Original Article

Nurse-Led Care of Heart Failure: Will it Work in Remote Settings?

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This paper reviews the role of predominantly nurse-led, multidisciplinary, chronic heart failure management programs as part of the gold-standard management of patients discharged from hospital with this syndrome. It discusses the various options for applying these evidence-based programs and how they apply to the management of those living in rural/remote Australia. Specifically, it describes the challenges of applying CHF management in remote settings and how face-to-face, family based programs of care might be particularly effective from an Indigenous perspective. Finally, it describes ongoing research to determine the best approach to CHF management in remote settings.

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Introduction: The Growing Burden of Heart Failure

Cardiovascular disease (CVD) and its most common manifestation, heart disease, affect more Australians than any other disease type. It is responsible for the greatest burden of any disease group. In 2004–2005, management of CVD was estimated to cost $5.94 billion (11% of total allocated health care expenditure) [1]. Its main components, coronary artery disease and cerebrovascular disease, are the leading killers of Australians resulting in 46,000 deaths in 2007, or 33% of all deaths [1]. A major portion of CVD-related premature mortality, morbidity and health care expenditure is attributable to the growing number of older individuals who subsequently develop heart disease as a result of chronic risk exposures (e.g. uncontrolled hypertension [2]) and/or improved survival rates from an acute coronary event [3]. A major component of this growing burden is chronic heart failure (CHF).

Unique population data from Sweden clearly showed that the number of de novo cases of CHF requiring hospital care during 1988–2004 was double that associated with the most common cancers (men and women combined) [4]. Moreover, these, and corollary data from wider Europe [5] and, indeed Australia [6] clearly demonstrate that despite steady improvements in survival trends, the overall prognosis for CHF patients remains poor. Five-year survival rates are still <50% in most age-groups and premature life years lost comparable if not greater (in both sexes) than the most common forms of cancer [4]. Western Australia-linked data-set findings demonstrate the overall burden of CHF hospitalisations (particularly due to non-ischaemic causes where the evidence for effective treatment is most scarce) is increasing [6]. Consistent with other high income countries, therefore, Australian data (non-individual linked) showed an absolute increase of 5.3% in the number of separations with a primary diagnosis of HF during 1996–2004 [7]; despite the same age and sex-standardised separation rates declining from 2.0 to 1.7 per 1000 population from 1996–97 to 2003–04.

Geographical Challenges

As highlighted by the recently published description of CARDIAC-ARIA [8], an objective, geographic measure to quantify access to Australian cardiac services, around two thirds of all Australians have ready access to all acute and aftercare services. However, around 6 million people (of whom 60% are Aboriginal and Torres Strait Islanders and 32% aged ≥65 years) reside in less accessible regions of Australia where there is a clear mismatch between levels of chronic disease and accessible health care services. Previous data mapping the location of CHF management programs (CHF-MPs – see below) relative to the likely distribution of the CHF patient population in Australia clearly reinforce the mismatch between supply and demand for such services [9].

Historical Development of CHF Management Programs

CHF-MPs, defined as a systematic approach to health service delivery specifically applied to meet the challenging needs of individuals affected by CHF, now form part

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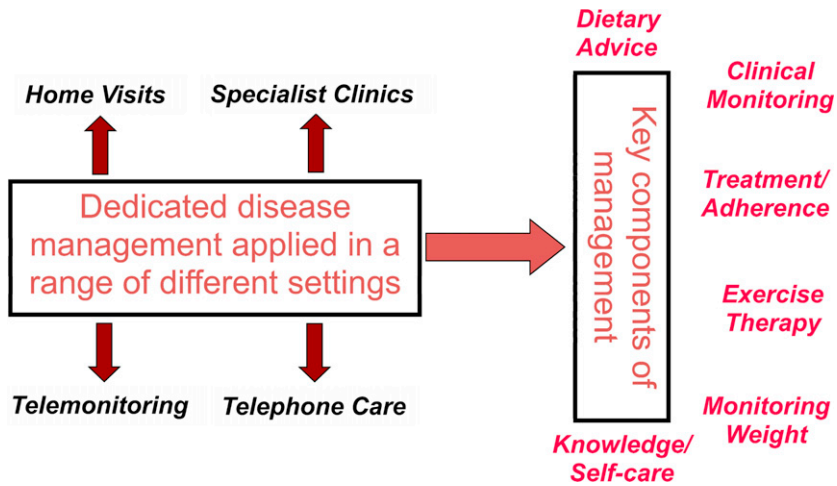

Fig. 1. *Structured components of heart failure management can be applied in different settings.*

of the gold-standard management of the syndrome [10]. Following the publication of seminal randomised trials undertaken in the 1990's [11–14] meta-analyses confirmed the benefits of CHF-MPs in reducing re-admission rates, improving quality of life, reducing costs and prolonging survival relative to usual care in those recently hospitalised with the syndrome [15]. However, translation into practice is often imperfect. This is mainly attributable to a lack of rigour in diagnosing CHF and selective application of key components integral to effective CHF management [16]. Moreover, there is continued debate about the best approach to CHF management to optimise health outcomes [17]. As such, there is increasing awareness of the need for rigorous pragmatic trials of different forms of CHF-MP to determine the most cost-effective modality and indeed components of management in order to address persistently high levels of CHF-related morbidity and mortality – see Fig. 1.

The Role of Remote Management in CHF

In parallel to the refinement of face-to-face forms of CHF-MP, there has been increasing interest in remote management of CHF [17,19]. Two essential approaches have been applied singularly and in different combinations. The first of these is structured telephonic support (*using the telephone to communicate* [*mostly verbal*] *with patients in a structured manner – including gaining feedback on clinical data – using automated systems*) and the second is telemonitoring (*more advanced remote technology that provides bio-feedback on clinical parameters in an automated manner*). A Cochrane Review of the evidence to date [19], concluded that both types can significantly reduce CHF-related hospitalisations and to a more modest extent all-cause hospitalisations relative to "usual care". The more costly option of telemonitoring alone was also found to convey all-cause survival benefits. However, the negative results of two large, contemporary trials undertaken in Europe [20] and USA [21] clearly identify the need to determine the potential impact of remote management as an adjunctive (rather than exclusive or singularly applied) strategy to improve gold-standard care provided by face-to-face CHF-MPs.

Which form of CHF-MP is Best?

The caveats surrounding remote management techniques to facilitate the management of CHF relative to more direct and personal approaches are reinforced by a pooled (individual patient data) analysis of a number of trials of different forms of CHF-MP. This study clearly demonstrated the superiority of those CHF-MPs involving: (a) face-to-face as opposed to remote management and (b) multidisciplinary as opposed to single person programs of care [22]. If one accepts that, as suggested by these data and previous meta-analyses [15], face-to-face programs are more effective than remote programs of care, which form of the latter is best?

This specific question was addressed by the Which Heart failure Intervention is most Cost-effective & consumer friendly in reducing Hospital care (WHICH?) multicentre, randomised trial undertaken by our group [23]. We postulated there were important differences between clinic and home-based CHF-MPs in respect to cost of health care and consumer preferences [23,24]. The study cohort comprised 280 hospitalised CHF patients (73% male, aged 71 ± 14 years and 73% with LVEF $\leq$45%) randomised to outreach, home-based intervention (HBI) or outpatient specialised CHF clinic-based intervention. During study follow-up, 102/143 (71%) home-based versus 104/137 (76%) of those managed through the CHF clinic experienced the primary endpoint of all-cause hospitalisation or death (adjusted HR 0.97; 95% CI 0.73–1.30; $p = 0.861$) during 12–18 month follow-up. However, the former had fewer days of hospitalisation overall. Moreover, total health care costs ($A3.93 versus $.53 million) was significantly less in the home-based intervention group ($p = 0.030$). We concluded, therefore, that whilst home-based care was not superior to that applied via a specialist CHF clinic in reducing all-cause death or hospitalisation, attributable to less hospital stay, it significantly reduced health care costs [25].