a hospital-operated service would get greater acceptance among patients.

Telehealth and other remote patient monitoring technologies have been frequently utilised among HaH programmes to deliver care to COVID-19 patients, as such technologies circumvent the geographical barrier as well as the infection prevention and control issues in dealing with COVID-19.⁵ In Ko et al.'s study,⁶ nurses educated HaH patients on monitoring vital signs via thermometers, blood pressure machines and pulse oximeters, as well as utilisation of teleconsultations. It is possible that telemedicine can help address patients' and healthcare workers' uncertainty regarding HaH programmes by improving the ability of patients and clinicians to emulate the care that would be received in a hospital ward. Wearable devices that continuously monitor and upload patients' vital signs in real time to the cloud, coupled with teleconsultations, could enable patients and clinicians to stay in constant contact, assist in earlier detection of clinical deterioration, and extend the ability of patients and their caregivers to communicate and collaborate with healthcare staff remotely.⁹ This might not be suitable for all patient cohorts however, as barriers remain in terms of access to technology and digital health literacy in certain segments of the population.

As the first such programme in Singapore, Ko et al. raise the importance of developing sustainable and adequate resourcing and funding models that would embed HaH programmes as an integral part of the national healthcare framework. They found that patient acceptability of HaH care varied depending on its

¹ RMH@Home, The Royal Melbourne Hospital, Parkville, Australia

² Department of Medicine, Faculty of Medicine, Dentistry and Health Sciences, The University of Melbourne, Parkville, Australia

Correspondence: Dr Seok Ming Lim, RMH@Home, The Royal Melbourne Hospital, 300 Grattan Street, Parkville, 3051 Victoria, Australia.

Email: SeokMing.Lim@mh.org.au

potential costs, as current private and government funding schemes are weighted towards inpatient hospitalisation. Countries where HaH care is clearly recognised as an acute alternative for inpatient care, and is funded and resourced as such, have been more successful in championing this model of care.¹⁰ Nevertheless, HaH should also not be seen as a substitute or cost-shifting alternative for primary care.

A limitation of this study lies in the non-standardised reporting of its evaluation measures. Utilisation of health services research methodologies such as the Standards for Quality Improvement Reporting Excellence (SQUIRE 2.0) would aid in ensuring outcomes from this study can be compared in a standardised fashion across different studies with different cohorts and geographical regions.¹¹ A larger study with a control group would similarly provide useful information about HaH's ability to substitute for an acute inpatient bed-day.

In conclusion, Ko et al.'s study describes an important step towards the development of HaH programmes in the Asian region. Although cultural differences among the various Asian countries affect how healthcare is perceived and delivered, health services in the region nevertheless share very similar issues with hospitals worldwide. These include requiring sustainable solutions to optimise access, and delivery of timely treatments and services to a complex, ageing and multimorbid population.

REFERENCES

1. Caplan GA, Sulaiman NS, Mangin DA, et al. A meta-analysis of "hospital in the home". *Med J Aust* 2012;197:512-9.
2. The Commonwealth Fund. Has the time finally come for hospital at home? 7 July 2020. Available at: <https://www.commonwealthfund.org/publications/2020/jul/has-time-finally-come-hospital-home>. Accessed on 5 July 2022.
3. Routledge D, Harrison SJ, Joyce T, et al. Hospital in the Home Delivery of Supportive Care for Autologous Stem Cell Transplantation: A Novel Single Centre Patient Focused Approach. *Blood* 2021; 138(Suppl 1):1834.
4. Leff B, Burton L, Mader SL, et al. Hospital at home: feasibility and outcomes of a program to provide hospital-level care at home for acutely ill older patients. *Ann Intern Med* 2005;143:798-808.
5. Lim SM, Allard NL, Devereux J, et al. The COVID Positive Pathway: a collaboration between public health agencies, primary care, and metropolitan hospitals in Melbourne. *Med J Aust* 2022;216:413-19.
6. Ko SQ, Goh J, Tay YK, et al. Treating acutely ill patients at home: Data from Singapore. *Ann Acad Med Singap* 2022;51:392-9.
7. Chua CMS, Ko SQ, Lai YF, et al. Perceptions of stakeholders toward "hospital at home" program in Singapore: A descriptive qualitative study. *J Patient Saf* 2022;18:e606-12.
8. Lim SM, Island L, Horsburgh A, et al. Home First! Identification of Hospitalized Patients for Home-Based Models of Care. *J Am Med Dir Assoc* 2021;22:413-7.e1.
9. Webster P. Virtual health care in the era of COVID-19. *Lancet* 2020;395:1180-1.
10. Viney R, Haas M, Shanahan M, et al. Assessing the value of hospital-in-the-home: lessons from Australia. *J Health Serv Res Policy* 2001;6:133-8.
11. Ogrinc G, Davies L, Goodman D, et al. SQUIRE 2.0 (Standards for Quality Improvement Reporting Excellence): revised publication guidelines from a detailed consensus process. *BMJ Qual Saf* 2016;25:986-92.