A home based intervention reduced hospital readmissions and mortality in patients with congestive heart failure

Stewart S, Vandenbroek AJ, Pearson S, et al. *Prolonged beneficial effects of a home-based intervention on unplanned readmissions and mortality among patients with congestive heart failure.* Arch Intern Med 1999 Feb 8;159:257-61.

Question

In patients with congestive heart failure (CHF) who have been discharged from hospital, can a home based intervention (HBI) reduce the frequency of hospital readmissions and out of hospital deaths?

Design

Subgroup analysis of a randomised controlled trial (RCT) with 18 months follow up (n = 762 patients).

Setting

A tertiary referral hospital in Woodville, South Australia, Australia.

Patients

97 patients (mean age 75 y, 52% women) with CHF and impaired systolic function, functional impairment (New York Heart Association class II-IV), and ≥ 1 previous hospital admission for CHF. Follow up was 100%.

Intervention

All patients received discharge planning. 49 patients were allocated to HBI care (a visit before discharge by a nurse and a home visit 1 week after discharge by a nurse and pharmacist to educate, assess the need for further intervention, and optimise medication management). 48 patients were allocated to usual care (a visit to the patient's family physician or cardiologist within 2 wks of discharge).

Main outcome measures

Proportion of patients with the combined endpoint of unplanned readmission or out of hospital death.

Main results

The groups did not differ for the proportion of patients with combined readmission or out of hospital deaths ($p = 0.12$) (table) but patients in the HBI group had fewer deaths ($p = 0.05$), out of hospital

deaths (table) ($p = 0.02$), and unplanned readmissions (64 v 125 admissions, $p = 0.02$); spent fewer days in hospital (10.5 v 21.1 d per patient, $p = 0.02$); made fewer visits to the emergency department (2.5 v 4.5 visits per patient, $p = 0.004$); and accrued lower hospital costs per patient (Aus\$5100 v \$10 600, $p = 0.02$). Death was predicted by non-English speaking background (adjusted odds ratio [OR] 4.9, 95% CI 1.5 to 15.4), unplanned admission in the previous 6 months (OR 4.9, CI 1.6 to 15.2), and left ventricular ejection fraction $\leq 40\%$ (OR 3.0, CI 1.1 to 8.6).

Conclusion

A home based intervention started in hospital and continued after discharge reduced mortality and unplanned readmissions for patients with congestive heart failure.

*Home based intervention (HBI) v usual care after discharge for patients with congestive heart failure at 18 months**

Outcomes	HBI	Usual care	RRR (95% CI)	NNT (CI)
Combined endpoint†	67.3%	81.3%	17% (-5 to 36)	Not significant
All cause mortality	22.4%	41.7%	46% (2 to 71)	6 (3 to 177)
Out of hospital death	4.1%	18.8%	78% (17 to 95)	7 (3 to 44)

*Abbreviations defined in glossary; RRR, NNT, and CI calculated from data in article.

†Unplanned hospital readmission or out of hospital death.

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Commentary

Despite major advances in pharmacotherapy, hospital readmission rates for CHF remain high.¹ This may be because of the many behavioural, financial, and psychosocial barriers to effective adherence with prescribed treatments. Promotion of adherence may improve outcomes and healthcare costs. The study by Stewart *et al* is one of the few studies that focuses on outpatient treatment of CHF.

Previous RCTs have found that similar programmes reduced hospital admissions.²⁻³ It is unusual to find lasting effects from a brief intervention; thus, this study is particularly interesting because Stewart *et al* continued to find clinically important differences at 18 months. In addition, the nurse visitor referred approximately 50% of patients to their primary care physician because of adverse effects or early clinical

deterioration. If interventions are delivered earlier, there is less chance for further complications. Patients were elderly and of lower socioeconomic status and therefore findings may differ in other populations. The study also did not examine functional status, quality of life, or patient satisfaction.

How can a single intervention after discharge continue to reduce readmissions and mortality for 18 months? The authors recommend that more research be done to confirm these findings but suggest that the effects may be attributable to increased caregiver vigilance and awareness of therapeutic goals, improved adherence, and better use of medical care.

The study is relevant to nurses who care for patients with CHF in multiple settings. It reinforces the fact that patients

with CHF have complex educational needs that cannot be met during a short hospital stay. They require continuous follow up and education that may be best met through an outpatient CHF treatment centre or other community resources. The study also emphasises the need for early evaluation and intervention, if needed, after discharge.

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- 1 American Heart Association. 1998 heart and stroke update. Dallas: American Heart Association, 1997.
- 2 Cline CM, Israelsson BY, Willenheimer RB, *et al.* Heart 1998;80:442-6.
- 3 Rich MW, Beckham V, Wittenberg C, *et al.* N Engl J Med 1995;333:1190-5.