Cardiac Rehabilitation and Secondary Prevention: A framework for the Northern Territory

2012
ACKNOWLEDGEMENTS

The Northern Territory Cardiac Rehabilitation and Secondary Prevention Framework 2012 was developed by a Working Group representing the Department of Health, Aboriginal Medical Services Alliance of the Northern Territory, Baker IDI, Heart Foundation NT, Healthy Living NT, and NT Cardiac.

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EXECUTIVE SUMMARY

The Northern Territory (NT) has a unique population with cardiac service being provided across a large proportion of the country. Current access to cardiac rehabilitation in the NT is predominantly based in the urban centres of Darwin (and Palmerston) and Alice Springs. Patients living in rural and remote regions and Indigenous patients are currently largely underserviced [4]. In order to address this, a strong framework for cardiac rehabilitation has been developed and now must be implemented and evaluated.

It is generally accepted that cardiovascular rehabilitation and secondary prevention decreases mortality rates in those who have had a myocardial infarction by 25% [10]. Rehabilitation also results in significantly improved morbidity outcomes and improved quality of life. Despite the overwhelming evidence that cardiac rehabilitation can decrease cardiovascular morbidity and mortality, only approximately 30% of eligible patients participate in cardiac rehabilitation across Australia [15]. Aboriginal and Torres Strait Islander populations are even less likely to attend cardiac rehabilitation programs than the non-Indigenous Australian population [16].

The framework has taken into account the unique population of the Northern Territory, namely a significant proportion of the population living in regional and remote areas and a high number of Indigenous clients. To address the geographical location of patients wanting to return home following an event, alternative models other than the traditional face-to-face need to be used. Remote communication-based models utilising phone or videoconference linkages have been shown to be as effective as traditional models for chronic disease self management [2]. Secondary prevention needs to involve not only the patient and their family, but also the Primary Health Care Service and engage existing community infrastructure. Cardiac rehabilitation should be provided by a flexible and innovative model of care which is applicable to both Indigenous and non-Indigenous patients across urban, regional and remote NT.

The framework developed works to maximise the numbers of clients able to access a high quality cardiac rehabilitation program. It is based on the national guidelines for cardiac rehabilitation released in 2004 by the National Heart Foundation and the Australian Cardiac Rehabilitation Association (ACRA). It is regionally focused, patient-centric, engages families and communities in the patient’s care, uses flexible approaches, engages with tele-health and integrates with existing services, whilst being culturally secure.
Principles of the framework are:
- Flexibility within evidence base
- Person-centred encouraging self management
- Culturally appropriate
- System coordination and integration

Enablers for the framework:
- Equity and access
- Collaborative partnerships
- Supportive IT system
- Skilled and sufficient numbered workforce

The NT model of cardiac rehabilitation describes the three phases of cardiac rehabilitation which is centred around the position of the Cardiac Nurse Case Coordinator, with support from an Aboriginal Health Practitioner for Indigenous clients. Phase 1 will continue as current. A planning meeting (phase 1B) is where the Cardiac Nurse Care Coordinator (with Aboriginal Health Practitioner) sit with the patient to design a cardiac rehabilitation program to suit the patient’s needs and own goals, with a focus on self management. Influencing the decision of which pathway to choose will be patient goals, lifestyle and work, geographical location, health literacy, language barriers and ability to use and access internet and smart phones. Phase 3 will be lifelong management by the patient’s primary health care service.

The options for phase 2 rehabilitation in the NT will be:
- Face-to-face group rehabilitation (Healthy Living NT – Darwin/Alice Springs)
- Supported at home (any location) with phone, smart phone or internet
- Hybrid of Face-to-face and Supported at home
- Remotely facilitated (regional or remote location)

Supported at home or remotely facilitated will involve the client having support (by phone, internet or videoconference) by the Cardiac Nurse Care Coordinator on at minimum weekly basis. The nurse will support the client in attaining their goals, monitoring their progress, giving support and giving cardiac education. The difference between Supported at home and remotely facilitated is essentially the amount of support given to the person, with the remotely facilitated model being facilitated by an on-site health professional in the community with the client.

Giving these above options to form a patient-centred and flexible approach to cardiac rehabilitation will greatly increase the potential access of clients to cardiac rehabilitation and the benefits it entails.
WHY AN NT FRAMEWORK?

The Northern Territory has a unique population with cardiac services being provided across a large proportion of the country. Current cardiac service provision is largely based out of either Darwin or Alice Springs (Appendix 1), with more difficult access for those living regionally and remotely. Given the geographical challenges and large proportion of patients living remotely, it is essential that any cardiac care and followup is well coordinated and communicated. An overarching policy basis for this requires development.

A significant challenge presents itself with engaging the Indigenous population in the Northern Territory as approximately 70% of this population live more than 145km from a cardiac rehabilitation service, thus making access difficult. [1]. Other states within Australia including SA, WA and QLD are not presented with this challenge to the same extent, highlighting what a unique population the NT has and that novel ways must be used to address these challenges. Culture and language considerations must be incorporated and health must be seen within a holistic structure, considering family and community. Similar issues need to be considered for patients from non-English speaking backgrounds.

The recent NT Specialist Cardiac Services Plan report by KPMG identified current services and made recommendations for a model of future specialist cardiac service care. Seven key recommendations were made with the expansion of cardiac rehabilitation services being highlighted as an area for development [1]. The expansion of services was recommended to cover inpatient, outpatient and community programs in a culturally secure fashion.

In addition, the estimated demand for cardiac rehabilitation in the NT is predicted to expand, with numbers of patients requiring rehabilitation services from angioplasty, CABG and valvular surgery procedures estimated to reach approximately 1200 by the year 2020 [1]. This reflects the increasing cardiovascular burden described above.

To address the volume of patients and geographical location of patients wanting to return home following an event, alternative models other than the traditional face-to-face need to be investigated. Remote communication-based models utilising phone or videoconference linkages have been shown to be as effective as traditional models for chronic disease self management [2]. Secondary prevention needs to involve not only the patient and their family, but also the Primary Health Care Service and engage existing community infrastructure.
PURPOSE OF FRAMEWORK

Despite clear evidence that cardiac secondary prevention and rehabilitation decreases morbidity and mortality significantly, there are large gaps within the current health system in the Northern Territory (NT). Currently many cardiac clients do not have adequate access to these services [1]. In order to address this, a strong framework must be developed, implemented and evaluated. This should be a flexible and innovative model of care which is applicable to both Indigenous and non-Indigenous patients across urban, regional and remote NT.

The framework describes a cardiac rehabilitation framework specific to the unique geographical and population characteristics of the Northern Territory, incorporating both secondary and tertiary prevention for people with cardiovascular disease. It forms the foundation for the development of model/s of care in cardiac rehabilitation and provides strategic direction for the improvement of cardiac services within the Northern Territory.

The framework works to maximise the numbers of clients able to access a high quality cardiac rehabilitation program. To achieve this, it will:

1. Provide strategic direction for a coordinated and integrated multidisciplinary approach to cardiac rehabilitation.
2. Facilitate systems to provide equitable and timely access for all cardiac clients to secondary prevention services, regardless of their residential location within the Northern Territory.
3. Facilitate improved communication between stakeholders across all phases of cardiac rehabilitation including ongoing secondary prevention.
4. Facilitate the development of consistent messages and educational resources about cardiovascular disease for clients across all phases of rehabilitation and services involved in their care.

Cardiac rehabilitation and secondary prevention services align with Key Action Area (KAA) 5 of the current NT Chronic Conditions Prevention and Management Strategy (CCPMS) 2010-2020 [3]. It will provide access to high quality evidence-based clinical care (KAA 5.2), coordinated and integrated multidisciplinary care (KAA 5.3) and improve rehabilitation care for people with chronic conditions (KAA 5.5).

It also aligns with the Northern Territory Cardiac Services Implementation Plan 2012-2017 [4] and is consistent with and promotes the principles of the NT Chronic Conditions Self-Management Framework 2012-2020 [5]. The Cardiac Rehabilitation and Secondary Prevention framework will be current until 2020, being consistent with the CCPMS strategy length. It will be evaluated as part of the evaluation of the CCPMS strategy.

National guidelines for cardiac rehabilitation were released in 2004 by the National Heart Foundation and the Australian Cardiac Rehabilitation Association (ACRA). Examples of existing frameworks for cardiac rehabilitation exist in some states of Australia, including SA, VIC and QLD, and NSW has an integrated model of care for the rehabilitation of chronic disease. In addition, the Australian Government National Health and Medical Research Council (NHMRC) have published a guide specifically for the ATSI population. See Appendix 2 for these titles.
Given that the Northern Territory is unique with differing population considerations and geographical challenges, current guidelines can be utilised but need to be adapted specifically for the NT setting.

**DEFINITIONS AND ACCEPTED TERMINOLOGY**

**CARDIAC REHABILITATION**

The World Health Organisation declared in 1993 that ‘Rehabilitation care should be available to all patients with cardiovascular disease in all countries’ [6]. Addressing the needs of Australians, The National Heart Foundation of Australia (NHF) and the Australian Cardiac Rehabilitation Association (ACRA) published a Recommended Framework for Cardiac Rehabilitation in 2004. This describes the two aims of cardiac rehabilitation: to ‘maximise physical, psychological and social functioning to enable people with cardiac disease to lead fulfilling lives with confidence’ and to ‘Introduce and encourage behaviours that may minimise the risk of further cardiac events and conditions’[7].

Cardiac rehabilitation works to shorten the required period of recovery following an acute event and to promote strategies to enable the patient to develop skills in self management for long-term prevention behaviour change, thus preventing repeated cardiac events in the future [7].

**SECONDARY PREVENTION TERMINOLOGY**

The National Public Health Partnership is a formal joint Australian intergovernmental partnership between the federal, state and territory governments to address public health agendas [8]. This group defines secondary prevention as “an aim to reduce progression of disease through early detection, usually by screening at an asymptomatic stage, and early intervention” [9]. They define the aim of tertiary prevention “includes minimisation of the impact of established disease, and prevention of delay of complications of subsequent events through effective management and rehabilitation” [9]. Cardiac rehabilitation is specifically defined as a form of tertiary prevention in this document, although the management of hypertension and hypercholesterolaemia could be considered as secondary prevention.

Contrary to this, cardiac rehabilitation is described as a part of secondary prevention by the World Health Organisation [6]. Throughout worldwide literature on the subject, cardiac rehabilitation is commonly referred to as secondary prevention and Australia has also adopted this terminology. As such, this document refers to cardiac rehabilitation as a part of secondary prevention in keeping with accepted literature on the topic, whilst realising this is inaccurate terminology as rehabilitation is an action of tertiary prevention.
TARGET PATIENTS
The target population for this framework is all people with cardiovascular disease living within the NT, including those living in urban, regional and remote centres from of both Indigenous and non-Indigenous backgrounds.

PHASES OF TYPICAL CARDIAC REHABILITATION
Three phases of cardiac rehabilitation are described in the worldwide literature:

- Phase 1: following an acute event when a patient is hospitalised
- Phase 2: a structured outpatient program which is time limited (often 4 to 12 weeks) and has usually involved a face-to-face model where the client physically attends group sessions at a particular place.
- Phase 3: ongoing, lifelong prevention of further cardiovascular disease.

The Northern Territory framework will cover all three phases. A short summary of the expected content of each phase is below, as described in the 2004 NHF and ACRA framework guidelines [7]. Expansion of this for the NT can be seen later in the document (p19).

<table>
<thead>
<tr>
<th>Phase 1 – Period of hospitalisation from admission to separation</th>
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<tbody>
<tr>
<td>• Basic information and reassurance</td>
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<td>• Supportive counselling</td>
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<tr>
<td>• Mobilisation and the resumption of activities of daily living</td>
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<td>• Discharge planning</td>
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<td>• Referral to phase 2</td>
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<tr>
<th>Phase 2 – From discharge until person’s medical, physical and psychological condition has stabilised. A structured program often 4-12 weeks.</th>
</tr>
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<tbody>
<tr>
<td>• Individual assessment, review and followup</td>
</tr>
<tr>
<td>• Low to moderate intensity physical activity</td>
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<tr>
<td>• Education, discussion and counselling</td>
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Phase 3 – Ongoing following completion of outpatient phase

Ongoing assessment and management of:

- Smoking, nutritional status, alcohol intake, physical activity and weight management
- Biomedical risk factors including lipids, blood pressure and diabetes
- Appropriate pharmacological treatments
- Psychosocial risk factors

Information from ACRA framework guidelines 2004 [7]

MODELS OF SERVICE DELIVERY

It is generally accepted that cardiovascular rehabilitation and secondary prevention decreases mortality rates in those who have had a myocardial infarction by 25% [10]. Rehabilitation also results in significantly improved morbidity outcomes and improved quality of life. Traditional models involved face-to-face group sessions, but there are an increasing number of alternative models, with no clear evidence as to what is the most superior delivery model. See Appendix 3 for a short literature review. Due to limited uptake of the usual model despite very strong evidence as to the benefits, it is now recognised that alternate models of care should be considered, being individualised to the patient [7].

A literature review by SA health on alternative models of rehabilitation found programs are more effective when flexible, individualised to the patient’s needs and choice, take into account individualised risk factors and are supported by the community [11]. A Cochrane review has shown home-based cardiac rehabilitation to be as effective as centre-based programs [12]. Other models including multifaceted individualised telehealth programs and community-based cardiac rehabilitation appear to be as effective as hospital-based programs, as reviewed by the South Australian Statewide Cardiology Clinical Network during the development of their cardiac rehabilitation framework [11]. At this stage, there appears to be insufficient evidence to demonstrate the same level of effectiveness for internet-based rehabilitation, although further studies are being conducted and initial outcomes appear promising [13].

SELF MANAGEMENT

A focus on and the support of self management is paramount to the success of a cardiac rehabilitation program. Self management involves the people with chronic disease becoming participants through learning and practicing new skills to carry on an active and emotionally satisfying life in the face of a chronic condition’ [14].

Self management acknowledges the patient as the expert in their own illness, giving them the skills and knowledge to help manage their own illness. It is a patient-centric partnership between the patient, family/carers and health care professionals to understand and manage the condition, have a plan of care and engage in health protective behaviours [5].
BARRIERS TO CARDIAC REHABILITATION

Despite the overwhelming evidence that cardiac rehabilitation can decrease cardiovascular morbidity and mortality, only approximately 30% of eligible patients participate in cardiac rehabilitation across Australia [15]. Aboriginal and Torres Strait Islander populations are even less likely to attend cardiac rehabilitation programs than the non-Indigenous Australian population [16].

Traditionally identified barriers include health beliefs, age, annual income, level of education, cardiac functional status, mood state and social support [17]. Factors which have been shown to improve adherence of cardiac rehabilitation include motivational letters, telephone contact, home visits, nurse coordination of care [17].

Cardiac rehabilitation captures elements of self management and the proposed model in the NT is largely based on this concept.

Although there is limited evidence on increasing the participation of Aboriginal and Torres Strait Islander populations, the NHMRC have published a guide on Strengthening Cardiac rehabilitation and Secondary Prevention for Aboriginal and Torres Strait Islander Peoples [16], highlighting key barriers that need to be addressed:

- Not enough Indigenous people involved in the planning, delivering and evaluation of health care and not enough Indigenous people employed in the area of cardiac rehabilitation
- Cultural factors are often not well understood by clinicians
- Poor communication and difficulty navigating the health system
- Poor continuity of care
- Competing priorities at home, such as food, housing and family stressors, which can lead to difficulties in maintaining a healthy lifestyle
- Programs with lack of consultation and community involvement

One key factor in having success of a cardiac rehabilitation program is to have a key facilitator in this process to lead the program. The National Heart Foundation recommends that cardiac rehabilitation is provided by a multidisciplinary team lead by a cardiac rehabilitation coordinator. The team is recommended to include an Aboriginal Health Practitioner and for the rehabilitation service to work with the cardiologist and primary health care service [7].
Specifically in the Northern Territory, consultation with Indigenous focus groups in 2009 found three key themes which remote cardiac patients felt needed to be addressed [18]:

- Poor communication and coordination between the patients/family and the health service
- Low level of understanding of heart disease by patients and families
- Limited community-based health services for cardiac disease management

Techniques to strengthen cardiac rehabilitation for Indigenous people which have been highlighted by the Medical Journal of Australia include [19]:

- Ensuring cultural competency of health staff
- Involve Aboriginal Health Workers and family members as needed
- Ensure community involvement in planning, implementing and evaluating health programs
- Incorporate elements of cardiac rehabilitation into existing activities
- Develop and sustain partnerships between organisations
- Specifically take into account the needs of Indigenous patients when planning cardiac services
- Develop a specialist education base for continuing training which includes Aboriginal Health Practitioners.

Identifying the current barriers to cardiac rehabilitation in the Northern Territory and the specific gaps faced in this region has lead to the development of the following innovative and flexible program with multiple modalities, centred around patient choice.

**NT CONTEXT**

The Northern Territory covers 17% of Australia’s land mass, but has only approximately one percent of the national population. The NT population varies considerably due to seasonal and visitor effects, but the resident population of the NT in March 2012 was approximately 233,000 people [20]. Of this population, just over half (55%) live in the Darwin/Palmerston area and approximately 12% live in Alice Springs. The rest reside in the regional centres of Katherine, Tennant Creek or Gove; or in more remote locations. A large proportion of remote towns have a predominant Indigenous population.

Approximately 30% of the NT population identify as being of Aboriginal or Torres Strait Islander origin [4]. Although there is a significant Indigenous representation in the population of the larger towns of Darwin and Alice Springs, 63% of the
Indigenous population of the Northern Territory actually live in very remote locations. There are over 70 Indigenous languages spoken across the Northern Territory and over 130 defined Indigenous groups [1].

The Northern Territory has the youngest population in Australia, with a median age of 31.2 years and the highest proportion in Australia of men to women, with 107.6 men for every 100 women [21]. The NT Indigenous population is considerably younger than non-Indigenous Territorians [4], reflected by comparing population pyramids between Indigenous and non-Indigenous Australians. Those living remote generally have a lower socioeconomic status, lower literacy rates and fewer achieve completion of high school education. Projections for the population of the Northern Territory is that it will continue to expand rapidly, largely from non-Indigenous migration [1]. The NT treasury predict the population will grow from between 13 to 23 percent by 2020, with most of this growth in the greater Darwin region [4].

Cardiovascular disease holds the place as the second highest burden of disease for the Northern Territory [22]. The Northern Territory has the highest burden of disease of all the states and Territories in Australia, with the Aboriginal population having 2.5 times the burden of disease when compared to non-Indigenous Territorians [23]. The true prevalence of cardiovascular disease in the NT is unknown, given that previous national data collected has not included information from remote locations. Much of the data available in this area is from when people present with acute events from their heart disease and need hospitalisation. In 2009-10 there was an estimated 1,596 cardiac-related admissions in all public hospitals of the NT, with approximately 81% of these being emergency admissions [4]. Most of these cardiac separations were from RDH (67% of cardiac related public separations) [4]. Cardiovascular disease represents a significant burden to the health system in the Northern Territory.

Over the period 1992-2004, it has been shown that there was an increasing mortality from Ischaemic Heart Disease in the NT Indigenous population, a result of a rise in the incidence of Acute Myocardial Infarction, even though there has been an improvement in the Acute Myocardial Infarction survival rates [24]. This improvement in survival has largely been attributed to substantial improvement in pre-hospital care, access to hospital and management at the primary health care centre [24]. For non-Indigenous patients in the Northern Territory over the same time, the annual incidence of Acute Myocardial Infarction was similar to that of the general Australian population and mortality in this population decreased at a similar rate to the rest of Australia [24]. Pre-hospital mortality from Acute Myocardial Infarction in the NT has been shown to increase for males and those who live remotely for the non-Indigenous population. Interestingly, there was no difference in pre-hospital mortality for Indigenous patients who lived remotely or in urban centres [24]. Other contributory factors to poorer outcomes for Indigenous patients with Ischaemic Heart Disease include higher rates of risk factors, lower rates of coronary interventions, delays to presentation and less patients strictly adhering to prescribed medications and management plans [24].
Despite being twice as likely to die from heart disease, Aboriginal and Torres Strait Islander Peoples are less likely to participate in conventional cardiac rehabilitation programs than non-Indigenous Australians. [16]. Contributing to this may be distance, with 70% of the NT Indigenous population live on average more than 145km from the nearest cardiac rehabilitation service [4].

The NT Cardiac Services Implementation Plan 2012-17 [4] has identified that cardiac rehabilitation in the NT needs to be regionally focused, patient-centric, engage families and communities in the patient’s care, use flexible approaches, engage with tele-health, integrate existing services, address workforce shortages, consider those from culturally and linguistically diverse backgrounds and those from low socio-economic backgrounds and needs to incorporate Aboriginal Health Workers. It is suggested that the model includes telephone, home visits, videoconferencing and group support and to engage with already existing services [4]. Workforce requirements for this expansion have been requested. Currently cardiac rehabilitation services in the Northern Territory are very limited and predominantly based in Darwin and Alice Springs. Clients in the urban setting have some access to services, but those in regional and remote areas have little to no services available to them. The Northern Territory has shown how the shared electronic health record can improve communication between services, and with recent expansion and the rollout of telehealth services, this has the potential to further improve care of cardiac patients.

CURRENT GAPS IN CARDIAC REHABILITATION IN THE NT

It is recognised that current cardiac rehabilitation services in the Northern Territory do not achieve good coverage across the population for various reasons. Patients who are currently potentially being underrepresented include:

- Remote patients
- Indigenous patients
- Patients undergoing angiography as a day patient
- Patients from remote communities undergoing angiograms prior to valvular surgery (staying in self-care whilst in Darwin)
- Patients with conditions other than IHD eg heart failure

Current challenges in the Northern Territory include:

- Lack of framework to form the basis for cardiac rehabilitation policy and services expansion
- Inadequate funding for cardiac rehabilitation services
- Inability to expand current services due to human resources and funding constraints
- Multiple flexible modalities not readily available with current rehabilitation
• Little central coordination for cardiac rehabilitation
• No dedicated cardiac Aboriginal Health Workers, despite the high numbers of Indigenous cardiac patients
• Low education and literacy rates amongst patients
• Culturally appropriate materials not available in all languages
• Language barriers, particularly for remote Indigenous patients

Current barriers to adequate service provision include:

• Recruitment and retention of staff at the cardiac educator level, staff in hospitals and primary health care settings.
• High workload with a difficulty to cover phase 1 needs in Royal Darwin and Alice Springs hospitals: patients are prioritised and not seen as frequently as ideal
• No annual leave cover when cardiac educators go on annual leave or when they are providing an education service to health professionals
• Referral of patients to cardiac rehabilitation from Alice Springs Hospital is difficult, given there is no dedicated cardiac ward where patients are located. This makes identification of cardiac patients more challenging and there are few coronary-care trained nursing staff who look after these patients, given they are often in the high dependency unit where there are a variety of other presentations being managed.
• Referral of patients from general medical wards and regional hospitals, as most patients seen in phase 1 are seen by looking at Coronary Care and High Dependency patient lists.
• Suboptimal involvement from allied health
• Incomplete communication between hospital and primary health care centres regarding ongoing follow-up of phase 2 and 3
• Limited phase 3 programs and support available
PLANS FOR EXPANSION OF CARDIAC SERVICES

It has been recognised in the NT Services Implementation Plan 2012-17, that to address the current priority issues an increased number of cardiac nurse educators, cardiac outreach nurses and cardiac coordinator positions are needed [4].

*Integrated NT wide cardiac network:*

Plans for an integrated NT-wide accessible cardiac network service are currently being developed. This will include formal diagnostic management pathways for cardiology conditions including an Acute Coronary Syndrome (ACS) pathway, an expansion of specialist outreach clinics, expanded diagnostic services, expanded angiography services (including revascularisation) and the expansion of eHealth technology to improve access to patients in remote locations. A cardiac patient registry will also be included in this expansion.

*Cardiac Nurse Care Coordinators:*

An expansion of the current cardiac coordinator role is envisioned to involve at least 5 cardiac outreach nurses. This current role will be extended to cover a geographical region each with 3 based in Darwin and 2 in Alice Springs. They would be assigned a variety of tasks including coordinating cardiac patients, the organisation of clinics in their regional location, education and coordination support for rehabilitation to these areas.

*DVD to support cardiac patient education:*

In 2012 a DVD entitled “Cardiac Story” was released – a patient education tool which describes in 5 different Indigenous languages the journey for an Indigenous patient from presenting with chest pain to Royal Darwin Hospital, through the journey to having bypass surgery in Adelaide.

A similar resource covering aspects of cardiac rehabilitation in language would be a very useful resource, particularly in supporting remote health centres in the decentralised provision of cardiac rehabilitation services in a patient’s home community.
FRAMEWORK SCOPE

The National Heart Foundation and Australian Cardiac Rehabilitation Association’s ‘Recommended Framework for Cardiac Rehabilitation ‘04’ [7] has been used, expanded into a framework appropriate for the unique population of the Northern Territory.

This framework for cardiac rehabilitation will apply to all people with cardiovascular disease in the Northern Territory, following their cardiovascular event. It is recognised that all cardiac patients should have access to phase 1 rehabilitation and education. All patients with cardiovascular disease will benefit from a phase 2 program following discharge from hospital, but expansion of rehabilitation services will be prioritised as to the severity of cardiac conditions requiring rehabilitation.

Three tiers of patient priorities have been formed from consensus opinion. High priority patients must all receive rehabilitation; medium priority patients should have rehabilitation if there are available resources; and for low priority patients, it is recognised that cardiac rehabilitation will have some benefit for these patients if resources allow. Australian Rheumatic Heart Disease guidelines list secondary prevention as needing to include patient and family education and support for patients to improve self management, in addition to the administration of secondary antibiotic prophylaxis and care [25].

Patient group priorities for phase 2 cardiac rehabilitation:

<table>
<thead>
<tr>
<th>High priority</th>
<th>Medium priority</th>
<th>Low priority</th>
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<tbody>
<tr>
<td>All must have Cardiac</td>
<td>Should have Cardiac Rehabilitation</td>
<td>Cardiac Rehabilitation if unlimited resources</td>
</tr>
<tr>
<td>Rehabilitation</td>
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<thead>
<tr>
<th>Acute Coronary Syndrome</th>
<th>NY Class II Heart Failure</th>
<th>Arrhythmias</th>
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<tbody>
<tr>
<td>Percutaneous Coronary</td>
<td>Stable angina</td>
<td>Rheumatic Heart Disease P2 &amp; P3</td>
</tr>
<tr>
<td>Intervention</td>
<td></td>
<td>Pacemaker insertion</td>
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<tr>
<td>All surgical intervention (including valves and Coronary Artery Bypass Grafting)</td>
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</tr>
<tr>
<td>NY Class III &amp; IV Heart Failure</td>
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<tr>
<td>Rheumatic Heart Disease P1</td>
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<tr>
<td>Implanted defibrillators</td>
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<tr>
<td>Pulmonary Hypertension</td>
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NY Class I Heart Failure: do not need Cardiac Rehabilitation (as they are asymptomatic)
NY Class II Heart Failure: some may be classified high priority by cardiologist
The scope of the framework covers all levels of the health service involved:

- Top End and Central Hospital networks
- NGOs: NT Healthy Living and National Heart Foundation
- Primary Care Settings, including private GP practices, Community Health Centres, NT Government remote health sites and Aboriginal Community Controlled Health services.

THE NT FRAMEWORK

The Cardiac Secondary Prevention Framework has been developed in consultation with stakeholders across the Northern Territory. A Cardiac Secondary Prevention Working group was established with the membership attached (Appendix 4).

Goal:

To describe a framework for the development of model/s of care which can be used across the Northern Territory to improve cardiovascular secondary prevention and rehabilitation.

| Principles |
|------------------|------------------|------------------|------------------|
| Flexibility within evidence base | Person-centred encouraging self management | Culturally appropriate | System coordination and integration |

| Enablers |
|------------------|------------------|------------------|------------------|
| Equity and access | Collaborative partnerships | Supportive IT system | Skilled and sufficient numbered workforce |

<table>
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<tr>
<th>Objectives</th>
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<tr>
<td>1. Provide equitable and timely access for all cardiac patients to secondary prevention services, regardless of their location within the Northern Territory.</td>
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<tr>
<td>2. Provide strategic direction to health professionals and policy/decision makers across health services for a coordinated and integrated multidisciplinary approach to cardiac rehabilitation.</td>
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<tr>
<td>3. Facilitate improved communication between stakeholders across all phases of cardiac rehabilitation including ongoing secondary prevention.</td>
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<tr>
<td>4. Facilitate the development of consistent messages about cardiovascular disease for patients across all phases of rehabilitation and services involved in their care.</td>
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PRINCIPLES

*Flexibility within evidence base*
Cardiac Rehabilitation and secondary prevention must be delivered by multiple modalities in order to reach across the NT population with high uptake and adherence.

- Different models of care available
- Patient choice as to what model to chose
- Ability for patient to move from model to another as needed
- Innovative use of resources across geographical, language and health literacy challenges
- Using evidence-based models
- The incorporation of quality assurance and key performance indicators into every day practice

*Person-centred encouraging self management*
An approach which is person-centred recognises that the individual is the centre of care and the expert in their own condition; improving health is achieved through a partnership between the patient, their family and health professionals

- Patients prioritise their own risk factors to be targeted and decide what model is most appropriate for themselves, with the support of health professionals
- Health professionals have a shared responsibility with client to look at problems, priorities and goal setting
- Individualised care with modular education
- Ensuring sustainable outcomes after discharge from the program
- Consistent with the NT Chronic Conditions Self Management Framework 2010-2020 [5]

*Culturally appropriate*
The framework must recognise the contribution of culture to the overall health of the individual and how it can influence accessing services

- Models must be appropriate for all individuals participating and particularly take into account the needs of Indigenous clients
- Respect to the individual and community’s preference, tradition, value and culture
- Having, at a minimum, an Aboriginal Health Practitioner as a key member of the cardiac rehabilitation team
- Recognition that rehabilitation needs to also be appropriate for not just Aboriginal people, but also accessible to culturally and linguistically diverse peoples originally from outside of Australia
- Engagement and inclusion of family and interpreters as needed and as consented to by the patient

**System coordination and integration**
A complex health care system aiming to deliver a multiple-modality rehabilitation program needs strong coordination, communication and integration with current systems
- Framework reliant on cardiac care coordinators to be the key linkage ensuring the provision of seamless care across different settings
- Appropriate system design that assures the delivery of effective, efficient clinical care and self management support
- Adequate communication between all relevant parties to ensure coordinated and quality care
- Involvement and communication to Primary Health Care services, who will look after lifelong secondary prevention, and phase 2 in some locations

**ENABLERS**

**Equity and access**
All people requiring cardiac rehabilitation service should have access
- Flexible and innovative model to encourage this
- Increased focus on regional centres and remote communities

**Collaborative partnerships**
Partnerships need to occur between clients, family, community, health service providers, relevant Non-governmental Organisations and those involved in the development of the framework and its implementation.
- Clear commitment from stakeholders that assures the provision of seamless and high quality cardiac services from:
  - Department of Health: Top End and Central Australia Hospital Networks, Health Development, Remote Health and potential partnerships with Community Health, Mental Health and Age and Disability.
  - NGOs: Healthy Living NT; The Heart Foundation; NT Medicare Local; NT Cardiac; private general practices.
  - Aboriginal Community Controlled Health Organisations and their peak body AMSANT.
• Multidisciplinary approach to each client’s cardiac rehabilitation
• Engagement of communities, particularly in remote settings
• Support provided by family, carers and community must be recognised

Supportive IT system
A complex multiple-modality rehabilitation delivery needs supportive Information Technology systems to have maximal function and use

• Incorporation of the rehabilitation model and associated clinical information onto the cardiac patient register (to be developed as part of infrastructure upgrades)
• System which can adequately track patients and facilitate appropriate coordinator recalls and contact
• Selection of an IT platform which is easy to use for both clients and staff
• Facilitation of the sharing of information with relevant parties, including via the shared electronic health record
• Increased usage of tele-health services

Skilled and sufficient numbered workforce
A multidisciplinary team lead by a cardiac nurse care coordinator and including an Aboriginal Health Practitioner, amongst others, must be adequately trained, resourced and funded to be able to achieve outcomes.

• Cardiac nurse care coordinator positions needed as a key role within the framework, adequate funding and recruitment needed
• Adequate resourcing of those providing cardiac rehabilitation and secondary prevention
• Health professionals are supported through ongoing education and training in cardiac rehabilitation and secondary prevention, self management and cultural security, and taking into account the high turnover of staff across urban, regional and remote locations
NT MODEL OF CARDIAC REHABILITATION

PHASE 1
- Transfer from Adelaide post surgery (or other interstate)
- Inpatient Care and Education
- External Referral (non hospital referral)

PHASE 1B ASSESSMENT
- Planning meeting with coordinator to undertake self management assessment and identify pathway (AHP involved in assessment and phase 2 for Indigenous clients)
  - Plan put on goACT platform
    - Urban: 1 week post discharge in Darwin or Alice Springs
    - Regional/Remote: 2 weeks post discharge when back in community

PHASE 2
- Face-to-Face Rehabilitation
  - Darwin/Alice Springs
- Supported at Home
  - Any location
- Hybrid of Face-to-Face and Supported at Home
  - Darwin/Alice Springs/Regional
- Remotely Facilitated Technology-Assisted Platform
  - Remote

PHASE 3
- Discharge back to PHC
  - Lifelong Self Management
  - Link into Community Services

**Figure 1**

Supported at home = Supported by regular phone calls, using smart phone or internet-based. For those who can independently navigate the technology and health system
Remotely facilitated = with an external person (eg RAN, AHP) to facilitate a similar model to Supported at home
NT MODEL OF CARDIAC REHABILITATION

The Northern Territory model is a multifaceted and flexible model which is individually tailored to the patient. It is based on the recommended framework by the Heart Foundation and ACRA and pulls together current available evidence, whilst taking into account the unique population of the Northern Territory, namely a significant proportion of the population living in regional and remote areas and a high number of Indigenous clients. Aims are to document an initial clear diagnosis to aid clinical pathway streaming, individual assessment with care planning to maximise risk reduction goals, encourage self management and enable long-term ongoing prevention of a further event. See Figure 1 for the visual NT cardiac rehabilitation model. This is an expansion of the existing services in the NT.

PROGRAM COORDINATOR: CARDIAC NURSE CARE COORDINATOR

The National Heart Foundation advises that the cardiac rehabilitation team should be multidisciplinary, with one health professional coordinating care [16].

The coordinator of the program will be a cardiac nurse care coordinator, who looks after a regional area. A similar role exists in the Department of Health currently, but an expansion of responsibilities and increased focus on cardiac rehabilitation will occur with increased staffing.

The cardiac rehabilitation responsibilities of the cardiac nurse care coordinator will include:

- Ensuring a self management care plan is completed, to help the patient identify their own goals
- Discussion and support of the patient on the most appropriate pathway to choose
- Ensure smooth transition across the rehab phases and foster adequate communication between patient, family and health professionals
- Tracking patients via goACT to look at their progress and to maximise their engagement in rehabilitation
- Providing regular telephone follow up for those being supported at home
- Provide planning assistance for remotely facilitated clients, including being involved in program support for chronic diseases management groups (described below)
- Delivery of cardiac-specific education to supported at home and remotely facilitated clients
- Monitor the process of rehabilitation
- Arrange appropriate referral and communication back to the Primary Health Care Centre on discharge from phase 2
MEMBERS OF THE CARDIAC REHABILITATION TEAM

The involved team is multidisciplinary and coordinated by the cardiac nurse care coordinator. For Indigenous patients, an Aboriginal Health Practitioner must be a key member of the rehabilitation team to enable increased access and ensure a culturally sensitive program [7, 16]. The involvement of all these members as appropriate is to provide a holistic approach to help the patient achieve their rehabilitation goals. The acute hospital care and Healthy Living NT will continue to work to jointly deliver phase 1 education services. Family and community involvement should be encouraged across the phases of cardiac rehabilitation where the client consents.

Multidisciplinary team members that may be appropriate to be engaged across phases 1 or 2:

- Cardiac Nurse Care Coordinator
- Aboriginal Health Practitioner (present for phase 1B planning if patient is Indigenous and help the coordinator facilitate, deliver and plan cardiac rehabilitation particularly for remote clients)
- Cardiologist
- Cardiac Nurse educator (from CCU or Healthy Living NT)
- Exercise physiologist/Physiotherapist
- Dietician/Nutritionist
- Diabetes educator
- Pharmacist
- Social worker/Psychologist
- Health Promotion team (eg tobacco and healthy living workers, Chronic Disease educators)

The Primary Health Care provider plays a key role in phase 3, the ongoing lifelong management.

REFERRAL TO CARDIAC REHABILITATION (referral to phase 1B)

Referrals will be to the Cardiac Nurse Care Coordinator (specific to the region the patient is from). Hospitals will be the main referral point for rehabilitation, with patients identified by:

- All patients admitted to Coronary Care Unit at RDH and ASH
- Referral of patients admitted under general medical wards with cardiovascular issues, cardiology patients at Darwin Private Hospital and regional hospitals, considering all high priority groups
- Referral from the cardiology team
• Referral from the Cardiac Coordinator (ASH) or Indigenous Cardiac Coordinator following return from interstate for cardiac intervention. In Alice Springs Hospital, the Cardiac Nurse Care Coordinator can liaise with the patient whilst they are admitted during transit and arrange a time for phase 1B planning following discharge. In Darwin, for the Indigenous Cardiac Coordinator to liaise with the Cardiac Nurse Care Coordinator when the patient is staying at self care in Darwin, so the idea of cardiac rehabilitation is introduced and a time made for phase 1B to plan rehabilitation further.

• Referral of patients having angiograms

Other patients who may benefit from cardiac rehabilitation will also include patients returning from cardiac interventions in Adelaide or other states (where phase 1 will have been given already), or non-hospital referrals from other medical doctors (for example General Practitioners). These referrals will also go to the Cardiac Nurse Care Coordinator, who will arrange a phase 1B planning appointment with the client.

PATIENT JOURNEY THROUGH THE PHASES IN THE NT

**Phase 1**

Delivery of phase 1 education as currently, a combined service between Healthy Living NT and the hospital (Darwin or Alice Springs).

Initial contact during hospital admission by the Cardiac Nurse Care Coordinator. Explanation of their coordinator’s role, the cardiac self management care plan and an appointment made to further plan the individualised rehabilitation. Prior to commencing an exercise component of cardiac rehabilitation, the patient must have be medically cleared by either their cardiologist or general practitioner to undertake exercise.

**Phase 1B**

Planning appointment with the Cardiac Nurse Care Coordinator to help the patient determine their Cardiac Self Management Care plan (see appendix 8). This emphasise patient goals, and a record will be put on the goACT platform to enable communication between health professionals.

Discussion with the patient around most appropriate cardiac rehabilitation pathway. Ultimately this is the client’s choice, with advice from the Cardiac Nurse Coordinator after taking into account patient goals, lifestyle and work, geographical location, health literacy, language barriers and ability to use and access to internet and smart phones.

Referrals made as above. For inpatients, face-to-face appointment made one week following discharge if remaining in Alice Springs/Darwin. If from a regional or remote area, appointment made for 2 weeks after discharge when the client has returned home, appointment to be via telephone or videoconference linkup.
Phase 2
Expanded options are available for the delivery of phase 2 cardiac rehabilitation service:

- Face-to-face group rehabilitation (with Healthy Living NT)
- Supported at home
- Hybrid of Face-to-face and Supported at home
- Remotely facilitated (with goACT)

The provision of patient handout information to aid decision-making have been developed (Appendix 5&6).

Face-to-face is only for those who will be physically located in Darwin or Alice Springs. Supported at home can be used wherever the client is located.

The hybrid of face-to-face and supported at home may be most appropriate for those who either live in Darwin or Alice Springs but have other commitments (eg work) and can attend just some of the face-to-face sessions, or for people from larger regional centres such as Katherine or Tennant Creek who may be able to come to some face-to-face sessions, but it is not feasible for them to attend all of them.

The difference between supported at home and remotely facilitated is essentially the amount of support given to the person. The client will generally need some technology and health literacy for supported at home, as compared to remotely facilitated which is generally designed for people from remote communities or regional centres who may need increased support in engaging with cardiac rehabilitation services, usually working with a local health professional.

Phase 3
Discharge from phase 2 occurs on completion of goals or after a defined time frame. The Cardiac Nurse Care Coordinator will identify with the patient the appropriate PHC service that will continue ongoing management and communicate the outcome of cardiac rehabilitation.

The patient will also be linked into other community services and programs available in their area.
INFORMATION TECHNOLOGY PLATFORM

Information technology is having an increased role in the provision of services outside hospital, with recent studies demonstrating tele-monitoring of heart failure patients as an effective tool to decrease hospitalisations [13]. A Cochrane review has shown that web-based applications can be an effective way to monitor and interface with patients across distances for people with a chronic disease [2].

A coordinated IT platform is key to enabling access to multiple modalities of cardiac rehabilitation services. The platform should be coordinated and use efficient and easy-to-use communication tools. There are limited examples of this type of platform currently in use, but one that has been trialled in Queensland after development with CSIRO and Queensland Health is the goACT platform. This uses mobile phone and internet technology to provide home-based cardiac rehabilitation including education, mentoring, personal feedback, motivational messages and counselling with recording capabilities of physical exercise, a wellness diary and goal setting. It is coordinated centrally by a health professional who can track the patient’s progress in the program [13, 26]. In addition to this platform, weekly telephone sessions with a mentor are also used.

This model is currently being evaluated further with a randomised control trial to evaluate clinical outcomes, acceptability, adherence and the cost-benefit ratio. Preliminary data shows high adherence rates and good acceptance by patients. [13]. The recent KPMG report suggested that this specific model may be useful for the Northern Territory [1]. The goACT platform can be modelled for different uses; previously it has been used as an electronic version of the Flinders Program for Chronic Disease management tool and for use in supporting Cognitive Behaviour Therapy in South Australian patients with major depression. Tailoring the platform specifically to the NT context for cardiac rehabilitation has commenced.

The Information Technology platform selected will be the central point for records where all rehabilitation care plans are recorded, regardless of the pathway chosen within rehabilitation. It will enable the patient to track their own progress and a summary of rehabilitation will be sent to the identified PHC providers on discharge.
CARDIAC REHABILITATION PHASES IN THE NT: THE DETAIL

The cardiac rehabilitation program will incorporate elements at each phase as described in the 2004 ACRA framework document [7].

<table>
<thead>
<tr>
<th>PHASE 1: Hospital Phase – period from admission to hospital separation</th>
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<tbody>
<tr>
<td>• Culturally appropriate basic information and reassurance</td>
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<tr>
<td>• Supportive counselling</td>
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<tr>
<td>• Involvement of family and interpreters as needed. Identifying a key family member to be present for education if warranted</td>
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<tr>
<td>• Mobilisation on ward</td>
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<tr>
<td>• Guidelines for ongoing mobilisation and management of symptoms at home</td>
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<tr>
<td>• Guidelines and rules for driving vehicles following a cardiac event</td>
</tr>
<tr>
<td>• Guidelines for return to sexual activity</td>
</tr>
<tr>
<td>• Discussion of basic medications used</td>
</tr>
<tr>
<td>• Checklist of patient education delivered</td>
</tr>
<tr>
<td>• Communication with other relevant health professionals</td>
</tr>
<tr>
<td>• Referral to Indigenous Liaison Officer or Social Worker if required</td>
</tr>
<tr>
<td>• Discharge planning</td>
</tr>
<tr>
<td>• Contact with Cardiac Nurse Care Coordinator</td>
</tr>
<tr>
<td>• Referral to phase 1B</td>
</tr>
</tbody>
</table>

Phase 1 education will continue to be given collaboratively by coronary care staff and Healthy Living NT. Written, video and other resources are available to assist in education. These are available from Healthy Living NT and Royal Darwin and Alice Springs Hospitals. See Appendix 7 for a summary of resources currently available. An education package is given to all cardiac inpatients and a education checklist is completed by discharge from hospital.

Standardised health service protocols (clinical or patient pathways) are now recommended by the National Heart Foundation [27], and these clinical pathways are being developed for the management of specific presentations. Some PROMPT hospital guidelines already exist.
Cardiac Rehabilitation Self Management Care Plan (Appendix 8) includes:

- Clear diagnosis
- Risk factor assessment
- Patient-directed goals
- Depression screening (initial) and referral as appropriate
- Location where patient will be whilst undertaking rehabilitation
- Identification of usual health centre/primary health provider
- Assessment of health literacy and technology literacy and access
- Potential barriers to cardiac rehabilitation
- Discussion decision as to appropriate rehabilitation pathway

During an acute cardiac event and hospitalisation, there may be many competing priorities and patients may have difficulty retaining and understanding information given [7]. Taking this into consideration, a time following discharge home may be the most appropriate time to plan rehabilitation. This will occur one to two weeks following discharge, depending on where the patient lives.

A visual self-management tool such as a “yarning tool” may be used to facilitate discussion and identify patient priorities. The Flinders Self Management model may be appropriate for use in some clients, but a culturally appropriate self management tool is currently being developed and may be appropriate for Indigenous clients. An example of a culturally appropriate “yarning tool” currently being used is the AIMHI Stay Strong Plan for mental health discussion [28].

The self management cardiac care plan will include baseline data and assessments which will help to identify modifiable risk factors, enable the patient to prioritise their own goals and help guide which pathway for phase 2 is the most appropriate. Ideal target goals for biomedical markers will be as per the National Heart Foundation Guidelines or other approved guidelines for the targets of specific conditions. Modular education may be used to help support the patient’s self-identified goals.

Irrespective of which pathway is used, the care plan will be put on the selected IT platform and will be shared between relevant services. The patient will be given a copy of the careplan with a contact person for their rehabilitation. If the client will participate in a technology-based pathway, then appropriate training for the client will be undertaken.

Depression is very common following acute coronary syndrome and in other cardiac problems. Screening for this on different occasions is appropriate, to identify who needs further support in this area. Screening for depression will occur in phase 1B and on discharge, with the PHQ9 screening tool (appendix 9) and subsequent referral pathway (appendix 10).
**PHASE 2:** Post event – from discharge until person’s medical, physical and psychological condition has stabilised. A structured program often 4-12 weeks.

- Focus on self management of the individual’s risk factors and goals
- Individual assessment, review and follow-up
- Low to moderate intensity physical activity
- Education, discussion and counselling
- Interventions targeting behaviour modification, looking at issues such as physical activity, weight control, healthy diet, smoking cessation, stress management, control of hypertension, lipids, glucose and psychological issues such as depression [29]

In the Northern Territory there will be four options for phase 2 rehabilitation; these pathways shall remain flexible after commencement of rehabilitation, enabling patients to move between pathways if needed for any reason:

**Face-to-face**

*Based in Darwin or Alice Springs*

- Healthy Heart Program, the usual (or accelerated) face-to-face group program, a running program over 4 weeks
- Able to join at any time in the program
- Delivered by Healthy Living NT

**Supported at home**

*For people with reasonable health literacy, confident with negotiating health system on their own. From any location.*

- Point of communication is the centrally located Cardiac Nurse Care Coordinator who covers the region the patient resides in. Only contact will be with the Cardiac Nurse Coordinator (more self-reliant option)
- Cardiac Nurse Care Coordinator reviews the client’s progress on goACT and supports the client as needed. This will include at a minimum weekly contact via telephone or internet whilst in the program.
- Group sessions may be run via phone or videoconference linkup
- Patient identifies which of telephone calls, smart phone or internet is the most appropriate modality for them
  - Telephone involves Cardiac Nurse Care Coordinator calling a home number or mobile phone regularly to discuss progress and
offer support

- Smart phone involves the client using an iphone or android application to enter data and record progress eg physical activity, food diary, weight, BSL monitoring etc. Motivational messages sent regularly. Cardiac Nurse Care Coordinator can call on a regular basis also.

- Internet involves the client using the same IT application online. Contact with the Cardiac Nurse Care Coordinator will be on a regular basis, either by telephone calls or emails.

### Hybrid of Traditional and Supported at home

*For people with reasonable health literacy, confident with negotiating health system on their own. For people residing in Darwin, Alice Springs, reasonably short distance from these centres or regional centres such as Katherine or Tennant Creek, where the client may be in Darwin or Alice Springs on occasion.*

- Combination of the above two options, depending on the patient’s goals and needs
- Patient may attend face-to-face sessions as they are able (depending on time, employment and location etc)

### Remotely facilitated (on selected IT platform)

*For people needing increased support to undertake rehabilitation but are not located in Darwin or Alice Springs. Ideal if have a lower health or technology literacy, are more complicated medically, need more physical assistance, have a carer or need social assistance to participate in rehabilitation.*

*Difference between this and the Supported at home model is the level of support given. For patients predominantly living in remote communities.*

- Regionally (eg Katherine, Gove, Tennant Creek), rehabilitation is facilitated by community health nurse or local Primary Health Care Centre. The centre involved and key contact at the centre will be identified by the Cardiac Nurse Care Coordinator during the planning phase 1B. Support offered from the Central Cardiac Nurse Care Coordinator is the same despite being located regionally or remotely.

- Remotely the program is facilitated by an Aboriginal Health Practitioner or a Nurse at the local health or community centre. There will generally be low numbers of patients per health clinic.

- The Centrally located Cardiac Nurse Care Coordinator for the region will plan individual goals with the client in 1B and liaise with the identified health centre to set up a plan to achieve the goals. The facilitator at the health centre will be able to guide what services are available locally.

- Health centre will help identify local supports and groups available eg walking groups, other patients that have recently been through a similar situation and have agreed to be supports etc.

- The Cardiac Self Management Care Plan will be put on the selected IT
platform, accessible over the internet by the centrally located Cardiac Nurse Care Coordinator, the local facilitator and the patient.

- The Cardiac Nurse Care Coordinator will follow the progress of the rehabilitation entered on goACT and regularly telephone or videoconference (depending on tele-link capabilities at the health centre), at a minimum interval of weekly. The local facilitator should be present to set up the technology linkup and help report on the client’s progress. Ideally a local Aboriginal Health Practitioner is involved in these sessions if able and family are encouraged to engage.

- Specific cardiac education needed will be delivered via the telephone or videoconference linkup as needed (relevant modular education) by the Cardiac Nurse Care Coordinator or visiting outreach cardiac educators.

- Health centres may assist to take physical measurements (weight, blood pressure, blood sugars etc) and entering in entering data onto the IT platform.

- The client will be encouraged to link in with chronic disease management groups in the community if available (see model on p 30).
MODULAR CARDIAC EDUCATION

Each patient will have an identified diagnosis which fits within one of the below categories. This will enable condition-specific cardiac modular education to be followed within their rehabilitation, whatever their planned modality of rehabilitation delivery. For face-to-face rehabilitation, the cardiac nurses from Healthy Living NT already provide this specific information. Extending this to the other modalities, the cardiac modular education will be the Cardiac Nurse Case Coordinator’s responsibility to deliver, in combination with Health Living NT remote cardiac education outreach visits if available.

There will be some overlap with the education given within some of these educational pathways, but the aim is so all relevant information has been given to the individual for the specific condition they have. For example, the modular cardiac education between IHD – medical management and CABG will both cover discussion about IHD, what it is and risk factors, but it is only relevant to discuss bypass surgery (including what to expect and complications), with someone who is going to undergo that procedure.

This modular education is separate to recommended clinical management, which is directed by the clinician, supported by accepted guidelines such as PROMPT and CARPA.

Educational pathways within cardiac rehabilitation:

- IHD – medical management
- IHD – angiography/PCI
- IHD – CABG
- Heart valve surgery
- Heart failure
- Rheumatic Heart Disease P1 (involving NT Rheumatic Heart Program)
- Pulmonary Hypertension (involving the Respiratory nurses)

A Remote Model: Chronic Disease Management Groups

Some regional locations already have chronic disease management groups, which have been shown to be highly successful [30]. Extending this further for usage in the remote setting, these groups may be a useful way to address many chronic diseases, but also cover relevant goals and core components of cardiac rehabilitation. The groups would be ongoing, open to anyone with a chronic disease. Considerations for these groups:

- In the remote setting, there will be only small numbers of people undergoing cardiac rehabilitation at any one time.
- Much of the lifestyle and physical activity messages are relevant more broadly to all chronic diseases.
Groups could meet once a week in large communities and once every 2 weeks in smaller communities. It may be appropriate to have separate male and female groups in some Indigenous communities.

The groups would cover both physical exercise and education goals, utilising what resources and visiting specialists available at the time.

Groups will have a core facilitator on the ground. This person will ideally be a Community Health Worker or an Aboriginal Health Practitioner, but could also be from elsewhere in the community (*eg* a Sport and Recreation Officer). They do not need to be a health worker. Their role is to facilitate program that has been planned out in conjunction with the visiting facilitator.

Groups will also have a visiting planning facilitator. This will be a health professional already involved in visiting the community (*eg* for Department of Health, it may be someone from Health Development – possibly a health promotion officer, PCD educator, dietician, etc). Aboriginal Medical Services may identify a similar role, depending on who visits the community. Larger communities may have a Chronic Disease Nurse who could be the planning facilitator.

This planning facilitator would keep the timetable and coordinate bookings of multidisciplinary staff. They would liaise with the Cardiac Nurse Case Coordinator for the region to ensure that cardiac rehabilitation patients are working towards identified goals on the care plan. Group visitors and activities would be dependant to the current goals of patients within the group and available visiting staff.

Although covering the goals of phase 2 cardiac rehab, these groups could continue into phase 3 and could also involve other chronic diseases. When clients have completed their goals for phase 2, they may wish to continue coming to the group to continue to address their phase 3 lifetime goals.
MINIMUM TRAINING AND EDUCATION FOR THOSE DELIVERING CARDIAC REHABILITATION

The incidence of medical complications occurring during exercise is relatively low, but during the time immediately following a cardiac event or surgery, the risk may be slightly higher. Due to this, safety issues must be carefully considered and understood by anyone running or facilitating a cardiac rehabilitation program. When exercise is initially commenced, early signs may be detected which can be indicative of problems, these are often able to be addressed before they become more serious. Such early signs may include blood pressure fluctuations with exercise, fluid overload, shortness of breath which does not settle with rest, chest pain and wound breakdown.

With the expansion of cardiac rehabilitation and the models described, more people who are not specifically trained in the commencement of exercise at this critical time will be involved. It is essential that anyone involved in facilitating exercise groups following a cardiac event or surgery undergoes a minimum standard of training to be able to identify the above described issues, then to postpone exercise in these patients and refer for further assessment. It would be useful for this education to be delivered via a remote cardiac course.
Exiting phase 2:
Completion of the program will be when goals are completed or after a specific timeframe decided between the patient and Cardiac Nurse Care Coordinator.

Prior to discharge, progress through the program is discussed between the patient and Cardiac Nurse Care Coordinator, a summary of rehabilitation provided and an ongoing plan put in place. This will be communicated to the client's Primary Health Care provider with the client's consent. If the client finds using the IT platform to be a useful adjunct, they may continue to use this in assisting their self management program, although this will not be monitored following completion of phase 2.

**PHASE 3 – Lifelong. Ongoing following completion of outpatient phase**

‘Services and activities that support ongoing maintenance of behaviour change to obtain long-term health benefits and reduce the risk of further events’[7]

Ongoing lifelong activities will be through the Primary Health Care provider identified by the patient as their local service (private GP or health care centre). This requires communication of cardiac rehabilitation goals and achievements to the relevant PHC team or General practitioner, as described above.

**Assessment and management**

This will occur through Primary Health Care services and should include [7]:

- Ongoing individual self management of smoking, nutrition, alcohol, physical activity and weight management
- Addressing biomedical risk factors including lipids, blood pressure and diabetes
- Pharmacology
- Psychosocial risk factors

The usage of GP Management plans and Team Care Arrangements for Medicare should be encouraged, to increase the uptake in General Practices and Primary Health Care settings. The Medicare items for GP Management Plans and review are Items 721 and 725; and for the Team Care Arrangement and review it is Items 723 and 727.
Ongoing prevention activities
The cardiac rehabilitation coordinator, with additional information from the primary health care service, should direct the patient to existing structures providing lifestyle programs and support groups available locally. These may include activities such as Heartmoves, City Council programs, Activate NT, HEAL, or Anglicare Services.

IMPLEMENTATION AND EVALUATION
The implementation and evaluation of the framework will be further developed, potentially with an application for an NHMRC funding grant. The aim would be to assess and improve the effectiveness of the health service delivery. [16]

Implementation of the multiple-modality model will initially be trialled in a selected regional or remote setting, increasing coverage in a stepwise fashion as resources allow. Initial implementation will rely heavily on funding for both the IT platform and the expanded cardiac coordinator positions.

A comprehensive program evaluation will assess the process, impact and outcome of the intervention. An abridged summary of the suggested data indicators is listed below, as identified in the Strengthening Cardiac Rehabilitation for ATSI Peoples report [16].

<table>
<thead>
<tr>
<th>Overall outcomes:</th>
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<tbody>
<tr>
<td>Number of patients referred</td>
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<tr>
<td>Proportion of patients completing the program</td>
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<tr>
<td>Changes in risk behaviours</td>
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<tr>
<td>Subsequent cardiac events</td>
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<tr>
<td>Mortality</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Performance Indicators [16]:</th>
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<tbody>
<tr>
<td>Process evaluation:</td>
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<tr>
<td>Program reach</td>
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<tr>
<td>Attendee numbers</td>
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<tr>
<td>Attendee numbers as proportion of those eligible</td>
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<tr>
<td>Number of eligible people referred</td>
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<tr>
<td>Proportion of patients completing the program</td>
</tr>
<tr>
<td><strong>Participant satisfaction</strong></td>
</tr>
<tr>
<td>----------------------------</td>
</tr>
<tr>
<td>Number of discharge summaries sent to GP/PHC service</td>
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</tbody>
</table>

**Impact evaluation:**

- Assessment of risk factors at completion of the program
- Physical activity status (clinical measures or self report tools)
- Assessment of quality of life
- Links established to follow-up services

**Outcome evaluation:**

- Maintenance of behaviour change
- Risk factor profile over the long-term
- Quality of life
- Morbidity (subsequent events)
- Mortality

A select number of these may be utilised. Specifically taking into account the NT context, it would be useful to incorporate the home location of patients and which modalities were used, and it may be possible to extract data from both the IT platform used and the IT programs used at the hospitals and in remote clinic settings. Analysing the number of people participating in the program, from what region they are from and what pathway they have chosen will give good snapshot as to the ways people are utilising the program.

National Key Performance Indicators are planned to be developed for cardiac rehabilitation. These will be incorporated into implementation when they are agreed upon and released. At this stage, it is unknown when they will be released.
LIST OF APPENDICES

1. Current cardiac services in the NT
2. Key documents informing framework
3. Literature review: What is the evidence for cardiac rehabilitation?
4. Cardiac secondary prevention workgroup membership
5. Patient Handouts: Which path should I choose? Supported at home
6. Patient Handouts: Which path should I choose? Remotely facilitated
7. Resources for patient education
8. Cardiac rehabilitation self management care plan
9. Adapted PHQ9 Questionnaire
10. Referral pathway from PHQ9 score
11. Healthy Living NT: Healthy Heart Program Brochure
Appendix 1

CURRENT CARDIAC SERVICES IN THE NT

The NT public system has 5 public hospitals: Royal Darwin Hospital (RDH), Alice Springs Hospital (ASH), and Katherine, Gove and Tennant Creek Hospitals (TCH). Darwin Private Hospital (DPH) is the only private hospital in the NT.

Cardiac services in the Northern Territory are currently largely based from Darwin and Alice Springs. NT Cardiac Services provide cardiology and related services to RDH and DPH. Services available to cardiac patients include monitored inpatient beds (Coronary Care Unit in RDH), cardiac investigations, coronary angiography and limited electrophysiology (pacemakers and defibrillator implantation) [4].

There are currently no on-site specialist cardiology services in ASH, with cardiology inpatients looked after by general physicians in the High Dependency Unit or Medical East Ward, with support from visiting Top End or interstate cardiologists [4]. Patients requiring angiography at ASH generally travel to Adelaide.

There are limited cardiology services available to Katherine, Gove and Tennant Creek Hospitals, with most patients travelling to Darwin or Alice Springs for further intervention. Remote communities usually have either a Department of Health or Aboriginal Controlled Community Health Service which runs a local health service with referral and retrieval as needed.

Currently any patients requiring angioplasty, percutaneous coronary intervention (PCI) or cardio-thoracic surgery are referred interstate. Patients from the Top End generally travel to Flinders Medical Centre and those from Central Australia travel to Royal Adelaide Hospital, or occasionally hospitals in other states. Specialised paediatric cardiology is often referred to the Royal Children’s Hospital in Melbourne.

Cardiac services are planned to be significantly expanded with increased Federal government funding. KPMG produced a report in 2011 to assist in setting key directions for cardiac services in the Northern Territory, subsequent to this an ‘NT Cardiac Services framework’ and an ‘NT Cardiac Services Implementation Plan’ have been developed [4]. The KPMG Cardiac Services Plan report 2011 highlighted that access to cardiac rehabilitation needed to be improved, particularly in regards to timely referral, incorporating culture, geography and improving communication between services [1].

Current access to cardiac rehabilitation in the Northern Territory is predominantly based in the urban centres of Darwin (and Palmerston) and Alice Springs. Patients living in rural and remote regions and Indigenous patients are currently largely underserviced [4].

A service plan exists between the Department of Health and Families and Healthy Living NT, enabling Healthy Living NT as an external provider to collaborate with health services to provide cardiac education and rehabilitation, provide cardiac education to health professionals and to coordinate and provide rehabilitation services for cardiac patients with
programs at Darwin, Palmerston and Alice Springs. Funding is sourced from the Department of Health [55]. This current service delivery agreement runs until 2014. The limiting factor on current service expansion is funding and human resources. Healthy Living NT has been providing cardiac education and rehabilitation in both the Top End and Central Australia since 2002 [55], in collaboration with the Coronary Care Unit at RDH.

**BakerIDI** in Central Australia conducts community-based, scientific and clinical research with the aim to improve the health of people with cardiovascular disease, diabetes and related disorders. The key themes of research are: clinical epidemiological research; prevention; detection; and health services research. Previous research in Central Australia identified significant barriers to health services across the continuum of care for patients with CVD. There was strong support from patients for a) improved access to outreach services; b) enhanced health education and awareness of treatment options; and c) direct involvement of their family in the long-term management of their condition. From this came the development of the Central Australian Heart Protection Study (CAHPS), the aim of which is to test the effectiveness of a nurse-led culturally appropriate, integrated family based secondary prevention program in reducing the incidence of major adverse cardiac events. This research project is for people who have been admitted to Alice Springs Hospital following a cardiac event and include people being treated for acute coronary syndrome or heart failure on a background of ischaemic heart disease. Participants must reside within a six hour drive from Alice Springs. Participants who have consented and are randomised to the active arm of the study will receive tailored outreach care including face to face cardiac education. Planned recruitment into CAHPS is for two years; this commenced November 2011. Participants are followed for a period of two years from recruitment.

The National Heart Foundation works on a national level to fund cardiovascular research, develop health promotion activities, support clinicians and patients and to educate the public on cardiovascular disease.

**Referral**

Referrals to phase 1 and 2 rehabilitation are currently through:

- Hospital admissions:
  - RDH: All Coronary care unit patients and patients admitted under cardiology are reviewed by the Healthy Living NT cardiac educator and seen as needed, regardless of what ward they are on. Coronary Care patients are generally prioritised.
  - DPH: Patients admitted under the cardiologists to DPH are seen by Healthy Living NT, often after direct referral from cardiologists.
  - ASH: The cardiac educator from Healthy Living NT reviews inpatients in High Dependency/Intensive Care and the general medical wards if they have a cardiac diagnosis.
Patients who are travelling from interstate but have a NT address are referred to Healthy Living NT, usually through the ACRA cardiac rehabilitation program directory.

Alternatively, patients can be referred from their GP

Pre-procedure education

Prior to planned cardiac procedures, patients can be referred to Healthy Living NT to be educated on the procedure prior to hospital admission. Most pre-procedure education occurs as phase 1 when the patient is a hospital inpatient.

Phase 1

Darwin: Education is provided as a collaborative effort between Coronary Care Nurses and Healthy Living NT. An education checklist is used at Royal Darwin Hospital to ensure patients cover off required education areas before their discharge. The majority of pre-procedure education is done in phase 1 whilst the patient is in hospital.

Alice Springs: Cardiac education is provided to patients who have been admitted to the Alice Springs Hospital by the cardiac educator from Healthy Living NT. Occasionally the cardiac nurse coordinator may also assist in education although this is not primarily her role.

Patients are made aware of the Healthy Heart Program run in Darwin/Palmerston and Alice Springs. They are encouraged to attend.

Phase 2 (Healthy Heart Program)

An outpatient group cardiac rehabilitation program is currently run through Healthy Living NT. In Darwin and Palmerston it is an open running program where patients can commence their rehabilitation at any point, consisting of a four week cycle incorporating education from a cardiac educator, nutrition education and other allied health. An exercise program is also run as a part of this program. Sessions are attended on a weekly basis and families are also welcome to attend [56] (Appendix 11). In Alice Springs, individual sessions are provided with the cardiac educator and dieticians and a session a week of exercise is also run for phase 2 or 3 participants.

Alternative options provided are face-to-face sessions in Darwin or Alice Springs (at Healthy Living offices or the local Aboriginal health services Danila Dilba in Darwin or Central Australian Aboriginal Congress in Alice Springs); an information package covering the education and an example exercise program; or a telephone service line [55]

Phase 3

There is limited formal phase 3 rehabilitation occurring in the Northern Territory. A follow-up mailout addressing risk factors is sent at 3 and 12 months following commencing the cardiac rehabilitation program, but clinical
review is advised with the primary health care provider. There is telephone support offered if needed.

Healthy Living NT in Alice Springs has an ongoing phase 3 group which meet on a weekly basis for exercise with the phase 2 clients and clients are also encouraged to access other community programs such as Lift for Life and/or Heartmoves. There is also some limited cardiac outreach to remote communities predominantly in the Top End. These visits mainly provide education services complementing the cardiology visits.

From the Healthy Living NT annual report 2010/11, the following numbers of people accessed these phases of service [57]:

<table>
<thead>
<tr>
<th>Phase accessed</th>
<th>Darwin</th>
<th>Alice Springs</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre-procedure</td>
<td>14</td>
<td>0</td>
<td>14</td>
</tr>
<tr>
<td>Phase 1</td>
<td>309</td>
<td>196</td>
<td>505</td>
</tr>
<tr>
<td>Phase 2 (HHP)</td>
<td>77</td>
<td>16</td>
<td>93</td>
</tr>
<tr>
<td>Phase 2 (individual)</td>
<td>35</td>
<td>17</td>
<td>52</td>
</tr>
<tr>
<td>Phase 3</td>
<td>10</td>
<td>48</td>
<td>58</td>
</tr>
</tbody>
</table>

Other services exist throughout the Northern Territory which encompass the targets of phase 3 rehabilitation. At this stage, these services are not coordinated but can be referred to locally.

Current examples include

- Heart Foundation Heartmoves program [58]
- Activate NT[59]
- Darwin City Council HEAL program [60]
- Lift for Life [61]
- Local patient support groups
- Some regional and remote health services also have groups targeting specific chronic diseases, an example being Katherine’s Wurli Wurlinjang weekly heart days.[30]
- Healthy Lifestyle workers in regional and remote areas with local programs
Related cardiac services

Indigenous Cardiac Coordinator – Royal Darwin Hospital
The Indigenous Cardiac Coordinator coordinates the care of Indigenous cardiac patients who are having procedures performed either in Darwin or interstate. The role involves ensuring smooth transfer of patients to interstate procedures and transfer and review back to Darwin and to their home community, facilitating appropriate information sharing between the treating teams, pharmacists and primary health care centres. This position is often the first point of call for primary health care providers in knowing what is currently occurring with an Indigenous cardiac patient undergoing a procedure. Patients are followed up to 6 months post procedure.

Cardiac Coordinator – Alice Springs Hospital
This is a similar position to the Indigenous coordinator at RDH, but instead looks after the coordination of both Indigenous and non-Indigenous patients.

Heart failure Coordinator – Royal Darwin Hospital
The coordinator position is largely for education and support for in-patients with heart failure. Patients are generally referred from the cardiology and general medical teams. Patient education is focussed on understanding of heart failure, self monitoring of symptoms and knowing when to seek further medical advice. A discharge follow-up schedule is continued until approximately 6 months post discharge from hospital. Pulmonary Hypertension patients are also managed.

Indigenous client cardiac education - Community
Partnerships currently exist between Healthy Living NT and Indigenous services including Bagot community in Darwin, Danila Dilba in Darwin and Central Australian Aboriginal Congress in Alice Springs, to provide diabetes and cardiac education to these clinics on a regular basis.

Remote cardiac education
Healthy living NT expanded services to remote communities and clinics in early 2011 with funding through the Commonwealth Medical Special Outreach Assistance Program – Indigenous Chronic Disease program [57]. These visits are often in coordination with when the cardiology team visit a community and offer both cardiac and diabetes education. A limited number of communities have visits at this stage.

Rheumatic Heart Disease (RHD) Program
The RHD program is based at the Centre for Disease Control (CDC) unit, at Top End and Central locations. The program provides education to RHD
patients, ensures appropriate clinical care and follow-up, supports adherence to secondary prophylaxis, contact surveillance and health care provider education.

A centralised electronic Rheumatic Heart Disease register exists, providing a coordinated overview of RHD patients with patient lists, recall reports and a centralised recording of secondary prophylaxis administration. Relevant health centre providers can access the register.
Appendix 2

KEY DOCUMENTS INFORMING FRAMEWORK

- *Recommended Framework for Cardiac Rehabilitation '04*, National Heart Foundation of Australia & Australian Cardiac Rehabilitation Association
- *Cardiac Rehabilitation: a Model of Care for South Australia – an overview*, SA Dept of Health, Statewide Service Strategy Division
- *Best Practice Guidelines for Cardiac Rehabilitation and Secondary prevention*, Human Services Victoria
- *Outpatient cardiac rehabilitation: Best Practice Guidelines for Health Professionals*, Queensland Government
- *NSW Chronic Care Program: Rehabilitation for Chronic Disease*, NSW Health
- *Strengthening Cardiac Rehabilitation and Secondary Prevention for Aboriginal and Torres Strait Islander Peoples*, Australian Government National Health and Medical Research Council
Appendix 3

LITERATURE REVIEW: WHAT IS THE EVIDENCE FOR CARDIAC REHABILITATION?

Strong evidence has existed for decades as to the efficacy of cardiac rehabilitation in decreasing morbidity and mortality after a cardiovascular event. Cardiac Rehabilitation units were first started in 1961 in Sydney and Melbourne by the heart foundation [10]. The first meta analysis on randomised controlled trials of cardiac rehabilitation in 1988 demonstrated mortality benefit from outpatient participation in these programs and in 1993 the WHO recognised that all people with cardiovascular disease should have access to rehabilitation [6]. Despite this, and ongoing consistent evidence over the last 40 years as to the usefulness of cardiac rehabilitation, there are still many areas of Australia which do not offer equitable and accessible cardiac rehabilitation services across the population.

Across the country 3.7 million Australians suffer from cardiovascular disease, presenting a significant health burden nationwide. In the Northern Territory, cardiovascular disease accounts for the second highest burden of disease [22]. The true prevalence of cardiovascular disease in the NT is unknown, as most data available is limited to hospital data. In 2009-10 an estimated 1,596 cardiac-related admissions occurred across all public hospitals in the NT. Overall death rates in recent years have decreased in Australia, attributed to improved prevention, detection and clinical management [31], but despite this, death rates are still significantly high from coronary events, with an overall mortality of 36% for males and 40% for females across Australia [32]. Despite improving survival from acute myocardial infarction, there has been increased mortality from Ischaemic Heart Disease across the Northern Territory Indigenous population [24].

A recent study from the Australian Institute of Health and Welfare in 2006 looked at outcomes of coronary heart disease in Aboriginal and Torres Strait Islander people across Queensland, Western Australia, South Australia and the Northern Territory. It found that when compared to other Australians, Indigenous people are three times as likely to have a major coronary event and have a 1.4 times higher out-of-hospital death rate [33]. Indigenous Australians also have a doubled risk of in-hospital death and are less likely to be investigated by angiography or treated with percutaneous coronary intervention or bypass surgery. Some proposed contributory factors to poorer outcomes for Indigenous patients with Ischaemic Heart Disease include higher rates of risk factors, multiple other comorbidities, delays to presentation and less patients strictly adhering to prescribed medications and management plans [24, 34].
It is generally accepted that cardiovascular rehabilitation and secondary prevention decreases mortality rates in those who have had a myocardial infarction by approximately 25% [10]. Rehabilitation also results in significantly improved morbidity outcomes and improved quality of life. In a Cochrane review, exercise-based cardiac rehabilitation has been shown to reduce total mortality (RR 0.87), have a reduction in cardiovascular mortality (RR 0.69) and to decrease hospital admissions (RR 0.69) [35].

The benefits of comprehensive cardiac rehabilitation have been summarised by the American Association of Cardiovascular and Pulmonary Rehabilitation (AACVPR) and adopted by the Australian Cardiovascular Health and Rehabilitation Association (ACRA). These guidelines state that cardiac rehabilitation results in increased objective exercise tolerance, improved symptoms for both angina and heart failure, improved lipid profile, a reduction in cigarette smoking, improved sense of wellbeing as well as an overall reduction in mortality [10]. The AACVPR and American Heart Foundation have recognised that cardiac rehabilitation programs need to be multifaceted, multidisciplinary and contain certain core components which include: patient assessment, nutritional counselling, lipid, hypertension and diabetes hypertension management, smoking cessation, weight management, addressing psychological considerations, counselling regarding physical activity and exercise training [36]. Regular exercise in itself has been shown to have multiple effects on the risk factors of cardiovascular disease: in addition to the direct benefits on the coronary vasculature including improved myocardial oxygenation, endothelial function, autonomic tone and the development of collateral coronary vessels [35], it also reduces blood pressure, increases high density lipoproteins, prevents/delays the development of diabetes mellitus and aids with the maintenance of a healthy weight, in addition to the positive psychological effects of increased activity [10].

Australian guidelines for the management of acute coronary syndromes recognise that all patients should be referred to an appropriate ongoing prevention and rehabilitation service [37], this again being reiterated in 2009 by the National Heart Foundation ACS Implementation and Advocacy Working Group [15]. More comprehensive guidance as to what structure the program should take and core elements for the Australian setting have been published by the National Heart Foundation of Australia and the Australian Cardiac Rehabilitation Framework, in the document “Recommended Framework for Cardiac Rehabilitation ‘04” [7]. More recently in late 2011 the inaugural National Secondary Prevention of Coronary Disease Summit was held by The George Institute, endorsed by the Australian Cardiovascular Health and Rehabilitation Association, Heart Support Australia, the National Heart Foundation and the Australasian Cardiovascular Nursing College, and with representation of over 35 relevant organisations across Australia. Consensus for the direction of cardiovascular secondary prevention services was that there should be a simple overarching framework, ensuring a patient-centred approach with a smoother patient journey and a flexible and individualised service with a case manager to coordinate patient care [38].
was also noted that common key performance indicators need to be agreed upon.

There is some difficulty in comparing trials of cardiac rehabilitation due to a lack of accepted criteria for admission to programs, their duration, content and structure, to name a few, as programs tend to be modelled to local needs. The Cochrane collaboration performed a meta analysis on exercise-based cardiac rehabilitation in 2010. The review included 47 studies which included over 10,700 patients randomised to either exercise-based cardiac rehabilitation or usual care. Results showed a reduction in total and cardiovascular mortality in the medium to long term (12 months or more of follow-up) and a reduction in hospital admissions, but not a reduction in total incidence of repeated myocardial infarctions or revascularisation [35]. It was recognised that within this meta analysis there was an overrepresentation of male, middle-aged and low risk individuals, thus making it difficult to reliably generalise these results to the wider population.

Considerable literature exists on alternative models of care for the delivery of cardiac rehabilitation and secondary prevention. It is well accepted that there is poor attendance to traditional cardiac rehabilitation service, despite the strong evidence as to their effectiveness. Innovative models have been developed in an attempt to improve the attendance rates, to result in both individual and population benefits of cardiac rehabilitation. Three broad models are described: education/counselling with supervised education; education/counselling without supervised exercise and exercise only. There are differing ways on model delivery, varying from traditional face-to-face to home-based care over the telephone or internet. Exercise alone has been shown to be inferior, but as to if hospital or home-based care and what modality is used to deliver care, it is unclear which model provides the best outcomes [10, 39]. Of the 371 current cardiac rehabilitation programs in Australia, most are group-based, multidisciplinary, incorporate education, counselling and physical exercise and last an average of 7 weeks [39]. There is no evidence as to optimal length of duration of cardiac rehabilitation programs [38].

Home-based cardiac rehabilitation has had a great deal of interest given that if education can be based in the home, many barriers to attending rehabilitation are lessened, including travel time and being able to return home for those who live a distance from hospital, a significant factor in the Northern Territory. Evidence suggests that home-based programs are at least comparable to hospital programs in outcomes, being both safe and effective with potentially longer-lasting maintenance of physical activity levels [40]. A comprehensive literature review by the Statewide South Australian Clinical Network in the development of their framework for cardiac rehabilitation identified telehealth as the most effective of all the alternative models to face-to-face care, when the telehealth program was multifactorial, evidence-based and individualised [41]. The Cochrane collaboration review comparing home and centre-based rehabilitation following acute myocardial infarction and revascularisation clearly found that home-based rehabilitation was equally
effective for both clinical and quality of life indicators [12]. The same has been demonstrated across a multi-ethnic population in the United Kingdom [42].

Previously home-based care has utilised telephone support or home visiting but with the recent advancement of technology, more options such as videoconferencing or the usage of smart phones are being investigated. With the roll-out and investment in tele-health services across Australia, this may indeed be a realistic option in the future. A study in remote Canada showed videoconferencing to be an ideal model to deliver a group-based self management program following stroke, which included education, support and group exercise [43]. Other utilisation of information technology includes tele-monitoring of heart failure patients being shown as an effective tool to decrease hospitalisations [13] and a multicentre trial is currently underway in Victoria and Queensland, looking at the benefits, cost effectiveness and acceptability of tele-based depression management following acute coronary syndrome [44]. A Cochrane review showing web-based applications can be an effective way to monitor and interface with patients across distances for people with a chronic disease [2]. Mobile phones are increasingly being used to engage with services; an internet-based model for cardiac rehabilitation has been developed in Queensland. Called the goACT platform, it uses mobile phone and internet technology to provide home-based cardiac rehabilitation including education, mentoring, personal feedback, motivational messages and counselling with recording capabilities of physical exercise, a wellness diary and goal setting [13, 26]. It is currently being evaluated through a randomised control trial to evaluate clinical outcomes, acceptability, adherence and the cost-benefit ratio of the platform. Preliminary data shows high adherence rates and good acceptance by patients. [13]. Social media may also be another avenue for interaction for information and delivering some elements of education in the future. Another alternative to care is the creation of small groups in regional settings which are incorporated into current health services. This has been demonstrated to be potentially feasible and sustainable in a small pilot study in rural Tasmania [45].

An example of combining all of approaches can be seen in Redfern’s Secondary Prevention of coronary heart disease for all in need (SPAN). This model covers individual goals and is flexible, whilst maintaining a level of health service standardisation [46]. Participants have the option to be in the home, hospital or community whilst participating in their rehabilitation and can participate in person, over the phone, with written communications or by electronic means. Alternate individual-based models used in other countries include the Stanford Coronary Risk Intervention Project (SCRIPT), a model for nursing case management (MULTIFIT), Coaching Patients on Cardiovascular Health (COACH) and the Choice of Health Options in prevention of Cardiovascular Events (CHOICE) [39]. The Secondary Prevention Summit in 2011 supported that the method of program delivery should be individualised to include face-to-face visits, telephone, internet, video/DVD and written information as needed by the patient [38]. These programs must be integrated with the primary health care setting and be multifaceted, flexible and culturally safe in order to reach more patients and have a sustainable effect [39].
Rehabilitation which incorporates education and counselling has shown to have improved mortality benefits, when compared to exercise-only rehabilitation [10]. Increased need for services from clients with an array of cardiovascular diseases, in the ongoing context of funding pressures, demonstrates the need for a united and coordinated model for delivery of appropriate patient education. A recent randomised control trial based in tertiary hospitals in Sydney has demonstrated the clear effectiveness of patient-centred modular education in risk factor modification following an acute coronary syndrome [47]. Modular education consists of patients having an initial one hour consultation to look at risk factors and subsequently access to completing modules in specific risk factor modification chosen by the patient, supported by just four 10-minute phone calls over a three month period. At three months, the modular education group had significantly reduced total cholesterol, blood pressure, body mass index, increased their physical activity and less of this group smoked [47].

The Wagner Chronic Care model has become the most prominent way to think about care of people with chronic conditions, identifying key elements needed for a quality chronic disease care model. These elements are: self management support, delivery system design, decision support and clinical information systems. This combined with an informed patient and proactive health care team leads to improved outcomes from chronic conditions [48]. Chronic disease self management and its importance has gained traction over the last few years, shifting the management of chronic diseases from the acute hospital centred focus to the patient. This model is also applicable to cardiac rehabilitation and secondary prevention, providing an ideal approach to care of these clients. The Australian Federal government has recognised chronic diseases self-management as a national priority and has increased funding in this area [49]. Some self management interventions internationally have failed for various reasons, but we can learn lessons from these failures by looking at what the barriers were. The Expert Patients Program in the UK was a self management program from Stanford University which failed to show demonstrable effects in widespread practice when it was implemented. Lessons learnt which can be related to the Australian health care system and potential barriers for self management programs include: low profile of self management within the health sector; lack of knowledge and the effectiveness of self-management programs; lack of engagement; lack of multidisciplinary care; fragmented health service delivery due to funding complexities and lack of a flexible approach [49].

Evidence-based prevention strategies targeting those at highest risk are the most effective way to reduce future cardiovascular events. Highest risk individuals (10% of the population) account for 40-50% of cardiovascular events [39]. Limited evidence has been published on the most effective model of cardiac rehabilitation to the Aboriginal and Torres Strait Islander population. Despite this, a Commonwealth document has been developed addressing potential barriers when engaging with Indigenous people [16], and some comparisons can be made and lessons learnt from other chronic disease
management programs used by Indigenous Australians. From these, it has been found that Aboriginal Health Practitioners are key service providers in the care of people with chronic conditions and that a holistic and culturally appropriate service encourages participation and improves clinical outcomes. It has clearly been demonstrated that Aboriginal and Torres Strait Islander people have a higher incidence of cardiovascular disease and poorer outcomes following a cardiovascular event, explained by higher levels of comorbidity [33, 34]. Potentially this population have the most to gain from secondary prevention, so it is crucial that we find innovative ways to engage Indigenous people in cardiac rehabilitation to reduce the risk of a repeated cardiac event.

Good evidence exists of the efficacy of secondary prevention such as blood pressure monitoring, control of hyperlipidaemia and the utilisation of cardiac rehabilitation, but the gap across Australia is the poor utilisation and uptake of these interventions [39]. Although valid national data is lacking for participation rates in cardiac rehabilitation, some studies show low numbers of those eligible for cardiac rehabilitation actually access it, with less than one third of patients attending programs [39]. A Queensland study in 2003 showed that only 29% of eligible patients were referred to rehabilitation following discharge from hospital, and fewer one third of these patients completed the outpatient rehabilitation [50]. This poor uptake is consistent with international literature on cardiac rehabilitation attendance. It has been shown that in Australia that those patients not participating in cardiac rehabilitation actually have a higher risk profile and poorer knowledge of these risk factors, as compared to those who commence rehabilitation [51]. A Cochrane review has looked at what interventions improve the uptake of cardiac rehabilitation, but concluded that although some evidence suggests that interventions can increase uptake, no specific recommendations can be made as to which interventions are useful given insufficient evidence in this area [17]. Despite this, it is known that poor health literacy must be addressed as that in itself has been found to increase mortality in older adults [52].

Across Australia it was estimated that in 2009, over 50,000 people had an acute myocardial infarction which on average cost the community approximately $281,000 for each event [15]. The core of secondary prevention is to prevent morbidity and mortality following an event, with one of the outcomes being obvious economic savings. The cost-effectiveness of rehabilitation after an acute coronary event across the Australian setting compared to usual care has been calculated through a randomised control trial based in Sydney, with outcome measures of economic costs and quality of life. Cardiac rehabilitation in the Australian setting was found to be comparable to other accepted funding decisions such as the Pharmaceutical Benefits Advisory Committee, and to be a cost-effective approach in Australia [53]. Comparing different models of cardiac rehabilitation in Queensland, it was found that home based cardiac rehabilitation programs were significantly cheaper than gym-based programs; $1,933 for an 8 week gym-based program, compared to $1,169 for 12 months of home-based care [54]. Given potential funding barriers, some propose that targeting a risk-stratified high
risk patient may be the most cost-effective means of cardiac rehabilitation, but this is obviously not equitable.

The National Heart Foundation of Australia has identified 9 key action areas for the secondary prevention of cardiovascular disease. One of these action areas is regarding the integration of cardiac rehabilitation into the routine patient journey for all patients with cardiovascular disease [27]. Other areas include addressing the need for adequate funding, providing flexible options tailored to the population and individual, to look at frameworks for secondary prevention of cardiovascular disease within the Primary Health Care setting, addressing mental health and cardiovascular disease, and the need to address professional development surrounding secondary prevention services, amongst others [27]. This document “Secondary prevention of cardiovascular disease: A call to action to improve the health of Australian” gives strategic direction for where further work must occur in this area [27]. This, in addition to the other key documents identified (APPENDIX **), form a firm base to create an improved model of cardiac rehabilitation in the Northern Territory.
Appendix 4

Cardiac Secondary Prevention Workgroup Membership

<table>
<thead>
<tr>
<th>Organisation</th>
<th>Representative</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dept of Health, Chronic Conditions Strategy Unit</td>
<td>Christine Connors</td>
</tr>
<tr>
<td></td>
<td>Jacqueline Boyd</td>
</tr>
<tr>
<td></td>
<td>Liz Kasteel</td>
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<tr>
<td>Dept of Health, Coronary Care Unit, RDH</td>
<td>Jeff Tinsley</td>
</tr>
<tr>
<td>Dept of Health, Chronic Disease Coordination Unit, RDH</td>
<td>Mark Haste</td>
</tr>
<tr>
<td>NT Cardiac</td>
<td>Marcus Ilton</td>
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<tr>
<td></td>
<td>Nadarajah Kangaharan</td>
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<td></td>
<td>Balan Iyngkaran</td>
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<tr>
<td>The Heart Foundation</td>
<td>Dot Morrison</td>
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<tr>
<td></td>
<td>Carol Beaver</td>
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<tr>
<td>Healthy Living NT</td>
<td>Chrissie Inglis</td>
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<td></td>
<td>Annette Warren</td>
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<tr>
<td>Baker IDI</td>
<td>Glynis Cacavas</td>
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<td>AMSANT</td>
<td>Natasha Pavlin</td>
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<td></td>
<td>Frances Squires</td>
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<tr>
<td>Dept of Health, Remote Health</td>
<td>Mark Ramjan</td>
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<tr>
<td>Dept of Health, ASH, rehabilitation services</td>
<td>Karen Harris</td>
</tr>
<tr>
<td>Dept of Health, ASH, Cardiac Coordinator for Central Australia</td>
<td>Wendy Corkill</td>
</tr>
<tr>
<td>Dept of Health, Acute Care Information Services</td>
<td>Kristine Luke</td>
</tr>
<tr>
<td>Dept of Health, Strategic and Health Reform Branch</td>
<td>Sandeep Reddy</td>
</tr>
</tbody>
</table>
Appendix 5

PATIENT HANDOUTS: WHICH PATH SHOULD I CHOOSE?

Supported At Home

There are lots of different ways you can now have access to cardiac rehabilitation in the NT. What path you choose depends on what suits you best.

Who is this pathway designed for?

For people who are independent, literate, can negotiate the health system on their own and can use technology (phones or internet) easily.

What will my rehabilitation look like?

A plan with your goals will be made with you Cardiac Nurse Care Coordinator. This will involve both exercise and relevant education goals. Supported at home means you will carry out most of your cardiac rehabilitation goals by yourself, with regular contact with the Cardiac Nurse Coordinator, by phone or internet, depending on what you choose. The regular contact will discuss how your goals are going, what exercise you have been doing and support if you have any issues. There may be some group sessions over the phone or internet where some specific cardiac education is given.

What do I need?

For the supported at home model, you will need any of (not all):

- Telephone (mobile or landline)
- Smartphone (an iPhone or android)
- Reliable internet connection

How do I choose which pathway?

Which pathway you choose is completely up to you, but we will support you to have a cardiac rehabilitation program which will work the best for you.

In your planning meeting, the Cardiac Nurse Care Coordinator will discuss the options further and help you decide what might be the best way to achieve the goals you have planned for yourself.

Your choice will depend on where you want to live for the duration of rehabilitation, if you will be in Darwin or Alice Springs at any point during rehabilitation, if you have a computer, smart phone or internet connection, etc.
Who do I contact if I have questions?

If you have any questions, your first contact is the Cardiac Nurse Care Coordinator, available on ___________________________
Appendix 6

PATIENT HANDOUTS: WHICH PATH SHOULD I CHOOSE?

REMOTELY FACILITATED

There are lots of different ways you can now have access to cardiac rehabilitation in the NT. What path you choose depends on what suits you best.

Who is this pathway designed for?

For people who need some more support with their health and to achieve their goals, for those who find it a little hard to understand the health system and do not have access to or do not know how to use internet or are out of phone range.

What will my rehabilitation look like?

A plan with your goals will be made with you Cardiac Nurse Care Coordinator. This will involve both exercise and relevant education goals. Remotely facilitated means you will carry out most of your cardiac rehabilitation goals in your community, with support from a key Aboriginal Health Practitioner or Nurse. The Cardiac Nurse will be located in Darwin or Alice Springs, and you will have contact with them at least once a week either over the phone or using telehealth at the local community health centre or remote health centre. At this time, they will checkup how things are going with your goals and the clinic staff will help you do measurements such as your weight and blood pressure. You will get some education about your heart condition too.

All towns and communities are different, with differing services available. Your health centre will connect you up with any relevant groups for exercise or education if they are available.

What do I need?

For the remotely facilitated model, you need to identify your local community health or remote health centre which is closest you.

You do not need to own a phone or have access to the internet.

How do I choose which pathway?

Which pathway you choose is completely up to you, but we will support you to have a cardiac rehabilitation program which will work the best for you.
In your planning meeting over the phone or videoconference, the Cardiac Nurse Care Coordinator will discuss the options further and help you decide what might be the best way to achieve the goals you have planned for yourself.

**Who do I contact if I have questions?**

If you have any questions, your first contact is the Cardiac Nurse Care Coordinator, available on ____________________________
Appendix 7

Resources for phase 1 cardiac patient education

**Coronary Care Unit Package, RDH**

- Healthy Living NT written information:
  - Cardiac Rehabilitation Exercise and Education classes: Healthy Heart Program
  - Cardiac Risk Factors
  - Angina Management Plan
  - Driving Restrictions - Cardiac
  - Making the Most of Your GP
  - Relaxation Techniques
  - Healthy Living NT privacy statement and information pack evaluation

- Heart Foundation information:
  - Written: Coronary angiography and Healthy Eating for the Heart
  - DVD: Warning signs of Heart Attack
  - Magnet, pocket card and A4 information sheet: Will you recognise your heart attack?

- The Cardiac Story DVD, a resource in multiple Indigenous languages describing the journey for those experiencing a health attack and related treatment, including transfer interstate.

**Additional Education Resources**

Healthy Living NT website: [http://www.healthylivingnt.org.au](http://www.healthylivingnt.org.au)

- Activity guide after a heart attack or cardiac surgery
- ATSI post heart attack and post surgery exercise guidelines
- Atrial fibrillation
- Heart disease and diabetes
- Blood pressure
- Cardioversion
- Internal Cardiac Defibrillators
- Specific medication information


Has patient information including:

- Healthy eating and drinking
• Physical activity and healthy weight
• Smoking
• Mental Health
### Appendix 8

**Cardiac Rehabilitation Self Management Care Plan**  
*(SAMPLE)*

**BASELINE CURRENT SITUATION INFORMATION**

<table>
<thead>
<tr>
<th>Name</th>
<th>HRN</th>
</tr>
</thead>
<tbody>
<tr>
<td>DOB/Age</td>
<td>Gender</td>
</tr>
<tr>
<td>Contact details</td>
<td>Address</td>
</tr>
<tr>
<td>Aboriginal or Torres Strait Islander?</td>
<td>Usual GP/Health Centre</td>
</tr>
<tr>
<td>Location post discharge</td>
<td>Interpreter needed?</td>
</tr>
<tr>
<td>Key family member for education?</td>
<td>Social History</td>
</tr>
<tr>
<td>Occupation</td>
<td>Activity level prior to admission</td>
</tr>
<tr>
<td>Access to telephone?</td>
<td>Access/usage of smart phone/internet?</td>
</tr>
<tr>
<td>Diagnosis</td>
<td>Date of event</td>
</tr>
<tr>
<td>Presenting History</td>
<td>Cardiac plan ?surgery ?next appointment</td>
</tr>
<tr>
<td>Past History</td>
<td>Had phase 1 education?</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>PHQ9 score</th>
<th>Action required?</th>
</tr>
</thead>
</table>
# Cardiac Rehabilitation Self Management Care Plan

## RISK FACTOR ASSESSMENT

<table>
<thead>
<tr>
<th>Risk Factor</th>
<th>Discharge aims</th>
<th>Plan</th>
<th>Comment</th>
<th>Follow-up</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Smoking</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Current amount</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Diabetes</strong></td>
<td>Aim: HbA1c, usual BSLs</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>HbA1c, usual BSLs</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Blood Pressure</strong></td>
<td>Aim: BP:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Currently:</td>
<td>BP:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Obesity</strong></td>
<td>Aim: Weight, BMI:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Weight, BMI:</td>
<td>Weight, BMI:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Waist circ:</td>
<td>Waist circ:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Cholesterol</strong></td>
<td>Aim: Total chol, Trig HDL, LDL, Ratio:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Date taken:</td>
<td>Total chol, Trig HDL, LDL, Ratio:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Physical Activity</strong></td>
<td>Aim: Current level, Restrictions?</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Diet</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Stress</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Medications
- Review medication list
- Understands medications
  - Taking as prescribed
- Taking meds as prescribed?
  - Difficulties with meds?

### Psychological issues
- PHQ9:
  - Primary coping mechanism:
    - Referral needed?
# Appendix 9

## ADAPTED PHQ9 QUESTIONNAIRE

### Adapted Patient Health Questionnaire-9

<table>
<thead>
<tr>
<th>Date:</th>
<th>Participant ID:</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Questions</th>
<th>None</th>
<th>A little Bit</th>
<th>Most of the time</th>
<th>All of the time</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>IN THE LAST TWO WEEKS, HOW OFTEN HAVE YOU BEEN FEELING THE FOLLOWING:</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1 HAVE YOU BEEN FEELING SLACK, NOT WANTED TO DO ANYTHING?</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>2 HAVE YOU BEEN FEELING UNHAPPY, DEPRESSED, REALLY NO GOOD, THAT YOUR SPIRIT WAS SAD?</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>3 HAVE YOU FOUND IT HARD TO SLEEP AT NIGHT, OR HAD OTHER PROBLEMS WITH SLEEPING?</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>4 HAVE YOU FELT TIRED OR WEAK, THAT YOU HAVE NO ENERGY?</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>5a HAVE YOU NOT FELT LIKE EATING MUCH EVEN WHEN THERE WAS FOOD AROUND?</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>5b HAVE YOU BEEN EATING TOO MUCH FOOD?</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>6 HAVE YOU BEEN FEELING BAD ABOUT YOURSELF, THAT YOU ARE USELESS, NO GOOD, THAT YOU HAVE LET YOUR FAMILY DOWN?</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>7 HAVE YOU FELT LIKE YOU CAN'T THINK STRAIGHT OR CLEARLY, ITS HARD TO LEARN NEW THINGS OR CONCENTRATE?</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>8a HAVE YOU BEEN TALKING SLOWLY OR MOVING AROUND REALLY SLOW?</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>8b HAVE YOU FELT THAT YOU CAN'T SIT STILL; YOU KEEP MOVING AROUND TOO MUCH?</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>9 HAVE YOU BEEN THINKING ABOUT HURTING YOURSELF OR KILLING YOURSELF?</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
</tbody>
</table>

**TOTAL SCORE (0-27)**

---

5. Scores for depressive symptoms - record only the highest in each of these sub-questions.

---

The original PHQ-9 tool was developed by Drs. Robert L. Spitzer, Janet B.W. Williams, Kurt Kroenke and colleagues, with an educational grant from Pfizer Inc. Adapted by Dr. Alex Brown, Baker IDI Heart and Diabetes Institute, Alice Springs, 2009.

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Appendix 10

REFERRAL PATHWAY FROM PHQ9 SCORE

Mental Health Referral Protocol

PHQ-9

0-9

Education

10-19

Discuss with patient
Discuss with Primary Health Care Centre

If stress ++ and/or
ETOH and/or recent trauma

If psychotic
symptoms and/or
suicidal ideation
and/or close
member of family or friend has suicided
then refer to psychiatric team

>20

SEWB
Social and Emotional Wellbeing

Psychiatric Team

Offer referral if participants report any of the following:

- High perceived stress level
- Recent stress, especially bereavement or grief
- Increased ETOH or drug use
- Suicidal ideation
- Low level of self harm – ask if anyone in the immediate family has self harmed. Refer if yes.
- >20 scored on PHQ9 questions (depression section of questionnaire)
- 10-20 scored on PHQ9 questions and nurse or doctor feels referral required

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Appendix 11
Healthy Living NT: Healthy Heart Program Brochure

Healthy Living NT
Shop 1 & 2 Tiwi Place
TIWI NT 0810
PO Box 40113
CASUARINA NT 0811
Phone: 08 8927 8488
Fax: 08 8927 8515
Email: cardiac@healthylivingnt.org.au

Healthy Heart Program
Cardiac Rehabilitation
Exercise and Education Classes
What is Cardiac Rehabilitation?

Cardiac Rehabilitation involves education and physical activity to get people with heart conditions back into the community and improve your lifestyle, both safely and confidently. The program is run in three phases, the inpatient program, the outpatient program called the Healthy Heart Program and a maintenance program.

Who is Cardiac Rehabilitation for?

You will benefit from cardiac rehabilitation if
- you have suffered a heart attack
- you are recovering from heart surgery
- you have angina
- you have had angioplasty
- you have heart failure
- you have coronary artery disease
- you have any other cardiac condition

What is the Healthy Heart Program?

The outpatient program consists of weekly visits to Healthy Living NT at either Tiwi shops or Palmerston Health Precinct for physical activity and education sessions. These last for 1 hour each for a total of 2 hours and will go for 4 weeks. Anyone referred can come at any stage of the 4 week program. The Cardiac Educator and Dietitian run the education sessions.

The physical activity program has been developed by an Exercise Physiologist and is designed for people who have just experienced a cardiac event or surgery. People with long standing cardiac disease who do not require physical activity classes can go into the education sessions, as the physical activity program is targeted specifically for initial exercise post cardiac event. Information about other community exercise programs is available.

How Will I Benefit?

Being a part of our Cardiac Rehabilitation Program will help you in many ways
- It will help you recover faster
- It will help you improve your fitness and mobility
- It will increase your confidence and sense of well being
- It will get you back into the community faster

Get the Most Out Of Life

The program is designed to be enjoyable. You are encouraged to bring along a partner, family or friend to the outpatient program and if you need an interpreter we can arrange one. The outpatient program is designed as a group session and is a great way to meet other people with heart conditions and start on the road to recovery together.

Be sure to wear loose fitting clothing and supportive footwear.

How Much and Bookings

The great thing is it does not cost you a cent. Healthy Living NT is a community organisation. To secure your place in the outpatient program, bookings can be made during the inpatient program, or you can talk to your doctor to be referred to the Cardiac Rehabilitation Program.
REFERENCES

6. WHO, Rehabilitation after Cardiovascular Diseases, with special emphasis on developing countries, W.t.r. series, Editor. 1993.


31. AIHW, Cardiovascular Disease Mortality: Trends at different ages. 2010, AIHW: Canberra.


44. A O'Neil, A.H., B Chan et al, A randomised, feasability trial of tele-health intervention for Acute Coronary Syndrome patients with depression ('MoodCare'): Study protocol. BioMed Central Cardiovascular Disorders, 2011. 11(8).


55. HealthyLivingNT, Cardiac Education and Rehabilitation Services: Future Directions Proposal by Healthy Living NT 2008, L.R.a.C.I. Anne Kemp, Editor. 2008.


