Australia and New Zealand Horizon Scanning Network

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Nurse-led telephone program to monitor heart failure patients after hospital discharge.

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PRIORITISING SUMMARY

REGISTER ID: **000175**

NAME OF TECHNOLOGY: **TELEPHONE HEART FAILURE MANAGEMENT**

PURPOSE AND TARGET GROUP: **NURSE-LED TELEPHONE PROGRAM TO MONITOR HEART FAILURE PATIENTS AFTER HOSPITAL DISCHARGE**

STAGE OF DEVELOPMENT (IN AUSTRALIA):

☐	Yet to emerge	☐	Established
☐	Experimental	☐	Established *but* changed indication or modification of technique
☐	Investigational	☐	Should be taken out of use
☒	Nearly established		

AUSTRALIAN THERAPEUTIC GOODS ADMINISTRATION APPROVAL

☐	Yes	ARTG number
☐	No	
☒	Not applicable	

INTERNATIONAL UTILISATION:

COUNTRY	LEVEL OF USE		
	Trials Underway or Completed	Limited Use	Widely Diffused
Argentina	✓		

IMPACT SUMMARY:

This prioritising summary examines the delivery of a nurse-led program whereby chronic heart failure (CHF) patients were monitored by telephone after hospital discharge.

BACKGROUND

Patients with CHF require comprehensive surveillance by health professionals in assessing treatment outcomes and disease progression. Such intensive management may prove difficult and costly to achieve in a general practice or hospital setting regardless of whether patients have difficulties in accessing these services. There is increasing interest in nurse-led, coordinated care programs where nurses rather than specialist physicians provide individualised care to patients to optimise health outcomes and in order to provide quality care at a lower cost (Horowitz and Stewart 2003).

CHF programs managed by nurses may include a range of activities for the monitoring, assessment and treatment of patients (Riegel et al 2002, Taylor et al 2005). Disease management programs for CHF can encompass community outreach programs where patients receive home visits from a nurse, physician and/or pharmacist, as well as clinic-based visits for patient follow-up. The purpose of these programs is to evaluate patients' physical environment, assess patients' health and provide education for disease management. A

variation on these models is case management via telephone that involves a nurse calling patients after hospital discharge to monitor patients' adherence to treatment plans, assess patients' health and arrange medical/emergency follow-up as required. This type of intervention requires a high degree of skill on the nurse's part due to the lack of visual cues in examining the patient (Riegel et al 2002).

The underlying causes of CHF hospital readmission have been identified as a lack of treatment adherence, dietary transgressions, lack of adequate education in self-management and problems associated with an elderly population with other comorbidities (Grancelli et al 2003). Heart failure patients often require readmission within the first year after discharge (AIHW 2003). Monitoring patients after discharge is one approach to reducing hospital re-admission.

CLINICAL NEED AND BURDEN OF DISEASE

In Australia heart failure occurs predominantly amongst those aged over 75 and accounted for approximately 2,729 deaths (14 per 100,000) in 2002 and 41,425 hospitalisations (principal diagnosis code I50) during the period 2003-2004 (AIHW 2005a, AIHW2005b). The number of hospital separations for patients with congestive heart disease or left ventricular failure was 28,113 and 12,648 respectively in 2001-2002 (AIHW 2003).

In New Zealand there were 374 deaths and 4139, 3090 and 963 hospitalisations for the respective diagnoses of heart failure, congestive heart failure and left ventricular failure in 2003/04.[1] In New Zealand, one in ten adults (10.4%, 95% CI [9.7, 11.1]) were diagnosed in 2002-2003 with heart disease (heart attack, angina, abnormal heart rhythm or heart failure) (Ministry of Health, 2004). In the period 2002-03, the age standardised and crude rates for heart failure alone were 3.0 and 3.4 per cent, respectively (Ministry of Health).

A recent cross-sectional survey of Canberra residents aged 60-86 years found the prevalence of heart failure to be 6.3% (95% CI 5.0%, 7.7%). Clinical heart failure increased in prevalence with increasing age (a 4.4-fold increase from 60-64 years to the 80-86 years age group, $p<0.0001$) (Abhayaratna et al 2006). The ageing population, improved survival after coronary events, and increasing incidence of diabetes and obesity may contribute to the growing incidence and prevalence of heart failure in Australia (AIHW 2003; Horowitz and Stewart 2001, Campbell 2003).

DIFFUSION

The resources required for establishing nurse management programs are already available within the healthcare systems of developed countries (Stewart and Horowitz 2003). The uptake of these programs would depend on the reorganisation of service structures and funding.

COMPARATORS

Usual care
The management of heart failure is directed at prevention, slowing disease progression, relieving symptoms and prolonging survival (Krum 2001). Non-pharmacological approaches include exercise, home-based support and risk-factor modification. Pharmacological therapy includes the use of angiotensin converting enzyme inhibitors, beta-blockers and diuretics.

Surgical approaches for selected patients may include myocardial revascularisation, insertion of a pacemaker or cardiac transplantation.

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[1] Data supplied by Chris Lewis from New Zealand Health Information Service. Total population of New Zealand for the year 2003 was 4,009,200.

Nurse-led programs

There have been numerous international studies published since 1993 indicating that nurse-led CHF management programs are effective in reducing morbidity and mortality (Stewart and Horowitz 2003, Phillips et al 2004). A range of nurse-led programs for CHF management have been developed. The programs differ in that:

- some concentrate on either hospitalisation or post-hospitalisation periods;
- management occurs within a clinic or home environment;
- a brief or sustained program of management may be applied; and
- coordination of the program of care can occur via a particular healthcare professional (e.g. cardiologist, primary care physician or GP) or a specialist heart failure nurse.

A recent systematic review (level I intervention evidence) assessing the effectiveness of different CHF management programs included 1,627 people from sixteen trials and 15 different interventions (Taylor et al 2005). Adults who had at least one admission to hospital with a diagnosis of heart failure were the focus of this review. The types of health professionals involved in the interventions differed but specialist nurses were common to all studies, although the level of their involvement varied. The included studies had common components in the nature of interventions, however the intensity and the duration of the interventions varied. The review concluded that there were insufficient data to make any recommendations.

Randomised trials (level II intervention evidence) of multidisciplinary specialist nurse programs where nurses trained in assessing and managing chronic heart failure in older, high-risk patients providing individualised and coordinated care assessing readmission rates have been conducted (Rich et al 1993, Rich et al 1995). The interventions consisted of comprehensive education for the patient and family, a prescribed diet, social service consultation and planning for an early discharge, optimisation of pharmacotherapy, and intensive home and clinic-based follow-up with frequent telephone contact. At 90 days, there was a significant reduction (36%) in days per patient of hospital readmission in the intervention group compared to usual care, which translated to a reduction from 6.2 to 3.9 days ($p = 0.04$).

EFFECTIVENESS AND SAFETY ISSUES

The DIAL trial (level II intervention evidence) compared the implementation of frequent telephone follow-up intervention versus usual care in 1518 patients with stable chronic heart failure (GESICA investigators 2005). The purpose of the intervention was to educate and monitor patients. Care was provided from a centralised surveillance centre by nurses trained in heart failure management. The intervention included education, counselling and monitoring to support patients in adhering to management of their condition by timely medical visits, diet and drug therapy compliance. The outcome measures were all-cause mortality or hospitalisation for worsening heart failure.

In the DIAL trial, telephone calls began within seven days after patient randomisation. The intervention was based on five main objectives: adherence to diet, adherence to drug treatment, monitoring of symptoms (especially progression of dyspnoea and fatigue), control of signs of hydrosaline retention (daily weight and oedema), and daily physical activity. The nurses administered a structured interview and standardised intervention procedures. Data were recorded on every call on software designed for the trial. According to the telephone evaluation nurses could adjust the dose of diuretic or recommend non-scheduled medical or emergency visits. The first four telephone calls were made fortnightly, but could occur more often according to the needs of the patient and at the nurse's discretion. After the fourth telephone call, the interval was automatically determined, on the basis of established criteria,

using data recorded at each phone contact. Patients in the control group were followed by their attending cardiologists and received similar care to the intervention group. The outcomes from both groups are presented in Table 1.

The mean length of follow-up was 16 (range 7-27) months. Patients in the intervention group (69%) were less likely to be admitted for worsening heart failure or to die compared to the control group (relative risk reduction 20%, 95% CI [3%, 34%] p=0.026). The reduced risk of this primary end point in the intervention group was primarily explained by a reduced risk of admission for heart failure relative to the control group. The telephone intervention group reported a better quality of life as assessed on the Minnesota heart failure questionnaire than the usual care group (p=0.001).

The study reported that 16 heart failure patients would need to be called in one year to prevent one admission for worsening heart failure.

Table 1   Summary of primary and secondary end points.

End point	Intervention (%) n=760	Control (%) n=758	Relative risk [95% CI]	p value
Composite*: Death or admission	200 (26)	235 (31)	0.80 [0.66, 0.97]	0.026
Heart failure admission	128 (17)	169 (22)	0.71 [0.56, 0.91]	0.005
All cause mortality	116 (15)	122 (16)	0.95 [0.73,1.23]	0.690
All cause admission	261 (34)	296 (39)	0.85 [0.72, 0.99]	0.049
Cardiovascular admission	183 (24)	228 (30)	0.76 [0.62, 0.93]	0.006
All cause admission and/or all cause mortality	299 (39)	339 (45)	0.86 [0.73, 1.00]	0.057
Cardiovascular admission and/or all cause mortality	239 (31)	288 (38)	0.79 [0.65, 0.95]	0.01

* The Primary end point is a composite of all cause mortality or admission to hospital for worsening heart failure

At the time of preparing this prioritising summary two trials (level II intervention evidence) in a total of 529 *high-risk* patients were found that compared nurse-provided *telephone* case management of CHF patients to usual care (Larame et al 2003, Riegel et al 2002). Both studies reported statistically significant reductions (p=0.03) in hospital readmission[2], emergency visits and cost of care in the intervention groups. However, the study by DeBusk et al (2004) (level II intervention evidence) concluded telephonic case management in *low-risk* patients with CHF was no more effective than usual care.

In a 3-arm trial (level II intervention evidence) the effectiveness of a nurse telephone call intervention was compared with home telecare (a 2-way video-conference device with an integrated electronic stethoscope) and usual care (Jerant et al 2001). Both interventions resulted in significantly fewer emergency department visits (p=0.03) and readmission charges (p=.05) than usual care.

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[2] Larame et al 2003 study endpoint was 3 months, Riegel et al 2002, 6 months.

COST IMPACT

Heart failure is responsible for a significant amount of health care expenditure as patients are frequently hospitalised (Grancelli et al 2003). Hospitalisation accounts for a large proportion of health care expenditure managing patients with heart failure in Australia (AIHW 2003).

There are no precise data for Australia concerning the economic burden associated with heart failure. However, direct health costs for cardiovascular disease in 1993-94 were estimated at $3719 million (12% of total health care costs), with heart failure estimated to account for $411 million, including $140 million per annum for costs of hospitalisation and $135 million per annum for nursing home costs (Krum 2001).

There were no data available on the cost impact of the DIAL telephone case management trial at the time of writing this summary.

A recent Australian study (level III-2 intervention evidence) found that a specialist nurse managed home visit program for heart failure patients demonstrated both clinical and economic effectiveness in reducing the burden of heart failure (Stewart and Horowitz, 2003). This study reported that at three years after index admission, hospital utilisation costs were reduced by one-third relative to usual care.

In a separate Australian study (level II intervention evidence) a nurse home visitation intervention resulted in a decrease in the rate of unplanned hospital readmissions and associated health-care costs, prolonged event-free and total survival, and improved quality of life among patients with chronic CHF (Stewart et al 1999). During 6 months follow-up unplanned hospital admission occurred more frequently in the usual care group (129 vs 77 primary events; $p = 0.02$) and more intervention patients remained event-free (38 vs 51; $p=0.04$). Overall, there were fewer unplanned readmissions (68 vs 118; $p=0.03$) and associated days in hospital (460 vs 1173; $p=0.02$) among intervention-group patients. Hospital-based costs were A$490,300 for the intervention group and A$922,600 for the usual-care group.

ETHICAL, CULTURAL OR RELIGIOUS CONSIDERATIONS

Patients experiencing CHF are generally a vulnerable population group due to age and comorbidities. Although there has been considerable research effort into disease management programs for CHF patients, the lack of conclusive evidence about what type of intervention or what components of the interventions are effective may create a burden on this already vulnerable group. A recent Cochrane Review suggests that the multi-layered components of the interventions and variability of intensity and duration of interventions make it difficult to clearly assess these types of programs (Taylor et al 2005). It does suggest that the common components of specialist nurse, telephone follow up and patient education confer patient benefit and provides some (limited) evidence for reduced hospital readmission.

It follows that clearly defined, simple interventions such as the DIAL telephone management program may reduce unnecessary, complicated interventions for this patient group.

OTHER ISSUES

No issues were identified/raised in the sources examined.

CONCLUSION:

Nurse-led programmes are now in widespread clinical practice in Austrslia and New Zealand, and programmes such as heart failure management are likely to diffuse rapidly. Programmes such as this are safe, cost-effective tools in the treatment and monitoring of high-risk patients.

HEALTHPACT ACTION:

Given the availability of numerous high quality studies of CHF disease management programs it is recommended that this summary be widely distributed within the jurisdictions and clinical practices. There is no need for further research.

LIST OF STUDIES INCLUDED   TOTAL

Total number of studies
Level II intervention evidence   3

SOURCES OF FURTHER INFORMATION:

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Stewart, S. & Horowitz, J. D. (2003). 'Specialist nurse management programmes: economic benefits in the management of heart failure', *Pharmacoeconomics,* 21 (4), 225-240.

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SEARCH CRITERIA TO BE USED:

Chronic Disease
Heart Failure, Congestive/mortality/ therapy
Home Care Services, Hospital-Based
Telemedicine/ methods