

Cardiovascular Health Network

Heart Failure Model of Care

Health Networks Branch
Working Together to Create a Healthy WA





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EXECUTIVE SUMMARY

The Model of Care for Heart Failure in Western Australia (The Model) provides the policy framework for the prevention, detection and management of heart failure. The Model was developed by the Cardiovascular Health Network Heart Failure Project Group, which comprised of a multi-disciplinary team of expert health professionals. The Model draws together the evidence in relation to best practice and consultation with people with heart failure, their carers and other stakeholders. The Model has been informed by the following:

- The Guidelines for the Prevention, Detection and Management of Chronic Heart Failure in Australia, 2006 ¹
- WA Health Promotion Strategic Framework 2007-2011 ²
- The Chronic Conditions Framework for Western Australia 2005 ³
- The National Service Improvement Framework for Heart, Stroke and Vascular Diseases 2005 ⁴
- Putting Prevention into Practice: An Education Manual and Smoking, Nutrition, Alcohol and Physical Activity: A population health guide to behavioural risk factors in General Practice ⁵
- Healthy Lifestyles 2002-2007: A Strategic Framework for Primary Prevention of Diabetes and Cardiovascular Disease in WA ⁶

Heart failure is a condition that is a great burden on the community, estimated to occur in 1.5-2.0% of Australians with a point prevalence of approximately 1% in people aged 50-59 years, 10% in people aged 65 years or more, and over 50% in people aged 85 years or more ¹. In WA during 2005/06, there were 3,924 admissions for heart failure in the hospital sector, which accounted for 30,314 bed days ⁷. Moreover, there were 7,040 admissions for people with heart failures who presented for another reason, but who also had heart failure ⁷. Primary, tertiary and community providers play an important role in the delivery of long term care and support of people with heart failure, across a range of services and settings.

The Model aims to ensure people with heart failure receive the right care, at the right time, by the right team and in the right place. The Model focuses on the provision of patient-centred care with the inclusion of carers ⁸ and aims to ensure that services are available in the most appropriate location, ideally with additional resources in the community. The Model is applicable to all age groups because it is geared towards individualisation, supported by care planning. The Model emphasises:

- **Primary and secondary prevention** and health promotion to support healthy lifestyles and risk reduction in support of self-management in the well population. Hypertension is noted as a major biomedical risk factor for heart failure.
- **Early detection, assessment and management** of heart failure in order to improve quality of life, slow the progression of the condition, and reduce invasive treatments and preventable hospital admissions. There will be early



engagement of appropriate community-based services with seamless transition to specialist services, including palliative care, when appropriate.

- **Integration** between State and Commonwealth sectors and health professionals through: agreed heart failure care planning; application of shared care models; telephone support; comprehensive community-based services, in line with an endorsed set of evidence-based guidelines and consumer pathways.
- Provision of **education** to people with heart failure and their carers based on self-management principles to enable maximisation of symptom control, health and wellbeing.
- **Building the capacity of the workforce** to meet the need to manage the complex requirements of people with heart failure within the community.
- Delivery of **optimal patient care** in line with evidence-based guidelines, development and implementation of new initiatives to meet service delivery gaps, and future research supported by integrated clinical information systems.

To support the transition from the current service provision to The Model, the establishment of expanded heart failure services, particularly community-based services, are required to support the delivery of high quality care with equitable access state-wide. These services will operate as an integrated network and maintain a clinical leadership role. Central to heart failure care will be the use of care management plans which are individualised, patient-centred, and require multi-disciplinary input.

To support the early diagnosis of heart failure and provision of best practice care, health professional education for the detection, assessment and management of heart failure will be enhanced. An endorsed set of evidence-based guidelines and patient pathways will be promoted, and a central resource directory for heart failure services in WA will be developed to be accessible to health professionals and the community.

Partnerships are key to driving the implementation of The Model. Key organisational partners include the Aboriginal Community Controlled Health Organisations, Aged Care Panels, Area Health Services, and General Practice Networks. Information and Communication Technologies have the potential to enable seamless high quality care through care planning which is integrated across hospital and community public health services.

Ten recommendations have been developed to support the implementation of the principles and components of The Model.



ACKNOWLEDGEMENTS

There have been many individuals who made key contributions to the development of The Model.

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METHODOLOGY

The Cardiovascular Health Network identified heart failure as a priority area where improvements could be made to improve prevention, detection and management of heart failure at the state-wide level. The Heart Failure Project Group was established in June 2007, to develop the Model of Care for Heart Failure for Western Australia.

The Project Group analysed the current service provision, service utilisation, gaps in service and literature pertinent to heart failure. In February 2008, telephone interviews were conducted and a workshop was hosted for people with heart failure and their carers, seeking the community perspective on current services and their priority areas for improvement. Forty-five people with heart failures and carers discussed their experiences with the various services, shared what had worked well for them and suggested areas for service improvement. The information gathered from the consultation was used to inform the development of The Model.

The Cardiovascular Health Network Executive Advisory Group endorsed The Model in July 2008.



1.0 HEART FAILURE

1.1 Definition of Heart Failure

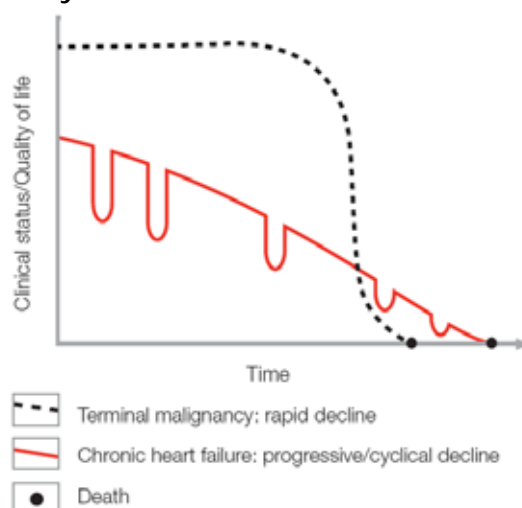
Heart failure is a condition where the heart function is impaired and the heart fails to pump blood effectively around the body^{1, 9}. Most commonly, it occurs in diseases that impair or overload the heart such as heart attack, hypertension or damaged heart valve(s). It can occur suddenly, although it usually develops over a period of years.

The National Heart Foundation of Australia and the Cardiac Society of Australia and New Zealand note that the definition of chronic heart failure includes either systolic or diastolic dysfunction heart failure (with preserved systolic function) of the ventricle(s) or a combination of both¹. The definition used in the Guidelines for the Prevention, Detection and Management of Chronic Heart Failure in Australia has been applied in The Model:

“a complex clinical syndrome with typical symptoms (eg. dyspnoea, fatigue) that can occur at rest or on effort, and is characterised by objective evidence of an underlying structural abnormality or cardiac dysfunction that impairs the ability of the ventricle to fill with or eject blood (particularly during physical activity)¹.”

It is important to highlight that the typical trajectory of the condition can be described as cyclical with progressive clinical instability. The diagram below illustrates the heart failure trajectory and contrasts it with terminal malignancy.

Figure 1. The typical trajectory of heart failure compared to a terminal malignancy¹





1.2 Causes of Heart Failure

The most common causes of chronic heart failure are coronary heart disease and prior myocardial infarction, hypertension and diabetes ¹. Data on the current burden of these conditions are presented below:

The Australian Institute of Health and Welfare ¹⁰ reports that:

- 28.8% of adults have treated or untreated hypertension
- 7.5% of adults or 950,000 Australians have diabetes
- 1.9% or 367,000 Australians have diagnosed coronary heart disease.

Other less common causes are diseases of the heart muscle (cardiomyopathy) which is present in approximately 5-10% of new cases of heart failure, diseases of the heart valves (such as with rheumatic heart disease) and arrhythmias ¹. One of the uncommon risk factors for dilated cardiomyopathy is pregnancy.

1.2.1 Risk Factors for Heart Failure

A number of the causes of heart failure, such as coronary heart disease are preventable. A significant proportion of the burden of coronary heart disease is attributed to the following risk factors: unhealthy diet, physical inactivity, obesity, diabetes, tobacco use and harmful alcohol use. It is important to highlight that hypertension is a major biomedical risk factor for heart failure.

Table 1. Risk Factor Prevalence in Australia ¹⁰

Behavioural Risk Factors	
Poor Diet	85.6% have inadequate vegetable consumption 46% have inadequate fruit consumption
Physical inactivity	34% of adults are not sufficiently active
Tobacco Smoking	21.3% of adults are current smokers
Excessive alcohol use	13.5% of adults demonstrate excessive alcohol use
Biomedical Risk Factors	
Excess weight	53.5% of adults are overweight or obese
High cholesterol	51.2% of adults have high cholesterol
Hypertension	28.8% of adults have hypertension



1.2.2 A Focus on Hypertension

The prevalence of hypertension in WA in 2005-2006 was estimated at 24.7%, with the number of adults who reported having hypertension in WA during the same period estimated at 379,200¹¹. This is displayed in Table 2.

Table 2. The prevalence of hypertension in WA in 2005-2006 (%)¹¹

Gender	Age (years)				
	35-44	45-54	55-64	65-74	75+
WA Males	8.3%	16.9%	32.7%	42.2%	45.5%
WA Females	6.0%	14.3%	30.5%	46.2%	54.9%

1.3 The Current Burden of Disease

1.3.1 Morbidity and Mortality Data

There is no population-based data on the incidence and prevalence of heart failure in Australia⁹. However, it is estimated that chronic heart failure occurs in 1.5-2.0% of Australians with a point prevalence of approximately 1% in people aged 50-59 years, 10% in people aged 65 years or more, and over 50% in people aged 85 years or more¹.

Although heart failure is associated with the elderly population, the prevalence is also high among the middle aged Indigenous population⁹. A recent geo-mapping study identified that there are many areas of high chronic heart failure prevalence outside capital cities, which are typically populated by Aboriginal and Torres Strait Islander communities and people over 65 years old¹².

The number of Australians with heart failure is likely to increase in the future due to ageing of the population, improved survival from heart attack and heart failure, the increased prevalence of diabetes and obesity in the population and the wider use of sensitive diagnostic technology⁴.

1.4 Hospitalisations for Heart Failure

In contrast to other conditions, heart failure is associated with high levels of health service utilisation across the various settings of care. However there are challenges in retrieving reliable data specific to heart failure service provision beyond hospitalisation data.

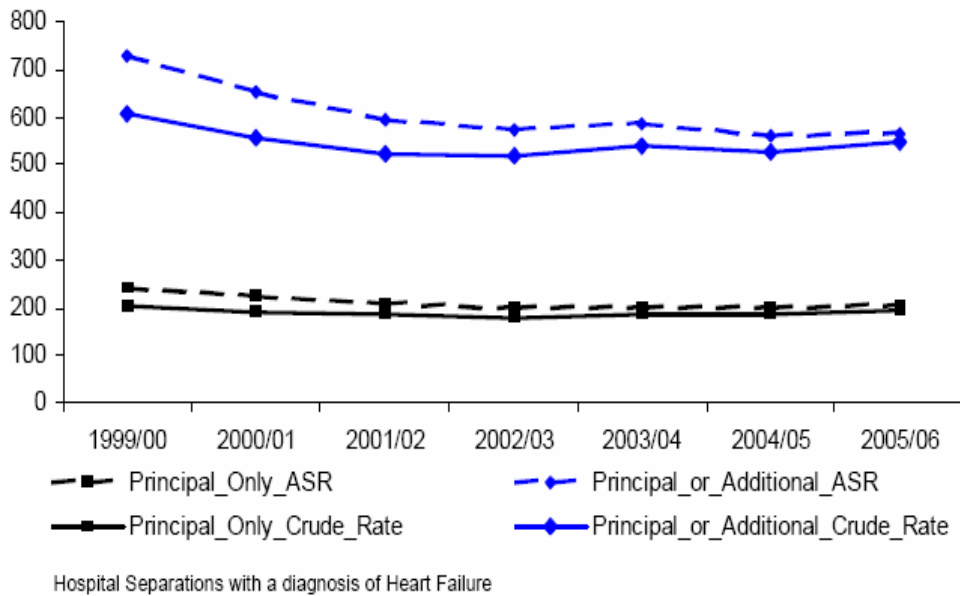
Hospitalisation data does not reflect the true burden of disease or demand for services, particularly in primary care; however, a large component of the cost incurred in treatment of heart failure is expended on hospital-based care^{13, 14}.

The age-standardised hospitalisation rate has decreased significantly by an average annual rate of 2.77% over the last seven years (Figure 1). The extent to



which this will offset increases in heart failure due to the aging population is uncertain.

Graph 1. WA Hospitalisation rates with a diagnosis of heart failure (Principal or Additional Diagnosis vs Principal Only), age standardised rate per 100,000 persons ⁷



Hospitalisation data specific to 2005/06 is presented in Table 6.

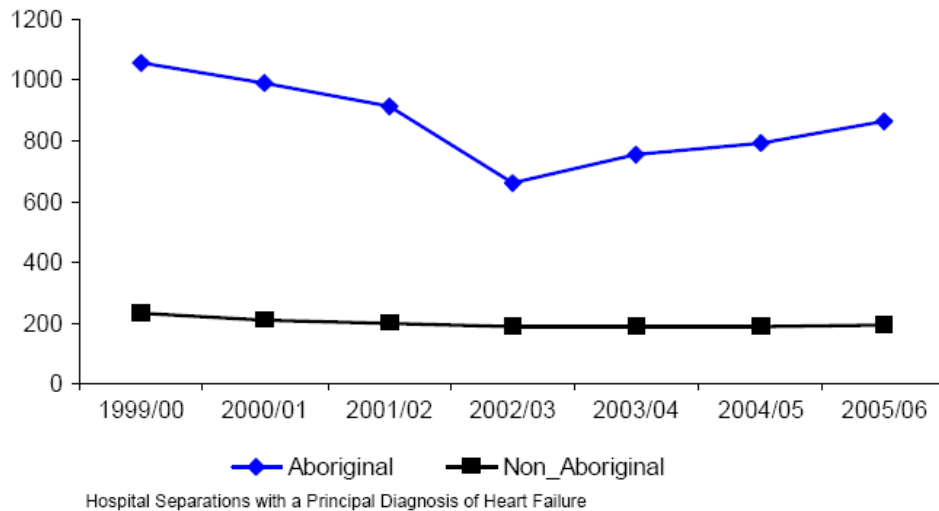
Table 3. WA Hospitalisations with a diagnosis of heart failure, 2005/06 ⁷

Diagnosis	Separations	Total Bed Days	Average Length of Stay (days)
Principal Diagnosis (Aboriginal and Non-Aboriginal)	3,924	30,314	7.73
Principal Diagnosis (Aboriginal)	272	1,315	4.83
Principal or Additional Diagnosis (Aboriginal and Non-Aboriginal)	10,964	-	-

Of those hospitalised with a principal diagnosis of heart failure, information is presented on the patient's residential address, age profile and Aboriginality in Figures 2 and 3 respectively.

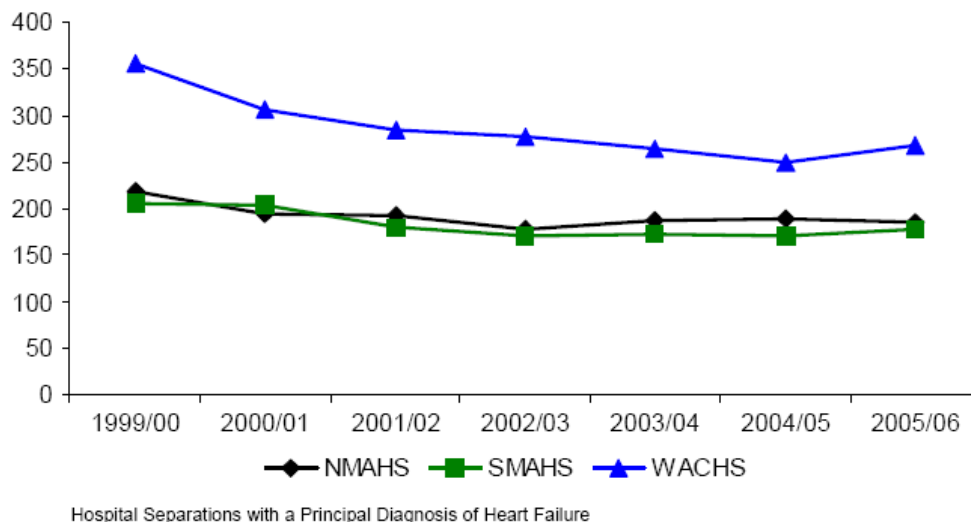


Graph 2. WA Hospitalisation rates with a diagnosis of heart failure (Aboriginal and Non-Aboriginal), age standardised rate per 100,000 persons ⁷



Heart failure hospitalisation rates for the Aboriginal population are on average more than four times that of the Non Aboriginal population.

Graph 3. WA Hospitalisation rates with a diagnosis of heart failure, according to patient's residential address, age standardised rate per 100,000 persons ⁷



People with heart failure living within the WA Country Health Service had higher hospitalisation rates for heart failure than those living in metropolitan areas. North and South metropolitan areas had similar hospitalisation rates. However, the average length of hospitalisation stay for heart failure does not vary significantly among residents of the three areas.



2.0 CURRENT SERVICE PROVISION FOR HEART FAILURE

The Chronic Conditions Framework for Western Australia ³ highlighted that people with chronic conditions such as heart failure access services from primary, tertiary and community providers across a range of settings, at different times in the progression of their condition. Additionally, many people with heart failure also have other conditions (comorbidities), and recognition and management of these conditions is an important component of overall care.

2.1 Current Service Provision

There are a range of heart failure services across the care continuum that are currently provided by the public, private and non-government sectors in Western Australia. Basic baseline data on a number of heart failure services was collected by the Heart Failure Project Group as part of the development of The Model.

Table 4. Current Service Provision for Heart Failure

Transplant services	<ul style="list-style-type: none"> ■ Royal Perth Hospital Advanced Heart Failure and Cardiac Transplant Service
Hospital Based Heart Failure / Cardiac Rehabilitation Programs*	<ul style="list-style-type: none"> ■ Sir Charles Gairdner Hospital Cardiac Rehabilitation and Heart Failure Service ■ Royal Perth Hospital Cardiac Rehabilitation Service ■ Hollywood Private Hospital WA Cardiac Rehabilitation Service
Community-based cardiac rehabilitation	<ul style="list-style-type: none"> ■ Heartbeat Cardiac Rehabilitation Program ■ WA Cardiac Rehabilitation Service - Community Sites
Ambulatory care services for chronic disease	<ul style="list-style-type: none"> ■ Heart Failure Clinic for Older People at Joondalup Health Campus ■ Chronic Disease Management Teams ■ Community Physiotherapy Service ■ Disease Management Unit ■ Phone Coaching ■ Remote Telemonitoring Trial ■ South West Chronic Disease Management Program
General services	<ul style="list-style-type: none"> ■ Echocardiography Services ■ General Practice ■ Health Call Centre Services - Health Direct and Residential Care Line ■ Palliative Care Services ■ Pharmacy (hospital and community) ■ Specialist cardiology, general medicine and geriatric medicine (hospital outpatients /private rooms)



Heart failure resources	<ul style="list-style-type: none"> ■ National Heart Foundation of Australia and the Cardiac Society of Australia and New Zealand - Guidelines for the Prevention, Detection and Management of Chronic Heart Failure in Australia, 2006 ■ National Heart Foundation of Australia Consumer Booklet including Action Plan - Living Well with Chronic Heart Failure, 2008 ■ Kimberley Aboriginal Medical Service - Protocols for Heart Failure ■ WA Health - Clinical Priority Access Guidelines for First Specialist Assessment of Heart Failure
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* Nil specific heart failure service and limited non-heart failure specific exercise classes provided at Fremantle Hospital.

It is acknowledged that there may be other services offering care to people with heart failure as a part of more generic programs.

2.2 The Community Perspective on Heart Failure Services

To inform the development of The Model the Cardiovascular Health Network sought the perspective of people with heart failure and their carers. In February 2008, a community workshop was hosted by the Health Networks Branch, and telephone interviews were also conducted. Forty-five people with heart failure and their carers reflected on their experience and identified what had worked well for them, what had not and the areas for improvement.

The views received varied widely amongst people, however some common themes emerged from these discussions around what was working well and the areas for improvement.

Question: What services are working well for you?

Generally people spoke highly of the services they accessed and of services meeting their needs.

People thought that teamwork between health professionals, and a good relationship between the specialist, General Practitioner, pharmacist and others, was essential. The specific elements of their care that people considered working well included:

- Receiving **information** about heart failure, management and medications, and providing ongoing support.
- Accessible **clinical support and advice** from General Practitioners, Cardiologists, and health professionals, including being able to telephone

"I don't feel confident or safe enough to do exercise at home."

"It's so important to know about the condition and how the different medicines interact"



health professionals for advice.

- Applying a **holistic** or whole person approach to services and care.
- Providing retraining and **rehabilitation** services.
- Supervised hospital or community-based **exercise programs** to structure exercise time, enhance confidence to exercise, make people with heart failure feel safe and maintain their motivation to exercise.
- Meeting other people with heart failure and their carers to share experiences, as a means of **networking**, and making new friends.

"The nurse at the hospital rings me at home, and I am able to ring her when I feel unwell or have any questions."

"Until I started exercising I was going backwards."

Question: What services are not working well for you?

Based on the experience of individual people and carers, there were some elements of their care that had not worked well for them. Some reflected on their own experiences and discussed the challenges associated with learning to live with heart failure.

"It is hard not being able to do what I used to be able to do, and learning to accept that."

The views of what was not working well varied widely amongst those consulted; however, some common themes emerged from discussion:

- Limited links between hospitals, General Practitioners and other health professionals, and **limited information sharing, communication and coordination**. People recalled experiences about not knowing what to do when they received conflicting advice, particularly about medications.
- Difficulties getting **support and advice** after hours, and delays getting appointments with General Practitioners and specialists.
- Lack of **home support** for those that lived alone. People with heart failure and carers commented on limited or costly services available for home help for cooking, cleaning and gardening.
- Delayed **referral** to appropriate services, as well as limited patient and carer **awareness of the services and programs** that are available for heart failure management and support.
- People with heart failure who completed hospital based exercise programs viewed them positively, but sought similar services closer to home for **ongoing exercise**. Those who were advised to follow a home exercise program reported that

"I felt very supported in hospital and then isolated once out of hospital"

"People don't know much about heart failure. They need to know that there are various forms of heart disease and heart failure is just one."

"I didn't know how to tell my children about their father's condition. There were no information materials on this and I didn't know anyone that I could speak to who had gone through something similar."



they either lost motivation, or did not feel confident or safe enough to follow it.

- Lack of **emotional and peer support** to enable people with heart failure, carers and their families to come to terms with how to deal with a major illness.
- Variable care coordination and established linkages between heart failure services and rural hospitals to support **country people with heart failure**.
- **Information and educational resources** were considered difficult to understand. People with heart failure and carers commented that at times resources were not provided at the most appropriate time.
- Low **community awareness** of heart failure and the prognosis. People with heart failure and carers thought there was also a stigma around the term 'heart failure'.

Question: What are the areas for improvement?

Based on their experience, people commented on the areas that should be improved in future for people with heart failure.

- Improve **care coordination and communication** between health services and health professionals.
- Provide after hours **telephone support and advice**, which is available for people who are worried or slightly unwell but not sick enough to go to hospital.
- Expand **community-based group exercise programs** and include information and support for people with heart failure completing a home based exercise program.
- Improve **community awareness** of the condition and the symptoms of heart failure, which can be similar to the symptoms of other conditions such as asthma.
- Improve access to **quality patient information resources**, particularly about medications.
- Provide nurse-led education sessions in major **rural centres** to complement existing specialist clinics.
- Encourage **peer support** for people with heart failure and carers to address the emotional components of care and facilitate the sharing of ideas and solutions.

2.3 The Gaps within the Current Service Provision for Heart Failure

The Heart Failure Project Group also considered the perceived gaps within current service provision from a health professional or provider perspective.

2.3.1 Prevention Gaps

- Late diagnosis of and/or under-treatment of **hypertension** ¹⁵.



2.3.2 Detection and Assessment Gaps

- Variable levels of **health assessment** for those at risk.
- Lack of good evidence for or against **screening** of asymptomatic populations.
- **Diagnostic delay** due to under-recognition of early heart failure symptoms by people with heart failure and health professionals. A large proportion are diagnosed at hospital presentation and require admission, but have had symptoms for many months.
- **Late referral** for echocardiography in some cases ¹⁶.
- Limited capacity to perform **public echocardiography**. It is recommended that echocardiography be conducted for all with suspected heart failure ¹; however, given the limited availability of public sector services, the bulk of echocardiography is done in the private sector. Additionally, echocardiography results are not shared across health services leading to greater **duplication of investigations**.
- The **role** of echocardiography in identifying heart failure with preserved systolic function needs to be clarified.

2.3.3 Service and Workforce Gaps

- Inadequate support for all people with heart failure to **reach target doses of heart failure medications** (ACE/ARB Inhibitors and B-Blockers) and to manage changing requirements for diuretic medication ¹⁷⁻¹⁹.
- Lack of **specialised knowledge on heart failure management** resulting from limited educational opportunities and a lack of coordinated clinical leadership. Lack of formalised **medical specialist consultancy services** for chronic disease with a broad scope of practice which includes heart failure. This may contribute to a lack of **consistency in care** delivered by health professionals who may deal with people with heart failure including, but not limited to, community health professionals, general practice, geriatricians and general physicians.
- Limited **resources and capacity of services providing heart failure care** to enable networked and integrated heart failure management across the state. Large areas of the metropolitan area, and rural and remote regions remain **without a service within a reasonable distance**, particularly for exercise.
- Lack of **community programs** for people with **moderate to severe heart failure**, given that there are community-based services available for mild to moderate people with heart failure.
- **Community Physiotherapy Services** is an established service with a metropolitan-wide infrastructure that currently does not receive **funding for specific heart failure classes** despite increasing demand.
- Limited capacity and **funding for self-management programs** promoting lifestyle modification for those with, or at risk of, cardiovascular disease.
- Lack of **programs for high risk people with heart failure** who are unable to access tertiary centres for physical activity maintenance programs. In



addition, there is a lack of physical activity and education programs which are provided **outside of business hours** for working heart failure consumers.

- **Delayed referral to palliative care services.**
- Unmet need in the heart failure population for **palliative care** in relation to symptom management, psychosocial support for people with heart failure and family, informed open communication and choice regarding end of life care ²⁰. This includes lack of **chronic palliative care services** which are able to provide long-term care in a manner which supports the typical trajectory of people with heart failure.

2.3.4 Service Gaps for Select Population Groups

- Limited support for people with heart failure who experience **barriers accessing care**, including those associated with cost, transport and time.
- Limited funding for project development and programs culturally appropriate for **Aboriginal and Torres Strait Islander and Culturally and Linguistically Diverse** people with heart failure. In particular, in 2005/06, the Aboriginal population were four times more likely to be hospitalised for heart failure than the Non Aboriginal population ⁷.
- Services are concentrated within the metropolitan area, with few programs available in **rural and remote regions** ¹². In addition, there is less frequent use of **recommended diagnostic methods and pharmacological treatments** among people with heart failure in rural areas ²¹. This may account for the fact that in 2005/06, people with heart failure living in the country had higher rates of hospitalisation ⁷.

2.3.5 Process and Procedural Gaps

- **Lack of care coordination** of people with heart failure, particularly those with **multiple co-morbidities and for inpatients post discharge**. This may result in numerous patient appointments in a given week. Variable use of formalised and agreed **care management plans**, leading to poor understanding of health professional and patient responsibilities. Variable use of formalised **general practice recall registers** for monitoring and follow up of people with heart failure.
- Lack of locally endorsed and comprehensive **implementation of guidelines** for the prevention, detection and management of heart failure. Similarly, lack of awareness of defined guidelines and processes for referral.

2.3.6 Research Gaps

- A better understanding of the local epidemiology of heart failure is required to inform planning of services for heart failure and demand management.
- Other examples include, but are not limited to, continuing research into appropriate use of current and new treatment modalities, optimal service delivery and the benefits of echocardiography screening. In particular, building on the Cochrane Review of Clinical Service Organisation for Heart Failure 2005 ²², a meta-analysis which encompasses more recent research into the effectiveness of heart failure services would be helpful in guiding future decision making. Where national and international studies are not adequately addressing research needs, local investigation may be required.



2.4 The Current Patient Journey

People with heart failure have a wide range of experiences. Using references from actual patient stories, the story of 'Kevin' has been developed to capture some of the common experiences of people with heart failure.

Kevin, a 69 year old man with type II diabetes, was experiencing symptoms of breathing difficulties when he exerted himself.

I decided I had better go and see my GP as when I walked I felt like my breathing was tight. He listened to what I said, put the stethoscope on my chest and back, and to my surprise told me he thought it was my heart. The GP started me on some tablets, gave me advice about salt and exercise, and asked me to make an appointment to get my blood pressure checked soon.

At the beginning the medication seemed to work so I **delayed the follow-up** appointment because I felt good. I don't have private health insurance and I felt ok so I thought the wait wouldn't hurt; after all, the problem seemed to have improved.

I must say, I was a little worried that he thought it was my heart, however my next-door-neighbour had a heart attack and mine was nothing like that - I had no pain at all and certainly did not need to go to hospital.

Two weeks later I woke up in the **middle of the night** feeling like I could not get any air. I had never felt like this before and I was scared. I sat up and began to feel a little better after about half an hour. I tried to go back to sleep however every time I lay down the feeling seemed to want to come back, so I propped myself up against some pillows and **waited until morning**.

My breathing was not any better next morning, and worse still I could feel my heart beating hard, bang - bang, in my chest. I called the GP but he was **booked up all day**. My wife was annoyed I had **cancelled the follow-up appointment**. I felt breathless when I moved around and even sitting still so I decided to go to emergency.

Kevin waited for **15 hours in the emergency department** before getting a hospital bed. Inpatient assessment included an echocardiogram, cardiac angiogram and medications and he was given education on how to manage his heart failure on discharge.

When Kevin was discharged he went to see his GP for repeat prescriptions. His GP had **not received a phone-call or discharge letter from the hospital**. Kevin mentioned that the nurses and doctors in hospital had told him that following discharge he would have an increase in the dose of some of his medications. The GP was **reluctant to change the dose** and advised Kevin that the Cardiologist would do this when Kevin attended the outpatient appointment at the hospital in six week's time.



3.0 MODEL OF CARE

The Model of Care for Heart Failure builds on the knowledge, best practice, current service delivery models and capacity of the existing programs and services to develop strategies to address the gaps in service provision.

3.1 Guiding Principles

The Model of Care takes a holistic patient-centred approach to the provision of services for people with heart failure. It outlines best practice through the application of a set of service principles across identified clinical streams and patient flow continuums.

The Model of Care aims to ensure people receive the right care, at the right time, by the right team and in the right place.

- **Primary and secondary prevention and health promotion to support healthy lifestyles and risk reduction in support of self-management in the well population.** All health professionals to maximise opportunities for early identification and modification of risk, in particular, the identification and treatment of hypertension.
- **Early detection, assessment and management of heart failure** in order to improve quality of life, slow the progression of the condition, and reduce invasive treatments and preventable hospital admissions. There will be early engagement of appropriate community-based services with seamless transition to specialist services, including palliative care, when appropriate.
- **Integration between State and Commonwealth sectors and health professionals** through: agreed heart failure care planning; application of shared care models; telephone support; comprehensive community-based services, in line with an endorsed set of evidence-based guidelines and patient pathways.
- **Provision of education to people with heart failure and carers based on self-management principles** to enable maximisation of symptom control, health and wellbeing.
- **Building the capacity of the workforce** to meet the need to manage the complex requirements of people with heart failure within the community. This includes upskilling, education and training of the health workforce within both the community and health service sectors, with particular attention to rural practitioners.
- **Delivery of optimal care** in line with evidence-based guidelines, development and implementation of new initiatives to meet service delivery gaps, and future research supported by integrated clinical information systems.



3.2 Overview

The Model emphasises primary risk reduction and early assessment, detection and management.

3.3 Primary Risk Reduction

Key Objectives

The key objectives of the primary risk reduction component are to focus on individual and population based approaches:

- To prevent risk factors for heart failure.
- To prevent conditions occurring which lead to heart failure.
- To increase awareness of the causes and risk factors for heart failure.
- To deliver health assessment for those at risk.
- To provide lifestyle modification advice and programs.

In line with the Western Australian Health Promotion Strategic Framework 2007-2011 ², prevention needs to be included across the continuum of care for people at risk of or with chronic diseases such as heart disease. Prevention approaches should target the behavioural and biomedical risk factors for heart disease, many of which are shared with other chronic diseases such as type 2 diabetes, chronic respiratory diseases and some cancers.

The Chronic Conditions Framework for Western Australia 2005 ³ recognises that preventative actions at all levels of the health system are required to support individuals to maximise healthy behaviours and reduce risky ones, including:

- Individuals, such as health practitioners, people with heart failure and carers
- Health care and community organisations
- Policy and population approaches.

At the population level, to be effective, preventative approaches targeting healthy lifestyle (particularly smoking, poor diet and physical inactivity) and risk factors influenced by lifestyle, should include an integrated comprehensive range of initiatives, including social marketing campaigns, education and skill development, environmental interventions, legislation and organisational policy, sponsorship and community development. Environmental factors such as access to healthy food, food labelling, advertising of unhealthy foods, urban design and access to physical activity opportunities can have a significant impact on people's ability to adopt healthier lifestyles whether well, at risk or with early disease.

At the individual level, interactions should include the provision of preventative advice about the links between lifestyle and risk, early detection of risk



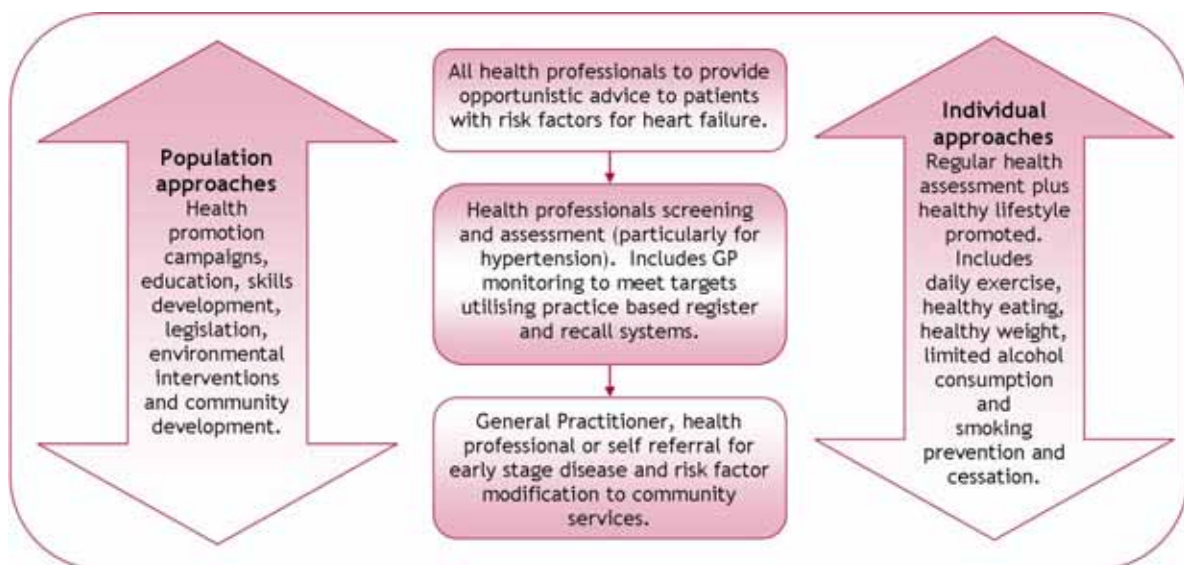
(associated with lifestyle, family history and biomedical screening), and early intervention. Systems need to be put in place to support opportunistic and planned screening in line with endorsed evidence-based guidelines such as blood pressure screening for hypertension. By addressing the multiple lifestyle risk factors for people identified as at risk, processes will be in place to support health professional referral to community programs and to access appropriate information.

In addition, a comprehensive approach that addresses the cultural, pharmacological and behavioural factors that affect smoking uptake, the nature of nicotine dependence, the reinforcement of continued smoking and the process of smoking cessation is supported.

An overall plan for the prevention of cardiovascular disease should be developed to guide integrated program and service planning in these areas.

The primary risk reduction component of The Model is displayed in Figure 2.

Figure 2. Primary Risk Reduction





3.4 Detection, Assessment and Management

Key Objectives

The key objectives of the Assessment, Detection and Management component are:

- To ensure that persons with elevated risk and/or symptoms of heart failure are screened and assessed.
- To provide a definitive diagnosis of heart failure.
- To provide secondary prevention and rehabilitation services, guided by an individualised care management plan and enable people with heart failure to self-manage their condition.
- To improve the quality of life for people with heart failure, with no avoidable health care utilisation.

3.4.1 Detection and Assessment of Suspected Heart Failure

Detection and assessment of suspected heart failure is important to identify early people with elevated risk and/or symptoms of heart failure.

Echocardiography is recommended for all people with suspected heart failure¹. Given the emphasis on the echocardiogram, health professionals should be alerted to using echocardiography as an initial assessment tool when suspecting a potential diagnosis of heart failure. Echocardiography providers will ideally also have processes in place to ensure echocardiograms can be undertaken and reported in a timely fashion.

If diagnosis is not clear following initial clinical assessment, and an echocardiogram cannot be performed in a timely fashion, then measurement of B-type natriuretic peptide (BNP) or n-terminal proBNP may be considered¹.

The role of echocardiography in identifying heart failure with preserved systolic function needs to be clarified.

Echocardiography screening for heart failure in targeted groups, especially where there is also likely to be a high prevalence of rheumatic heart disease may be useful.

3.4.2 Management of Heart Failure

All people with heart failure should have access to appropriate services that are ideally delivered locally via an integrated and coordinated network that delivers care in line with an endorsed set of evidence-based guidelines and patient pathways. The Model defines the twelve elements of heart failure care for service provision.



Services for the management of heart failure will be guided by the care management plan and current evidence-based guidelines and individualised for people with heart failure's needs. Services for the management of heart failure should comprise:

- **General Practitioner** - Care planning and coordination, medical management and symptom review.
- **Specialist Cardiologists, General Physicians and Geriatricians** - Specialist management and symptom review.
- **Multi-disciplinary services** - Ideally delivered locally, either as a part of a broader community-based chronic disease program or specific community-based heart failure service or a hospital-based program for the smaller group of people with heart failure with more difficult to manage heart failure or complex comorbidities. In addition, Aboriginal-specific management programs that have been designed in collaboration with the community should be provided.
- **Designated cardiac transplant services** - Specialist service for severe symptomatic people with heart failure eligible for cardiac transplant.

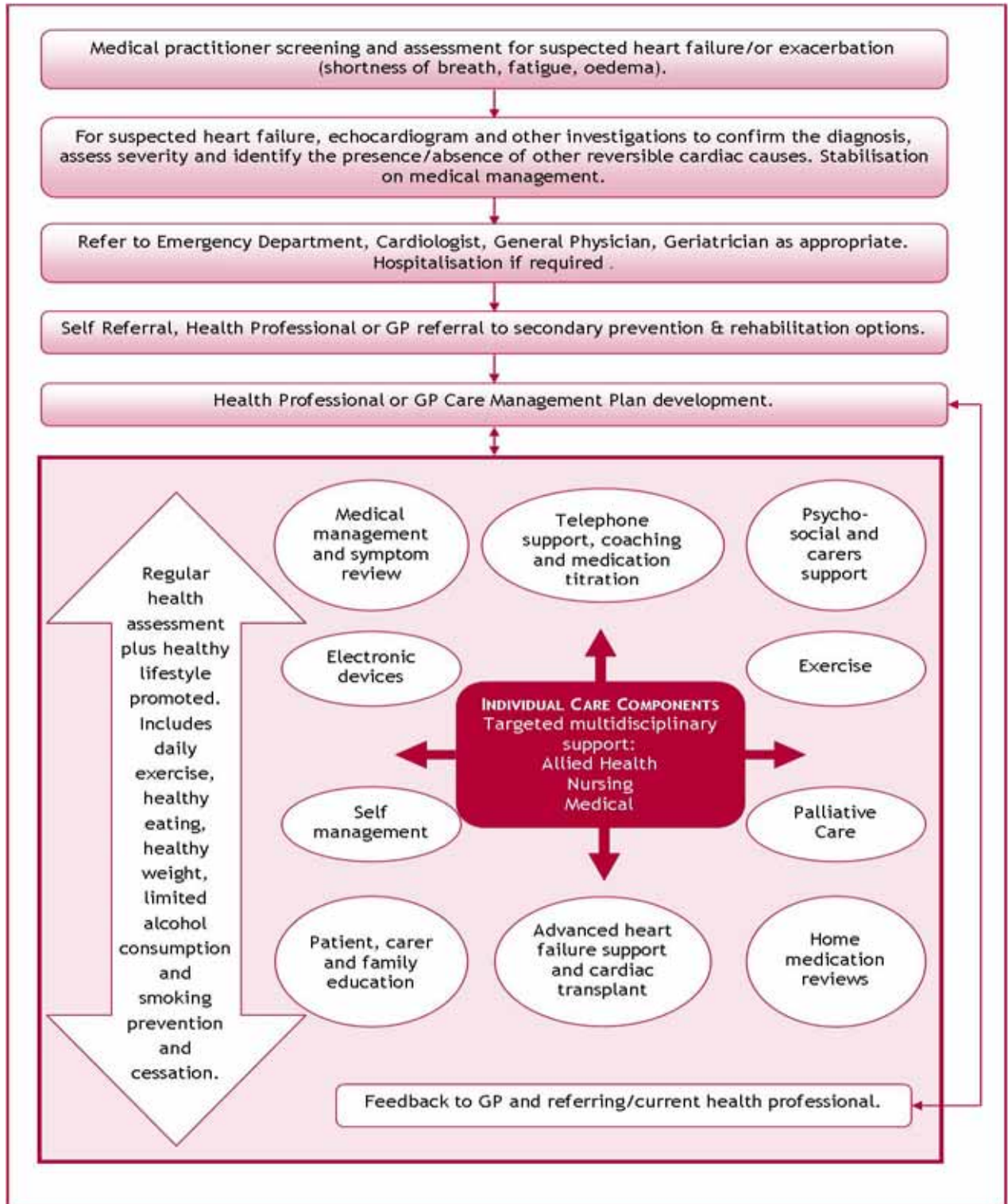
Strategies to support integration between the network of services include strengthening partnerships between designated heart failure services and Aboriginal Community Controlled Health Organisations, residential aged care facility providers, and WA Country Health Service Regional Resource Centres. Opportunities to expand heart failure education will be maximised and access to a central directory of heart failure services will be developed. Improvements to the system of referral, with priority placed on improving referral from hospital to community-based services will enable appropriate low-to-medium risk people with heart failure to access services closer to home. The use of an endorsed set of evidence-based guidelines and patient pathways is supported.

The use of Information and Communication Technology for patient-level health information data collection and sharing will underpin communication and care coordination across public hospital and community health providers in the longer term.

Figure 3 illustrates the Detection, Assessment and Management component of The Model.



Figure 3. Detection, Assessment and Management





The Health Workforce

Heart failure management is multi-disciplinary in nature, and requires a skilled and sustainable workforce to meet the needs of people with heart failure. Designated heart failure services should be supported to provide a clinical leadership role. Educational opportunities for other members of the care team to improve their specialised knowledge on heart failure management in line with evidence-based guidelines and the palliative care/supportive approach should be in place.

The members of the team working together to provide care for people with heart failure may include but not be limited to:

- Aboriginal Health Workers
- Cardiologists
- Community Nurse
- Clinical Psychologists
- Dietitians
- Exercise Physiologists
- General Physicians
- General Practitioners
- Geriatricians
- Health care interpreting services
- Home help providers
- Home oxygen suppliers
- Nurses
- Nurse Practitioners
- Occupational Therapists
- Palliative Care Specialists
- Pharmacists
- Physiotherapists
- Practice Nurses
- Social Workers

Under The Model each person with heart failure receives appropriate services and care, but there is flexibility in who and where the components are delivered. This allows optimisation of workforce as role definitions change and health professionals gain competencies in new areas. It promotes appropriate upskilling in the smaller groups of health professionals in rural and remote areas.



The Twelve Elements of Heart Failure Care

1. Medical Management and Symptom Review

People with heart failure require ongoing medical management and symptom review. This may be delivered by General Practitioners, Cardiologists, General Physicians, Geriatricians, Palliative Care Physicians and/or Nurse Practitioners, and involves:

- Identification and management of reversible cardiac causes of heart failure (where appropriate)
- Medication and symptom review, aiming to achieve target doses of heart failure medication such as ACE/ARB Inhibitors and Beta-Blockers in line with evidence-based guidelines and changing requirements for diuretic medication^{1, 23}
- Referral for investigation
- Care management plan development
- Referral to secondary prevention and rehabilitation services.

2. Care Management Planning

All health professionals, and in particular General Practitioners, should initiate the development of a care management plan to guide heart failure management, in collaboration with the person with heart failure, their carer and family. A care management plan identifies all problems requiring attention (including comorbidities), and outlines the person responsible for addressing each problem. Care management plans are individualised, patient-centred, multi-disciplinary, and written in lay-person terms.

Components of care management plans should include problem types (such as lifestyle changes, personal care, home duties, meal preparation and transport), management goals, treatment plans, the person responsible, relevant contact details and review person and time. When a care management plan is initiated, it should be developed gradually and kept simple and short to ensure that people with heart failure remain motivated to achieve their goals. A copy of the care management plan should be given to the patient and/or carer and circulated to each health care provider identified within the plan.

Hospital based care management planning for inpatients can be supported by automated processes which enable a copy of the care management plan to be sent with the medical discharge letter via fax or email. The medical discharge letter and care management plan complement each other and provide the General Practitioner and other health professionals with a well rounded summary of a patient's needs and treatment plan.

As many people with heart failure are elderly, care plans are also useful as a tool for those living in aged care facilities since they give information on the care level provided for each person with heart failure.



General Practitioners are also able to claim specific Medicare items for arranging and/or participating in care management plan development and review.

3. People with Heart Failure, Carer and Family Education

Information should be provided to people with heart failure, and their carers, to enable them to be informed and to self-manage their condition. Patient education should include information on the condition; lifestyle changes; medications, treatments and devices; potential course of the condition and the service directory for heart failure services. It is also recommended that education on the MedicAlert system be provided.

The carers and family of people with heart failure should also receive tailored education with a focus on additional supports and respite services available. To meet the educational objectives of people with heart failure and carers, there should be standardised heart failure educational resources available. Complementary education sessions should be flexible and available after hours for people with heart failure and carers that work. The development of educational resources should be done with input from people with heart failure and carers to ensure relevance.

4. Self-Management

Self-management involves people with heart failure engaging in activities that protect and promote health, and is relevant to people with heart failure. Self-management entails engaging in activities that promote health; managing a chronic condition by monitoring signs and symptoms; dealing with the effect of a chronic condition on personal well-being and interpersonal relationships; and following a treatment plan ²⁴.

Short-term action plans are a process and tool to address the long-term goals which were identified in the patient's care management plan. Short term action plans are a vital tool in successful patient self-management and are used in a step wise manner to achieve long-term goals, by breaking these goals into manageable steps. As part of the process to develop the short term action plan, people with heart failure are encouraged to develop problem solving skills to identify and manage their health related problems, and formulate realistic goals and solutions which can be accomplished within a week ²⁵.

5. Management of Comorbidities

Many people with heart failure have comorbid conditions such as atrial fibrillation, diabetes, obesity and arthritis, just to name a few. Recognition and management of comorbidities is an important component of overall care. All members of the team providing care for heart failure, including the person with heart failure's GP, should be aware of comorbidities, management goals and the health professionals involved in the person with heart failure's care. Good communication and care management planning underpins this. Likewise health professionals treating people with heart failure for other conditions need to be



aware of the heart failure diagnosis, care management plan and to liaise with members of the heart failure care team appropriately.

All components of care for people with heart failure with comorbidities should be coordinated. Opportunities to combine generic chronic disease care exist and these should be maximised to best use a person with heart failure's time, ability and desire to access programs.

6. Exercise Options

It is recommended that when medically stable, all people with heart failure should be referred to a specifically designed physical activity program ¹. Hospital- and community-based exercise options should be available for people with heart failure depending on their level of risk.

Community-based specific heart failure classes provide a maintenance option for people with heart failure requiring ongoing supervision to exercise safely. Attendance can facilitate the transition of people with heart failure from hospital based classes to self-managing at home and in the community. Moderate to low risk people with heart failure should be referred to an appropriate community-based maintenance program. Classes should follow best practice guidelines, use simple low cost equipment and incorporate an easily reproducible home program.

Hospital-based exercise programs should be reserved for high risk people with heart failure, who require a higher level of supervision, monitoring and medical backup when exercising. High risk people with heart failure include those that have more severe heart failure, complex comorbidities or are eligible for transplant. Hospital-based exercise programs support people with heart failure to exercise independently, with a view to transition to community or home exercise regimes. Hospital-based exercise programs should be time limited, involve regular sessions, and include the following:

- Initial individual exercise assessment and exercise planning
- Monitoring of weight, blood pressure, heart rate and oxygen saturation
- Intervention for medical crisis
- Liaison with heart failure Clinical Nurse Specialist or Cardiologist regarding medical concerns
- Promotion of self-management techniques.

7. Telephone Support, Coaching and Medication Titration

Telephone support, coaching and medication titration complements other components of care and provides people with heart failure with additional support. Telephone support, coaching and medication titration should be nurse led and be delivered within operating hours with some coverage out of hours. Designated heart failure services will provide tailored telephone support for enrolled people with heart failure, including medication titration and advice for



those with increasing symptoms. In addition, telephone support should be available for all people with heart failure and health professionals which:

- is accessible to people with heart failure and health professionals state-wide
- is operational seven days per week with twenty-four or extended hours service
- utilises a single 1800 number
- delivers telephone support with reference to endorsed evidence-based guidelines
- links with General Practitioners, specialists, other heart failure services and community providers, and rural and remote areas not serviced by a specific heart failure service
- has adequate infrastructure to allow data entry and electronic communication.

There is potential for the application of remote telemonitoring of people with heart failure.

8. Home Medication Reviews

People with heart failure, particularly those with comorbidities, may take a number of medications and may benefit from Home Medication Reviews. The goal of Home Medication Reviews is to maximise an individual person with heart failure's benefit from their medication regimen through a team approach involving the GP and the person with heart failure's preferred community pharmacy. The Home Medication Review process involves the person with heart failure and their carer, the GP, the pharmacist from the person with heart failure's preferred community pharmacy and other members of the health care team that are identified as appropriate.

General Practitioners are also able to claim specific Medicare items for arranging and/or participating in a Home Medication Review.

9. Psychosocial and Carers Support

Heart failure places enormous stress on people with heart failure and their carers, family and significant others. People with heart failure occasionally suffer from depression and anxiety, and the provision of psychosocial support aims to improve mental health, which may also improve heart failure prognosis. During an informal or formal health professional assessment of people with heart failure, psychosocial issues should be identified, and people with heart failure should be educated on coping mechanisms and undergo additional therapies. Some people may benefit from specific Clinical Psychologist input.

People with heart failure and their carers may also be interested to attend individual and group peer support sessions held by non-government organisation providers.



10. Electronic Devices

People with heart failure may be considered for electronic device implantation, involving:

- Biventricular permanent pacing devices for cardiac resynchronisation therapy
- Implantable cardioverter defibrillator implantation
- A combination device of implantable cardioverter defibrillator and biventricular permanent pacemaker

Cardiologist review may include discussion with the person with heart failure about electronic devices. It is acknowledged that people with electronic devices may experience psychological distress as a result of the intervention. Designated heart failure services should provide education pre implantation and offer the opportunity to attend support groups run specifically for people with electronic devices such as implantable cardioverter defibrillators. Support groups can assist to relieve feelings of isolation and enables mentoring of other ²⁶.

11. Advanced Heart Failure Support and Cardiac Transplant

Advanced heart failure support is required for a relatively small group of people with heart failure who are likely to be managed intensively in a tertiary hospital. Most of these would be eligible for cardiac transplant. Care should be delivered in line with endorsed evidence-based guidelines and patient pathways.

12. Palliative Care

Palliative care is an approach that aims to improve the quality of life of people with heart failure and their families facing the problems associated with life-threatening illness ²⁷. Heart failure is indeed recognised as a life-threatening illness, with an unpredictable trajectory.

The Palliative Care Model of Care developed by the WA Cancer and Palliative Care Network focuses on the prevention and relief of suffering by means of early identification, assessment and treatment of pain and other physical, psychosocial and spiritual problems.

The provision of palliative care is not limited to specialist palliative care physicians and health professionals. The palliative care philosophy should be embedded in the roles and approach of members of the team, including the General Practitioner, specialist, and heart failure nurse practitioner. To achieve this, health professionals treating heart failure should have good linkages with palliative care and be offered educational and training opportunities in the palliative care philosophy.

Specialist palliative care health professional involvement will vary based on the needs and degree to which the care team is able to meet the person's palliative care needs. As such people with heart failure may require a single palliative care consultation, or episodic input or referral. Specialist palliative care could assist



with person with heart failure, carer and family support, medication optimisation, symptom control, advance care directive development and support, with the decision around the person with heart failure's preferred place of care.

3.5 The Patient Journey under the Model of Care

The implementation of the principles and components of The Model will make direct improvements to the experiences of people with heart failure. The patient journey will be individual depending on the evidence-based guidelines applied at the time, the severity of heart failure, the response to treatment, services available locally and patient preferences. The story of 'Kevin', has been revised to demonstrate how his experience and outcomes could have improved within the proposed Model of Care.

Kevin, a 69 year old man with type II diabetes, was experiencing symptoms of breathing difficulties when he exerted himself.

Kevin was seen by his **GP who treated his symptoms**, ordered relevant tests including an echocardiogram and after reviewing these results, referred him to a Cardiologist for advice.

Following **assessment** the Cardiologist talked to him about the diagnosis of heart failure, added more medications to his treatment, discussed the plan for further investigations and communicated this promptly to Kevin's GP via secure electronic means.

Kevin was admitted to hospital for an angiogram and the heart failure service nurse visited him and talked to him about how he was feeling with this new diagnosis, as well as **options for education and exercise in the community**. The option of **telephone support** and follow-up, through a coaching service, was discussed; however, Kevin wished to attend a group as he wanted to meet others with the same heart condition as himself.

Kevin was referred to a **community-based service delivering heart failure care** following his discharge from hospital to help monitor his progress, ensure that his cardiac medications were at appropriate doses, and develop a **management plan** for Kevin's heart failure and diabetes in consultation with his GP and Cardiologist. Kevin was also told that he was able to bring his wife along to appointments and education sessions and that his wife could be provided with support if she needed it.



[continued]

Within weeks of discharge he underwent **assessment** to determine his physical and psychosocial health needs, attended education sessions about heart failure and also type 2 diabetes and entered an exercise program. Kevin's **GP was regularly updated**. On completion of the exercise program Kevin did not feel ready to exercise independently so the community physiotherapist suggested referral to the Community Physiotherapy Service to see him weekly while he built up his own home exercise regime.

Kevin's GP arranged a **Home Medicine Review** in which an accredited community pharmacist visited Kevin and his wife at home to review his medication therapy and reported recommendations back to his GP.

Kevin continues to have regular check ups with his GP and **six monthly reviews with his Cardiologist**, who are both aware of the continuing management plan and responsibilities via the care plan and can communicate changes efficiently. Although he has ceased contact with the community-based service following maximisation of his medical therapy and completion of his sessions, he knows how he can easily access assistance if he develops any further heart failure signs or symptoms, concerns or worries.

3.6 Future Horizons

It is acknowledged that models of care are time limited and will need to be dynamic given the changing health environment.

The results of a meta-analysis, which encompasses recent research into the effectiveness of heart failure services would be helpful in guiding future decision making.

The results of research into the prevention, detection and management of heart failure, will inform the development of future iterations of The Model, evidence-based guidelines and service plans.



4.0 MODEL OF CARE RECOMMENDATIONS & IMPLEMENTATION

4.1 Model of Care Recommendations

Recommendation 1:

The Model of Care for Heart Failure is endorsed by the State Health Executive Forum.

Recommendation 2:

Develop appropriate statewide evidence-based guidelines and patient pathways for the prevention, detection and management of heart failure in WA. These should be regularly reviewed and updated in line with current evidence.

Recommendation 3:

All people with heart failure have access to appropriate, multi-disciplinary services, ideally delivered locally, including:

- Delivery of community-based services to people with heart failure throughout the metropolitan area and the WA Country Health Service (WACHS) Regional Resource Centres with outreach to other rural areas. Across WACHS, areas of high prevalence of heart failure should be considered priority areas.
- Hospital-based programs to service the small group of people with heart failure that have more difficult to manage heart failure, complex comorbidities or are eligible for transplant.
- Formalised partnerships or links between services and organisations in order to develop an integrated network with agreed heart failure care planning, consistent use of evidence-based guidelines and patient pathways and seamless transfer as appropriate.
- A structured system of seven day per week, extended hours telephone advice for people with heart failure, carers and health professionals.
- Adequate and suitable community-based exercise options.
- The provision of clinical leadership and ongoing support to health professionals in diagnosis and long term care including adequate resources to enable designated heart failure service staff to deliver education to other health care professionals.

Recommendation 4:

Support the development of Information and Communication Technology to allow appropriate data collection and sharing. Guided by evidence-based guidelines and patient pathways this technology will allow high quality care in the most appropriate setting; care planning across different settings and disciplines; and service planning for the future.



Recommendation 5:

Establish a central resource directory for heart failure services in WA. The scope of this directory will include community- and hospital-based service options and information on risk modification and diagnostic services. This resource directory will be accessible to the community and health professionals through a variety of mediums.

Recommendation 6:

Develop and implement a state-wide heart failure education plan for health professionals in partnership with the WA General Practice Network and relevant non-government organisations.

Recommendation 7:

Establish partnerships between the Cardiovascular Health Network and relevant organisations including Aboriginal Community Controlled Health Organisations and Aged Care Panels to identify strategies to support the implementation of the guiding principles and objectives of The Model.

Recommendation 8:

Develop a strategy for the prevention of cardiovascular disease to guide integrated program and service planning. This strategy should be multi-disciplinary and multi-sectoral in nature and link with existing frameworks to assist prevention of a range of cardiovascular and non-cardiovascular disease.

Recommendation 9:

Identify research needs to inform and enhance heart failure care. This includes identification of research which should be undertaken locally in WA.

Recommendation 10:

Deliver periodic review of the Model of Care for Heart Failure to identify and address gaps in the future.

4.2 A Strategy for Implementation

It is recognised that the recommendations for change presented differ in terms of resource requirements and expected timeframe for implementation. Given this, a strategy for the phased implementation of recommendations is proposed. The three phases for implementation are defined as:

- Phase 1: Achievable within existing resources and current service provision.
- Phase 2: Require further planning and development.
- Phase 3: Require additional human resources, funding and endorsement.



As each recommendation contains a number of elements, each element has been classified against a phase for implementation.

Phase 1: Achievable within current service delivery model and existing resources

- Endorse the Model of Care for Heart Failure (Rec 1).
- Review patient pathways between general practitioners, specialists and allied health professionals (Rec 2).
- Review current evidence-based protocols and patient pathways for the prevention, detection and management of heart failure in WA (Rec 2).
- Promote the use of care management planning, particularly within General Practice (Rec 3).
- Promote the use of Home Medication Reviews for people with heart failure, particularly those with comorbidities (Rec 3).
- Review existing telephone support services available for people with heart failure and health professionals in metropolitan and WA Country Health Service (Rec 3).
- Review of current information, education and resource materials for people with heart failure and their families (Rec 3).
- Formalise current linkages and networks between designated heart failure services and the WA Country Health Service, with a view to improving communication, staff development and support, and shared care models (Rec 3).
- Promote self-management training for health professionals working with people with heart failure (Rec 6).
- Establish partnerships between the Cardiovascular Health Network and Aboriginal Community Controlled Health Organisations and Aged Care Panels to identify strategies to support the implementation of the guiding principles and objectives of The Model (Rec 7).
- Review current population health and health promotion initiatives for hypertension management (Rec 8).
- Identify research needs to inform and enhance heart failure care in WA (Rec 9).

Phase 2: Require further planning and development

- Endorse and implement appropriate current evidence-based protocols and patient pathways for the prevention, detection and management of heart failure in WA (Rec 2).
- Formalise partnerships or links between services and organisations in order to develop an integrated network with agreed heart failure care planning, consistent use of current and evidence-based protocols and patient pathways, and seamless transfer as appropriate (Rec 3).
- Support the development of Information and Communication Technology to enable multi-disciplinary care planning (Rec 4).



- Develop and implement a state-wide heart failure education plan for health professionals in partnership with the WA General Practice Network and relevant non-government organisations (Rec 6).
- Build capacity for heart failure care using the palliative care philosophy through education, training and support for health professionals, particularly in community-based settings (Rec 6).
- Develop a strategy for the prevention of cardiovascular disease to guide integrated program and service planning (Rec 8).
- Identify research needs to inform and enhance heart failure care in WA (Rec 9).

Phase 3: Require additional human resources, funding and endorsement

- Ensure that all people with heart failure have access to appropriate, multi-disciplinary services, ideally delivered locally, including:
 - Delivery of community-based services to people with heart failure throughout the metropolitan area and the WA Country Health Service (WACHS) Regional Resource Centres with outreach to other rural areas. Across WACHS, areas of high prevalence of heart failure should be considered priority areas.
 - Formalised partnerships or links between services and organisations in order to develop an integrated network with agreed heart failure care planning, consistent use of evidence-based guidelines and patient pathways, and seamless transfer as appropriate.
 - A structured system of seven days per week, extended hours telephone advice for people with heart failure, carers and health professionals.
 - Adequate and suitable community-based exercise options.
 - The provision of clinical leadership and ongoing support to health professionals in diagnosis and long term care, including adequate resources to enable designated heart failure service staff to deliver education to other health care professionals. (Rec 3).
- Establish a central resource directory for heart failure services in WA. The scope of this directory will include service options and information on risk modification, diagnostic services, long term care services and advanced heart failure services (Rec 5).
- Develop and implement heart failure programs which are culturally appropriate for Aboriginal and Torres Strait Islander and Culturally and Linguistically Diverse populations (Rec 7).



Table 5. Comparison of current service provision with The Model of Care for Heart Failure and recommendations

Model of Care Principle: Primary and secondary prevention and health promotion to support healthy lifestyles and risk reduction in support of self-management in the well population. All health professionals to maximise opportunities for early identification and modification of risk, in particular, the identification and treatment of hypertension.	
Current Gaps in Service	Overview of Relevant Recommendation
<ul style="list-style-type: none"> ■ Late diagnosis and/or under-treatment of hypertension 	<ul style="list-style-type: none"> ■ Recommendation 2 - Develop appropriate statewide evidence-based guidelines and patient pathways for the prevention, detection and management of heart failure in WA. These should be regularly reviewed and updated in line with current evidence. ■ Recommendation 6 - Develop and implement a state-wide heart failure education plan for health professionals in partnership with the WA General Practice Network and relevant non-government organisations.
<ul style="list-style-type: none"> ■ Variable levels of health assessment to detect those at risk. 	<ul style="list-style-type: none"> ■ Recommendation 2 - Develop appropriate statewide evidence-based guidelines and patient pathways for the prevention, detection and management of heart failure in WA. These should be regularly reviewed and updated in line with current evidence. ■ Recommendation 6 - Develop and implement a state-wide heart failure education plan for health professionals in partnership with the WA General Practice Network and relevant non-government organisations. ■ Recommendation 8 - Develop a strategy for the prevention of cardiovascular disease to guide integrated program and service planning.



Model of Care Principle: Early detection, assessment and management of heart failure in order to improve quality of life, slow the progression of the condition, and reduce invasive treatments and preventable hospital admissions. There will be early engagement of appropriate community-based services with seamless transition to specialist services, including palliative care, when appropriate.

Current Gaps in Service	Overview of Relevant Recommendation
<p>Diagnostic delay due to under-recognition of early heart failure symptoms by people and health professionals. A large proportion are diagnosed at hospital presentation and require admission, but have had symptoms for many months.</p>	<ul style="list-style-type: none"> ■ Recommendation 2 - Develop appropriate statewide evidence-based guidelines and patient pathways for the prevention, detection and management of heart failure in WA. These should be regularly reviewed and updated in line with current evidence. ■ Recommendation 6 - Develop and implement a state-wide heart failure education plan for health professionals in partnership with the WA General Practice Network and relevant non-government organisations.
<p>Inadequate support for all people with heart failure to reach target doses of heart failure medications (ACE/ARB Inhibitors and B-Blockers) and to manage changing requirements for diuretic medication.</p>	<ul style="list-style-type: none"> ■ Recommendation 2 - Develop appropriate statewide evidence-based guidelines and patient pathways for the prevention, detection and management of heart failure in WA. These should be regularly reviewed and updated in line with current evidence. ■ Recommendation 5 - Establish a central resource directory for heart failure services in WA, including risk factor modification services. ■ Recommendation 6 - Develop and implement a state-wide heart failure education plan for health professionals in partnership with the WA General Practice Network and relevant non-government organisations.



<p>Lack of community programs for people with moderate to severe heart failure, given that there are community-based services available for people with mild to moderate heart failure.</p>	<ul style="list-style-type: none">■ Recommendation 2 - Develop appropriate statewide evidence-based guidelines and patient pathways for the prevention, detection and management of heart failure in WA. These should be regularly reviewed and updated in line with current evidence.■ Recommendation 3 - That all people with heart failure have access to appropriate, multi-disciplinary services, ideally delivered locally. This includes community-based services, hospital based programs, telephone advice and community-based exercise options, all operating as an integrated network.■ Recommendation 7 - Establish partnerships between the Cardiovascular Health Network and relevant organisations including Aboriginal Community Controlled Health Organisations and Aged Care Panels to identify strategies to support implementation.
<p>Community Physiotherapy Services is an established service with a metropolitan wide infrastructure that currently does not receive funding for specific heart failure classes despite increasing service demand.</p>	<ul style="list-style-type: none">■ Recommendation 2 - Develop appropriate statewide evidence-based guidelines and patient pathways for the prevention, detection and management of heart failure in WA. These should be regularly reviewed and updated in line with current evidence.■ Recommendation 3 - That all people with heart failure have access to appropriate, multi-disciplinary services, ideally delivered locally. This includes community-based services, hospital based programs, telephone advice and community-based exercise options, all operating as an integrated network.■ Recommendation 7 - Establish partnerships between the Cardiovascular Health Network and relevant organisations including Aboriginal Community Controlled Health Organisations and Aged Care Panels to identify strategies to support implementation.



<p>Limited resources and capacity of services providing heart failure care to enable networked and integrated heart failure management across the state. Large areas of the metropolitan area and rural and remote regions remain without a service within a reasonable distance, particularly for exercise.</p>	<ul style="list-style-type: none">■ Recommendation 2 - Develop appropriate statewide evidence-based guidelines and patient pathways for the prevention, detection and management of heart failure in WA. These should be regularly reviewed and updated in line with current evidence.■ Recommendation 3 - That all people with heart failure have access to appropriate, multi-disciplinary services, ideally delivered locally. This includes community-based services, hospital based programs, telephone advice and community-based exercise options, all operating as an integrated network.■ Recommendation 5 - Establish a central resource directory for heart failure services in WA, including risk factor modification services.■ Recommendation 7 - Establish partnerships between the Cardiovascular Health Network and relevant organisations including Aboriginal Community Controlled Health Organisations and Aged Care Panels to identify strategies to support implementation.
<p>Delayed referral to appropriate services, such as diagnostic services, specialists, designated heart failure services and palliative care services.</p>	<ul style="list-style-type: none">■ Recommendation 2 - Develop appropriate statewide evidence-based guidelines and patient pathways for the prevention, detection and management of heart failure in WA. These should be regularly reviewed and updated in line with current evidence.■ Recommendation 3 - That all people with heart failure have access to appropriate, multi-disciplinary services, ideally delivered locally. This includes community-based services, hospital based programs, telephone advice and community-based exercise options, all operating as an integrated network.■ Recommendation 5 - Establish a central resource directory for heart failure services in WA, including risk factor modification services.■ Recommendation 6 - Develop and implement a state-wide heart failure education plan for health professionals in partnership with the WA General Practice Network and relevant non-government organisations.



<p>Limited availability to undertake public echocardiography. Echocardiography results are not shared across health services leading to greater duplication of investigations.</p>	<ul style="list-style-type: none"> ■ Recommendation 3 - That all people with heart failure have access to appropriate, multi-disciplinary services, ideally delivered locally. This includes community-based services, hospital based programs, telephone advice and community-based exercise options, all operating as an integrated network. ■ Recommendation 4 - Support the development of Information and Communication Technology to allow appropriate data collection and sharing.
<p>Lack of programs for high risk clients who are unable to access tertiary centres for physical activity maintenance programs. In addition, there is a lack of physical activity and education programs which are provided outside of business hours for people with heart failure that work.</p>	<ul style="list-style-type: none"> ■ Recommendation 2 - Develop appropriate statewide evidence-based guidelines and patient pathways for the prevention, detection and management of heart failure in WA. These should be regularly reviewed and updated in line with current evidence. ■ Recommendation 3 - That all people with heart failure have access to appropriate, multi-disciplinary services, ideally delivered locally. This includes community-based services, hospital based programs, telephone advice and community-based exercise options, all operating as an integrated network.
<p>Limited support for people with heart failure who experience barriers accessing care, including those associated with cost, transport and time.</p>	<ul style="list-style-type: none"> ■ Recommendation 3 - That all people with heart failure have access to appropriate, multi-disciplinary services, ideally delivered locally. This includes community-based services, hospital based programs, telephone advice and community-based exercise options, all operating as an integrated network. ■ Recommendation 5 - Establish a central resource directory for heart failure services in WA, including risk factor modification services. ■ Recommendation 7 - Establish partnerships between the Cardiovascular Health Network and relevant organisations including Aboriginal Community Controlled Health Organisations and Aged Care Panels to identify strategies to support implementation.



<p>Services are concentrated within the metropolitan area, with a few programs available in rural and remote regions ¹². In addition, there is lower use of recommended diagnostic methods and pharmacological treatment among people with heart failure in rural areas ²¹.</p>	<ul style="list-style-type: none"> ■ Recommendation 2 - Develop appropriate statewide evidence-based guidelines and patient pathways for the prevention, detection and management of heart failure in WA. These should be regularly reviewed and updated in line with current evidence. ■ Recommendation 3 - That all people with heart failure have access to appropriate, multi-disciplinary services, ideally delivered locally. This includes community-based services, hospital based programs, telephone advice and community-based exercise options, all operating as an integrated network. ■ Recommendation 6 - Develop and implement a state-wide heart failure education plan for health professionals in partnership with the WA General Practice Network and relevant non-government organisations. ■ Recommendation 7 - Establish partnerships between the Cardiovascular Health Network and relevant organisations including Aboriginal Community Controlled Health Organisations and Aged Care Panels to identify strategies to support implementation.
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<p>Model of Care Principle: Integration between State and Commonwealth sectors and health professionals through: agreed heart failure care planning; application of shared care models; telephone support; comprehensive community-based services, in line with an endorsed set of evidence-based guidelines and patient pathways.</p>	
<p>Current Gaps in Service</p>	<p>Overview of Relevant Recommendation</p>
<p>Lack of care coordination of people with heart failure, particularly those with multiple comorbidities and inpatients post discharge. This may result in numerous patient appointments in a given week. Variable use of formalised general practice recall registers for monitoring and follow up.</p>	<ul style="list-style-type: none"> ■ Recommendation 2 - Develop appropriate statewide evidence-based guidelines and patient pathways for the prevention, detection and management of heart failure in WA. These should be regularly reviewed and updated in line with current evidence. ■ Recommendation 3 - That all people with heart failure have access to appropriate, multi-disciplinary services, ideally delivered locally. This includes community-based services, hospital based programs, telephone advice and community-based exercise options, all operating as an integrated network.



	<ul style="list-style-type: none">■ Recommendation 4 - Support the development of Information and Communication Technology to allow appropriate data collection and sharing.■ Recommendation 5 - Establish a central resource directory for heart failure services in WA, including risk factor modification services.■ Recommendation 6 - Develop and implement a state-wide heart failure education plan for health professionals in partnership with the WA General Practice Network and relevant non-government organisations.■ Recommendation 7 - Establish partnerships between the Cardiovascular Health Network and relevant organisations including Aboriginal Community Controlled Health Organisations and Aged Care Panels to identify strategies to support implementation.
<p>Limited funding for project development and programs culturally appropriate for Aboriginal and Torres Strait Islander and Culturally and Linguistically Diverse people.</p>	<ul style="list-style-type: none">■ Recommendation 3 - That all people with heart failure have access to appropriate, multi-disciplinary services, ideally delivered locally. This includes community-based services, hospital based programs, telephone advice and community-based exercise options, all operating as an integrated network.■ Recommendation 7 - Establish partnerships between the Cardiovascular Health Network and relevant organisations including Aboriginal Community Controlled Health Organisations and Aged Care Panels to identify strategies to support implementation.



Model of Care Principle: Provision of education to people with heart failure and carers based on self-management principles to enable maximisation of symptom control, health and wellbeing	
Current Gaps in Service	Overview of Relevant Recommendation
Limited capacity and funding for self-management programs promoting lifestyle modification for those with, or at risk of, cardiovascular disease.	<ul style="list-style-type: none"> ■ Recommendation 2 - Develop appropriate statewide evidence-based guidelines and patient pathways for the prevention, detection and management of heart failure in WA. These should be regularly reviewed and updated in line with current evidence. ■ Recommendation 3 - That all people with heart failure have access to appropriate, multi-disciplinary services, ideally delivered locally. ■ Recommendation 5 - Establish a central resource directory for heart failure services in WA, including risk factor modification services.

Model of Care Principle: Building the capacity of the workforce to meet the need to manage the complex requirements of people with heart failure within the community. This includes upskilling, education and training of the health workforce within both the community- and health service sectors, with particular attention to rural practitioners.	
Current Gaps in Service	Overview of Relevant Recommendation
Lack of specialised knowledge on heart failure management resulting from limited educational opportunities and a lack of coordinated clinical leadership.	<ul style="list-style-type: none"> ■ Recommendation 6 - Develop and implement a state-wide heart failure education plan for health professionals in partnership with the WA General Practice Network and relevant non- government organisations.



Lack of formalised medical specialist consultancy services for chronic disease services with a broad scope of practice which includes heart failure. This may contribute to a lack of consistency in care delivered by health professionals who may deal with people with heart failure including, but not limited to community health professionals, general practice, geriatricians and general physicians.

- Recommendation 3 - That all people with heart failure have access to appropriate, multi-disciplinary services, ideally delivered locally.
- Recommendation 6 - Develop and implement a state-wide heart failure education plan for health professionals in partnership with the WA General Practice Network and relevant non- government organisations.



Model of Care Principle: Delivery of optimal patient care in line with evidence-based guidelines, development and implementation of new initiatives to meet service delivery gaps, and future research supported by integrated clinical information systems.	
Current Gaps in Service	Overview of Relevant Recommendation
Variable use of formalised and agreed care management plans, leading to poor understanding of health professional and patient responsibilities.	<ul style="list-style-type: none"> ■ Recommendation 2 - Develop appropriate statewide evidence-based guidelines and patient pathways for the prevention, detection and management of heart failure in WA. These should be regularly reviewed and updated in line with current evidence. ■ Recommendation 4 - Support the development of Information and Communication Technology to allow appropriate data collection and sharing.
Lack of locally endorsed and comprehensive implementation of guidelines for the prevention, detection and management of heart failure. Similarly, lack of awareness of defined guidelines and processes for referral.	<ul style="list-style-type: none"> ■ Recommendation 2 - Develop appropriate statewide evidence-based guidelines and patient pathways for the prevention, detection and management of heart failure in WA. These should be regularly reviewed and updated in line with current evidence. ■ Recommendation 4 - Support the development of Information and Communication Technology to allow appropriate data collection and sharing. ■ Recommendation 6 - Develop and implement a state-wide heart failure education plan for health professionals in partnership with the WA General Practice Network and relevant non-government organisations.
Limited understanding of the local epidemiology of heart failure to inform planning of services for heart failure. National and international research may not be adequately addressing research needs.	<ul style="list-style-type: none"> ■ Recommendation 9 - Identify research needs to inform and enhance heart failure care. This includes identification of research which should be undertaken locally in WA.



GLOSSARY

Age standardised	Weighted average of age specific rates according to standard distribution of age to eliminate the effect of different age distributions and thus facilitate valid comparisons of groups with different age compositions.
Arrhythmia	Irregularity of the heartbeat.
Asymptomatic	An illness or condition is present without symptoms.
Atrial Fibrillation	Chaotic heart irregularity arising from the atria (reservoir chambers of the heart), common in people with HF and in the aged.
Bed days	The number of full or partial days of stay for patients who were admitted for an episode of care and who underwent separation during the reporting period. A patient who is admitted and separated on the same day is allocated one patient day.
Biventricular	Pertaining to both ventricles of the heart.
B-type Natriuretic peptide	A key regulator in the homeostasis of salt and water excretion that maintain blood pressure. It is a key marker indicative of heart failure.
Coronary heart disease	The condition in which coronary arteries develop fatty disease cholesterol-containing deposits in their walls, coupled with reaction to that deposit with scarring and inflammation.
Diastolic	Relaxation of the left ventricle.
Dyspnoea	Shortness of breath.
Echocardiogram	A visual definition of the heart chambers and valves, either as a static picture or as moving structures. The images are created by the bouncing back of ultra sound waves from a hand-held source.
Electrocardiogram	A recording or display of the heart's electrical activity as the cardiogram staged stimulating electrical impulse passes through each phase of contraction of the heart.
Hypertension	High blood pressure.



Implantable cardioverter
defibrillator

A device that is put within the body and is designed to recognise certain types of abnormal heart rhythms (arrhythmias) and correct them.

Myocardial Infarction

Death of heart muscle which arises from coronary artery infarction occlusion. The dead tissue is replaced over time by scar formation.

Systolic

Contraction of the left ventricle.

Telemonitoring

Remote monitoring of signs and other health indicators.

Ventricle

A heart chamber which collects blood from an atrium.



REFERENCES

1. National Heart Foundation of Australia and the Cardiac Society of Australia and New Zealand (Chronic Heart Failure Guidelines Expert Writing Panel). Guidelines for the Prevention, Detection and Management of Chronic Heart Failure in Australia; 2006.
2. Department of Health WA. Health Promotion Strategic Framework 2007-2011. Perth WA; 2007.
3. Department of Health WA. Chronic Conditions Framework for Western Australia 2005. Perth WA; 2005.
4. National Health Priority Action Council. National Service Improvement Framework for Heart, Stroke and Vascular Diseases. Canberra: Australian Government Department of Health and Ageing; 2006.
5. The Royal Australian College of General Practitioners 'Green Book' Project Advisory Committee. Putting Prevention into Practice: An Education Manual and Smoking, Nutrition, Alcohol and Physical Activity (SNAP): A population health guide to behavioural risk factors in General Practice (2nd edition). South Melbourne, Victoria; 2006.
6. Department of Health WA. Healthy Lifestyles 2002 - 2007: A Strategic Framework for Primary Prevention of Diabetes and Cardiovascular Disease in Western Australia. Hard copy report. Western Australia: Government of Western Australia; 2002.
7. Health Networks and Epidemiology Branch. Heart Failure October 2007 Data Extract (Unpublished). In: Department of Health WA; 2007.
8. Department of Family and Communities. Carers Recognition Act 2004. State Law Publisher; 2004.
9. Australian Institute of Health and Welfare. Heart, Stroke and Vascular Diseases Australian Facts 2004. Hard copy or Website Report: Australian Institute of Health and Welfare and National Heart Foundation; 2004 May 2004. Report No.: AIHW Cat. No. CVD 27.
10. Australian Institute of Health and Welfare. Chronic Disease and Associated Risk Factors in Australia. Canberra: Australian Institute of Health and Welfare; 2006.
11. Department of Health WA. Health and Wellbeing Surveillance System: Diabetes, Hypertension and Smoking (Unpublished). In; 2007.
12. Clark R, Driscoll, A., Nottage, J., McLennan, S., Coombe, D., Bamford, E., Wilkinson, D., Stewart, S. Inequitable provision of optimal services for patients with chronic heart failure: a national geo-mapping study. *Medical Journal of Australia* 2007;184(8):169-73.
13. Stewart S, Jenkins, A, Buchan, S, McGuire, A, Capewell, S, McMurray, JJ. The current cost of heart failure to the National Health Services in the UK. *European Journal of Heart Failure* 2002;4(3):361-71.
14. Liao L, Anstrom KJ, Gottdiener JS, Pappas PA, Whellan DJ, Kitzman DW, Aurigemma GP, Mark DB, Schulman KA, Jollis JG. Long-term costs and



- resource use in elderly participants with congestive heart failure in the Cardiovascular Health Study. *American Heart Journal* 2007;153:245-52.
15. Reid C, Nelson, MR, Shiel, L, Chew, D, Connor, G, DeLooze, F. Australians at risk: management of cardiovascular risk factors in the REACH Registry. *Heart, Lung and Circulation* 2008;17(2):114-8.
 16. Krum H, Tonkin, A, Currie, R, Djundjek, R, Johnston, C. Chronic heart failure in Australian general practice. *Medical Journal of Australia* 2001;174:439-44.
 17. Stafford R, Radley D. F. Failure to reach appropriate doses: the underutilization of cardiac medications of proven benefit, 1990 to 2002. *Journal of the American College of Cardiology* 2003;41:56-61.
 18. Lainscak M, Cleland, J, Lenzen, M, Follath, F, F, Komajda, M, Swedberg, K. International variations in the treatment and co-morbidity of left ventricular systolic dysfunction: data from the EuroHeart Failure Survey. *European Journal of Heart Failure* 2007;9:292-9.
 19. Granmyr J, Ball, P, Curran, S, Wang, L. Evidence-based use of medications in patients with coronary artery disease in a rural Australian community. *Australian Journal of Rural Health* 2007;15:241-6.
 20. Coventry P, Grande, G., Richards, D., Todd, C., P. Prediction of appropriate timing of palliative care for older adults with non-malignant life-threatening disease: a systematic review. *Age and Ageing* 2005;34:218-27.
 21. Clark R, Eckert, K., Stewart, S., Philips, S., Yallop, J., Tonlin A., Krum, H. Rural and urban differentials in primary care management of chronic heart failure: new data from the CASE study. *Medical Journal of Australia* 2007;186(9):441-5.
 22. Taylor S, Bestal, I J, Cotter, S, Falshaw, M, Hood, S, Parsons, S, Wood, L, Underwood, M. Clinical service organisation for heart failure. *Cochrane Database of Systematic Reviews* 2005(Issue 2. Art. No.: CD002752. DOI: 10.1002/14651858.CD002752.pub2).
 23. American College of Cardiology / American Heart Association Task Force on Practice Guidelines. ACC/AHA 2005 Guideline Update for the Diagnosis and Management of Chronic Heart Failure in the Adult. *Circulation* 2005;112:1825-52.
 24. Flinders University. Chronic Conditions Self Management Education Manual. Adelaide: Flinders University; 2005.
 25. Bodenheimer T, Lorig, K, Holman, H, Grumbach, K. *Journal of the American Medical Association*. 2002;288:2469-75.
 26. Williams A, Young, J., Nikoletti, S. & McRae, S. Reasons for attending and not attending a support group for recipients of implantable cardioverter defibrillators and their carers. *International Journal of Nursing Practice* 2004;10(3):127-33.
 27. World Health Organisation. WHO Definition of Palliative Care; 2007.



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