Heart, Lung and Circulation (2014) **23,** 391–406
1443-9506/04/$36.00
http://dx.doi.org/10.1016/j.hlc.2013.12.005

REVIEW

Implementing Guideline Based Heart Failure Care in the Northern Territory: Challenges and Solutions

Pupalan Iyngkaran, FRACP[a*], Melanie Harris, PhD[b,1], Marcus Ilton, FRACP[c,2], Nadarajan Kangaharan, FRACP[d,3], Malcolm Battersby, FRANZCP FAChAM PhD[e,4], Simon Stewart, FCSANZ[f,5], Alex Brown, MPH PhD[g,6]

[a]Consultant Cardiologist, Senior Lecturer Flinders University, Royal Darwin Hospital, Rocklands Drive, Tiwi, PO Box 41326, Casuarina NT 0811
[b]Senior Research Fellow, Flinders Human Behaviour and Health Research Unit, Flinders University, GPO Box 2100 Adelaide SA 5001
[c]Director of Cardiology, Royal Darwin Hospital, Rocklands Drive, Tiwi, PO Box 41326, Casuarina NT 0811
[d]Director of Medicine/Consultant Cardiologist, Royal Darwin Hospital, Rocklands Drive, Tiwi, PO Box 41326, Casuarina NT 0811
[e]Flinders Human Behaviour and Health Research Unit (FHBHRU), Margaret Tobin Centre, Flinders University, Bedford Park, South Australia, Australia 5001
[f]Director NHMRC Centre of Research Excellence to Reduce Inequality in Heart Disease, Baker Heart and Diabetes Institute, 75 Commercial Road, Melbourne VIC, 3004, Australia
[g]Professor of Population Health and Research Chair Aboriginal Health School of Population Health, University of South Australia & South Australian Health & Medical Research Institute, Adelaide

Received 28 November 2013; accepted 8 December 2013; online published-ahead-of-print 17 December 2013

The Northern Territory of Australia is a vast area serviced by two major tertiary hospitals. It has both a unique demography and geography, which pose challenges for delivering optimal heart failure services. The prevalence of congestive heart failure continues to increase, imposing a significant burden on health infrastructure and health care costs. Specific patient groups suffer disproportionately from increased disease severity or service related issues often represented as a ''health care gap''. The syndrome itself is characterised by ongoing symptoms interspersed with acute decompensation requiring lifelong therapy and is rarely reversible. For the individual client the overwhelming attention to heart failure care and the impact of health care gaps can be devastating. This gap may also contribute to widening socio-economic differentials for families and communities as they seek to take on some of the care responsibilities. This review explores the challenges of heart failure best practice in the Northern Territory and the opportunities to improve on service delivery. The discussions highlighted could have implications for health service delivery throughout regional centres in Australia and health systems in other countries.

Keywords Heart Failure • Indigenous • Nurse led care • Remote • Self-Care • Telemedicine

*Corresponding author. Tel.: +618 8920 6250., Emails: balaniyngkaran@hotmail.com, melanie.harris28@flinders.edu.au, marcus.ilton@gmail.com, kanganada@gmail.com, malcolm.battersby@health.sa.gov.au, simon.stewart@bakeridi.edu.au, alex.brown@sahmri.com
[1]Tel +618 8404 2615.
[2]Tel: +618 8920 6250.
[3]Tel: +618 8920 6250.
[4]Tel: +618 8404 2314.
[5]Tel: +61 438 302 111.
[6]Tel: +618 8116 4427.

Introduction

Congestive heart failure (CHF) occurs in 1.5 to 2.0% of Australians, is associated with comorbidities, high morbidity and mortality, and is usually irreversible. It is a leading cause for hospital admissions and GP consultations and has the highest 30-day readmission for all hospitalised medical conditions, approaching 30%. It requires daily attention, much of which can be imposed on caregivers. This increased cost and imposition on family members can strain already stretched health systems, divert funds from other essential services and fracture strained social dynamics. The Northern Territory (NT) of Australia is unique in its demography, a multicultural population with greater than 30% Indigenous residents, the highest of any Australian state. Its geographical mass is six times that of Great Britain but 250 times less populated. NT and rural Australians are challenged with access and service availability factors, while the Indigenous community battles additional variables of increased severity of CHF, pre-existing co-morbidities, social, economic, language and cultural factors, poor access to preventative care for high risk groups and poor uptake of post-discharge services such as cardiac rehabilitation [1–10]. These harsh realities dent morale but it is important for us not to appear pessimistic. Australia along with many other OECD nations share common examples of positive development in HF management. Firstly, the concept of ''Heart Failure Services'' or programs that deliver comprehensive and coordinated HF best practice; secondly, where gaps exist The OPTIMIZE-HF study has demonstrated that even simple practice changes in tertiary health care can significantly improve outcomes [5]; thirdly, ongoing governmental and community support with examples of electronic health records and ''Closing The Gap programmes''; fourthly, the availability of world class research and education infrastructure that can support think tanks, translational policies and databases to follow the outcomes, are but a few examples.

The discrepancies between lagging outcomes and positive developments again raise the questions ''Why does there continue to remain such large gaps in this developed nation?'' and ''What can we do to improve this?'' It does appear that advancements that have led to improved health outcomes for Australians as a whole have not translated to its rural citizens, in conjunction with improved urban health accentuating the stagnating rural health. While these factors are also shared by many heath systems, in the NT we have to accept that its demography and geography are crucial factors. As these factors are likely to persist, this review will focus on describing the problems and practice changes that are likely to deliver better health care when faced with issues of resource availability, cultural diversity and geographical distances. We describe the CHF burden in the NT; we explore a cultural view of illnesses focusing on Indigenous and Western paradigms; and the role of a collaborative allied health and technology approach in comprehensive CHF care. Issues of pharmacology are discussed elsewhere [9]. We are well aware of the many various systems and paradigms; however, the broader themes discussed may have universal appeal.

The Size of the Problem and Unmet Needs

Disease Burden, Geography and Northern Territory Health Service Structure

The true prevalence of CHF in the NT is unknown and is likely to be underrepresented as national sampling usually under investigates very remote areas. Themes from previous studies support a greater prevalence in the community as a whole and are even higher among Indigenous Australians [10], approaching 40% in Far North Queensland [11]. There are deficiencies in all aspects of CHF services including underutilisation of echocardiography and pharmaceuticals. Comparing national benchmarks for cardiac service utilisation, the unmet specialist care needs is speculated to approach 66% [3]. Extrapolated data from the most vulnerable group, the Indigenous population, suggest significant differences in disease burden, severity, and age of presentations where incidence rates could be 30 times greater in groups aged 25-29, but lower at 70-74 years (2-3 times), with 1.5 times greater overall case fatality [12] and disparities in all treatments including invasive procedures [13]. Additional differentials exist in life expectancy, final high school year educational level, labour force participation, home ownership, financial stress, funding basic living expenses, reported good health and cigarette smoking and alcohol use. The majority of the NT resident population, (229,500 June 2010), live around two major cities and three smaller towns. In contrast, 63% of Indigenous Territorians live in very remote areas, constituting 130 discrete communities, with 70 spoken languages. Four regions divide the NT public health system: Darwin, East Arnhem, Katherine (Top End) and Central Australia. There are five public hospitals and two tertiary referral centres. These factors affect CHF Service delivery [3,4]. Box 1 and Box 2 summarise the key demographics and services involved for comprehensive HF care.

Heart Failure Programs, Clinical Resources and Challenges of Applying HF Guidelines

There is no longer any ambiguity that interventional HF programs led by HF specialist nurses reduce CHF related readmissions, all cause readmissions and all cause mortality. When we review the resources needed to implement guideline-based practice with on the ground realities of health staff availability, geographical distances and cultural diversity this task is challenging (Box 3). From an idealistic perspective, CHF programs implement guidelines with a health provider (clinician versus nurse centred) or client (self-management) focus, usually a combination. Within this