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**title** Is Hospital in the Home as safe and effective as inpatient care?

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**policy issue** When Activity-Based Funding (ABF) for public hospitals begins on 1 July this year, it should make it easier for hospitals to establish Hospital in the Home (HITH) services. The pricing framework underpinning the ABF system stipulates that public hospital services should be priced in a way that facilitates the timely roll-out of evidence-based innovations in the most appropriate care setting.<sup>1</sup>

HITH services have been operating in some Australian hospitals for nearly 20 years. However before starting up a service of their own, many hospital managers will want to know if HITH is safe, and for which patients.

This paper briefly outlines the evidence on the safety, quality and costs of HITH services. A list of resources is provided for those who want to know more.

## what does the evidence say?

Many health services provide care in patients' homes. To qualify as a HITH service it must provide active treatment by health care professionals in patients' homes for conditions that otherwise would require hospital in-patient care.<sup>2</sup> Examples of acute treatments delivered in the home include blood transfusions, intravenous antibiotic treatments for infections, and anticoagulation for patients with deep venous thrombosis and pulmonary emboli. Some HITH services (early-discharge HITH) also provide subacute treatment such as rehabilitation at home after orthopaedic injuries and procedures. The range of conditions that are treatable at home continues to expand as technology and confidence in HITH improves.

Cochrane Reviews are generally regarded as an authoritative source of research evidence. A systematic review of the evidence on HITH was conducted by the Cochrane Collaboration in 2008 (it was updated in 2011 and no changes were made to the conclusions). After searching the main medical databases, the Cochrane reviewers found 10 randomised controlled trials (RCTs) that compared HITH with inpatient care; RCTs are generally thought to produce high quality evidence. Data from five of the RCTs on admission-substitution HITH services were broadly comparable, so they were pooled and used to conduct a more high-powered statistical analysis, a meta-analysis. This analysis showed that compared to hospital inpatients, patients treated in HITH services had:

- lower mortality rates 6 month after discharge (38 per cent lower)
- better functional outcomes
- greater satisfaction with care
- cost less to treat, and
- had less chance of ending up in institutional care.

The meta-analysis also found that HITH patients tended to be re-admitted to hospital more often than hospital inpatients, but these results were not statistically significant. When the costs of any hospital readmission were considered as part of an economic analysis of the benefits of HITH, the Review authors concluded that the benefits were not evident.

Overall, the Cochrane Review concluded that there was no evidence that outcomes for patients treated in HITH services differed from those who received inpatient care. This should not necessarily be interpreted as a negative conclusion as it shows that HITH is a viable substitute for inpatient care for certain patients. Despite this, the Cochrane Review results have been controversial because they included so few RCTs in their analysis, even though dozens have been done. The Review does not explain in detail why some trials were included and others were not.

Two of the trials included in the Cochrane Review were Australian, so their findings are worth highlighting. One RCT conducted at Prince of Wales Hospital in Sydney during the late 1990s compared HITH and inpatient care for patients with a range of acute medical conditions.<sup>3</sup> It included 100 patients, most of them over 65 years of age. It found that HITH patients did as well as inpatients, even better on some scores (HITH patients were less likely to experience confusion, urinary and bowel complications). Because the study was small, the authors were unable to definitively say that HITH is as safe as inpatient care even though there were no differences in

the number of adverse events, mortality rates or unplanned readmissions to hospital.

The second Australian study compared the costs of treating patients with an exacerbation of COPD in HITH and in hospital.<sup>4</sup> It was conducted in Brisbane, and the results were published in 2001. The authors found that treating patients at home costs about a third of what it cost to treat them in hospital, and there were no differences in outcomes. The authors acknowledged, however, that just because HITH was cheaper it did not lead to lower overall costs for the health system, as hospitals still had to maintain inpatient beds for other patients. Supporters of HITH argue that the real saving with HITH comes from reducing the need to build extra hospital wings, or indeed hospitals.<sup>5</sup>

Because the Cochrane Review had such a small number of studies, it was not able to make any comments on which types of patients were most suitable for treatment in HITH services. There is however RCT evidence that HITH is safe and effective for selected patients with:

- cellulitis<sup>6</sup>
- chronic heart failure<sup>7,8</sup>
- pulmonary emboli<sup>9-11</sup>
- Chronic Obstructive Pulmonary Disease (COPD)<sup>12-20</sup>
- mild to moderate community-acquired pneumonia<sup>21-22</sup>
- acute mental illnesses.<sup>23-28</sup>

A recent unpublished Australian meta-analysis of HITH included many of these studies (it included 61 in total) and confirmed the Cochrane Reviews findings about the benefits of HITH.<sup>29</sup> However, it also found that there was a significant decrease in mortality, consistent across all subtypes of HITH, as well as significant decreases in readmissions and cost.

## what is the quality of the evidence available?

Cochrane Reviews are considered high quality evidence so its findings about the benefits of HITH as a model should be valued. However in recent years, the Cochrane Collaboration's review methodology has been criticised because many reviews make no firm conclusions.<sup>30</sup> Critics also argue that the Cochrane Collaboration places too much emphasis on methodological rigour and not enough on the objective of most clinical research – to generate evidence that can be used to improve clinical practice.<sup>31,32</sup> Because the Cochrane Review on HITH included so few of the available RCTs, it was unable to make any conclusions about the type of patients most likely to benefit from HITH. The recent Australian meta-analysis outlined above includes many more of these RCTs and produces more evidence on which patients benefit from HITH. This study however has not yet been published in a peer reviewed journal in full, so it is not possible to critically appraise it.

## what does this mean for policymakers?

There is strong evidence that HITH is safe and effective for some groups of patients, but it should be considered as a supplement to inpatient care not a replacement for it.<sup>33</sup>

## key readings

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