Heart Foundation

# IMPROVING THE HEARTS OF TASMANIANS

## Tasmanian Statewide Cardiac Services Plan 2018-2022

**1 in 8**
DEATHS IN TASMANIA IS DUE TO HEART DISEASE

**HEART DISEASE**
IS THE LEADING SINGLE CAUSE OF DEATH IN TASMANIA

AN ESTIMATED
**37,200**
TASMANIANS ARE LIVING WITH HEART DISEASE

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ISBN 978-1-74345-129-8
PRO-186-1117

Suggested citation: National Heart Foundation of Australia. Improving the Hearts of Tasmanians: Tasmanian Statewide Cardiac Services Plan 2018-2022, 2017.

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# Foreword

Tasmania is one of the most beautiful places in the world. It offers myriad opportunities for living a high-quality, healthy lifestyle. Many people like me who moved away in our youth to pursue other opportunities have come back, attracted by the wonderful community, the waterfront lifestyle, the mountains and countryside right at our doorstep.

These are also the factors that attract people from around the world to relocate and live in our community.

But we have what some call a Tasmanian paradox. On one hand we have a growing international reputation as an island offering a quality, healthy lifestyle in a clean environment with beautiful locally-produced food, yet on the other we have the worst health outcomes of any state in the Commonwealth for most indicators of chronic disease.

The solution to the paradox lies in addressing the root causes of poor health. Planning for environments that encourage physical activity, improving literacy, creating employment opportunities and providing adequate housing must become embedded in our governance. We need to take a 'health in all policies' approach to preventing ill health from the outset. This takes leadership, commitment, and support for community-based enterprises with a focus on healthier living.

We also need to ensure that when we do get sick, we have a health system that is coordinated and resourced to provide the care we need.

Over the past decade we have seen our health system go through various changes, from a single health service, to multiple-area health services, and now we're back to a single entity. During all of these upheavals, at no point has there been a statewide plan for delivering cardiac services. Funding has been irregular and fragmented, and our service delivery mechanism has not always put the patient first.

The Heart Foundation has been calling on the Tasmanian Government to develop a statewide cardiac services plan since 2010. In the absence of government action on this, the Heart Foundation, in consultation with clinicians from across the state, has developed a plan for Tasmania – *Improving the hearts of Tasmanians: Tasmanian Statewide Cardiac Services Plan 2018–2022*.

We will continue to work with all relevant government departments, the Tasmanian Health Service, Primary Health Tasmania, general practice, and other health organisations and clinicians to implement the priority actions in this plan.

Graeme Lynch
CEO Heart Foundation Tasmania

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# Executive Summary

*Improving the hearts of Tasmanians* (Tasmanian Statewide Cardiac Services Plan) builds on Tasmania's existing system of cardiac care and the impressive advances made in recent decades to treat heart disease. It provides a five-year plan and key strategic directions that aim to improve prevention efforts and enhance cardiac services based on evidence of best practice. While more people are surviving acute cardiac events, the prevalence of heart disease in the Tasmanian community is still growing. This is a consequence of an ageing population and the increasing incidence of obesity and diabetes. The Tasmanian Statewide Cardiac Services Plan acknowledges these challenges, and that some Tasmanians are at a higher risk of developing heart disease or of having poorer outcomes. In order to continue to improve cardiac survival rates and achieve the best possible patient outcomes for all Tasmanians regardless of where they live, the Tasmanian Statewide Cardiac Services Plan prioritises and guides the planning of cardiac services across the full continuum from prevention to end-of-life care.

The plan is based on four strategic directions. These begin with a clear emphasis on the importance of healthy living, identifying risk factors and preventing disease. Direction 1 builds on significant investment across Tasmania in relevant education and prevention initiatives, including tobacco control and obesity. It also complements the focus of the *Healthy Tasmania* strategy to engage communities and strengthen systems for health protection and promotion. For those with early signs of disease, this direction focuses on greater health literacy and self-management, as well as improved assessment and early management of risk factors in primary care to reduce disease progression.

Direction 2 provides a focus on maximising the system response to time-critical events, with faster access to cardiac care, including specialist advice as required. This direction also recognises that surviving an acute event can be dependent on a rapid and effective response from both members of the community and the health system to reduce death and improve patient outcomes.

Accessing best practice care when it is needed and in the most appropriate setting is the focus of direction 3. Cardiac services should be based on evidence of best practice and provided as close as possible to where people live, with highly specialist services accessible to all. The care needs of people who have experienced an acute cardiac event, undergone a cardiac procedure, or who have a chronic heart condition go beyond episodic hospital-based interventions. They need a combination of targeted rehabilitation services, information and ongoing supports to improve their quality of life. To provide this, care needs to be consistent, coordinated and tailored to the individual needs of people with heart disease.

Finally, direction 4 aims to strengthen system performance to ensure there is seamless transition between all stages of the care continuum and health service providers. Clinical leadership, performance monitoring, and strengthening of the cardiac workforce will drive continuous improvement across cardiac services and the health system, in turn delivering the best possible health outcomes.

### Vision

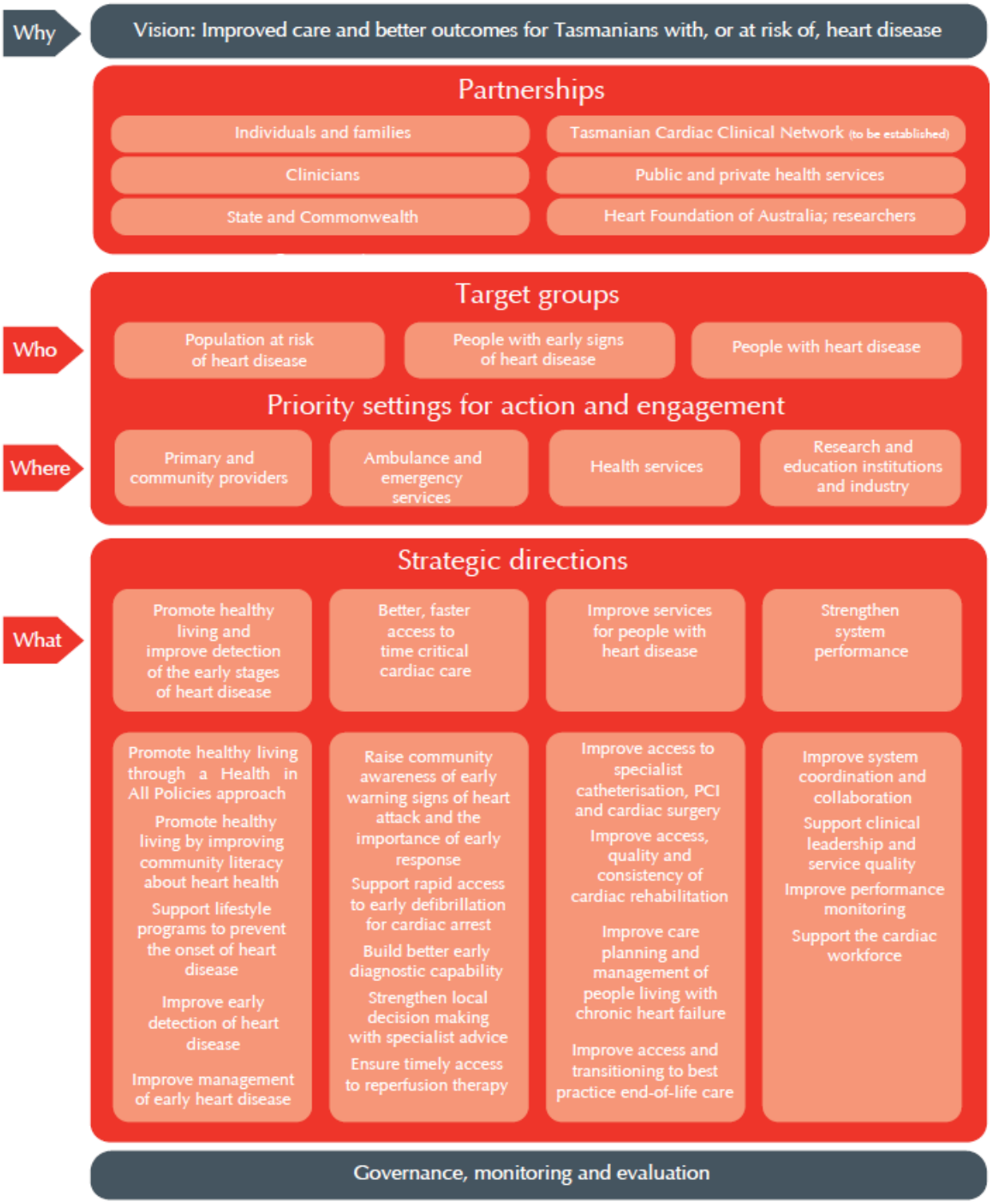
Improved care and better outcomes for Tasmanians with, or at risk of, heart disease.

### Strategic directions

The four strategic Tasmanian Statewide Cardiac Services Plan directions are the pillars that will guide the development of cardiac services across Tasmania and across the full continuum from prevention to end-of-life care.

The graphic on the following page provides a summary of the four strategic directions, with the priority actions defined for each. The target groups, priority settings for action and engagement and important partnerships are also described.

*Tasmanian Statewide Cardiac Services Plan summary*




Taking a system-wide approach, and with adequate funding and resources, the strategic directions outlined will guide the effective and sustainable evolution of cardiac services in Tasmania.

Working together, the Tasmanian Government, health services, the Tasmanian Cardiac Clinical Network (yet to be established), the Heart Foundation of Australia and clinicians across the state can improve the heart health of all Tasmanians.

# Introduction

Despite improvements in medical technology, emergency management and treatments that have led to improved survival rates over recent decades, coronary heart disease remains the leading single cause of death in Tasmania. Whilst the need for preventative health strategies and the importance of primary care in keeping people well is better understood, one in every six deaths in 2015 in Tasmania was as a result of heart disease*, with 815 deaths in total, of which, 198 were deaths from heart attacks.

Tasmania has the highest heart disease prevalence (people living with heart disease) across all states and territories. Its prevalence of 9.5% (or 37,200 people 18 years and over) is 2.9 percentage points higher than the national average of 6.6%[1]. It is expected that this already high prevalence will increase as a result of the increasing proportion of people aged 65 or older, and the increasing proportion of Tasmanians who have risk factors for heart disease. While more people are surviving acute events, they are also living longer with ongoing chronic heart conditions.

The Tasmanian Government's vision is for "a Healthy Tasmania" with a goal to have the healthiest population in Australia by 2025. It is also committed to providing an excellent health care system where people get treatment and support when they need it[2]. In order to achieve this goal, there is a critical need to respond in order to improve the health and wellbeing of Tasmanians, and reduce growing demand and cost pressures on the health system. We require a statewide plan to guide the systemic improvement of care. We require a whole-of-system approach that will involve all sectors of health and wellbeing services, including primary care, acute and subacute services and important stakeholder organisations such as the Heart Foundation.

The content of this plan and its strategic directions is based on the Victorian Department of Health and Human Services Plan *Heart health: improved services and better outcomes for Victorians*[3]. The Heart Foundation has led the adaption and development of this Plan for the Tasmanian setting, with advice from the Heart Foundation's Health Advisory Committee and the Tasmanian Health Service's (now concluded) Tasmanian Cardiac Clinical Advisory Group.

* Includes deaths from ischaemic heart disease and other forms of heart disease, ABS Causes of Death, Australia 2015

# Background

## Demography and geography of Tasmania

### The population of Tasmania

The Estimated Resident Population of Tasmania at December 2014 was 515,200 persons[4]. The population is expected to increase by 20.1% (using the high projected growth rate[5]) between 2012 and 2037, with population growth in the Hobart and South East to 339,193 people (increase of 24.9%), the Launceston and North east to 164,219 people (increase of 12.6%) and the West North-West to 138,042 people (increase of 17.3%).

Many Tasmanian communities are small, creating a tension between the desire to deliver comprehensive health services locally and the need to structure services so that they are sustainable. This is a particular challenge for small and/or complex services.

There will also be an overall change in the distribution of the population across the State. Populations in local government areas such as the West Coast, Circular Head, Dorset and Flinders Island will decrease; other local government areas such as the Huon Valley, Latrobe, Kentish, Brighton, Kingborough, Sorell and the Southern Midlands are expected to grow[5].

### Physical geography

The major population centres in Tasmania are Hobart in the South, Launceston in the North and Burnie and Devonport in the North West.

There are major road networks between Hobart and Launceston; and between Launceston, Devonport and Burnie. Many areas of the State are not well served by major road networks, however, which influences the ways in which residents access health services.

There are currently 29 Local Government Areas (LGAs).

### Socio-economic status

Tasmania has a higher proportion of its population living in areas of disadvantage than any other State or Territory. This is shown in Figures 1 and 2. In summary, 57.1% of Tasmania's population (or 282,149 Tasmanians) are living in the lowest two SEIFA quintiles of disadvantage.

*Figure 1 Proportion of population in lowest SEIFA quintile*

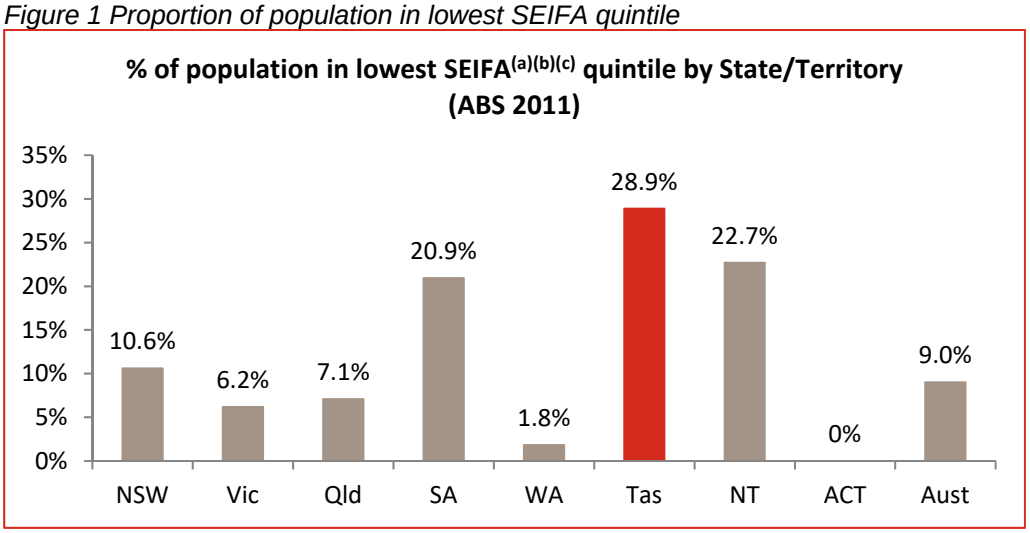
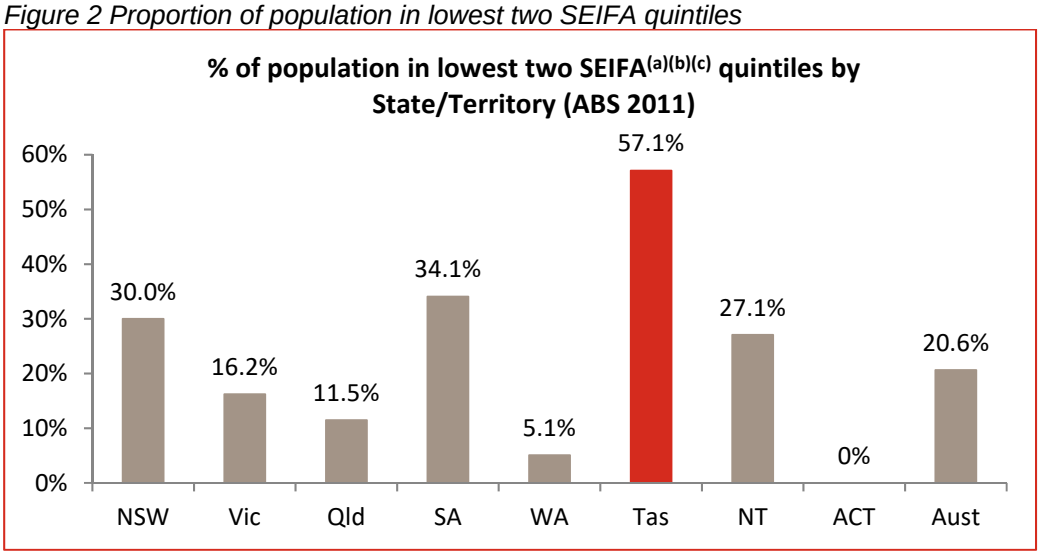



*Figure 2 Proportion of population in lowest two SEIFA quintiles*




Source for Figures 1 and 2:

(a) Index of Relative Socio-economic Disadvantage, 2011
(b) Derived from Table 2, LGA SEIFA indices, ABS Cat. No. 2033.0.55.001 - Socio-economic Indexes for Areas (SEIFA), Data Cube only, 2011
(c) SEIFA quintile is area-based, not population-based, so % represent % of population living in the bottom 20% of disadvantaged areas within Australia

# Heart disease

Heart disease is a collective term for acute and chronic diseases affecting the function of the heart, or the arteries that supply the heart with oxygen and nutrients. Heart disease includes coronary heart disease (CHD), heart failure, valvular heart disease, arrhythmias, congenital heart conditions, and inherited cardiac conditions.

CHD, also known as coronary artery disease or ischaemic heart disease is the most common form of heart disease, and the most common cause of acute myocardial infarction (heart attack), chronic congestive heart failure and sudden cardiac death. The two types of acute myocardial infarction (AMI), ST elevation myocardial infarction (STEMI) and non-ST elevation myocardial infarction (non-STEMI), along with unstable angina are grouped together as acute coronary syndromes (ACS).

Arrhythmias and conduction disorders are also a significant health issue as they can predispose people to sudden cardiac arrest and death, heart failure and strokes. For example, atrial fibrillation, one of the most common cardiac arrhythmias, is estimated to

increase the risk of stroke by a factor of five, and increases stroke severity, morbidity and mortality outcomes.

Appendix 1 provides further detail on definitions of heart disease, and Appendix 2 provides further information on risk factors in Tasmania.

## Heart disease in Australia

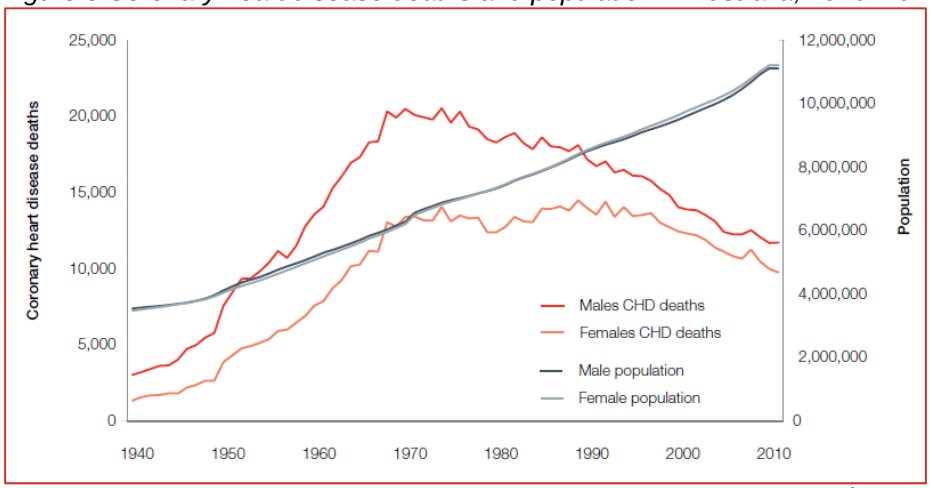
Heart disease is a substantial burden on the health of Tasmanians and the Australian population as a whole.
In Australia:

- CHD was the single leading underlying cause of death during 2015[6], and has been the leading cause of death in the country since 2000.
- In 2014, CHD was also found to contribute to 36,154 or 23.5 per cent of all deaths as either an underlying or multiple cause, and heart failure contributed to 20,265 or 13.2 per cent of all deaths.[7]
- Each year there are approximately 55,000 heart attacks in Australia, which equates to an average of 151 reported heart attacks a day, or one heart attack every 10 minutes.[8]
- It has been estimated that if you are male, 40 and live in Australia, your chance of having a heart attack by the age of 70 is one in two, compared with one in three for females. For women who smoke, however, the chance of having a heart attack increases to the same level as men.[9]

Over the past century the age profile of the population has shifted as people live longer, with an increasing proportion of the population now aged 65 or older. This means people have longer periods of exposure to risk factors for heart disease and other chronic diseases. In the past, few interventions were available to manage a person with heart disease or experiencing a major acute cardiac event, so mortality from CHD grew steadily from the early part of the 20th century.

In the late 1960s and early 1970s advances in the management of risk factors and acute cardiac events, improved cardiac diagnostics, and the development of complex interventions resulted in improved survival from CHD (Figure 3).

*Figure 3 Coronary heart disease deaths and population in Australia, 1940–2011*




Source: Australian Bureau of Statistics and Australian Institute of Health and Welfare data[3]

The introduction of invasive cardiac catheter-based diagnostics led to the development of non-surgical catheter-based therapies such as percutaneous coronary intervention (PCI).

Developments in non-invasive techniques such as echocardiography, cardiac computed tomography (CT) and cardiac magnetic resonance imaging (MRI) have enabled the function and structure of the heart to be better assessed. Cardiac surgery has also become less invasive as techniques have improved, leading to reduced complications and lengths of hospitalisation.

Comprehensive therapeutic regimens and rehabilitation programs following an acute event such as a heart attack have aided recovery and reduced the likelihood of a subsequent event or complication. Cardiac transplants and artificial cardiac pumps used as a bridge to transplant provide additional options for some people with end-stage heart disease.

## Heart disease in Tasmania

- An estimated 37,200 Tasmanians are living with heart disease.
- In 2014, heart disease and related conditions were the underlying causes of death for 814 Tasmanians, which equates to 18.2% of all deaths[6].
- Heart disease kills two Tasmanians a day[6].
- Although there has been a significant decline in avoidable mortality due to CHD since 1997, it remains the leading single cause of avoidable mortality.
- The cost of heart disease on the healthcare system as a whole is significant, with an estimated cost of nearly $40 million in 2011-12 in Tasmania for hospitalisations due to Acute Coronary Syndrome and Heart Failure (see pp. 17-18 of this document).

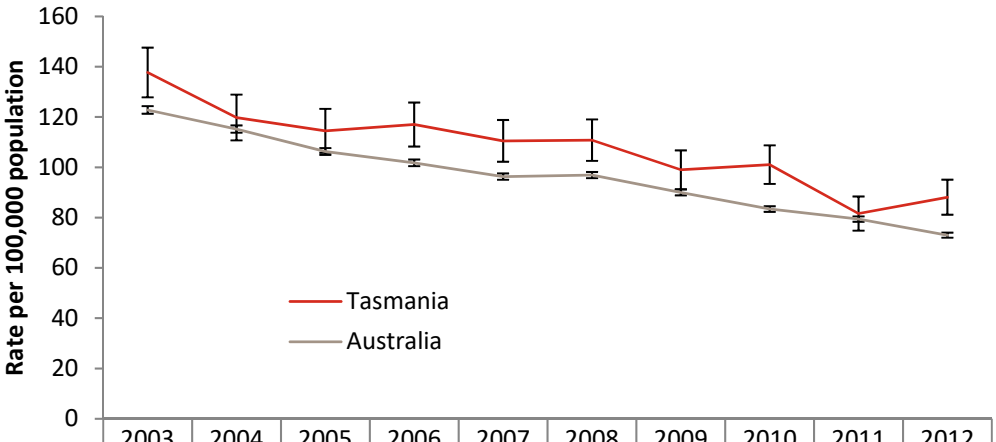
Many Tasmanians are at risk of developing chronic health conditions such as heart disease due to lifestyle factors and social disadvantage. The most recent National Health Survey[10] revealed that there remains a large proportion of the community with lifestyle risk factors that put them at higher risk of heart disease. For example, 52.8 per cent of Tasmanians surveyed did not meet the recommended minimum daily intake of fruit, 88.5 per cent did not eat enough vegetables, 67.9 per cent did not undertake sufficient daily physical activity to meet national guidelines and 18.9 per cent were smokers.

The Australian Health Survey[11] also identified the prevalence of heart disease biomedical risk factors in Tasmania. This showed that 36.9 per cent of adults are overweight, 27.8 per cent obese, 40.9 per cent have high blood pressure, and 39.4 per cent have high blood cholesterol. See Appendix 2 for further risk factor data.

Tasmanians are at increased risk of developing heart disease or poorer outcomes due to the complex interplay between prevalence of risk factors, socioeconomic circumstances, education (and health literacy), cultural backgrounds and available local access to healthcare.

Looking at ACS alone, Tasmania has higher age-standardised mortality rates for ACS when compared nationally. See Figure 4.

*Figure 4 Age-standardised mortality rates of acute coronary syndromes (ICD-10 120-125), Tasmania and Australia, 2003-2012*




| | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 |
|---|---|---|---|---|---|---|---|---|---|---|
| Tasmania | 137.7 | 119.8 | 114.5 | 117.0 | 110.5 | 110.8 | 99.0 | 101.1 | 81.6 | 88.1 |
| Australia | 122.8 | 115.2 | 106.3 | 101.8 | 96.3 | 96.9 | 90.0 | 83.4 | 79.4 | 73.0 |

Notes: 1. Rates are age-standised to the Australian 2011 population. 2. The error bars represent the 95% confidence intervals of the rate. 3. ABS Causes of death, Cat. No. 3303.0.

The Australian Heart Maps developed by the Heart Foundation (found at www.heartfoundation.org.au/for-professionals/australian-heart-maps) provide an overview of mortality and hospital admission rates for heart-related conditions at a national, state, regional and (where possible) local government level. The maps show how indicators for heart disease are distributed across Australia. Importantly, they highlight the association between disadvantage, remoteness and cardiovascular outcomes. Serving as a valuable tool for health professionals, health services, local governments, researchers and policy makers, the maps can be used to set strategy, plan services and target prevention initiatives to areas of greatest need.

## Organisation of the Government-run Health System in Tasmania

The Department of Health and Humans Services (DHHS) has overall responsibility for health care policy, planning and performances, and act as the interface with government in Tasmania.

DHHS operational units are responsible for delivering population health, ambulance, disability, housing, community, children and youth services against policies, plans and standards set by the departmental units. Within the DHHS, units that have important roles in policy, funding, and the organisation and coordination of services for people with cardiac diseases are the Corporate, Policy and Regulatory Services, Planning Purchasing and Performance, Public Health Services and Ambulance Tasmania.

- The Corporate, Policy and Regulatory Services ensure effective strategic processes are established and maintained across the health and human services system to provide efficient statewide service delivery. The group has overall responsibility for education and training, strategic policy, drug and alcohol services, nursing and midwifery, chief information officer and financial control.

- Planning, Purchasing and Performance functions include service improvement (focussing on state wide services and new patient pathways) and supporting the

Tasmanian Health Service (THS) to develop consistent, collaborative models of care, particularly for chronic and complex conditions. The group is responsible for service planning and design, service purchasing and performance, service quality and improvement and strategic planning.

- Public Health Services focusses on improving and promoting health and wellbeing for all Tasmanians. It operates within a framework of primary, secondary and tertiary prevention to deliver policies and programs based on evidence and provide tangible benefits for all Tasmanians. It oversees the work of the Health Protection and Health Improvement Units, including, Public and Environmental Health Services.

- Ambulance Tasmania provides integrated pre-hospital emergency and medical services, health transport, aeromedical and medical retrieval services to the Tasmanian community.

Under the *Health Services Establishments Act 2006* (the HSE Act) the DHHS is also responsible for regulating private health service establishments (private hospitals, day procedure centres and private residential care services) through a licensing regime. The DHHS, through its Planning, Purchasing and Performance functions, can also commission services from the private sector.

Further to the above-mentioned roles of the DHHS and in accordance to the current *Tasmanian Health Organisations Act (2011)*, the DHHS sets out Service Agreements for the THS. In July 2014, the Minster for Health announced the move from three Tasmanian Health Organisations (THOs) to one single THS, which commenced on 1 July 2015. The change from 'Organisation' to 'Service' reflects the Government's focus on reducing bureaucracy and delivering better health services to Tasmanians.

Under the *Tasmanian Health Organisations Act 2011*[12], the purpose and function of the THS is:

- To improve, promote, protect and maintain the health of residents of its local area
- To manage public hospitals, health institutions, health services and health support services under the organisation's control
- To achieve and maintain the standards of patient care and delivery of services set out in the organisation's services agreement
- To manage the organisation's budget as determined by the services agreement to ensure the efficient and economic delivery of health and hospital services
- To cooperate at a state level for the provision of statewide health services
- To provide training and education relevant to the provision of health services
- To undertake research and development relevant to the provision of health services
- To collect health data and provide health data for reporting and research

The THS has responsibility for providing a wide range of health services. These services are provided in both community and hospital-based settings, including the person's home, schools, and workplaces. Health services delivered include health promotion activities, disease prevention strategies, primary health care, mental health services, forensic health services, alcohol and drug services, palliative care, rehabilitation, and sub-acute and acute care. The services provided are flexible enough to target specific needs at the different stages of a patient's health journey, in order to provide an integrated, holistic and patient-centred approach health care delivery. Services provided at a community level include access to general practitioners and outreach medical specialists, emergency response, allied health, midwifery and nursing (including specialised nursing), aged and palliative care, community care, aids and appliances and disease prevention programs. These services are commonly provided from community

health centres in the THS but can also be provided from hospitals and non-government organisations.

Features of the THS include:

- the establishment of a single statewide delivery structure designed to improve the coordination of services and reduce duplication in both administrative overheads and clinical support services,
- a single Tasmanian Governing Council, comprising a chairperson and skills-based members, with a spread of regional representation,
- a single Chief Executive Officer supported by local managers to coordinate statewide services at the local level,
- a Health Council of Tasmania to provide advice on clinical strategy and priorities for health service purchasing and delivery, and
- enhanced community and consumer engagement to ensure the needs of the Tasmanian community are considered in health service purchasing and service delivery.

The *Delivering Safe and Sustainable Clinical Services - White Paper*[13] was released I June 2015 which outlines the planned reform processes. The *Tasmanian Clinical Services Profile – Implementation Plan*[14] was also released at this time, along with the *Role Delineation Framework*[15] for the four major hospitals in Tasmania. The Role Delineation Framework for cardiology and cardiothoracic services in Tasmania can be found at appendix 3. It is important that this framework is referred to in conjunction with this Plan.

# Cardiac care in Tasmania

## Primary care

In primary care, services are focused on early detection and intervention and managing the risk factors of early disease to promote heart health and healthy living. Primary care, including general practice and community health services, also play important roles in supporting recovery and ongoing chronic disease management.

Cardiovascular conditions are one of the most frequently managed problems in general practice across Australia[16].

The National Vascular Disease Prevention Alliance *Guidelines for the management of absolute cardiovascular disease risk*[17] informs and guides the implementation of assessing and managing absolute cardiovascular disease (CVD) risk in general practice. Absolute CVD risk assessments should be completed for all Tasmanians aged over 45 (or aged over 35 for Aboriginal and/or Torres Strait Islander people) in primary care settings, and management plans established and implemented according to risk. All general practices should be encouraged to undertake absolute CVD risk assessments in their practice populations. Government-funded community health/integrated care centres should also be encouraged to assess and manage the risk in their populations.

An Australian Government funded Practice Incentive Program is available to support general practices to provide their patients with appropriate access to after-hours care. Where there are gaps in the availability of after-hours care in Tasmania, Primary Health Tasmania (PHT - previously Tasmania Medicare Local) has commissioned a telephone-based after-hours Primary Medical Advice and GP Support Service[18].

PHT also commissions a range of services to support health professionals and other people working in primary health care, providing up-to-date information and resources, professional development, training and networking opportunities, and aims to support the

best use of systems and technology and strengthening communication between providers.

## Pre-hospital care

Managing an acute cardiac event may begin in the community, with coordinated action by the public, Ambulance Tasmania and/or other community service providers being critical to the survival and outcomes for people experiencing such events.

Members of the community can play a significant part in the survival of a person experiencing a heart attack or cardiac arrest by knowing the warning signs of heart attack, by calling for an ambulance and/or actively assisting by providing cardiopulmonary resuscitation (CPR), including the use of automated external defibrillators (AEDs) where available. Improving the delivery of first responder CPR by increasing public awareness and improving access to formal training in a range of settings (such as schools, workplaces, sporting clubs) for the Tasmanian public is one of the links (in the chain of survival) to improving survival from cardiac arrest.

Publicly accessible AEDs have been installed in many locations throughout the state, and through the Ambulance Tasmania Early Access to AED program, many of these are now registered by Ambulance Tasmania and can be deployed to the site of a cardiac arrest via a volunteer who receives a message to do so via SMS. Access to these lifesaving devices will also improve the chances of survival.

Ambulance Tasmania is an essential part of Tasmania's emergency response system, providing prehospital care and transport.

## Acute hospital care

As in other States and Territories, the care of patients with cardiac diseases in Tasmania involves the full spectrum of public, non-government, and private sector services. The mixture is complex, especially in view of the small population of Tasmania.

All Tasmanian public hospitals (along with some private hospitals) play an important role in providing care to adults with heart disease, including emergency care, inpatient, outpatient, rehabilitation services and palliative care. The level and complexity of cardiac care ranges from supporting independent self-managed care at home to specialist acute services providing a range of cardiac care and therapy for the more complex cardiac conditions.

Both the Royal Hobart Hospital and the Launceston General Hospital perform percutaneous coronary intervention (PCI). There are limited clinical electrophysiology services in Tasmania but as yet, no diagnostic electrophysiology facility or radiofrequency ablation is performed.
Cardiothoracic surgery such as coronary artery bypass grafts (CABG) is only provided at the Royal Hobart Hospital. All public specialist cardiology services are provided in Hobart and Launceston with limited or no outreach (i.e. intermittent visiting) to other sites. Private cardiology is offered in Devonport, Burnie, Scottsdale, Smithton and St Helens by visiting, private cardiologists from Launceston. Most patients with cardiac diseases are managed by general physicians and non-specialist doctors, and much day-to-day care is undertaken by nurses.

Smaller regional hospitals generally provide initial resuscitation and stabilisation of emergency cardiac presentations prior to transfer to a more specialist service. They also have a major role in follow-up care and ongoing patient support.

The private hospital sector offers some inpatient adult cardiac services, such as angiograms and angioplasty, but at present, no private hospitals offer CABG, electrophysiology services, or cardiac rehabilitation.

A monthly paediatric cardiology clinic is conducted at the Royal Hobart Hospital with a paediatric cardiologist from the Royal Children's Hospital (Melbourne) visiting Hobart, Launceston and Burnie quarterly. There is scope to expand the role of Tasmanian cardiologists in this shared care model. There is no formal public sector service for patients with Adult Congenital Heart Disease (ACHD). Preliminary discussions have taken place with Royal Melbourne Hospital around the development of a shared care model for ACHD patients. There is also scope to develop expertise in heart disease during pregnancy.

Heart, heart-lung transplants and mechanical support devices (Left and/or Right ventricular assist devices) are not performed in Tasmania, with patients needing to travel to The Alfred Hospital, Melbourne, for such procedures.

In general, cardiac patients who live in Hobart and elsewhere in the Southern region of Tasmania obtain access to specialist care through services in Hobart and Melbourne, while those who live in the northern region (i.e. Launceston, Devonport and Burnie) obtain access to specialist care through Launceston, Hobart and Melbourne. Cardiac services in Hobart and Launceston have strong, long-standing relationships with services in Melbourne, mostly at Royal Melbourne Hospital, The Alfred Hospital, Monash Hospital and the Royal Children's Hospitals. These relationships have grown from the professional connections and clinical networks.

Those who are required to travel greater than 75km for their assessment/treatment may be eligible for financial assistance (for travel and/or accommodation) as part of the DHHS's Patient Travel Assistance Scheme.

## Recovery and rehabilitation care

Cardiac rehabilitation maximises recovery from cardiac events and procedures, and minimises the risk of subsequent cardiac events. Cardiac rehabilitation programs are available only in the public system in Hobart, Launceston, Burnie and Latrobe.

The Heart Foundation and the Australian Cardiac Rehabilitation Association's *Recommended framework for cardiac rehabilitation*[19]*2004* is the accepted best practice underpinning the design and delivery of cardiac rehabilitation services. The guidelines recommend that inpatient rehabilitation should begin as soon as possible after admission to hospital with supportive counselling, the development of a mobilisation program and discharge planning. The Framework also recommends that Tasmanians who have had an ACS admission or presentation, undergone a cardiac procedure, or have had cardiac surgery, should be referred to a comprehensive program of rehabilitation and support.

Patients, families and carers are able to access extensive information from the Heart Foundation, including the comprehensive patient information booklet *My heart, my life: a manual for patients with coronary heart disease*[20]. This information and advice should be incorporated into the discharge plan and provided to patients and primary healthcare providers to facilitate continuity of care.

Considerable scope exists for the expansion of cardiac rehabilitation and secondary prevention services in Tasmania with a menu based approach. Expansion could take place in primary care with support from hospital-based cardiac rehabilitation professionals. Other models could be investigated to provide secondary prevention to more people following a cardiac event or intervention, including home-based telephone-supported programs, internet-based, or utilising mobile technology.
Any expansion or the use of alternate models would depend on a variety of health-care professionals undergoing training. Many professionals, such as nurses in regional clinics, have the capacity to offer rehabilitation services, but may need upskilling to provide consistent heart heath messages as they have limited or no experience in cardiac rehabilitation or the ongoing management of cardiac patients. Expanded capacity would enable rehabilitation programs to be offered to patients who are at high

risk of cardiac disease, and could also be offered on an outreach basis, perhaps supporting cardiologists and general physicians who conduct outreach clinics. The role of telehealth in enabling further expansion of secondary prevention needs exploration.

Expansion of cardiac rehabilitation services in primary care could provide the opportunity to include heart failure rehabilitation and support programs within existing hospital-based services as some less acute patients, for example elective PCI, NSTEMI, could be managed in primary care.

The Queensland State Government recently introduced a $5M Quality Improvement Payment (QIP) for their Health and Hospital Services (equivalent to the THS) to increase referrals and attendance at cardiac rehabilitation services in Queensland. A similar incentive could be considered for the THS.

# Cardiac service activity

## Emergency presentations

Nearly 10,000 people present to public hospital emergency departments every year in Tasmania, with chest pain or possible ACS which are subsequently diagnosed as a heart related condition. Of these:

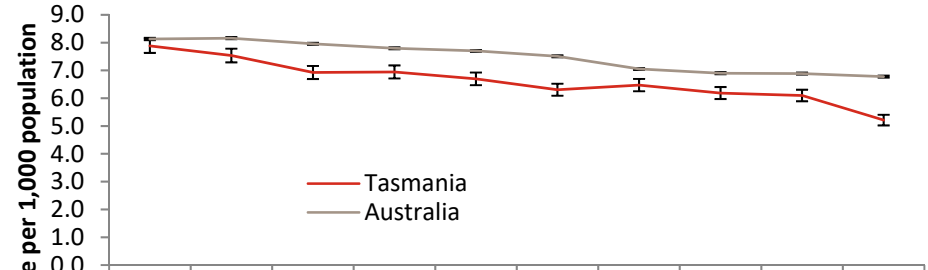
- 56% arrive by ambulance – 44% arrive through other means,
- almost 30% are under 50 years of age, and
- one in three present after hours (between 7pm and 7am.)

Source: DHHS Emergency Department data, 2010/11

## Inpatient separations

Tasmania has significantly lower rates of admission for ACS when compared nationally. See Figure 5.

*Figure 5 Crude hospital admission rates of acute coronary syndromes (ICD-10 120-125), Tasmania and Australia, 2002/03-2011/12*



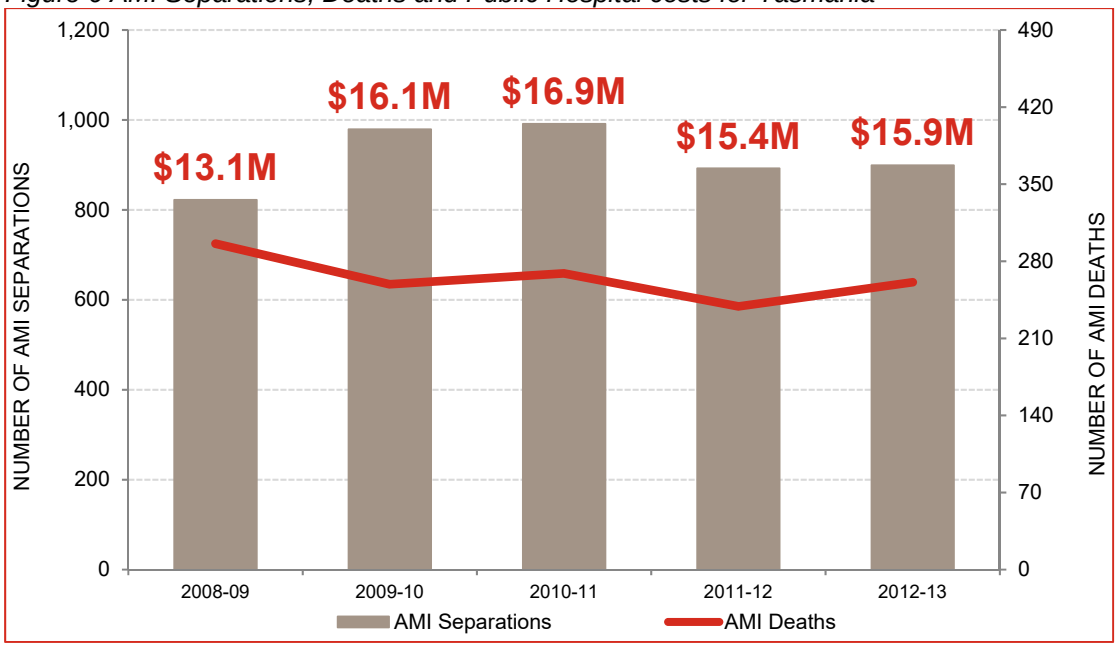

| | 2002/03 | 2003/04 | 2004/05 | 2005/06 | 2006/07 | 2007/08 | 2008/09 | 2009/10 | 2010/11 | 2011/12 |
|---|---|---|---|---|---|---|---|---|---|---|
| Tasmania | 7.9 | 7.5 | 6.9 | 6.9 | 6.7 | 6.3 | 6.5 | 6.2 | 6.1 | 5.2 |
| Australia | 8.1 | 8.2 | 8.0 | 7.8 | 7.7 | 7.5 | 7.1 | 6.9 | 6.9 | 6.8 |

Notes: 1. Public and private hospitals. 2. The error bars represent the 95% confidence intervals of the rate. 3. Australia and Tasmania Morbidity Database.

It is recommended that further analysis be undertaken to understand if there is any correlation with the higher mortality rates shown in Figure 4 and the lower admission rates shown in Figure 5 to see if there are any systematic improvements that could be made.

Hospitalisations due to heart disease are costly for the THS, with hospitalisations due to AMI costing the Tasmanian public hospitals nearly $16 million in 2012-13. See Figure 6.

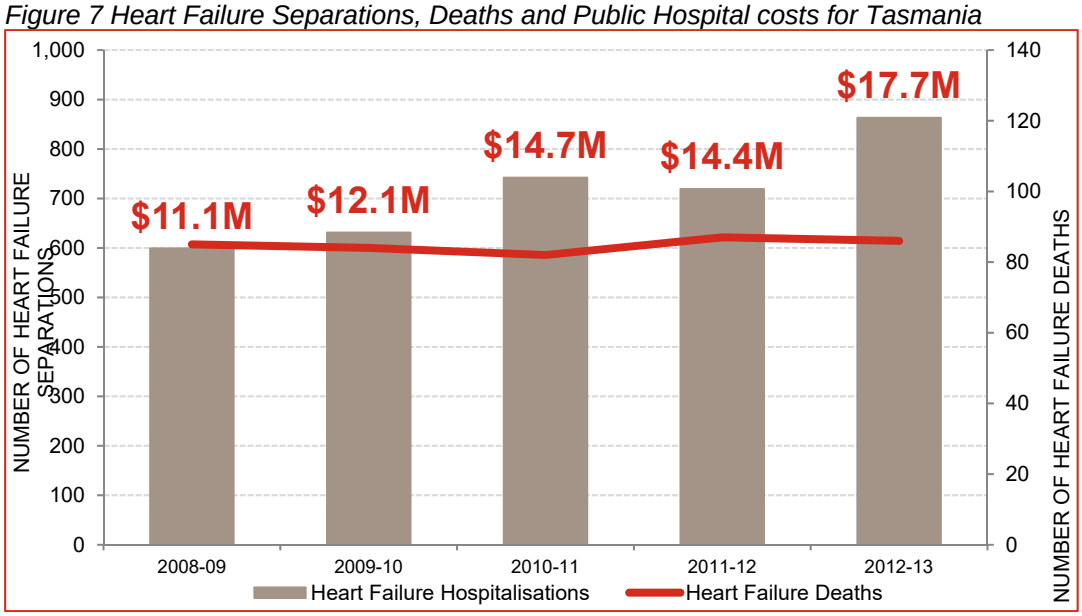
*Figure 6 AMI Separations, Deaths and Public Hospital costs for Tasmania*




*Source:* *Separations: AIHW Hospital Statistics, 2000/01 to 2012/12*
*Deaths: Australian Bureau of Statistics, Causes of Death, 2000 to 2012*
*Costs: The Economic Costs of Heart Attack and Chest Pain, 2009. Costs indexed to 2013 value.*

Hospitalisations due to heart failure cost the Tasmanian public hospital system $17.7 million in 2012-13. This figure is expected to rise due to an increase in the proportion of Tasmanians developing heart failure. See Figure 7.

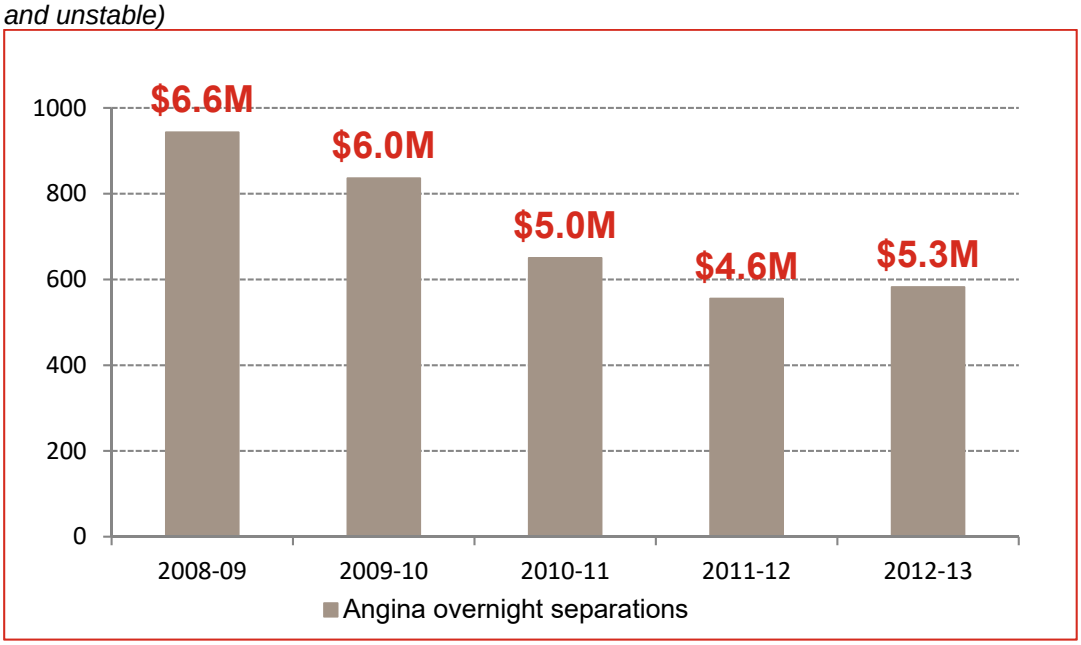
*Figure 7 Heart Failure Separations, Deaths and Public Hospital costs for Tasmania*




*Source:* *Separations: AIHW Hospital Statistics, 2000/01 to 2012/12*
*Deaths: Australian Bureau of Statistics, Causes of Death, 2000 to 2012*
*Costs: AIHW Disease Expenditure Database 2008-09. Costs indexed to 2013 value.*

Hospitalisations due to angina cost the Tasmanian public hospital system $5.3 million in 2012-13. See Figure 8.

*Figure 8 Angina (overnight) Separations and Public Hospital costs for Tasmania (includes stable and unstable)*




*Source: Separations: AIHW Hospital Statistics, 2000/01 to 2012/12*
*Costs: AIHW Disease Expenditure Database 2008-09. Costs indexed to 2013 value.*

# Policy context

## One State, One Health System, Better Outcomes reform process

The Tasmanian Government announced the One State, One Health System, Better Outcomes reform process in July 2014. As part of the reform, the Tasmanian Government's *Green Paper on Delivering Safe and Sustainable Clinical Services in Tasmania* (the Green Paper) and the draft Tasmanian Role Delineation Framework was released for consultation in late 2014. This was followed in March 2015 by an exposure draft of the White Paper and a further draft Tasmanian Role Delineation Framework that sets out what services can be safely and sustainably delivered across the health system and where. The final White Paper[13] and Role Delineation Framework[15] (appendix 3) was released in July 2015.

In addition to the Green and White Papers, the other key elements outlined as part of the Government's One State, One Health System, Better Outcomes reform agenda included:

- The creation of a single THS on 1 July 2015, in place of the existing three regional Tasmanian Health Organisations (THOs);
- Improved consultative and clinical leadership arrangements, with the formation of a new Health Council of Tasmania which will, among other roles, advise the Health Minister on the appropriate strategic priorities to guide health service planning and delivery in Tasmania. The Health Council will be supported by discipline specific Clinical Advisory Groups (CAGs);
- The development and implementation of Accountability and Performance Management Frameworks, to give both Government and the public a greater level of confidence in the performance of our health system;
- The review and redesign of the Department of Health and Human Services, to more effectively align its structure with its roles as purchaser of services and health system manager;
- The development of a Statewide Elective Surgery Waiting List, to give Tasmanians equal access to services and equitable waiting times, regardless of where they live;
- Improved purchasing processes, aligned with strategic priorities and an evidence-based statewide Clinical Services Profile;
- A review of the statewide Clinical Governance Framework, to assist in monitoring processes and ensuring the safety and quality of services provided; and
- The development of monitoring and performance indicators to guide and monitor the improvement of the health system.

## National health policy and reform

### Primary Health Networks

Through the National Health Reform process, the previously known Medicare Locals have transitioned to Primary Health Networks. In Tasmania, there is one Primary Health Network known as Primary Health Tasmania (PHT). PHT is funded through the Australian Government to increase the efficiency and effectiveness of medical services for patients, particularly those at risk of poor health outcomes, and improving coordination of care to ensure patients receive the right care in the right place at the right time.

### Reform of Primary Health Care

The Australian Government called for the establishment of a Primary Health Care Advisory Group to investigate options into the reform of primary health care to support patients with complex and chronic conditions, including mental illness. The Advisory Group provided its final report – *Better Outcomes for People with Chronic and Complex Health Conditions*[21] to Government in December 2015. Central to the recommendations

is the implementation of a Health Care Home model of care for patients with chronic and complex conditions.
The Health Care Home provides a 'home-base' for these patients, coordinating the comprehensive care needed on an ongoing basis. The report outlines reform options structured around four reform themes:
• Effective and appropriate patient care
• System integration and improvement
• Payment mechanisms
• Achieving outcomes

The theme of *better use of technology* is embedded throughout the *Better Outcomes* report in recognition of its important role as an enabler and vehicle for implementation across all aspects of the reforms recommended.

At the time of writing, the Australian Government has just announced the ten trial-site Primary Health Networks that will pilot the Health Care Homes model of care†. PHT has been named as one of the trial sites so it will be important to be actively engaged in supporting the implementation of this trial.

### Medicare Benefits Schedule (MBS) Review

The MBS Review Taskforce is considering how the more than 5,700 items on the MBS can be aligned with contemporary clinical evidence and practice and improve health outcomes for patients. The review is clinician-led and there are no targets for savings attached to it. An interim report was due to be provided to the Australian Government by the Taskforce in January 2016. At the time of writing, it is not clear whether this has been provided or not. The final report with final recommendations was due to be submitted by the Taskforce in December 2016. It will be important to keep abreast of any changes that result from this review. The Heart Foundation has been advocating for a new quality-focussed Practice Incentive Payment (PIP) which includes detection and prevention of vascular and related diseases as part of this review.

### Acute Coronary Syndromes Clinical Care Standard

At the end of 2014, the Australian Commission on Safety and Quality in Health Care, in collaboration with consumers, clinicians, researchers and health organisations, developed and released the Acute Coronary Syndromes Clinical Care Standard and resources to guide and support its implementation.

The *Acute Coronary Syndromes Clinical Care Standard*[22] is a resource that provides guidance to clinicians and health service managers on delivering appropriate acute coronary syndromes care. It should be implemented in Tasmania.

The commission also released the *Indicator Specification*[23] resource which provides a set of suggested indicators to assist with local implementation of the ACS Clinical Care Standard. With the introduction of this standard, and the introduction of a single THS, the THS should commit to ensuring that clinicians and health services collect the required data to use the indicators to monitor the implementation of quality statements, and support improvement as needed.

† See Australian Government's Department of Health website for further information on Health Care Homes

# Factors driving change

The Tasmanian healthcare system provides a high standard of care to people with heart disease and related conditions. The improvements in survival from heart diseases that have already occurred demonstrate the quality of the care provided, advances in medicine and treatment techniques by health and emergency services.

Along with the need for Government to adopt a Health in All Policies approach to preventative health to delay the onset of heart disease, there is still room for improvement in the management of those with existing disease. In order to sustain and continue to improve cardiac survival rates and achieve the best possible patient outcomes for all Tasmanians regardless of where they live, key service objectives must still be addressed. The specific factors that will drive change are identified to prioritise action for individuals, for health services and for the health system.

## Factors driving change for individuals

- Community literacy should be strengthened to increase understanding of health risks, which would help to prevent heart disease and improve quality of life.
- Lifestyle modification programs that reduce risk factors for heart disease as well as associated chronic diseases such as diabetes and renal disease should be promoted.
- Early detection of disease must be improved to better identify people at risk of developing heart disease, and avoid or slow disease progression.
- Consistent access to care within recommended timelines would improve chances of surviving an acute cardiac event and achieve the best possible long-term outcomes.
- Better support for people following their acute episode of care would assist them to independently manage their ongoing healthcare needs.
- Improved community knowledge of the warning signs of heart attack and the importance of responding quickly by calling triple zero, along with more people being trained to deliver CPR and use (more publicly available) AEDs will save lives and reduce heart muscle damage, resulting in better long-term outcomes.

## Factors driving change for health services

- Patient pathways and models of care need to be consistent, based on evidence of best practice and incorporate the full cardiac care continuum.
- Access to time-critical and specialist care must be improved, particularly in rural and outer metropolitan areas, to see real improvement in patient outcomes across Tasmania.
- Coordinated care must be person centred and patient goals articulated within a comprehensive care plan.
- Specialist infrastructure should be appropriately located to ensure it is utilised efficiently.

## Factors driving change for the system

- All health services, including Ambulance Tasmania, must be supported to respond efficiently and effectively to growing demand for cardiac services.
- The role of all health service providers (both public and private) within a coordinated system of care needs to be clearly defined, with roles and relationships established in accordance with an agreed capability framework, with models of care and subsequent pathways and protocols developed.
- Access to all care options needs to be coordinated and efficient to improve patient referral pathways and patient outcomes.
- All health services and primary care providers should be providing best practice care, in accordance with evidence-based clinical guidelines.

Efficiency and cost-effectiveness of care and accountability of health services are integral to achieving the government's vision for Tasmania to have the healthiest population in Australia by 2025, and a world-class health care system where people get treatment and support when they need it.
To respond to the factors driving change above, a series of actions have been identified and form the basis of four strategic directions.

## Strategic directions

Four strategic directions are identified to deliver improved services and better outcomes for Tasmanians with, or at risk of, heart disease. They prioritise action to: promote healthy living and improve health literacy; improve early detection and intervention; enable faster access to emergency and time-critical services; and improve a range of services for people with heart disease.

These directions have been adopted directly from the *Heart health: improved services and better outcomes for Victorians* plan and endorsed by the Tasmanian Cardiac Clinical Advisory Group (prior to the Clinical Advisory Groups being disbanded). They will guide service and system improvement in cardiac care over the coming years.

Within each direction there are a number of priorities or actions to be targeted. These are specific areas in which the Department of Health and Human Services, in partnership with the THS, the proposed Tasmanian Cardiac Clinical Network (TCCN), PHT, General Practice, non-government organisations and the community, will work to improve cardiac care and patient outcomes.

| DIRECTION | PRIORITIES |
|---|---|
| **1. Promote healthy living and improve detection of early stages of heart disease** | • Promote healthy living through a Health in All Policies approach to improving the Social Determinants of Health<br>• Promote healthy living by improving community literacy about heart health<br>• Support lifestyle programs to prevent the onset of heart disease<br>• Early detection of risk factors – risk assessment<br>• Improve early detection of heart disease<br>• Improve management of early heart disease |
| **2. Better, faster access to time critical cardiac care** | • Raise community awareness about the early warning signs of heart attack and the importance of early response<br>• Support rapid access to early defibrillation for people experiencing cardiac arrest and improve the delivery of bystander CPR<br>• Build better early diagnostic capability<br>• Strengthen local decision making with remote specialist advice<br>• Ensure timely access to reperfusion therapy |
| **3. Improve services for people with heart disease** | • Improve access to specialist catheterisation, PCI, cardiac surgery and other cardiology services<br>• Improve access to the full range of cardiac investigations and imaging<br>• Improve access, quality and consistency of cardiac rehabilitation<br>• Improve care planning and management of people living with chronic heart failure<br>• Improve access and transition to best practice end-of-life care<br>• Improve access to electrophysiological services |
| **4. Strengthen system performance** | • Improve system coordination and collaboration<br>• Establish a managed clinical network for cardiac disease<br>• Support clinical leadership and service quality<br>• Improve performance monitoring<br>• Support the primary care and cardiac workforce |

# Strategic Directions

## Direction 1: Promote healthy living and improve detection of the early stages of heart disease

Priorities

- Promote healthy living through a Health in All Policies approach to improving the social determinants of health
- Promote healthy living by improving community literacy about heart health
- Support lifestyle programs to prevent the onset of heart disease
- Improve early detection of heart disease
- Improve management of early heart disease

### 1.1 Promote healthy living through a Health in All Policies approach to improving the social determinants of health

Social determinants of health are economic and social conditions that influence the health of people and communities[24]. These conditions are shaped by the amount of money, power, and resources that people have, all of which are influenced by policy choices. Social determinants of health factors that are related to health outcomes include:

- How a person develops during the first few years of life (early childhood development)
- How much education a person obtains
- Being able to get and keep a job
- What kind of work a person does
- Having food or being able to get food (food security)
- Having access to health services and the quality of those services
- Housing status
- How much money a person earns
- Discrimination and social support

While behaviour change approaches and programs to improve access to health care can help to reduce health inequity, these are insufficient if implemented in isolation[25]. A review of interventions across the cardiovascular prevention and treatment continuum[26] has shown that underlying social and environmental factors associated with disadvantage are a significant barrier to change. 'Downstream' approaches such as population screening, dietary advice, smoking cessation programs, media campaigns, statin and anti-hypertensive prescribing have all been shown to widen inequities[27,28]. These approaches typically have a greater uptake by more advantaged groups[26] so it is essential that these types of health interventions are carefully planned to ensure they do not exacerbate health inequities[28].

By contrast, 'upstream' population health approaches (such as those legislating smoke-free environments, banning trans fats or modifying built environments) are more likely to improve the health of all members of society across the social gradient[24,26,29,30,31]. This is because upstream approaches rely more heavily on environmental or social change than individual agency. However, even if all population groups were to benefit equally from a public health effort, a health divide will remain. The goal therefore, should be to 'level up' (that is, to disproportionately improve the health of more disadvantaged groups while at the same time improving the health of the entire population).[29,32]

Levelling up requires carefully targeted and population-wide approaches. It also requires efforts to move beyond narrow sectoral interventions to the development of

comprehensive social approaches that involve participatory processes to address the root causes (the social determinants) of health inequity.[33]

This is why a whole-of-government Health in All Policies approach is needed to address the Social Determinants of Health; so that making healthier choices become the easiest choices to make, and so that people are equipped, skilled, and live in environments that support those healthier choices.

## 1.2 Promote healthy living by improving community literacy about heart health

Many of the risk factors and lifestyle choices that contribute to the development of heart disease are shared with a range of other chronic conditions such as stroke, diabetes and cancer. It is therefore imperative that people are aware of these risk factors, and understand what they need to do to reduce their risk. This requires them to have a degree of health literacy. It is estimated that 63 per cent of Tasmanians do not have an adequate level of health literacy[34].

The Tasmanian Government has released the *Healthy Tasmania Five Year Strategic Plan*[35] which provides a focus on: decreasing smoking, improving healthy eating and physical activity, improving community connections (including approaches to increase health literacy), and better screening for and management of chronic conditions. Whilst there is not specific detail about what approaches are going to be used to increase health literacy, it is essential that evidence-based, adequately resourced initiatives are adopted. The 26TEN network that provides adult literacy support in Tasmania is a great initiative to improve Tasmanian's literacy more broadly, however more work needs to be done to improve Tasmanian's health literacy, which includes improving the way health information is provided to people.

The Heart Foundation has a major role in promoting healthy lifestyles and reducing the burden of heart disease, and provides an extensive range of information through its website and Health Information Service (phone 13 11 12). The Heart Foundation also undertakes: a wide range of health promotion activities; education and support; research; and service improvement activities including developing evidence-based guidelines to fulfil its objective of reducing premature death and suffering from heart, stroke and blood vessel disease.[36]

## 1.3 Support lifestyle programs to prevent the onset of heart disease

Supporting initiatives to reduce the risk of many chronic diseases, while also building capacity and empowering people to manage their own health, will drive a reduction in heart disease over time.

Known modifiable risk factors for heart disease include:

- smoking – both active smoking and being exposed to second-hand smoke (passive smoking)
- dyslipidaemia (high blood cholesterol)
- high blood pressure
- diabetes
- overweight and obesity
- physical inactivity
- depression, social isolation and lack of quality support.

Lifestyle modification programs address these known modifiable risk factors, and are one way to encourage healthy behaviours and a more active lifestyle to reduce the likelihood

of serious chronic conditions, including heart disease. The key to the success of these programs is ongoing support from trained health professionals, such as dieticians and exercise physiologists utilising evidence based interventions to support long term sustainable behaviour change.
Often lifestyle modification programs will be delivered through group-based courses or individual health coaching sessions. More recently and more frequently individual programs are supported through innovative technology including smartphone applications or tele-coaching.

In addition to lifestyle modification programs, public community health services will often provide intensive early intervention to people at risk of chronic disease and deliver innovative models of care to engage people in health-promoting behaviours.

## 1.4 Improve early detection of heart disease

In many cases, early detection of heart disease provides the opportunity for highly targeted intervention to slow disease progression and reduce the likelihood of a major cardiac event.

In addition to modifiable risk factors for heart disease listed above, there are non-modifiable risk factors - increasing age, gender and a family history of heart disease.

The inherited genetic predisposition to heart disease is not well known and often only detected after a major cardiac event. Many inherited predispositions to heart disease, in particular sudden cardiac death, can now be detected through genetic testing.

Guidelines for genetic testing have been developed by Cardiac Society of Australia and New Zealand (CSANZ)[37], and a voluntary National Genetic Heart Disease Registry has been established to gather information on families with inherited cardiac conditions to provide a better understanding of these conditions. Genetic counselling should be made available when required.

Pregnant women are offered foetal anomaly scanning at around 18-20 weeks of pregnancy, and amniocentesis is offered where indicated. Those identified antenatally to have critical congenital heart disease, who continue with the pregnancy, are always referred to the RWH FMU and have a planned delivery at the RWH, with postnatal transfer to the RCH Melbourne for definitive management. The Patient Travel Assistance Scheme (PTAS) supports those that require assessment and management in Melbourne.

Newborn babies are assessed and screened prior to discharge to help to identify those with unrecognized critical congenital heart disease (CCHD).

Congenital heart disease detected in the antenatal period is invariably referred for tertiary level scanning with a senior radiologist or obstetrician skilled in high level foetal ultrasound. Counselling with a neonatologist and obstetrician is available as appropriate via the high risk antenatal clinic.

Screening an individual's risk of heart disease can be complex in the presence of more than one risk factor.

The Australian Guidelines for the assessment and management of absolute CVD risk include a risk calculator[17] that considers the impact of multiple factors on a person's individual risk of a cardiovascular event within a five-year period. It is recognised that many practitioners in general practice use these tools routinely to assess a person's risk, however the level of uptake is unknown. It is recommended that every Tasmanian over the age of 45 years (35 for Aboriginal and/or Torres Strait Islander people) should have

an absolute risk assessment undertaken in primary care to determine their risk of heart attack and stroke. Management can then be directed based on the identified level of risk. The greater a person's absolute risk of CVD, the more benefit is to be gained through intervention and the more intensive the intervention should be. General practice can play a significant role in secondary prevention in managing those found to be at risk, or indeed, found to have disease.

The THS can also play a role in increasing the proportion of those in that undergo absolute CVD assessment and management, by commissioning the provision of absolute risk assessments in general practice, and setting targets for the adoption of these assessments in general practice, along with in the community health centres and integrated care centres that it funds.

The availability of Medicare Benefit Schedule (MBS) items for health assessment screening in primary care, and introducing screening in community and workplace settings will offer Tasmanians a chance to better understand their risk level, detect early disease and make positive changes to their lifestyle.

Along with potential incentives to improve uptake of absolute cardiovascular risk assessment, consideration needs to be given to improving practice patient management systems so that general practice work flow can be improved.

## 1.5 Improve management of early heart disease

PHT commissions care coordination services to support elderly people and people with chronic health conditions. People are assisted to actively participate in their plan of care, and gain access to necessary services to support improved health outcomes.

In the THS provided services (in community health and integrated care centres), opportunistic screening of patients and the provision of education and advice regarding the management of risk factors and early heart disease is not actively undertaken. Health professionals working in the primary care sector have key roles in the screening, detection and management of CVD, particularly early after diagnosis to prevent deterioration and recurrent events.

Direction 1: Promote healthy living and improve detection of the early stages of heart disease

| Priority | Actions | Impacts |
|---|---|---|
| Promote healthy living by a Health in All Policies approach to improving the Social Determinants of Health | • Support a Health in All Policies approach to improving the Social Determinants of Health, so that the responsibility of improving and promoting good health in Tasmania is seen as everybody's business | Health in All Policies is acknowledged and acted upon by Government<br><br>Tasmanians live in an environment that supports health and wellbeing |
| Promote healthy living by improving community literacy about heart health | • Support a whole-of-government approach and community programs and opportunities in different settings (such as workplaces, schools, community, early childhood centres) to address the determinants of health and build knowledge, skills and opportunities to lead a healthy lifestyle<br>• Support evidence-based campaigns and approaches that promote healthy living such as tobacco control, healthy weight, good nutrition, physical activity, mental health<br>• Work collaboratively with health promotion and illness prevention programs in primary and community-based services to:<br>• strengthen heart health messages within existing programs<br>• support provision of current information about risks of cardiac disease | Health literacy is improved as people receive information appropriate to their needs<br><br>Tasmanians use information to make more informed decisions about their heart health<br><br>Evidence-based approaches to the early management of CVD are uniformly utilised throughout the THS |
| Support lifestyle programs to prevent the onset of heart disease | • Support primary and community health programs and the piloting of new and innovative models of lifestyle modification programs, including through the use of e-health, smartphone applications, or telecoaching | Tasmanians at risk of heart disease adopt positive lifestyle changes |
| Improve early detection of heart disease | • Increase use of the absolute CVD risk assessment guidelines and tool in primary and community health settings<br>• Work with General Practitioners (GPs), PHT, Primary Care Partnerships (PCPs), the THS and other stakeholders to improve patient review and monitoring of risk factors as part of routine primary health encounters. This should include exploring the adoption of set targets for risk assessment. This will increase development and use of:<br>• standard CVD absolute risk assessment tool<br>• standardised consumer education resources<br>• culturally and linguistically appropriate resources<br>• Enhance access to cardiac genetic testing and counselling services for families at high risk of an inherited cardiac disorder<br>• Support effective translation of research into clinical practice, particularly in the area of genetic testing to enhance targeting of those at increased risk and facilitate access to personalised medicine therapies<br>• Maximise opportunistic screening of high-risk individuals in community programs | Tasmanians at high risk of developing heart disease or with the early stages of heart disease are identified<br><br>GPs regularly monitor biomedical markers and risk factors for signs of early disease<br><br>Ongoing active management is based on level of risk<br><br>Tasmanians at high risk of an inherited cardiac disorder are identified and receive counselling and targeted management<br><br>The incidence of heart disease in the Tasmanian population is reduced with early intervention and management |
| Improve management of early heart disease | • Promote regular assessment and care planning by GPs and primary care providers of consumer's lifestyle, biomedical and psychosocial risk factors for heart disease<br>• Improve ongoing management of those at risk or with early heart disease, including pharmacological management, self-management support and referral to appropriate lifestyle services (such as QUIT, exercise programs, specialist multidisciplinary providers); working with community health service providers and stakeholders<br>• Promote the use of MBS items that support planned and integrated care for those with chronic heart conditions by working with the Commonwealth Government, PHT, GPs, TCCN and other stakeholders | Tasmanians at high risk of heart disease are supported in managing their health, slowing disease progression and avoiding an acute cardiac event |

# Direction 2: Better, faster access to time critical cardiac care

Priorities

- Raise community awareness about early warning signs of heart attack and the importance of early response
- Support rapid access to early defibrillation for people experiencing cardiac arrest and improve the delivery of bystander CPR
- Build better early diagnostic capability
- Strengthen local decision making with specialist advice
- Ensure timely access to reperfusion therapy

Many heart diseases and conditions can precipitate a life-threatening emergency, so timely access to best practice care is vital to ensure survival and best possible outcomes. Surviving such an acute event can be dependent on a rapid and effective response from both community members, Ambulance Tasmania and the health system.

The greater the delay in obtaining medical care the greater the risk to life and damage to the heart muscle, with the potential to develop life-threatening chronic heart failure. The time to treatment is crucial to restoring blood flow to the heart. Table 1 describes the likely outcomes when time to treatment varies.

*Table 1 Likely heart attack (STEMI) outcomes by time to treatment*

| Time to treatment | Likely outcome from treatment |
|---|---|
| < 1 hour * | Aborted heart attack or only little heart muscle damage |
| 1 – 2 hours * | Minor heart muscle damage only |
| 2 – 4 hours | Some heart muscle damage with moderate heart muscle salvage |
| 4 – 6 hours | Significant heart muscle damage with only minor heart muscle salvage |
| 6 – 12 hours | No heart muscle salvage (permanent loss) with only infarct healing benefit |
| > 12 hours | Significant heart muscle damage; treatment unlikely to be of any benefit |

** Recommended time to treatment from the onset of symptoms for best possible health outcome*[3]

The first step in the response to a life-threatening event is patient and/or bystander action; namely the time taken to recognise the warning signs and symptoms of heart attack and call triple zero. This is a critical component of overall response time, and therefore the capacity of the system to reduce total time from onset of symptoms. The benefit of early treatment starts from symptom onset so the community needs to know when to take appropriate action.

People living in rural and regional Tasmania are often further away from time-critical hospital treatment, which can contribute to poorer outcomes than their metropolitan counterparts. To ensure all Tasmanians experiencing a cardiac emergency receive appropriate treatment (no matter where they live), care needs to be responsive and based on agreed best practice guidelines.

To achieve this, Tasmania needs collaborative systems of care to ensure all patients have access to the services they need within appropriate timelines, with access to specialist services and facilities when required. The underlying principles for developing these systems are equity of access, equity of care and evidence-based care, while also recognising patient preferences.

## 2.1 Raise community awareness about early warning signs of heart attack and the importance of early response

It is well documented that lives can be saved, and damage to the heart minimised, by reducing the time it takes to re-establish blood flow to the heart muscle following a heart attack, as described in Table 1.

One of the significant contributors to treatment delay is the time it takes to recognise the warning signs of heart attack and take action by calling an ambulance. More than half of heart attack deaths occur before the person reaches hospital, with about 25 per cent dying within one hour of the onset of their first symptom[38].

Recent Heart Foundation data shows that in Australia, the median delay time for patients who present with an admission diagnosis of ACS is between two and three hours. Critically, 28 per cent of patients present after eight hours of the onset of symptoms, and 32 per cent do not use an ambulance[39]. Patients who present with an admission diagnosis of chest pain have an even longer delay, with a median time of five hours[40].

There is a need to enhance community knowledge on some of the less well known warning signs of heart attack such as heaviness in the arms, pain in the neck, jaw, shoulders, or back, nausea and dizziness. People who do not experience crushing chest pain are likely to dismiss other warning signs and delay seeking treatment. In addition, people don't always understand the time-critical nature of heart attack and the importance of calling an ambulance as the entry point into the treatment pathway. Providing community education on the warning signs of heart attack and the importance of acting quickly by calling an ambulance is essential in reducing patient delay. The focus on reducing time from the onset of symptoms should include a consideration of patient delay in order to drive improvements in survival rates and a reduction in disability from heart attack.

A recent study undertaken in Victoria[41] demonstrated that the Heart Foundation's Warning Signs campaign was associated with significantly shorter prehospital decision-making and faster presentation to hospital. Consideration should be given to actively supporting a similar campaign in Tasmania.

## 2.2 Support rapid access to early defibrillation for people experiencing cardiac arrest and improve the delivery of bystander CPR

It is well recognised that effective bystander CPR and early defibrillation will lead to measurable reductions in morbidity and mortality in patients who have suffered cardiac arrest. Survival rates in patients attending cardiac rehabilitation programs who have had defibrillation within the first few minutes of a cardiac arrest are higher than 85%, with this rate of survival dropping by 10% with every passing minute.

The advent of technology has also seen the development of mobile phone apps, whereby individuals with CPR certification can register as "first responders" and can be called to support early CPR. Increasing the number of people capable of delivering effective CPR through a public health awareness campaign and formal community based training in a variety of settings such as schools, workplaces and sporting clubs, should be considered.

Through the utilisation of new technology, public education and an automatic external defibrillator registry, Ambulance Tasmania has recently implemented an initiative that aims to improve the accessibility of lifesaving defibrillators for use in cardiac arrest. The program aims to identify cases where there is a publicly-accessible AED at or near the same location as a suspected cardiac arrest. With new software that incorporates Automatic Vehicle Location (AVL), geo-fencing and automated messaging systems, Ambulance Tasmania is able to alert AED owners to nearby medical emergencies and inform first responders about the location of nearest AED during emergency 000 call. This aims to significantly increase the potential for life-saving defibrillation by members of the general public prior to the arrival of paramedics.

## 2.3 Build better early diagnostic capability

Pre-hospital ECGs, with the capacity to transmit the results to the receiving hospital before the patient arrives, allows time for the hospital's emergency capability to be activated. This has been shown to result in significantly shorter door-to-reperfusion times and a higher proportion of patients receiving reperfusion within the recommended timelines[42]. This can facilitate direct admission to a cardiac catheterisation/PCI facility. Currently, whilst 12-Lead ECGs are able to be taken by Ambulance Tasmania personnel, there is no ability to transmit ECGs to emergency department or cardiology staff in Tasmanian hospitals.

With the advent of smart phones and mobile technology, defined management protocols and clinical pathways need to be established to facilitate the transmission of ECG's taken by ambulance staff to a nominated person (cardiologist on-call, Emergency Department physician, or registrar) and then the appropriate management protocols followed e.g. thrombolyse and transfer (remote/rural); or Code STEMI if within an acceptable geographical distance (to be determined) from a centre with early PCI capacity. Delays in the transfer of patients from the site of their event must be avoided to ensure evidence-based door-to-reperfusion times are achieved. If 12-Lead ECG diagnostic capacity in other strategic rural localities is enhanced, along with implementing pre-notification protocols, more people experiencing a STEMI will have access to time critical cardiac care within evidence-based timelines.

Similarly, protocols should be established for patients who have presented to their general practice. It is not unusual for patients with ACS to present to their GP rather than calling for an ambulance. GPs diagnose ACS, perform ECGs whilst they initiate management with nitrates and aspirin, oxygen if needed and intravenous access and arrange transport. Many GPs have defibrillators (and it has been proposed that these be standard equipment in the next Royal Australian College of General Practitioners (RACGP) accreditation standards). Protocols need to be established between GP and Ambulance Tasmania regarding hand-over of patients (when a history has already been taken, and an ECG diagnostic of an AMI has already been taken) to reduce unnecessary delay and duplication incurred by retaking a history, re-doing ECGs.

## 2.4 Strengthen local decision making with remote specialist advice

The majority of persons with CVD are well managed in the primary care sector but may require specialist support and management if there has been a step change in their condition or symptoms. The Tasmanian Health Pathways have a role in providing primary care providers with local, reliable information and management strategies, but need to be embedded into practice. However, often people with cardiac conditions will need specialist expertise and care. This cardiac expertise is available in specialist cardiac centres and larger health services. For health services without cardiac specialists, this level of expert input and advice needs to be readily accessible to assist

local clinicians in providing appropriate patient care, particularly during time-critical events.

Therefore a system of improved access to specialist advice from cardiologists through outreach and telehealth, needs to be developed. This will strengthen local decision making and enhance patient access to current, evidence-based clinical care. It will also improve triage, referral pathways and care coordination, and streamline access to specialist cardiac interventional services, including surgery, if this is required.

There are multiple telehealth facilities available throughout the state. Each THS facility has at least one telehealth unit which could be utilised for consultations with specialists in one of the major hospitals. Patients could be present during the consultation and management decisions determined in a timely manner between the referring practitioner, consultant and patient.

The system will complement regional partnerships already established, be available to rural and regional health services and to GPs for time-critical care, and support decision making regarding managing people with heart disease. It is not intended to substitute for appropriate patient referral to a cardiology specialist for advice and management.

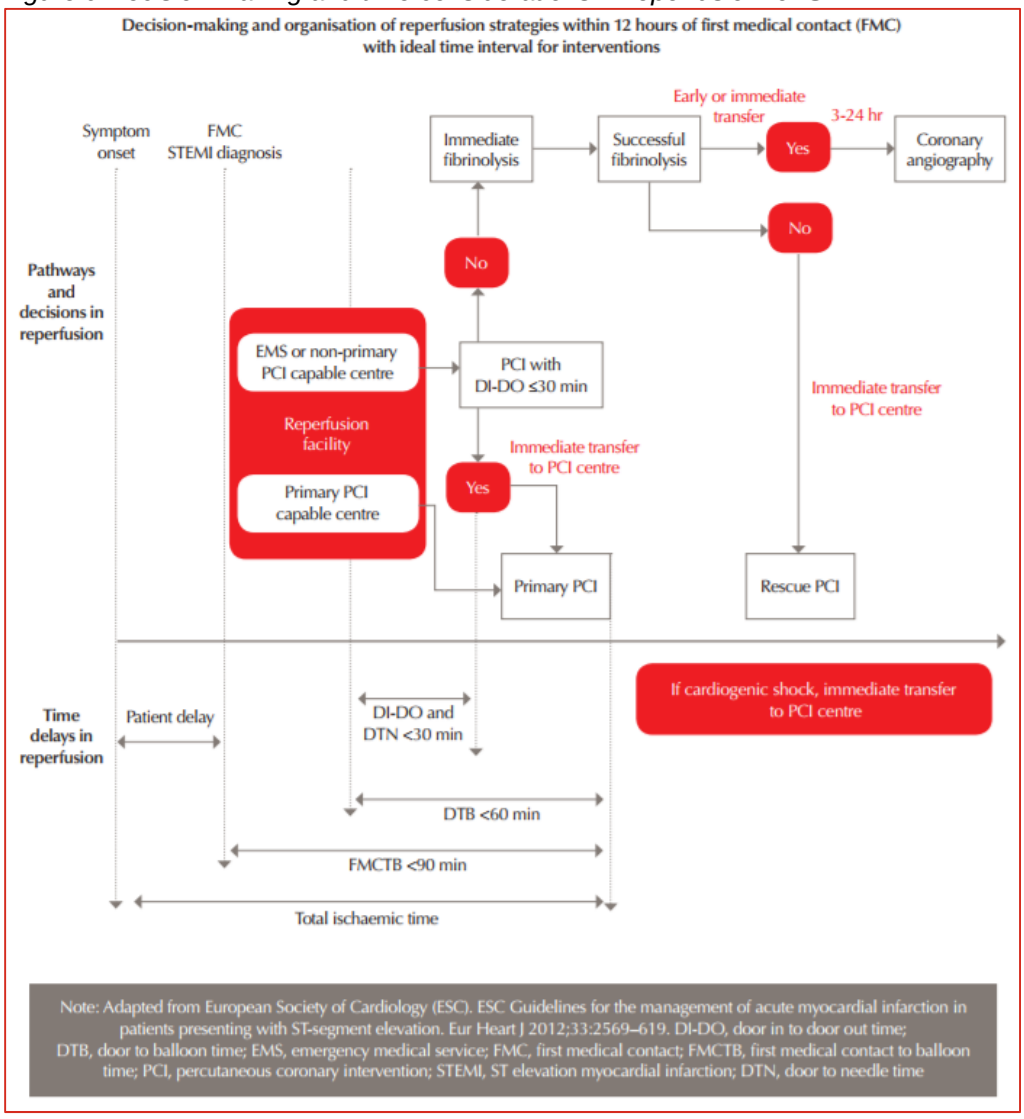
## 2.5 Ensure timely access to reperfusion therapy

Reperfusion therapy includes both PCI and administration of thrombolytic drugs. To restore blood flow to the heart and minimise damage to the heart muscle, time to treatment is crucial. The benefits of reperfusion therapy are greatest if given as close as possible to the onset of symptoms.

Currently in Tasmania, there is no systematic method of collecting data on the time from when the patient first experienced their warning signs of heart attack – or "time-from-symptom-onset". Currently a range of useful data is collected routinely via emergency department/hospital data systems in fields that are reasonably easy to analyse. These include age, sex, mode of arrival (ambulance/self-driven/walk in) and Indigenous status. With the introduction of the Australian Commission on Safety and Quality in Health Care's *Acute Coronary Syndromes Clinical Care Standard*[22], "Quality statement 3 – Timely reperfusion", the collection of time-from-symptom-onset data will be required in order to establish whether the standard for timely reperfusion has been met. It will need to be determined how time-from-symptom-onset data can be recorded in patient management systems in Tasmania.

Appropriately identifying cardiac emergencies using rapid diagnosis supported by specialist clinical advice for decision making and streamlined transfer to a PCI capable facility (if this can be achieved within recommended timeframes) improves patient outcomes. The *Heart Foundation and CSANZ 2016 Acute Coronary Syndrome guidelines*[43] provide the clinical standards for evidence-based management of ACS and are summarised in Figure 9.

*Figure 9 Decision making and time considerations in reperfusion for STEMI*




These guidelines identify time, both to presentation and reperfusion, as the major factor in determining the most appropriate treatment option. The guidelines indicate that, unless contraindicated, reperfusion with thrombolytic drugs should occur if there are potential delays to PCI beyond the timeframes indicated. This may be the case for patients in some rural or outer metropolitan areas that are a considerable distance from a hospital capable of providing PCI. In these cases, early diagnosis with 12-lead ECG and administration of thrombolytic drugs in the pre-hospital or hospital environment will be the optimal form of treatment. Most patients who have received thrombolysis for STEMI should be transported to a PCI centre for early invasive investigation by coronary angiography with a view to intervention if required.

Apart from emergency departments in the major hospitals, several smaller district hospitals managed by the THS have been identified as able to administer thrombolysis therapy under the direction of a hospital doctor and administered by a local GP. Identified sites include St Helens, Swansea, Scottsdale, Flinders Island, King Island, Smithton, Queenstown, and Rosebery local hospitals. Patients are then transferred to the nearest major hospital (with PCI capability) for ongoing management.

Rural and remote facilities have variable capability for the management of chest pain. The majority are able to provide basic life support and management of cardiac arrest with AED's in all facilities. Protocols generally exist for the early management of the patient

presenting with suspected heart attack – triage assessment, aspirin and/or clopidogrel, GTN, oxygen, point-of-care troponin testing with ambulance transport to the nearest catheterisation/PCI facility. However, transport times vary depending on the location, and ambulance and/or aircraft availability, and it could be up to 10 hours from the time of presentation. These times will heavily influence the time to reperfusion, further strengthening the case for in-ambulance or other health care practitioner provided thrombolysis as standard practice. These potentially prolonged transport times increase the risk of mortality and morbidity for patients e.g. future development of heart failure, and the consequent financial impost on the health budget. STEMI and aortic dissection are now considered as a time critical conditions that qualify for helicopter transport to the appropriate higher level service if accessible within the defined timeframes for treatment.

An assessment needs to be undertaken in Tasmania to determine where pre-hospital thrombolysis is the best option (due to inability to transfer to PCI facility within guideline timeframes), and whether there is a role for ambulance paramedics (as occurs in other jurisdictions such as Victoria, NSW and QLD), or other health professionals (such as GPs and Registered Nurses (RNs) as also occurs in other jurisdictions) to be upskilled and accredited to administer thrombolysis, using standardised protocols in locations not currently identified as being able to perform pre-hospital thrombolysis. This is a life-saving therapy and one which reduces morbidity. A map outlining the Cardiac ARIA index for accessibility to cardiovascular services for Tasmania can be found at Appendix 6. The full Cardiac ARIA index[44] could be utilised to determine where pre-hospital thrombolysis is the preferred first-line treatment for STEMI patients. A map of Ambulance stations and units around Tasmania can be found at Appendix 7. This too could assist in informing possible locations where pre-hospital thrombolysis will be the preferred first-line treatment.

Similarly, an assessment needs to be made to determine the feasibility of direct admission of STEMI patients to cardiac catheter/PCI facilities in Tasmania, thereby bypassing the emergency department (reducing time from symptom onset to treatment), and develop the subsequent protocols if deemed feasible.

| Australian Commission on Safety and Quality in Health Care Acute Coronary Syndromes Clinical Care Standard indicators relevant to Direction 2: |
|---|
| 1. A patient presenting with acute chest pain or other symptoms suggestive of an acute coronary syndrome receives care guided by a documented chest pain assessment pathway.<br>2. A patient with acute chest pain or other symptoms suggestive of an acute coronary syndrome receives a 12-lead electrocardiogram (ECG) and the results are analysed by a clinician experienced in interpreting an ECG within 10 minutes of the first emergency clinical contact.<br>3. A patient with an acute ST-segment-elevation myocardial infarction (STEMI), for whom emergency reperfusion is clinically appropriate, is offered timely percutaneous coronary intervention (PCI) or fibrinolysis in accordance with the time frames recommended in the current National Heart Foundation of Australia/Cardiac Society of Australia and New Zealand Guidelines for the Management of Acute Coronary Syndromes. In general, primary PCI is recommended if the time from first medical contact to balloon inflation is anticipated to be less than 90 minutes, otherwise the patient is offered fibrinolysis.<br>4. A patient with a non-ST-segment-elevation acute coronary syndrome (NSTEACS) is managed based on a documented, evidence-based assessment of their risk of an adverse event. |

## Direction 2: Better, faster access to time critical cardiac care

| Priority | Actions | Impacts |
|---|---|---|
| Raise community awareness about early warning signs of heart attack and the importance of early response | • Support opportunities for community education about early warning signs of heart attack and the importance of early response by calling triple zero | People experiencing a heart attack will recognise the serious nature of the event and immediately seek medical care |
| Support rapid access to early defibrillation for people experiencing cardiac arrest | • Improve access to community installed AEDs by encouraging general practices, private companies, organisations and large retail or commercial centres to ensure equipment is available, maintained appropriately and registered with Ambulance Tasmania<br>• Encourage middle sized shopping centres to install AEDs and register them with Ambulance Tasmania<br>• Increase community awareness and understanding about responding early to cardiac arrest, including use of community-based AEDs and CPR training | Increase in bystander CPR and use of community-based AEDs<br><br>People experiencing cardiac arrest in the community will have greater chance of surviving to hospital |
| Build better early diagnostic capability | • Enhance pre-hospital 12-Lead ECG diagnostic capability in strategic rural localities, including the ability for Ambulance Tasmania and other health care facilities to transmit 12-Lead ECGs to designated person in a major centre for interpretation and action<br>• Develop capability in rural health services for early cardiac diagnosis and risk stratification | People experiencing a cardiac emergency or with a suspected cardiac condition will have timely local access to more efficient diagnostic services and treatment |
| Strengthen local decision making with specialist advice | • Establish a system for statewide access to specialist cardiology advice<br>• Utilise existing telehealth facilities at rural locations to establish remote clinics between primary care practitioners and cardiologists | Local clinicians, particularly those in rural Tasmania, will be supported by cardiology specialists to improve local decision making and patient management<br><br>Rapid response to heart attack and ongoing care and management of people with heart disease will be improved |
| Ensure timely access to reperfusion therapy | • TCCN form a working group to determine where there may be delays in lysing patients, and whether there is a role for ambulance paramedics or other health professionals to be upskilled and accredited to administer thrombolysis (as occurs in other jurisdictions such as Victoria, NSW and QLD)<br>• Develop and implement regional cardiac reperfusion plans to support local responses<br>• Thrombolytic therapy:<br>• Support provision of thrombolytic therapy in Tasmanian public emergency departments and urgent care centres<br>• Implement local models of pre-hospital thrombolysis by other trained personnel or extended care ambulance paramedics in areas where travel times limit access to health service-delivered reperfusion therapy within best practice timeframes<br>• Standardise thrombolytic drugs and clinical pathways, including exploring opportunities for centralised purchasing of consumables<br>• PCI:<br>• Improve and streamline access to catheterisation laboratory services, consistent with a statewide capability framework for cardiac services<br>• Determine the feasibility of direct admission of STEMI patients to cardiac catheter laboratories in Tasmania, thereby bypassing the emergency department (reducing time from symptom onset to treatment), and develop the subsequent protocols if deemed feasible<br>• Support efficient and timely activation of catheterisation laboratories for primary PCI | Time to reperfusion for heart attacks will be improved to meet benchmark timeframes<br><br>Lives will be saved as people experiencing a heart attack have access to the treatment they require within appropriate timeframes and potentially reducing ongoing morbidity from heart disease and subsequent impost on the health budget |
| Monitor implementation of the ACS Clinical Standard quality statements, and support improvement as needed. | • TCCN support the adoption of the ACS Clinical Standards 1, 2, 3 and 4. | Improved safety and quality of care for people experiencing ACS |

# Direction 3: Improve services for people with heart disease

Priorities

- Improve access to specialist catheterisation, PCI, cardiac surgery and other cardiology services
- Improve access, quality and consistency of cardiac rehabilitation
- Improve care planning and management of people living with chronic heart failure
- Improve access and transition to best practice end-of-life care

## 3.1 Improve access to specialist catheterisation, PCI, cardiac surgery and other cardiology services

All Tasmanians are entitled to equitable access to quality, safe, evidenced based cardiac services with timely referral to specialist care from clinicians in both the acute and primary care sectors. Systems should be in place to facilitate an early review following referral. A recent initiative is the appointment of liaison nurses for cardiology and cardiothoracic surgery who accept and manage referrals, have contact with patients, and manage waiting and procedure lists.

A formalised statewide governance structure across Tasmania is required to support decision making, streamline accountability and ensure decisions impacting cardiac services are taken at the state-wide level. Appointing a Statewide Clinical Director for Cardiac Services would support this, and the establishment of a TCCN to provide advice and assist in the implementation of this plan is recommended. The TCCN could provide advice in the development of statewide models of care (currently being developed through the THS's HeartSafe Project Expert Advisory Committee), that would include local and regional protocols and pathways to facilitate and streamline care and to reduce transport times. This would facilitate prompt transfer of patients deemed to be urgent or emergency from other facilities to the point of service (intervention).

The proposed TCCN should also liaise with the DHHS regarding the cardiac-related services being commissioned from the DHHS (external to the THS) to ensure that it is more fully informed of the full health system services provided statewide, and is more informed of where gaps continue to exist.

Accurate data also needs to be collected and readily accessible regarding patients who are transferred interstate for procedures that could be undertaken in Tasmania, to ensure those costs incurred are not borne by the THS, and that the THS can maintain the level and standard of services that are appropriate and required for Tasmania.

### Cardiothoracic Surgical Services

Cardiothoracic Surgical Services are currently provided state-wide at the Royal Hobart Hospital (tertiary referral centre) for emergency and elective patients as outlined in the Tasmanian Role Delineation Framework (see Appendix 3). This service requires sufficient capacity (ICU and ward accommodation), adequate resourcing and staffing. If it is deemed that cardiothoracic services can be provided for private patients at a private hospital site (as is currently being proposed), then it is imperative that the Statewide Cardiothoracic Surgical Service is considered as one single integrated service across two sites. The viability, sustainability and accreditation for both sites would be significantly under threat if they were to be treated as separate services. The service would need to be supported by cardiology services at both sites.

It is also essential that whether situated over two sites, or provided solely by the RHH, that the RHH continues to coordinate the Statewide Cardiothoracic Surgical Service as it

is the major trauma centre for the state as identified in the White Paper on *Delivering Safe and Sustainable Clinical Services*[13].

It is estimated, that with a population of over 517,000, coupled with Tasmania's ageing population and poor cardiovascular health, that there would be at a minimum, 350 Tasmanians per annum requiring Coronary Artery Bypass Graft surgery (CABG) alone. In addition, it is estimated that there would be a further 100 – 150 procedures for valvular surgery (AVR / MVR).

There are several issues (outlined below) that need to be addressed in order to ensure that the THS is able to sustain a viable Tasmanian Cardiothoracic Surgical Service. The interdependence between the cardiothoracic service and other key services, including cardiology, trauma, respiratory and vascular services must be considered in order for the THS to sustain a Level 6 facility as outlined in the *Tasmanian Role Delineation Framework*[15].

The key issues are described below:

- Interstate Referrals
    - It has been estimated more than 150 cardiothoracic patients per year are referred interstate for cardiothoracic surgery. It is likely that this is largely the result of referrals being made from private cardiology services, but also includes a significant number of public patients in the north of Tasmania. While providing a legitimate option for private patients so as not to burden the scarcely resourced existing public cardiology service, this service has built a referral network with mainland cardiology services resulting in specialists from Melbourne providing a service to both cardiology and subsequently Tasmanian cardiothoracic patients. This has a significant impact on the critical mass of patients required to sustain a Cardiothoracic Surgical Unit in Tasmania.
    - Referring cardiologists and general practitioners have indicated that the single most common reason for sending patients to the mainland is a lack of the ability for the RHH service to provide a definitive date for this type of surgery and ability to do the cases in a timely fashion. The capacity to provide this level of surety is currently impacted by staffing and access issues.
- Staffing Issues
    - Historically, the Cardiothoracic Surgical Service has operated with 2 senior surgeons. Peer units in both Australia and New Zealand would have a minimum of 3 senior surgeons, and an aligned private model (which does not currently exist in Tasmania).
    - 3 surgeons would ensure an appropriate roster and adequate leave cover was readily available, in order to provide a consistently reliable service to patients.
    - In order for the service to retain quality staff a critical patient mass needs to be maintained. This requires a functional public and private model to be available within the State.
- Access to Intensive Care Beds
    - The surgical throughput of the Unit is constrained by reliable access to Intensive Care Unit (ICU) beds for planned cases. It is estimated that 30 – 40 cases are

cancelled per annum as a result of ICU access or exit block. This is contributing to the growing number of patients referred interstate for their CT surgery, in turn affecting the viability and sustainability of the Unit.

At the RHH there is currently a robust cardiology service including 24 hour, 7 days per week acute interventional cardiology, pacemaker and device implants, general outpatient cardiology services, a rapid access chest pain clinic, heart failure pathway, cardiac imaging and paediatric liaison service. To support this service, it is critical that there also be a robust Cardiothoracic Surgical Service.

Increasing demand, which combined with action to improve ICU access, should provide adequate throughput to ensure the sustainability of the service in Tasmania. Increased efficiency and cost effectiveness can result through ensuring sustainable throughput, and increased clinical patient risk (identified with travel interstate for cardiothoracic surgical treatment) will be avoided.

Demand for a viable Cardiothoracic Surgical Service will continue to increase as:

- the Tasmanian population is ageing
- over half of the total population are overweight or obese
- a quarter of adults continue to smoke
- two thirds of Tasmanian's have inadequate levels of activity
- there is an increasing prevalence of hypertension, high cholesterol and diabetes, and
- there are high levels of social and economic disadvantage in the Tasmanian population.

Currently, the availability of ICU beds for post-operative elective cardiothoracic surgery is not guaranteed. As a consequence, the pre-operative length of stay for in-patient's whose surgery is cancelled is increased, increasing the cost of care prior to treatment being provided and increasing the risk of complications.

The transfer and retrieval of patients (with/without family/carers) to interstate hospitals for cardiothoracic surgery is costly, and is associated with risks for quality patient outcomes.

The practice of referring public patients interstate for cardiothoracic surgery, where the cost (along with the travel cost) is borne by the THS needs to cease and the referrals redirected back to the Tasmanian Cardiothoracic Surgical Service by:

- developing consistent protocols and clinical pathways
- consistent application of the Patient Travel Assistance Scheme eligibility criteria in relation to cardiothoracic patients referred interstate for surgery, and
- negotiating a private/public partnership to ensure that more private sector cardiothoracic surgery patients are referred to the RHH rather than go interstate.

Cardiothoracic surgery is characterised by fixed infrastructure costs. The Commonwealth financial contribution to this service is based on the amount of activity. Greater hospital throughput in cardiothoracic surgery would mean a lower unit cost for Tasmania, and will make the service more viable. To do this, the service requires an investment in workforce requirements which will increase the fixed costs, yet enable the service to undertake more activity, and maintain capacity and throughput to meet safety and quality requirements.

Outreach services to the North and North-West of the State need to be strengthened to ensure that patient need is identified and met, appropriate throughput to the Cardiothoracic Surgical Service is sustained, and interstate cardiothoracic referrals are reduced. This could be achieved by linking all regions into the multidisciplinary team meetings using video-conferencing facilities.

The Role delineation paper at Appendix 3 clearly defines the resources required to maintain this service. In addition, The Australian and New Zealand Society of Cardiac and Thoracic Surgeons have developed guidelines for the requirements of an adult cardiac surgery unit which should inform the required resourcing of the Cardiothoracic Surgical Service for Tasmania. These are found at Appendix 4.

### Interventional Cardiology

Interventional cardiology procedures are provided at the RHH and the LGH with both centres providing a 24-hour, 7-day a week service for primary percutaneous interventions (PCI). It makes sense from a geographical perspective to have two centres in Tasmania. Patients in the NW with ACS should be referred for invasive investigation with a view to intervention to LGH.
However, there are key personnel dependencies with the LGH service. There are services available in the private sector in Hobart, and more recently in Launceston; however these do not have a 24/7 roster and deal mainly with elective cases. Permanent pacemakers and implantable defibrillators (device therapy) are also procedures undertaken in some facilities (see below).

As a delay in reperfusion causes increased mortality, or heart muscle damage resulting in poorer health outcomes, for patients who are further than one hour away from these centres (from time of symptom onset to arrival at a PCI facility), it is strongly recommended that thrombolysis (unless contraindicated) be administered by trained and accredited personnel, e.g. ambulance paramedics, GPs or nurses (see Direction 2 – 2.5 of this document).

The Role Delineation paper at Appendix 3 clearly defines the resources required to maintain these services. CSANZ have also developed position statements on the Performance and Support Facilities for Primary PCI Service[45] and the Support Facilities for Coronary Angiography and PCI (Including Guidelines for Rural Sites)[46]. A summary of the recommendations is provided below.

- A comprehensive system of care to shorten time between symptom onset and primary PCI should be in place. Ideally this should include an 'in-field activation' program established in conjunction with local ambulance services to minimise treatment delays.
- Furthermore, a system facilitating early recognition in the Emergency Department with prompt contact with the cardiology team should be established. Pathways of communication and a clearly defined mechanism of primary PCI activation needs to be implemented prospectively. Real-time data feedback with Emergency Department and catheterisation laboratory staff should be undertaken.
- Primary PCI must be performed routinely as the treatment of first choice for STEMI around the clock to ensure streamlined care paths and increased case volumes. Door to balloon times should not exceed 90 minutes.
- On-site rigorous data collection, ongoing program of outcomes review, benchmarking, quality improvement and formalised periodic case analysis. Door to balloon times should be frequently reviewed as a component of quality assessment with a view to implementing strategies permitting optimal reperfusion within 90 minutes of presentation.
- Coronary interventional procedures are preferably performed in hospitals with on-site surgical support. Laboratories performing diagnostic angiography should

have access to coronary care or intensive care facilities and they should be capable of inserting intra-aortic balloon pumps, and transvenous pacemakers.

- Staff capable of managing patients with temporary pacing wires or intra-aortic balloon pumps should be available in the coronary or intensive care unit to management patients requiring these devices following a coronary angiogram.

### Electrophysiology (EP) and Device Therapy

Currently EP services for Tasmanian patients are provided interstate in Victoria. An options appraisal should be undertaken to determine the feasibility of providing a single statewide EP service for both public and private patients. Following the development of an options appraisal, a business case should be developed by the TCCN which outlines the requirements for servicing the preferred model.

### Device therapy

Cardiac Implantable Electronic Devices include pacemakers, implantable cardioverter defibrillators (ICD), cardiac resynchronization devices (CRT) and implantable loop recorders.

The insertion of permanent pacemakers including cardiac resynchronisation therapy and implantable cardiac defibrillators are procedures undertaken within the RHH and Hobart Private. Pacemakers are also implanted by cardiologists at the LGH, Launceston Heart Centre, and Calvary campuses in Hobart and Launceston. Experienced technicians provide a monitoring and management service for patients with cardiac devices. A multidisciplinary cardiac device clinic is also conducted at the RHH.
The Role Delineation paper (at appendix 3) clearly defines the resources required to maintain these services.

### Imaging

There should be equity of access to cardiac imaging in the THS. Echocardiography is a core service in the acute sector and should be provided at RHH, LGH and Burnie Hospital with remote support and reporting if required. Cardiac CT and nuclear cardiac imaging should be readily available, accessible and located on sites with facilities and expertise. Cardiac MR and PET scanning should be centralised at the RHH for all Tasmanian public patients. There is a cardiac MR service for private patients at Calvary Hospital in Hobart.

### Transcatheter Aortic Valve Implantation (TAVI)

TAVI is a relatively new procedure, and the Medical Services Advisory Committee is currently considering an application for MBS listing of TAVI for use in patients who are symptomatic with severe aortic stenosis and are “at high risk for surgical aortic valve replacement or non-operable”. At present, an increasing number of patients are being referred to Melbourne for TAVI. The CSANZ Position Statement for the Operator and Institutional Requirements for a Transcatheter Aortic Valve Implantation (TAVI) Program[47] provides guidance for the requirements of a TAVI program.

Potentially this new intervention could be introduced in Tasmania in the future following a rigorous feasibility study. If deemed appropriate to deliver the service in the state, a business case would be prepared by the TCCN to support its establishment. A business case should include the establishment of a heart team (interventional cardiologist, cardiothoracic surgeon, anaesthetist, TAVI nurse case-manager/coordinator, proctorship for clinical training) for the service as an independent project.

A TAVI service in Tasmania could potentially reduce the need for ICU bed occupancy required for open aortic valve surgery, thereby freeing those beds for other cardiac surgical procedures.

## Rheumatic Heart Disease

The incidence of rheumatic heart disease (RHD) is approximately 1.8 per 100,000 in Tasmania, with the death rate approximately 2 per 100,000 in Tasmania each year (i.e. about 10 people each year). However, there are patients who present for surgery with underlying valvular disease as a consequence of RHD in their early years.

## Congenital Heart Disease

The expansion of the current management service for adult and paediatric patients with congenital cardiac conditions needs consideration. This should be in collaboration with the Royal Melbourne Children's Hospital paediatric services and the Royal Melbourne Hospital ACHD service. In addition to onsite clinics, Telehealth facilities could also enhance consultation between specialists, primary care health providers, and patients and should be instituted as a priority. Telehealth could also maximise consultations with specialists in Melbourne who contribute to the overall management of a specific patient cohort.

A dedicated congenital and inherited cardiac conditions service should be developed as an integral part of a state-wide cardiology service as a shared model of care with the Royal Melbourne Hospital. One or more cardiologists and nurse co-ordinators for the service should be employed to manage the service and liaise with all relevant specialists in Tasmania and in Melbourne, and manage the patient appointments for both face-to-face and telehealth clinics.

Telehealth and phone technology can further assist health care providers (and patients) to engage with specialists in the event of an unforeseen change in a patient's condition or disease state.

## Adult Congenital Heart Disease (ACHD)

A summary of the CSANZ Adult Congenital Heart Disease Recommendations for Standards of Care[48] are provided below:

- (CSANZ) recognises that adult congenital heart disease (ACHD) is a relatively new and rapidly growing area of need, for which appropriate planning is required to establish and maintain adequate standards of care.
- Recent data have emphasised that (i) without adequate planning, "loss to follow up" rates in transition from paediatric to adult congenital heart services are over 50% and that (ii) mortality rates are substantially higher for young adults lost to follow up, compared to those under regular review at a dedicated ACHD centre. A recent publication has also documented a mortality benefit for those young adults with ACHD cared for in specialist centres, compared to those who are not (Wray et al, Heart 2013; 99: 485-90).
- Transition of care from the Paediatric Cardiology to the ACHD environment is difficult and challenging. The transition occurs from a "trusted" team to an unknown team in a different environment. International studies have suggested that even in the best models, up to 50% of children may not successfully transition and may be lost to long term follow up, with potentially catastrophic consequences for their health. Transition should be *from* a paediatric cardiologist or paediatric cardiac service to a specific ACHD Specialist or to a recognised ACHD centre.
- A Regional Adult Congenital Heart (RACH) Service for regions which are at a substantial distance from a Comprehensive Adult Congenital Heart (CACH) service ideally staffed by at least one ACHD cardiologist, a Clinical Nurse Coordinator (at least part time); and established links to a CACH service.
- Every young adult with repaired congenital heart disease should be seen at least once in an ACHD specialist centre, except those who have been discharged from follow up by their paediatric cardiologist.
- Every young adult with unrepaired congenital heart disease should be seen regularly at an ACHD facility.

- Every adult with non-simple congenital heart disease should be seen regularly at an ACHD centre, with or without shared care by community-based specialists.

Currently no formal Adult congenital heart clinic exists in the public sector. Most cardiologists would have some involvement in the management of patients with ACHD and inherited cardiac conditions, some more than others. Some patients with more complex ACHD will also be managed jointly at the Royal Melbourne ACHD clinic. It would be advantageous to have a formal Statewide ACHD clinic that provides a service to all regions.

An adult congenital heart service is currently available in a private cardiology practice in Launceston, coordinated with the Royal Melbourne Hospital service.

### Paediatric Congenital Heart Disease

The CSANZ Standards of Practice for Paediatric Cardiology[49] state:

- Paediatric Cardiology involves the management of the fetus, neonates, infants, children and young adolescents with heart disease. Cardiac lesions and their implications differ considerably from those that are seen in adult cardiology.
- Where a cardiology opinion is requested, for infants and children in whom there is a strong suspicion of congenital or acquired heart disease, this should be provided by a paediatric cardiologist, in order to ensure that appropriate advice is provided to the patient's family and management is optimised.

A monthly paediatric cardiology clinic is conducted by one of the cardiologists at the Royal Hobart Hospital. A visiting paediatric cardiologist from the Royal Children's Hospital Melbourne visits Hobart, Launceston and Burnie quarterly. These are large clinics run over several days seeing up to 80 paediatric patients. There is scope to expand the role of Tasmanian cardiologists in this service to support the visiting paediatric cardiologists from Melbourne in a shared care model.

Reducing the incidence of congenital heart disease is possible through reducing the incidence of obesity, ensuring diabetes is well controlled prior to conception, and pregnancy planning to allow the use of folate for at least 3 months prior to conception.

### Inherited Cardiac Conditions

Currently there is no specific service for patients with inherited cardiac conditions, rather they are managed individually in general cardiology clinics.

A small, but increasing number of patients have been referred for genetic testing and this can be costly for families. Providing better access to the best evidence-based service and support for persons identified with an inherited condition will require the support of a qualified genetic counsellor.

Presently, patients with suspected inherited cardiac conditions are referred to the Tasmanian Genetic Service of which there are 2.1 FTE genetic counsellors. The Victorian Clinical Genetic Service is contracted to provide a clinic with 2 geneticists providing a monthly clinic over 2 days alternating between the Northern and Southern regions of Tasmania i.e. RHH has a clinic every second month. Presently there would be at least a 5-6 month wait from the time a referral is received. The service goes over its meagre budget due to demand and expense of testing. Clinicians should promote the Australian Genetic Heart Disease Register to patients and encourage them to enrol.

### Pulmonary arterial hypertension (PAH)

The management of pulmonary hypertension requires a statewide approach. The clinical cardiology expertise for diagnosis and management of Pulmonary Hypertension is currently based at RHH. This service is research active and participates in clinical trials of new therapies. In Hobart there is a dedicated nurse 0.8FTE and 0.4FTE

administration position managing a weekly clinic where 7-10 patients are seen. Patients are seen a minimum of every 6 months and undertake a 6MWT and echocardiography to meet the ongoing prescribing requirements for Pharmaceutical Benefits Scheme (PBS) prescriptions. There is also a clinical trial nurse (0.6FTE) responsible for patient enrolments currently into 4 clinical trials. This is another important advantage of patients with a rare disease being managed in an academic centre - access to new therapies. Recently the Launceston General Hospital (LGH) became an authorised prescribing centre for PAH therapies (required by Medicare to register to prescribe these expensive therapies) although no overall referral pathways were considered. It has been identified that the LGH lacks the resources presently to manage the more acute patients who require epoprostenol infusions. There is no cardiologist with a sub-speciality interest in PAH at LGH. The service at LGH does not have sufficient patient numbers or staff resources to deliver a sustainable service. LGH could however participate in a shared-care model with RHH. Therefore, initial diagnosis should be made with right heart catheter studies at the RHH with subsequent management in outreach clinics or via telehealth modalities. A review of statewide services to manage PAH is required.

## 3.2 Improve access, quality and consistency of cardiac rehabilitation

The National Heart Foundation of Australia and Cardiac Society of Australia and New Zealand: Australian Clinical Guidelines for the management of Acute Coronary Syndrome 2016[50] recommend that all patients hospitalised with ACS should attend cardiac rehabilitation or a structured secondary prevention program.

Successful recovery and transition from hospital to the community after an acute cardiac event or procedure depends on effective planning and supported rehabilitation through evidence-based and menu-based comprehensive programs provided statewide to facilitate recovery, avoid disease progression and readmission and maximise quality of life.

Cardiac rehabilitation programs are recognised as being able to maximise recovery and minimise the risk of a person experiencing a repeat cardiac event. Despite this, services may be underutilised (due to both lack of referral and limited participation), or in some cases services are not able to meet the demand, with some patients on waiting lists for up to 3 months. There are many known barriers to participation in cardiac rehabilitation and these include inflexible timing, programs not being sufficiently tailored to meet particular needs, distance from a service, lack of referral, language barriers and a lack of understanding of the benefits. A variety of service models should be available e.g. home-based telephone support, text messaging, internet-based and tele-health options, to improve the uptake of this invaluable service. All information provided must be evidence-based, individualised and consistent.

Cardiac rehabilitation nurses providing these programs identify patients for cardiac rehabilitation daily through in-patient reports. The program begins while they are still inpatients. After discharge, the patients are referred to an out-patient program for at least 6 weeks at the LGH (Northern Integrated Care Centre), RHH or the Clarence Integrated Care Centre, and at the North West Regional (NWRH) and Mersey Community Hospitals (MCH). The major referral centres for revascularisation procedures, RHH and LGH, refer patients back to the cardiac rehabilitation service closest to where they are able to participate.

Timely referral between centres when patients have been transferred to another facility for management is paramount to ensure a seamless transition of care. Delays in these processes have an impact on participation in cardiac rehabilitation programs and may

slow recovery following an intervention, especially cardiac surgery. Monitoring of waiting times to commence programs should be a KPI.

Almost all of the patients who enter a cardiac rehabilitation program are recovering from an acute coronary event, which may include a revascularisation procedure. Some patients may be referred to a cardiac rehabilitation program due to an exacerbation of heart failure, however this does not occur often, as due to resourcing constraints, cardiac rehabilitation is generally prioritised for those recovering from an acute coronary event.

During their involvement in a cardiac rehabilitation program, individuals participate in a graded exercise program are provided with education about appropriate physical activity, as well as receiving information and advice from a menu of options such as: smoking cessation, healthy eating, medication adherence, psychological and emotional recovery, secondary prevention, pain management and mobility from nursing or allied health personnel.

There are limited provisions for transport for patients from their homes to the rehabilitation programs anywhere in Tasmania and in many instances this impacts considerably on an individual's capacity to attend and or complete a cardiac rehabilitation program.

The cardiac rehabilitation service at the RHH is nurse-led rather than the more comprehensive multi-disciplinary service which exists at LGH, NWRH and MCH. Allied health services are under-resourced and are therefore unable to accept out-patient cardiac rehabilitation as part of their core business. While the cardiac rehabilitation nurses are experienced, it precludes the nurse-led service from being benchmarked against other services measured as part of the Health Round Table‡. It is a strong recommendation of this Plan that allied health services be adequately resourced to support and strengthen the cardiac rehabilitation services within the THS. It is also strongly recommended that all cardiac rehabilitation nurse positions within the THS be consistently graded as a Grade 6 Clinical Nurse Consultant position.

The Australian Cardiovascular Health and Rehabilitation Association's *Core Components of Secondary Prevention and Cardiac Rehabilitation*[51] document clearly defines the core components, minimum data set and key performance indicators for cardiac rehabilitation services in Australia.

The collection of outcomes data is the only accurate means of determining the effectiveness and costs of individual treatments and can be utilised in developing and maintaining standards of practice[52]. There is a major issue relating to the inability to collect and collate data regarding cardiac rehabilitation referral, attendance and completion in Tasmania. Each site collects varying levels of information, however it is not consistent and cannot be collated at a State level. A true picture of cardiac rehabilitation referrals, attendance and completion is therefore unknown for Tasmania. Data analysis is also an issue with limited, if any, support to input and analyse the information collected. This is a key area for service improvement. Whilst there will be the potential to at least capture data relating to referral to cardiac rehabilitation (a component of the new *ACS Clinical Care Standard*), this is not current practice, and should be expanded to include waiting times, attendance and completion data.

It is strongly recommended that a state-wide minimum data set be developed in Tasmania whereby all programs collect the same information regarding their service that can be benchmarked against like programs both intrastate and interstate. Appendix 5 outlines what the minimum data set should include.

‡ https://www.healthroundtable.org/

It is recognised that many patients do not attend a cardiac rehabilitation program run through the THS, and that in many cases these patients are managed in primary care practices. These practices should also be acknowledged and supported to collect minimum data regarding outcomes.

## 3.3 Improve care planning and management of people living with chronic heart failure (CHF)

People with heart failure are often older and have comorbidities that make their management more complex and increases the length of time required to care for their needs while in hospital. People with heart failure also have high rates of re-presentation to emergency departments and readmission to hospital. CHF is a complex clinical syndrome characterised by high mortality and reduced quality of life and is a major public health issue. The prevalence remains high with poor clinical outcomes and associated health costs place a burden on the health budget. In 2010 it was estimated the cost to be over $1 billion annually[53]. There is a higher prevalence and risk factor burden among the population in non-metropolitan and lower socio-economic areas. Aboriginal and Torres Strait Islander peoples significantly are more likely to die from heart failure than other Australians. A consensus statement[54] has been developed by the Heart Foundation which outlines the systematic approach required to improve heart failure management.

Multidisciplinary heart failure management programs led by specially trained heart failure nurses and with ready access to clinicians trained in heart failure management have been shown to reduce the rates of hospitalisation and death[55,56]. Tasmanians living with moderate or severe heart failure should have access to these programs which can support them to take a more active role in managing their own health. Yet despite evidence of efficacy, only a small proportion of people with heart failure have access to such programs. In Tasmania the only formal multidisciplinary heart failure management program is located at RHH for southern patients. The service is coordinated by a specialist heart failure nurse (nurse practitioner) working collaboratively with cardiologists, with referral pathways to allied health professionals. The service manages both in-patients and out-patients providing support and education to patients and families promoting self-management strategies and skills. Telephone support and timely follow-up in clinics are part of the service with the nurse specialist expediting appointments at the time of discharge. Medication up-titration to maximum tolerated doses (as per guidelines[57]) and the monitoring of renal function contributes to reduced readmission rates. Liaison with the patient's general practitioner is imperative.

Home tele-monitoring is also available for suitable patients and this is viewed daily and triaged as the need is identified by contracted external staff.
There is a strong link with the physiotherapist-led cardiopulmonary rehabilitation program to refer some patients for exercise management and to grief counselling for psychological support. A similar service needs to be established at LGH and include outreach heart failure services to the North West.

As with cardiac rehabilitation services discussed previously, a comprehensive evidence-based, menu-based heart failure-focused rehabilitation program should be available and offered to all patients with heart failure.

To improve access and participation, models of care must address service barriers, maximise available resources and increase self-management capacity. Opportunities to redesign programs or establish new models of care will target interventions and enhance support for patients in the home environment, including using telehealth and other technologies allowing patients to be monitored remotely. Collaboration between

patients, GPs, community service providers and hospital staff is essential to ensure a multidisciplinary approach to heart failure care is maintained and avoidable use of hospital services is minimised.

A proposed pathway for the acute management of patients with CHF is under review for the RHH to ensure evidenced based quality management in the emergency department. Patients who have a new primary diagnosis of decompensated heart failure without co-morbidities ideally will be admitted under and managed by the cardiology team. Other patients with CHF who should be managed by cardiologists include those with known CHF or pulmonary hypertension under regular cardiology review who present with decompensated heart failure; cardiac transplant or ventricular assist devices; and cardiogenic shock, the latter in liaison with the ICU. Others include patients with known structural cardiac disease such as adult congenital heart disease or hypertrophic cardiomyopathy who present with a significant cardiology problem.

An individualised clinical risk profile (developed by the Menzies Medical Research Institute) for readmission and a discharge plan or checklist will be included in the pathway document as a vital component of the overall management strategy for heart failure patients. At the time of discharge the discharge plan and a medication titration plan, designed to facilitate evidence based clinical handover, will be sent to the GP clearly defining the planned and ongoing management of the patient. A copy will be discussed with, and given to, the patient and carer and also forwarded to the cardiologist.

## 3.4 Improve access and transition to best practice end-of-life care

The health decline of people with CHF is gradual, usually over many years, punctuated by unpredictable acute deterioration. People with CHF and their families and carers need care and support over an extended period of time, including the provision of integrated palliative care services[58].

Palliative care components of an integrated heart failure program are best personalised to the individual's needs and include: the management of symptoms; reassessment of medication regimens; consideration of home oxygen therapy; psychological and social support; compassionate and open communication including discussions about the patient's prognosis; and advanced care planning. These services are best delivered through greater integration and coordination between heart failure services and palliative care services. With early referral facilitated by heart failure services, such an approach would bring together the knowledge and expertise of both fields and integrate palliative care principles into heart failure management programs.

There are opportunities within the THS to upskill health professionals in palliative care through workplace development initiatives such as the "Program of Experience in the Palliative Approach§" (PEPA) provided by the southern Specialists Palliative Care Services.
Workshops have also been provided by Silver Chain and The Australian Healthcare and Hospitals Association – Guidelines for a Palliative Approach for Aged Care in the Community Setting (COMPAC)[59]. Pathways defining shared transfer and coordination of care developed by PHT[60] have also been adopted.

Guidelines[57] recommend maximising the quality of life and comfort for patients with CHF approaching end of life and the provision of psychosocial support to the patient, family and other carers. The goal of management is effective symptom relief and the provision of interventions and support for advanced care planning and end-of-life decisions. All

§ http://www.pepaeducation.com/

patients with CHF should be informed of their probable prognosis and consideration for advanced care planning as part of the standard education they receive from their health care professionals. Palliative care support can be provided both in a hospital setting and in the community. Consideration must also be given to the deactivation of life saving devices where these are part of overall management. The *NSW Guidelines for Deactivation of Implantable Cardioverter Defibrillators at the End of Life*[61] provide sound guidance.

**Australian Commission on Safety and Quality in Health Care Acute Coronary Syndromes Clinical Care Standard indicators relevant to Direction 3:**

5. The role of coronary angiography, with a view to timely and appropriate coronary revascularisation, is discussed with a patient with a non-ST-segment-elevation acute coronary syndrome (NSTEACS) who is assessed to be at intermediate or high risk of an adverse cardiac event.
6. Before a patient with an acute coronary syndrome leaves the hospital, they are involved in the development of an individualised care plan. This plan identifies the lifestyle modifications and medicines needed to manage their risk factors, addresses their psychosocial needs and includes a referral to an appropriate cardiac rehabilitation or another secondary prevention program. This plan is provided to the patient and their general practitioner or ongoing clinical provider within 48 hours of discharge.

## Direction 3: Improve services for people with heart disease

| Priority | Actions | Impacts |
|---|---|---|
| Improve access to specialist catheterisation and cardiac surgery | • Develop clinical pathways to support consistent patient management based on evidence of best practice that:<br>• considers clinical urgency, critical needs and patient risk, to prioritise and streamline access – includes local and regional protocols for emergency and non-emergency interhospital transfers<br>• mobile technology and telehealth services with protocols will be developed to support the early recognition and management of patients experiencing a STEMI or step change in their condition<br>• incorporates formal protocols between catheterisation services without onsite cardiac surgery and cardiac surgical services regarding emergency and urgent patient transfers<br>• Undertake detailed planning based on demand, quality and performance measures to inform further specialist cardiac service development in the outer metropolitan and regional areas<br>• Ensure effective new technology and clinical practices are appropriately utilised in Tasmania | Tasmanians requiring specialist cardiac services have streamlined and timely access to tertiary cardiac centres and will be managed in accordance with best practice guidelines<br><br>High-quality and efficient specialist cardiac services in outer metropolitan areas and regional areas are planned and developed to be sustainable and to meet local demand<br><br>Cardiac technology is utilised efficiently and new clinically and cost-effective technology is integrated into the health system |
| Improve access, quality and consistency of cardiac rehabilitation | • Enhance the suite of cardiac rehabilitation programs provided for patients at different risk levels to maximise utilisation. This may include telehealth opportunities such as remote monitoring and support<br>• Strengthen rehabilitation and support services, including community based services<br>• Support the provision of early inpatient cardiac rehabilitation and referral to ambulatory cardiac rehabilitation following discharge, within a comprehensive and standardised model of care<br>• Support the development of a state-wide minimum data set for cardiac rehabilitation services including appropriate resourcing to accurately collect, input and analyse data | New or redesigned models of rehabilitation will enable flexibility and increase patient participation<br><br>Accurate data collected regarding the number of eligible patients who are referred to and complete cardiac rehabilitation and the clinical outcomes |
| Improve care planning and management of people living with chronic heart failure | • Improve models of care for people with chronic heart failure to reduce avoidable readmission to hospital or re-presentation to emergency departments<br>• Improve coordination and integration of care to reduce the risk of another life-threatening event and enable people to manage their own condition<br>• Establish system protocols and pathways to ensure effective clinical handover and service coordination across care transitions, and activate appropriate service according to clinical need for an exacerbation, emergency presentation, hospitalisation or palliation.<br>• Improve the transition to and provision of longer term support and care for people with heart failure in the primary care and community setting<br>• Establish heart failure nurse practitioner candidate positions at the RHH and LGH<br>• Establish a multidisciplinary HF NP-led service at the LGH<br>• Explore the option of a specialist out-patient clinic to cater for less common chronic cardiac conditions eg atrial fibrillation, lipid disorders with referral pathways to other health professionals for ongoing patient management | People with heart failure and other chronic cardiac conditions will be better supported in managing their health, slowing progression of their condition, and affording them a better quality of life |
| Improve access and transition to best practice end-of-life care | • Strengthen linkages and relationships between heart failure programs and palliative care services | People with severe heart failure nearing the end of their life will have access to integrated specialist heart failure and palliative care services tailored to their individual care and support needs |
| Monitor the implementation of the ACS Clinical Standard quality statements, and support improvement as needed. | • TCCN support the adoption of the ACS Clinical Standard. Relevant standards for this section are standards 5 and 6 (below). | Improved safety and quality of care for people experiencing ACS |

# Direction 4: Strengthen system performance

Priorities

- Improve system coordination and collaboration
- Support clinical leadership and service quality
- Improve performance monitoring
- Support the cardiac workforce

The Heart Foundation's *Australian acute coronary syndromes capability framework*[62] (the Framework) seeks to present national consensus on the system requirements for the delivery of quality acute coronary syndromes (ACS) care. The Framework identifies the types of services, workforce, processes and service linkages needed to deliver an ideal, evidence-based health service. It identifies four service categories:

• Pre-hospital emergency care
• Category A service – Hospital with an emergency service
• Category B service – Hospital with an emergency department
• Category C service – Tertiary cardiac centre.

These service categories are based on the stages of patient care and closely align to the *Acute coronary syndromes clinical care standard* quality statements, which describe what a health service provider could be reasonably expected to address within an integrated care system.

The Framework facilitates the time-critical care, communication and seamless transfers necessary to meet the *Acute coronary syndromes clinical care standard*. When implemented fully, the framework will help prevent avoidable ACS deaths and disability regardless of where a patient lives in Australia.

It is recommended that the Framework be utilised to guide the strengthening of system performance in Tasmania.

## 4.1 Improve system coordination and collaboration

The appointment of a Statewide Clinical Director for Cardiac Services is recommended. The system must be focused on delivering quality services statewide, through the adoption of evidence-based models of care, with the implementation of subsequent pathways and protocols. The distribution of services is based on clear roles and relationships, with links and collaborative practice between services to benefit patient outcomes. An effective and efficient system has strong clinical governance with a focus on engagement of, and leadership by, clinicians. It has accountability through health services, system-wide data collection and monitoring of service and system quality. Whilst a Cardiac CAG existed until November 2016 when it was disbanded, its focus had been to provide advice regarding the *One State, One Health System* reform and the *Role Delineation Framework* to the Health Council of Tasmania. It did not have the ability to support the other vital collaborative functions that Clinical Networks have been able to provide in other states. It is recommended that a TCCN be established (as in all other Australian states), to drive the proposed recommendations and outcomes of this Plan.

Coordination of cardiac care can be improved through greater clarity of health service capability, roles and responsibilities within the system of care for cardiac patients. Coordination would also be improved by an enhanced role for primary and community-based service providers in providing early disease management and ongoing support.

It is proposed that the TCCN be tasked to develop models of care for the services that the THS deliver. These models will determine which clinical pathways (based on service capability and evidence-based best practice) will need to be developed (or adapted) to ensure a state-wide approach. The pathways will guide how people move through the

care continuum, across health settings and providers, and assist patients in accessing the right level of care as their needs change.

With the transition from three Tasmanian Health Organisations into a single THS, it has been timely that the *Role Delineation Framework*[15] (appendix 3) has been developed identifying human and other resources necessary to support the provision of comprehensive, integrated and patient-centred cardiac services across Tasmania. However, the role delineation only applies to the four larger hospitals in Tasmania, and doesn't take into account the roles that the THS funded smaller district hospitals and community health/integrated care centres can play, nor does it outline linkages with the private sector. Informed by the *Cardiac ARIA index*[44], the capacity for service provision and support in these smaller facilities needs to be investigated and better understood for incorporation into the planning, provision and sustainability of statewide services.

Workforce capacity for all aspects of care for patients with heart disease across the life span must be developed and supported in THS services to deliver evidence-based care appropriate to the local population. Health services are inclusive of all THS hospitals (both major and district), primary care, Aboriginal health services, aged care services and any other appropriate services. Services or models of care developed in local communities must be funded accordingly in both the short term and for sustainability in the longer term. The *Role Delineation Framework*[15] supports this in defining health professional requirements in the hospitals but will need to be enhanced to define those needs in services outside the major hospitals. Specific training and educational support will promote capacity in the various services.

Closer relationships and linkages between primary, community and acute health providers will also need to be developed to support the local provision of sustainable, streamlined service models, and better planning at a regional level. As previously outlined, it would be beneficial for the TCCN to determine what services are being commissioned by the THS in the private sector, and identify any potential linkages.

Care coordination is a key element of the work of PHT, which, through strong local provider partnerships, aims to place patients at the centre of service delivery and ensure they have access to the services they need and opportunities for early intervention, health promotion and coordinated care.

Strong local partnership approaches lead to effective, coordinated, client-centred care. These approaches identify the client's needs beyond their cardiac condition through services, knowing what supports are available in the local area and through clear referral pathways and access to the required supports.

Telehealth also plays an essential part in connecting and coordinating services, increasing access to specialist services and supporting clinical decision making and care planning.

## 4.2 Support clinical leadership and service quality

The TCCN will work with clinicians to promote continuous improvement in cardiac care by supporting the consistent application of evidence-based practice, measuring clinical performance and strengthening relationships and referral pathways between and within health services. Ensuring compliance with evidence-based protocols is also a clinical governance responsibility for hospital executives, managers and clinicians, and ultimately the Tasmanian Governing Council of the THS. The TCCN will also play a key leadership role in guiding the implementation of many of the key strategies identified in the *Tasmanian Statewide Cardiac Services Plan*.

The TCCN will need to:

- determine how best to develop and implement a statewide cardiac clinical quality registry for cardiac procedures, treatments and outcomes so that consistent data is captured and monitored;
- develop appropriate statewide models of care for cardiac conditions
- determine how to strengthen relationships between health sites and how to streamline referral pathways through the development of appropriate pathways within the models of care; and
- develop a standardised cardiac rehabilitation referral, attendance and completion form.

## 4.3 Improve performance monitoring

Currently there is no consistency to the collection of data relating to people experiencing cardiac conditions. Tasmanian primary care data does not link to the Tasmanian acute setting data. In the acute settings, Tasmanian ambulance data is not linked with Tasmanian emergency department data, which doesn't link with admission and inpatient data; and there are different database systems collecting inconsistent data depending on what hospital or health service you are attending.

In order to monitor and improve care across Tasmania we need a mechanism that enables the recording of **consistent statewide data**, and that this data is comparable to other states and territories nationally and internationally. The Tasmanian Government claims it wants to have a world-class health system[2], but at present, we are unable to capture consistent statewide data to measure progress towards that goal.

The following areas need to be addressed in order to collect the required data to improve the safety and quality of the care provided by the THS:

- Time-from-symptom-onset data is required
- Data that is required to meet the *Indicator Specifications for the Australian Commission on Safety and Quality in Health Care's Acute Coronary Syndromes Clinical Care Standard*[63]
- The need to include referral, attendance, and completion data for cardiac rehabilitation – data collection that includes the *ACRA Core Components*[64], (also see minimum data set at Appendix 5)
- The data required to participate in the *Australian Cardiac Outcome Registries (ACOR) for cardiac devices and cardiac procedures*

## 4.4 Support the cardiac workforce

### Teaching, Training, Research

The Tasmanian *Role Delineation Framework*[15] (appendix 3) clearly outlines the staffing requirements for the various levels of service at each site in the state, exclusive of smaller THS funded district facilities. To ensure the ongoing sustainability and management of a state-wide cardiac service it is essential that the *Role Delineation Framework*[15] is adopted with this Plan. To achieve and maintain some of the recommendations for cardiac services in this Plan, additional staff not referenced in the *Role Delineation Framework*[15] may be required. For example, it is recommended that a Statewide Clinical Director for Cardiac Services is appointed, and a nurse coordinator for congenital and inherited cardiac conditions.

The sustainability of cardiac services in Tasmania requires a dedicated and committed workforce, well-educated and qualified, with capacity to access professional development and other educational opportunities without a prohibitive cost to the individual or their organisation. The workforce will be supported across all services providing care and support throughout the life span to those with a cardiac condition.

Tasmania has a relatively stable population in an island environment which makes it ideal for research. The poor health statistics outlined in this Plan demonstrate the existing and potential adverse impact of CVD in the state. The short- and long-term outcomes of the adoption of the strategies recommended in this Plan could be demonstrated through concurrent research and ongoing evaluation of those outcomes. Engaging the health research sector to facilitate and support research projects related to the implementation of the Plan, is recommended.

Fostering current and future researchers in all health disciplines through the availability of scholarships and research grants to support the research projects targeting the outcomes of the recommendations, and promoting and supporting opportunities to present and publish research findings will be an added incentive for health professional researchers.

The UTAS offers post graduate certificate/diploma in Acute Care – including a cardiovascular specialty for nurses. Nurses working with cardiovascular conditions, in both primary and acute care facilities, should be encouraged to increase their knowledge and skills and the post graduate programs are ideal to support this.

Establishing a Nurse Practitioner (NP) position to develop a heart failure service at LGH and RHH with succession planning will enhance the collaborative care for heart failure patients. A NP in Heart Failure requires a master's degree but the capacity to undertake this qualification is not yet available in Tasmania. This study therefore incurs a cost to the individual to undertake the study interstate, often including a residential component, and this can be prohibitive for experienced nurses. The course takes up to four years of part time study to attain and includes a supported (NP and medical) internship. Positions would need to be created, initially as candidate positions, and funded for long-term sustainability.

Medical and nursing students - establish a rotation through cardiac services including the cardiac rehabilitation and heart failure services. Second year medical students get a 'taste' of cardiac rehabilitation and pre-assessment (approximately 2-3 hours) electively, but no heart failure exposure. Some second year nursing undergraduates may spend a day with the cardiac rehabilitation nurses during a cardiology placement. Third year nursing students could share a week's exposure with the cardiac rehabilitation nurses, NP and liaison nurses. Physiotherapy and other allied health students on practicum placements have some exposure in the management of post cardiac surgery patients during their placements.

There needs to be consistency in the grading of cardiac rehabilitation nurses. It is recommended that all cardiac rehabilitation nurses in the state be classified at Grade 6 Clinical Nurse Consultant (CNC). Currently there is inconsistency in the grading which should be rectified.

Allied health professional human resources are stretched in both the acute and primary care sectors, impacting on the capacity to provide a service of excellence to patients. While priority is given to the acute patients in the hospital setting, this often means that some out-patient services for sub-acute patients, e.g. cardiac rehabilitation, are compromised due to lack of staffing. The possibility of utilising exercise physiologists in cardiac rehabilitation programs should also be explored.

Direction 4: Strengthen system performance

| Priority | Actions | Impacts |
|---|---|---|
| Improve system coordination and collaboration | • Develop a service capability framework for cardiac services<br>• Appoint a Statewide Clinical Lead for Cardiac Services for the THS<br>• Define and disseminate models of care and clinical pathways based on evidence of best practice, including appropriate management and referral practices, and the use of standard practice and referral tools<br>• Develop an integrated statewide service model for congenital heart conditions including a transition pathway for adolescents with congenital heart conditions to adult cardiac services | Cardiac service capability will be clearly defined and developed in accordance with parameters for high-quality and sustainable services<br><br>Services for people with heart diseases and conditions will be coordinated, consistent and evidence-based along the care continuum |
| Support clinical leadership and service quality | • The TCCN to continue to work with health services and provide clinical leadership to enable implementation of best practice, evidence-based cardiac care<br>• Appoint a Statewide Clinical Lead for Cardiac Services for the THS to manage the statewide cardiology service | Tasmanian cardiac services are efficient, sustainable and consistent with evidence-based best practice |
| Improve performance monitoring | • Develop performance indicators to monitor service effectiveness and impact of initiatives<br>• Support the continuing development of performance indicators and improve the capacity to collect data | The quality and performance of cardiac services are continuously improved |
| Support the cardiac workforce | • Deliver flexible education and provide support for clinicians working in rural health services, primary and community health providers and residential aged care to increase knowledge and skills in cardiac disease management<br>• Support innovative and flexible workforce models<br>• Support access to existing accredited professional development opportunities in goal-directed care planning and service coordination<br>• Explore opportunities for cardiac and heart failure nursing scholarships<br>• Establish NP candidate positions for heart failure | The cardiac workforce will be effectively and efficiently utilised |

# The way forward / Implementation plan

The *Tasmanian Statewide Cardiac Services Plan* has been developed to guide the development of cardiac services across Tasmania and across the life span from early detection, management, and prevention to end-of-life care. The directions and priorities aim to reduce disease progression and develop and enhance services in response to evidence of best practice.

The burden of heart disease on individuals, families, the community and the health system is significant, and tackling this is a complex task. A collaborative approach between government, health services, peak bodies, health professionals and consumer organisations will be required to make a real difference.

The vision of the *Tasmanian Statewide Cardiac Services Plan* to improve care and outcomes for Tasmanians with, or at risk of, heart disease (and contribute to Tasmania becoming the healthiest population in Australia by 2025) will only be realised if the plan for improvement is implemented and supported by all those involved in providing cardiac care. The responsibility for facilitating action is with the THS, working in conjunction with the DHHS and numerous groups including the Heart Foundation, Ambulance Tasmania, PHT, community and primary health services, consumer organisations and a range of public and private healthcare institutions.

The TCCN will have a major role in implementing the *Tasmanian Statewide Cardiac Services Plan's* strategic directions, with an initial focus on developing statewide models of care and patient pathways, driving evidence-based practice, supporting culturally appropriate care, developing systems to monitor clinical performance and reducing unnecessary variation in clinical practice.

The *Tasmanian Statewide Cardiac Services Plan* describes a five-year plan, with directions and priorities defined for implementation as short or medium term, or ongoing (Table 2). This reflects the iterative and incremental nature of the work to be completed.

Other directions are ongoing or have longer term objectives, working with partners in community, primary care and health promotion areas.

Priorities identified as short-term will be completed within one to two years. Those identified as medium term can be expected to be completed within five years and those described as ongoing may take in excess of five years. While it is anticipated that some of these projects could be undertaken within existing resources, many of these projects will require additional funding.

# Tasmanian Statewide Cardiac Services Plan summary table

*Table 2 Tasmanian Statewide Cardiac Services implementation plan*

| Timeframe | Priorities | Lead organisation | Key stakeholders |
|---|---|---|---|
| Short term | Support rapid access to early defibrillation for people experiencing cardiac arrest | Ambulance Tasmania | Ambulance Tasmania, Heart Foundation, DHHS, THS, community groups, private sector |
| | Strengthen local decision making with specialist advice | THS | DHHS, TCCN |
| | Ensure timely access to reperfusion therapy | Ambulance Tasmania, THS | Ambulance Tasmania, THS, TCCN, DHHS, PHT, RACGP |
| | Improve access, quality and consistency of cardiac rehabilitation | TCCN | TCCN, THS, DHHS, ACRA-Tas, Heart Foundation |
| | Improve care planning and management of people living with chronic heart failure | TCCN, PHT | TCCN, THS, DHHS, PHT, ACRA-Tas, Heart Foundation |
| | Improve system coordination and collaboration | TCCN | TCCN, THS, DHHS, PHT, community health providers |
| | Improve performance monitoring | TCCN | TCCN, THS, DHHS, ACOR |
| Short term and ongoing | Support clinical leadership and service quality – establish Statewide Lead for Cardiac Service for THS | TCCN | DHHS, THS |
| Medium term | Build better early diagnostic capability | TCCN, Ambulance Tasmania | TCCN, Ambulance Tasmania, THS, DHHS |
| | Improve access to specialist catheterisation and cardiac surgery | TCCN | TCCN, DHHS, THS, Ambulance Tasmania |
| | Improve access and transition to best practice end-of-life care | THS, DHHS | THS, PHT, primary health organisations, palliative care providers |
| Ongoing | Promote healthy living through a Health in All Policies approach to improving the Social Determinants of Health | DPAC | Premier's Health and Wellbeing Advisory Council, all State Government Departments |
| | Promote healthy living by improving community literacy about heart health | THS | DHHS, THS, ICC, PHT, 26 TEN, Heart Foundation |
| | Support lifestyle programs to prevent the onset of heart disease | THS | DHHS, THS, ICC, PHT |
| | Improve early detection of heart disease | PHT, THS | PHT, THS, DHHS, ICC, GP practices, workplaces |
| | Improve management of early heart disease | PHT, THS | PHT, THS, DHHS, ICC, GP practices, workplaces |
| | Raise community awareness about the early warning signs of heart attack and the importance of early response | THS, DHHS, Heart Foundation | THS, DHHS, Heart Foundation, ICC, PHT, GP practices, workplaces |
| | Support the cardiac workforce | TCCN, DHHS, THS | TCCN, DHHS, THS, professional organisations, RACP, RACS, CSANZ, ACRA |

The *Tasmanian Statewide Cardiac Services Plan* is a living document that will be adapted and modified to reflect new developments and actions as they arise. Progress towards achieving the recommended actions and corresponding impacts should be regularly monitored to ensure all directions remain aligned with evolving best

practice, new evidence of service innovation and government priorities. New actions and desired impacts should be defined as work progresses or as research identifies more effective ways to prevent and treat heart disease.

Performance against each of the identified priorities should be measured in an ongoing evaluation process, with a view to identifying further priorities and actions to address the heart health of Tasmanians. This will go some way to achieving the Tasmanian Government's vision of a Healthy Tasmania, with the goal of making Tasmanian the healthiest population in Australia by 2025.

# Appendix 1: Glossary
## Heart diseases

### Coronary heart disease
The underlying cause of coronary heart disease is a slow build-up of fatty deposits on the inner wall of the blood vessels that supply the heart muscle with blood (the coronary arteries). These fatty deposits gradually clog the arteries and reduce the flow of blood to the heart. This process, called atherosclerosis, begins when people are young and can be well advanced by middle age.

When the fatty deposits build up to a point where there is reduced blood flow to the heart, it can produce mild heart distress from a lack of oxygen and nutrients, producing the signs and symptoms known as angina. Sometimes these fatty deposits can lead to blood clots that may suddenly and completely block the flow of blood to the heart, causing the heart muscle to die. The longer the flow of blood is obstructed, the greater the damage to the heart. This is a heart attack, of which there are two types, STEMI and non-STEMI.

STEMI is a time-critical emergency, as early treatment can reduce the risk of death and minimise the amount of permanent damage done to the heart. Unstable angina is also a medical emergency, as it can lead to a heart attack. Unstable angina and both types of heart attacks have been grouped together and are known as acute coronary syndromes. Stable angina is a chronic condition that can be managed with medical treatment and/or lifestyle changes.

### Heart failure
Heart failure is where the heart muscle has become too weak to pump blood around the body as well as it used to. Once heart muscle is damaged, it can't heal itself.

Often heart failure is triggered from a heart event where the muscle gets damaged, like a heart attack. However other chronic health problems like long-term high blood pressure, diabetes and heart disease (cardiomyopathy) can also cause it.

A weakened heart muscle will make the person affected feel tired and fatigued. As the muscle struggles to work, blood can 'dam up' behind the heart and cause fluid to collect in the lungs or other body tissues, which leads to shortness of breath and swelling in the legs or ankles.

Living with heart failure can be devastating, as everyday activities, like showering, walking or doing the shopping can become exhausting. Around 2,000 Tasmanians are living with heart failure. For mild-moderate heart failure, 20-30% of patients die within one year, and for severe heart failure 50% of patients die within one year.

### Arrhythmias and conduction disorders
Arrhythmias and conduction disorders cause disturbances in the heart's rhythm. These disturbances may be irregular or chaotic heart rhythms that inhibit the chambers of the heart from filling and contracting properly and are potentially life-threatening.

### Congenital heart disease
Congenital heart disease is a group of conditions present at birth including abnormalities of the heart, heart valves and blood vessels, is a major cause of death in children.

### Rhematic heart disease
Rheumatic heart disease is damage to the heart and/or heart valves resulting from single or multiple attacks of rheumatic fever. Rheumatic heart disease is a chronic condition, though multiple cases and untreated cases of rheumatic fever can potentially lead to

chronic heart disease and eventually heart failure.  A rare condition in non-Aboriginal populations, the condition remains a significant health issue for remote Aboriginal populations.

# Appendix 2: Risk factors for heart disease in Tasmania

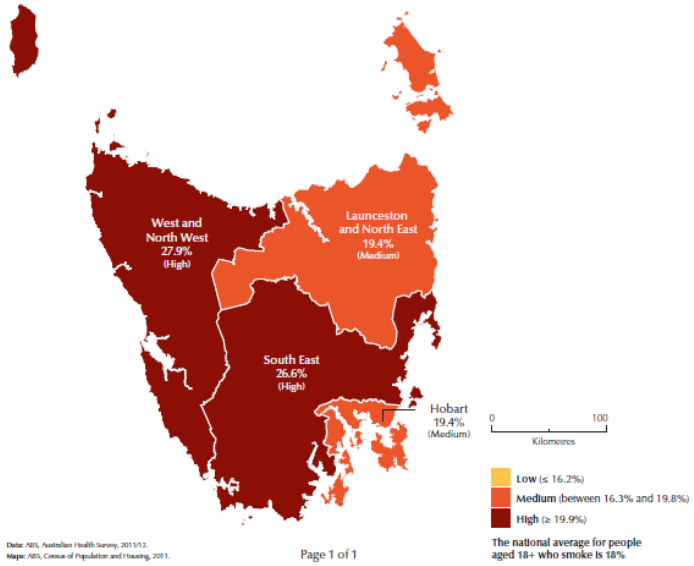
## Lifestyle risk factors

Source data for figures 10,11,12,13 and 14 are from ABS, Australian Health Survey, 2011/12 and ABS, Census of Population and Housing, 2011.

### Smoking

Tasmania has the second highest prevalence of adult smokers in Australia (the Northern Territory is first), with 21.7% smoking. The West/North West region has the 3rd highest rate of smokers (27.9%) in Australia. See Figure 10 for a regional breakdown.

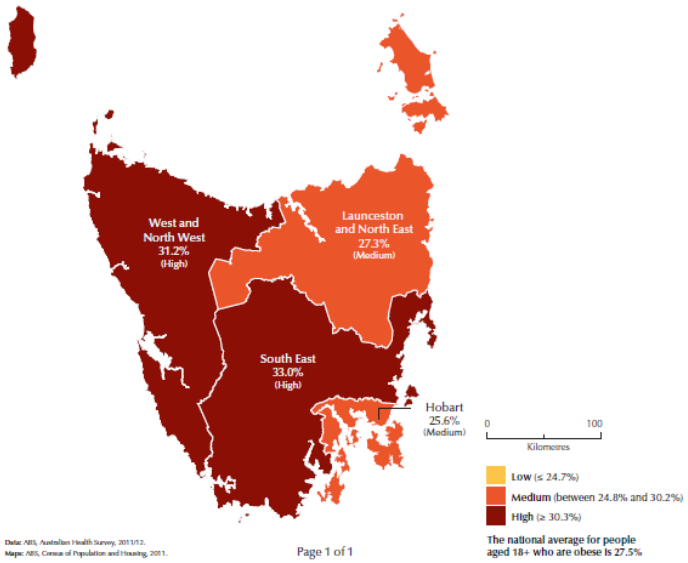
*Figure 10 Prevalence of Smoking in Tasmania*




### Obesity

Tasmania has the fourth highest prevalence of obesity, with 27.8% of Tasmanians being obese, compared with 27.5% nationally. See Figure 11 for a regional breakdown.

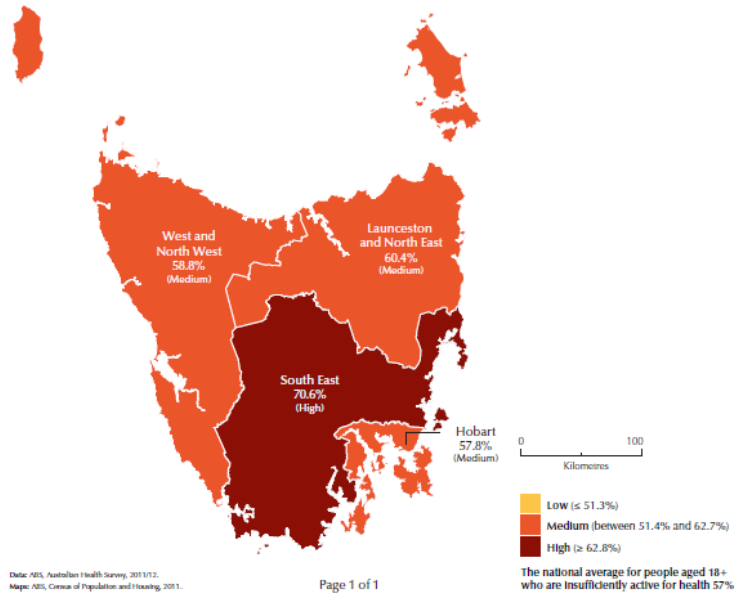
*Figure 11 Prevalence of Obesity in Tasmania*



### Physical Inactivity

Tasmania has the fourth highest prevalence of physical inactivity, with 59.5% of Tasmanians being physically inactive, compared with 57.0% nationally. See Figure 12 for a regional breakdown.

*Figure 12 Prevalence of Physical Inactivity for Health in Tasmania*




## Biomedical risk factors

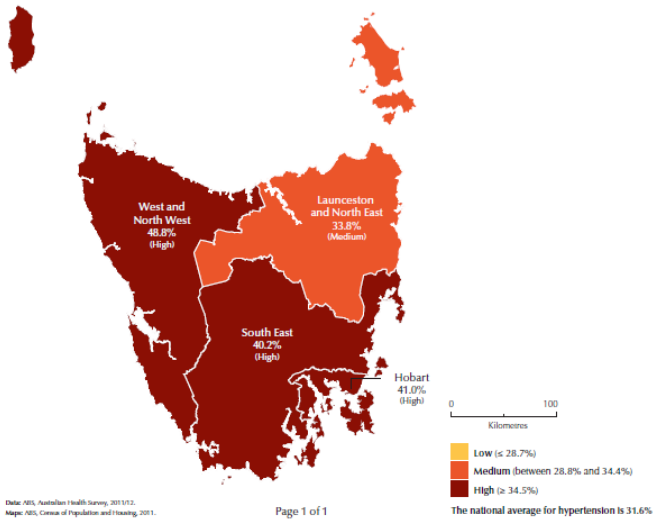
Tasmania has the highest proportion of residents with hypertension and high cholesterol.

### Hypertension

40.9% of adult Tasmanians have hypertension, compared with 31.6% nationally (30% above the national average) and 39.4% have high cholesterol, compared with 32.8% nationally (20% above the national average).

The West/North West region has the second highest rate of hypertension in Australia, with nearly one in two either having high blood pressure (≥ 140/90mmHg) or taking medication to control their blood pressure. See Figure 13 for prevalence of hypertension within Tasmania.

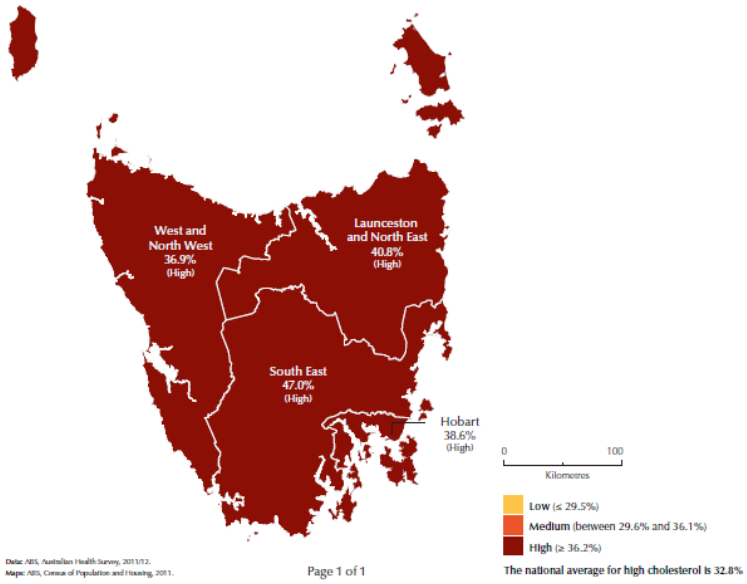
*Figure 13 Prevalence of Hypertension in Tasmania*



### High cholesterol

The South East region has the fifth highest rate of high cholesterol in Australia, with close to one in two having high cholesterol (47%). See Figure 14 for prevalence of high cholesterol within Tasmania.

*Figure 14 Prevalence of High Cholesterol in Tasmania*




Given the high proportion of Tasmanians with measured (rather than inaccurate self-reported) high blood pressure and cholesterol, and given many of these Tasmanian's will be unaware that they are at increased risk if they haven't been assessed, this is a significant issue for the Tasmanian health system. We need to ensure that the primary care sector is supported to enable them to undertake absolute CVD risk assessments on the eligible population, and then also be supported to manage those at high risk, or those with disease detected.

## Comorbidities

There is a complex relationship between chronic kidney disease and diabetes, and with heart disease and CVD more broadly. While CVD and chronic kidney disease share many risk factors, shared risk factors alone do not fully explain the high incidence of CVD in people with chronic kidney disease. Research indicates that each disease is a risk factor and complication of the other.

People with chronic kidney disease have a greater risk of cardiac death than those without kidney disease. People on dialysis programs have a CVD risk of up to 20 times greater than the general population and people with diabetic nephropathy on dialysis are about 50 times more likely than the general population to develop CVD. CVD is the most common cause of death in people with chronic kidney disease.[65]

## Social, economic and cultural status

Aboriginal and Torres Strait Islanders, people of culturally and linguistically diverse backgrounds or low-socioeconomic status, and residents of rural and regional Tasmania have an increased risk of developing heart disease and poorer outcomes. This is due to the higher prevalence of modifiable risk factors, lower levels of education or health literacy, genetic predispositions and difficulties in accessing healthcare.

Aboriginal and Torres Strait Islander people, especially in the 35–54 age groups, have more than three times the rate of major coronary events such as heart attack compared with other Australians, and 1.4 times the out-of-hospital death rate from CHD. When in hospital Aboriginal and Torres Strait Islander people experience more than twice the in-hospital CHD death rate and a lower rate of angiography investigations, coronary angioplasty or stent procedures, and coronary bypass surgery[66].

People of low socioeconomic status or who are Aboriginal and Torres Strait Islander have a greater number of hospital admissions for ambulatory care sensitive conditions. People of low socioeconomic status and rural/regional Tasmanians have a greater rate of avoidable mortality. Tasmania still has significantly higher rates of potentially avoidable deaths than Australia (in 2014, 132 per 100 000 population compared with 108 for Australia as a whole) – indicating this should be a major focus and that Tasmania has a lot of scope for improvements in healthy life expectancy[67].

# Appendix 3: Role delineation

The following role delineation for cardiology and cardiothoracic services in Tasmania is sourced directly from pages 45-53 of the Tasmanian Role Delineation Framework[15].

# Cardiology Services

Cardiology Service involves the prevention, investigation, diagnosis, treatment and management of a range of cardiac diseases, e.g. coronary artery disease, valvular heart disease, arrhythmias, heart failure and adult congenital heart disease. Services can range from emergency care, to acute care, surgery, rehabilitation, ongoing care for chronic conditions, and palliative care.

The scope of this Framework describes the service, its requirements and the minimum staffing needs and clinical support services required within each level.

## Level 1 Cardiology Services

### Service description

A Level 1 service provides a low-acuity, ambulatory care for minor cardiac diseases and management of acute conditions with the ability to provide acute resuscitation.

It should provide health promotion/disease prevention and chronic disease management programs. This service would normally be delivered by General Practitioners in an outpatient setting and may incorporate nurse led services.

### Service requirements

- Access to / integration into a statewide Acute Coronary Syndrome (ACS) management pathway and should include:
    - access to a network phone system for immediate access to on-call cardiologist for ACS service as well as routine advice
    - access to electrocardiograph (ECG) machine and the ability to safely and effectively operate and maintain equipment, and
    - if digital ECG is present, the service has access to the central server to provide ECG data
- Provision of basic cardiovascular risk factor/disease prevention information

### Workforce requirements

- A registered medical practitioner or RNs with appropriate post graduate qualifications and/or experience; RNs may be supported by ENs in providing care to inpatients

## Level 2 Cardiology Services

### Service description

A Level 2 service provides services at Level 1 but in addition provides a low-acuity, single-system medical condition ambulatory and outpatient service.

It is run by registered medical practitioner, usually a GP with 24 hour access to a

registered medical practitioner which may require a deputising service or GP Assist.

This service will be delivered in small community hospitals, large GP practices or rural health centres.

## Service requirements

As for Level 1 plus:

- Has digital ECG machine with appropriate support from higher level services within the network to safely and effectively operate and maintain equipment
- Ability to perform point of care testing
- Appropriate support from higher level services within the network
- Access to pathology / medical imaging in a relatively short time frame
- Access to Automated External defibrillator, oxygen and the ability to achieve venous access

## Workforce requirements

As for Level 1 plus:

- 24 hours access to a registered medical practitioner
- Business hours access to allied health professionals, as required

## Support service requirements

| Anaesthetics | ICU/HDU | Pathology | Pharmacy | Imaging |
|---|---|---|---|---|
| - | - | 3 | 2 | 1 |

# Level 3 Cardiology Services

## Service description

A Level 3 service provides services at Level 2 plus ambulatory and non-acute services.

Outpatient care is accessible by a visiting registered medical practitioner, general internal medicine specialist or cardiologist or via telephone, telehealth and/or e-health.

Patients with acute cardiac care needs are transferred to a higher level service.

## Service requirements

As for Level 2 plus:

- Provides outpatient, ambulatory and non-acute care led by a cardiologist and supported by visiting medical specialists and / or via telehealth
- Elective diagnostic investigations performed
- Provides thrombolysis, and blood gas monitoring
- Ability to provide close care and monitoring at the bedside with appropriate facilities and appropriately trained nursing staff in place
- Must have communication linkages to specialist medical services from a higher level service within the network

- Formal referral protocols established with higher level services
- Links to Cardiac Nurse Practitioner

## Workforce requirements

As for Level 2 plus:

- On-site 24 hour access to a registered medical practitioner or registered medical specialist
- 24 hour cover by RNs/ENs
- Access to cardiologists in the network
- Has access to some allied health services e.g. physiotherapy
- Has access to Cardiac Rehabilitation Nurse
- Access to Cardiac Nurse Practitioner or Clinical Nurse Specialist (Cardiac/Health Promotion)

## Support service requirements

| Anaesthetics | ICU/HDU | Pathology | Pharmacy | Imaging |
|---|---|---|---|---|
| 2 | - | 3 | 3 | 2 |

# Level 4 Cardiology Services

## Service description

A Level 4 service provides services at Level 3 plus inpatient cardiology care by a registered medical practitioner practicing in general medicine and/or non-interventional cardiologist.

Outpatient consultation is provided by a cardiologist.

## Service requirements

As for Level 3 plus:

- Capability and capacity to deliver multidisciplinary team-based care to cardiology patients
- Provides a range of inpatient and outpatient cardiology services including transthoracic echocardiography, cardiac event monitoring, ambulatory blood pressure monitoring, implantable cardiac device checks, and exercise stress testing
- Provides cardiac rehabilitation and preventive patient cardiac education
- Discrete area within the facility for provision of level of care more intensive than ward-based care (e.g. may be CCU, HDU or ICU)
- Performs non-invasive monitoring
- Formal referral protocols established with higher level services

- Can provide resuscitation and stabilisation of emergencies until transfer or retrieval to higher level facility

## Workforce requirements

As for Level 3 plus:

- Registered medical specialist with experience in cardiology, on-call 24 hours
- Access to an anaesthetist
- Outpatient cardiologist service provided by outreach but would include review of inpatients by visiting cardiologist
- Formal liaison with higher level 6 cardiology service
- In-hours access to allied health services appropriate to the level of cardiology services being provided (local, visiting or via telehealth dependent on availability and clinical appropriateness), including psychology, dietetics and social work
- On-site emergency medicine specialist
- Cardiac Rehabilitation Nurse
- Cardiac Nurse Practitioner or Clinical Nurse Specialist (Cardiac/Health Promotion)

## Support service requirements

| Anaesthetics | ICU/HDU | Pathology | Pharmacy | Imaging |
|---|---|---|---|---|
| 4 | 4 | 4 | 4 | 4 |

# Level 5 Cardiology Services

## Service description

A Level 5 service provides cardiology services at Level 4 plus a full range of cardiac services through a dedicated cardiology department including emergency services and an on-site cardiac catheterisation laboratory. A Level 5 service caters for the complex cardiology medical care. The service is usually provided at a general hospital by a multidisciplinary team available 24 hours and includes and has a network referral role.

## Service requirements

As for Level 4 plus:

- Has on-site CCU capable of providing a dedicated ward area for patients requiring cardiac monitoring and/or resuscitation, with appropriate levels of staff and specialised resources including monitoring equipment and appropriate investigations
- Provides a range of cardiology of diagnostic services including , CT coronary angiography, transthoracic echocardiograph, stress echocardiogram, transeosophageal echocardiography cardiac event monitoring, ambulatory blood pressure monitoring, implantable cardiac device checks, tilt table testing and functional assessment
- Access to on-site central haemodynamic monitoring capacity
- On-site diagnostic coronary angiography, permanent pacemaker, percutaneous revascularisation and angioplasty

- Provides a range of outpatient services, coronary risk factor clinics as well as cardiac rehabilitation and preventive patient education programs
- Paediatric liaison service and shared care model with Royal Melbourne Hospital for Adult Congenital Heart Disease
- A comprehensive heart failure service with a Nurse Practitioner
- Formal links to cardiothoracic service and Level 5 Respiratory service
- Specialist consultation or diagnosis provided by telehealth or via telephone to smaller sites and services
- Formal liaison with Level 6 Cardiology service
- Provides specialist consultation and diagnosis to lower level services
- May have research role
- Clinical audit and monitoring

## Workforce requirements

As for Level 4 plus:

- 24/7 cover by an interventional cardiologist
- Cardiology registrar (advanced trainee)
- RMO or intern in cardiology
- Medical registrar on-site 24 hours
- CNC providing clinical leadership in cardiology
- RNs with appropriate post graduate qualifications and/or extensive experience in cardiac nursing
- Heart Failure Nurse Practitioner
- Designated multi-disciplinary Cardiac Rehabilitation service
- Access to relevant allied health service provision 24/7 e.g. physiotherapy
- A full complement of cardiac technicians for echocardiography with 24/7 on call roster and pacing services

## Support service requirements

| Anaesthetics | ICU/HDU | Pathology | Pharmacy | Imaging |
|---|---|---|---|---|
| 5 | 5 | 5 | 5 | 5 |

# Level 6 Cardiology Services

## Service description

A Level 6 service provides services at Level 5 plus a full range of cardiac services through a dedicated cardiology department including emergency services and an on-site cardiac catheterisation laboratory. A Level 6 service caters for the most complex cardiology medical care. The service is usually provided at a large referral hospital by a multidisciplinary team available 24 hours and includes an interstate referral role.

## Service requirements

As for Level 5 plus:

- Full range of cardiology services, with dedicated cardiology department, emergency care, diagnostic and interventional cardiology services with on-site cardiac catheter laboratory, on- site cardiothoracic surgery and cardiac Rehabilitation Medicine Services
- Able to deal with highly complex diagnostic and treatment procedures in consultation with other specialties
- Provides implant and follow up service for complex cardiac devices
- Provides statewide pulmonary hypertension service
- May provide an electrophysiology service (EPS) including radiofrequency ablation and a structural heart disease program including Trans-aortic valve implant (TAVI)
- Capable of providing an adult congenital disease service
- Cardiac MRI and cardiac PET scanning services available on-site
- On-site cardiothoracic surgery
- Access to invasive cardiovascular monitoring on-site
- Statewide referral role
- Provides clinical advice, education and training to lower level services via telehealth
- Active research role
- Outreach provided to lower level services
- Clinical audit and monitoring

## Workforce requirements

As for Level 5 plus:

- Staff Specialist in cardiology on-site and on-call 24 hours
- Cardiology Registrars (advanced trainees) on-site and on-call 24 hours
- Cardiology RMO or intern
- Nurse Practitioner providing high level nursing expertise in cardiac care/cardiac rehabilitation
- Senior allied health professionals e.g. physiotherapists with advanced specialty skills and involved in education and research appropriate to their specialty, as required

## Support service requirements

| Anaesthetics | ICU/HDU | Pathology | Pharmacy | Imaging |
|---|---|---|---|---|
| 6 | 6 | 6 | 6 | 6 |

# Cardiothoracic Services

Cardiothoracic surgery is the field of medicine related to the surgical treatment of diseases of the chest, particularly surgery of the heart and lungs.

Services can range from emergency and trauma care to elective surgery for chronic heart, lung and chest conditions.

The scope of this Framework describes the service, its requirements and the minimum staffing needs and clinical support services required within each level.

## Level 1 Cardiothoracic Services

No Level 1 service. Refer to higher level.

## Level 2 Cardiothoracic Services

No Level 2 service. Refer to higher level.

## Level 3 Cardiothoracic Services

No Level 3 service. Refer to higher level.

## Level 4 Cardiothoracic Services

No Level 4 service. Refer to higher level.

## Level 5 Cardiothoracic Services

### Service description

A Level 5 Service may provide pre-operative and post-operative cardiothoracic surgical services on- site by a visiting cardiothoracic surgeon. A Level 5 Service has on-site cancer services, palliative care and pain management services.

### Service requirements

- Radiation oncology and medical oncology available on-site
- Palliative care and pain management services available on-site
- On-site ICU/CCU
- Access to specialised allied health services

### Workforce requirements

- Visiting cardiothoracic surgeons
- On-call cardiothoracic surgeons able to be contacted 24 hours
- General surgeon on-site and on-call 24 hours
- Specialist anaesthetists on-site
- Medical oncologist, radiation oncologist, palliative care physician, pain medicine

specialist on- site

- Access to CNC providing high level nursing expertise to a collaborative model of interdisciplinary care
- Access to designated allied health services appropriate to the level of cardiothoracic services being provided

## Support service requirements

| Anaesthetics | ICU/HDU | Pathology | Pharmacy | Imaging |
|---|---|---|---|---|
| 5 | 5 | 5 | 5 | 5 |

# Level 6 Cardiothoracic Services

## Service description

A Level 6 service provides services at Level 5 plus the service is able to deal with high complex diagnosis and treatment in association with other specialities. It has a statewide referral role, research role and undergraduate and post graduate teaching role.

Level 6 cardiothoracic services in Tasmania do not provide heart and lung transplantation services.

## Service requirements

As for level 5 plus:

- Statewide referral role and pathways established to refer patients for elective and urgent cardiothoracic surgical procedures
- Elective and emergency thoracic and cardiothoracic procedures by on-site cardiothoracic surgeons
- Able to deal with highly complex diagnosis and treatment in association with other specialties
- Ability to provide intra-aortic balloon pump and Extra corporeal membrane oxygenation [ECMO] facility by having perfusion and support services available round the clock
- Research role

## Workforce requirements

As for Level 5 plus:

- At least 2 fully trained cardiac surgeons accredited by the Royal Australasian College of Surgeons
- available 24 hours, seven days a week
- Cardiothoracic registrar/RMO and round the clock cover
- A cardiac anaesthetist – one for every 100 adult cases treated
- At least 2 cardiac medical and/or clinically accredited perfusionists
- At least 2 Registrars/Fellows/Trainees with additional resident medical staff

including interns

- ICU specialists on-site. They should be supported by registrars or junior staff (year 3 or above in training) 24 hours, seven days a week for ICU management
- Appropriately qualified and experienced nursing staff in operating theatres, intensive care units, wards and Rehabilitation Medicine Services along with dedicated nurse managers
- CNC/Nurse Practitioner providing leadership within a collaborative model of interdisciplinary care.
- Physiotherapists and allied health services, and cardiac Rehabilitation Medicine Services
- Actively practising medical specialists in the following specialities should be available at all times for clinical consultation:
    - Cardiologists
    - Haematologists
    - General surgeons
    - Urologists
    - Respiratory physicians
    - Neurologists
    - Neurosurgeons
    - Nephrologists
    - Endocrinologist
    - Infectious diseases consultants
    - ENT specialists
    - Dental surgeons
    - Vascular surgeons
- On-call rosters for echo cardiographers, radiographers, pacemaker technician, biomedical engineers
- Audit manager, educators and data collectors

## Support service requirements

| Anaesthetics | ICU/HDU | Pathology | Pharmacy | Imaging |
|---|---|---|---|---|
| 6 | 6 | 6 | 6 | 6 |

# Appendix 4: Guidelines for the Establishment of an Adult Cardiac Surgery Unit (CSU)

## The Australian and New Zealand Society of Cardiac and Thoracic Surgeons

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**GUIDELINES FOR THE ESTABLISHMENT OF AN ADULT CARDIAC SURGERY UNIT (CSU)**

**INTRODUCTION:**

These guidelines are intended to assist surgeons, cardiologists, hospital administrators, health departments and others interested in planning the set up of a new CSU (1).
The ultimate goal is to provide the highest quality of care and cardiac surgical service in the most cost-effective manner.

As a general principle, a CSU should only be established in, or co-located with a tertiary referral hospital with established facilities as detailed below (1, 2).

It is advised that a newly established CSU should have a liaison or consulting arrangement with an established CSU, one which has performed 400 plus cases per year for 3 or more years. This would ensure a platform for exchange of ideas, setting up protocols, quality control, helping out in case of difficulty and most importantly, in the training of personnel.
These guidelines will be considered under the following headings: Hospital infrastructure and facilities
Support services Staffing Equipment
Minimum case loads Training and education Patient information systems
Data keeping, audit and quality control systems Organisation and administration

**HOSPITAL INFRASTRUCTURE and FACILITIES** (5, 9)

1. Intensive care unit with monitoring facilities for post-cardiac surgery. There should be at least 1 ICU bed per 100 cardiac cases per year. The question of dedicated or fenced or pooled beds is not resolved, although some form of reservation for cardiac patients would be desirable.

2. A Cardiac catheterisation laboratory or angiography suite on-site.

3. At least one operating theatre of adequate size, were we recommend 55 square metres (sqms) which is suitably equipped to perform Cardiac surgery. It is strongly advised that in any new CSU, at least one of the theatres is a hybrid, or has a capacity to upgrade to having both operating and angiographic facilities. We recommend a minimum area of 70 sqms for a hybrid theatre, plus an additional area up to 150 sqms in total to include the control room etc. The theatre suite must include an anaesthetic induction or monitoring area, proximate equipment storage, a perfusion store and separate instrument and perfusion set up areas. The theatre should be dedicated to cardiac surgery only and the theatre must have class 'A' air conditioning, in terms of air exchange, flow and filtration (19).

4. There should be a separate cardiac surgical ward to manage the patient peri-operatively. This should include dedicated patient monitoring systems and telemetry. The set-up must include the capability to visually monitor all patients simultaneously, at least for the high dependency part of the ward.

5. There should be a high dependency or step-down unit. This should have facilities for invasive pressure monitoring, running defined doses of inotropes and anti-arrhythmic drugs and managing postoperative thoracic cases as well. Roughly, for a unit doing 400 cardiac cases and 100 thoracic cases per year, there should be 4 ICU beds, 4 step down beds and 15 ward beds.

6. Radiology department must provide a full range of services including portable X-rays, image intensifier services, CT scans (including CTCA) and cardiac MRI.

7. Echocardiography department to provide a dedicated echo machine with TOE and 3-D facility, for each cardiac theatre. There should be a portable Echo machine for patients in ICU, Step-down unit or the ward.

8. Appropriately equipped blood bank, biochemistry laboratory, microbiology, pharmacy, pathology and haematological services. These facilities should have round the clock rapid access. It is preferable to have a dedicated blood gas and electrolyte and ACT and TEG machines in the close vicinity of cardiac theatre/s and or ICU.

9. It is preferable to have the cardiac surgical ward, operation theatres and the ICU / HDU in close proximity or at least on the same floor.

**SUPPORT SERVICES**

1. It is essential to have a full time physiotherapy service, for preoperative assessment and postoperative follow-up. These can be combined with the rehabilitation services. The unit should document a rapid mobilisation programme and a rehabilitation programme. Liaison with occupational therapist should be available when needed.

2. Respirology services providing a lung function laboratory with bronchoscopes available and expert pulmonology back up.

3. An onsite biomedical engineering department is necessary. The engineers should be acquainted and trained with the CSU equipment and all the major equipment should have service / maintenance contracts in place.

4. Pacemaker installation services including a technician must be available.

5. A dedicated and organised cardio-pulmonary resuscitation team should be identified and be available round the clock.

6. A nuclear medicine facility should be available with suitable equipment and trained staff to perform myocardial viability studies and PET studies

7. Infectious diseases service including infectious diseased physicians consultant with appropriate peri-operative infection control protocols.

8. A non-invasive vascular laboratory and a suitably equipped vascular angiography suite.

9. Pastoral and / or appropriate counselling services should be available.

10. The office space should include consulting rooms, pre-assessment clinics, and space for secretaries, junior medical staff, database managers etc. Besides the pre and post operative clinics, facilities should be provided for dedicated valve, pacemaker and aneurysm/aortic clinics as well.

11. The unit should have liaison with appropriately experienced units to cater for patients with sub-specialty problems like paediatric, adult congenital, heart failure and transplantation.

12. Infection control protocols and critical event pathways should be instituted (15).

**STAFFING** (3, 14, 17, 23)

Staff of the CSU are responsible for:

- Provision of cardiac surgical services
- Preparation of protocols
- Teaching
- Ongoing management
- Research
- Audit

1. Cardiothoracic surgeons - At least 2 fully trained cardiac surgeons accredited by the RACS should be available at all times. It is preferable that they have different sub-specialty interests so that a broader spectrum of the referred patients could be offered cardiac surgical services. Surgeons would be working approximately 5 theatre sessions, 1 – 2 clinic sessions, 1 audit and 1 for research and teaching. 1 in 2 surgeons on call is acceptable provided there is adequate locum cover (11).

2. Cardiac anaesthetists - Initially, 3 per 400 adult cases of suitably trained and accredited cardiac anaesthetists are needed (12).

3. Cardiac perfusionist - Suitably trained and accredited medical and or clinical perfusionist is a must. At least 2 and preferably 3 perfusionists are needed in a CSU (13).

4. Registrars / Fellows / Trainees - At least 2 or preferably 3 registrars with additional resident medical staff including interns.

5. ICU specialists should be on site. They should be supported by registrars or junior staff of sufficient seniority in round the clock patient management (year 3 or above in their training).

6. Fully trained nursing staff in operating theatres, intensive care units, wards and rehabilitation services.

7. Physiotherapists and allied health services.

8. Actively practising medical specialists in the following specialities should be available at all times for clinical consultation:

    8.1. Cardiologists
    8.2. Haematologists
    8.3. General surgeons
    8.4. Urologists
    8.5. Respiratory Physicians
    8.6. Neurologists
    8.7. Neurosurgeons
    8.8. Nephrologists
    8.9. Endocrinologist
    8.10. Infectious diseases consultants

8.11. Dentists
8.12. ENT specialists
8.13. Vascular surgeons

9. On call rosters for echo cardiographers, radiographers, pacemaker technician, biomedical engineers.

10. Secretaries, junior medical staff, audit manager, educators, data collectors.

11. In view of changing scenarios, there could be more roles for nurse practitioners, surgical assistants, peri-operative specialists etc.

**EQUIPMENT** (5, 6, 7)

1. Operating Theatre - The following equipment is mandatory:

1.1. Full cardiac surgery operating theatre instrumentation and appropriate sub-specialty sets (at least 2 sets per theatre).
1.2. Heart lung machine. 5 pump heads, level and air alarms, on-line monitoring facility, heating-cooling regulators. A back up pump should be available during performance of all open hearts.
1.3. Intra-aortic balloon pump.
1.4. Facility for ECMO. Liaison with a centre with VADs and transplant programme is desirable.
1.5. Anaesthetic machines with 2 display monitors with 5 channel ECG, 2 invasive pressures, 2 temperatures, oximetry, capnography and other monitoring facilities with cardiac output module and slave facility to other equipment including IABP.
1.6. Echocardiography machine with TOE probe and 3D software.
1.7. Operating table with ability to tilt, fold, lift or turn appropriately. Should be able to accommodate the severely obese / extra tall patients.
1.8. Pacemaker boxes and cables, diathermy machines, operating lights (3), headlights with light sources, VATS trolley, infusion pumps, bear-hugger, heating-cooling blanket, pneumatic calf compression device, ultrasound vessel locator, medistim or similar flow probe, epicardial probe, defibrillator with external and internal paddles, fibrillator and suction systems with variable pressure adjustments.
1.9. Inventory and stock of appropriate disposables and sutures along with adequate space for storage and set-up.
1.10. Suitable transport equipment including portable ICU bed, monitor with ECG, invasive pressure, oximetry, capnography, disconnection alarm, FIO2 etc. must be available.

2. ICU - The equipment should be equivalent to a level 3 ICU: (8)

2.1. Separate room / cubicle allowing 360 degree access with enough space for ventilator, monitor, heating systems, IABP, echo machine, ECMO or VAD if needed.
2.2. Level 3 monitor with each bed with networking facility.
2.3. Facility to monitor invasive pressures, ECG, temperature, oximetry, capnography, disconnection alarm, cardiac output etc.
2.4. Ventilators capable of various ventilator modes, syringe pumps, infusion pumps, IABP, warming blankets, defibrillators with both external and internal paddles, pacemaker boxes, pacing facility, both external and internal; blood gas analysis.
2.5. Should preferably be located close to cardiac surgical theatre.
2.6. Emergency pacing and sternotomy trays available.
2.7. HDU facility available.

2.8. Facility for isolated beds, renal replacement therapy, vascular monitoring, bronchoscopy, tracheostomies [percutaneous / open], nitric oxide and variable suction.

3. Step down or HDU:

3.1. Telemetry and central monitoring and networking.
3.2. Emergency pacing facility and sternotomy tray.
3.3. Emergency cart / trolley.
3.4. Suction facility with variable suction adjustment.
3.5. Isolation facility.
3.6. Non-invasive ventilation facility.
3.7. Syringe pumps.

**MINIMUM CASE LOAD**

Changing times demand different guidelines. It is recommended that to keep up with the expertise, a surgeon should be doing at least 100 cases per year and the CSU should be doing at least 200 cases per year. Otherwise, the expertise of the unit nursing and ancillary staff cannot be maintained (4, 13).
Recommended numbers for sub-specialities are 100 per year for neonatal or infant and at least 50 per year for adult congenital (10, 20).

**TRAINING AND EDUCATION** (14, 15)

It is necessary to set up a liaison with an established CSU doing over 400 cases per year on all levels. The accreditation and scope of practice process of all the staff members should be regularly reviewed. Arrangements for continuing medical education and updates should be made.

**PATIENT INFORMATION SYSTEMS** (16, 17)

The unit should have in place appropriate information booklets and resources for patients, which deal with majority of the day to day scenarios. The consent forms and protocols should be well documented and formatted. Dedicated staff looking after secondary prevention strategies should be a part of the unit.

**DATA KEEPING, AUDIT AND QUALITY CONTROL** (20, 21, 22)

The CSU must have a mandatory data keeping system and participate in the national database program from the beginning.

**ORGANISATION AND ADMINISTRATION**

The organisational structure and administrative protocols must be written down and adhered to. This would not only avoid any confusion but also set in sense of responsibility at the appropriate staff level.

**RERERENCES** (for the Guidelines to establish CTU):


1. Department of Veterans Affairs. VHA handbook, 1102.3 (1999).
2. SCTS: Recommendations on the workload of cardiothoracic surgeons (July 1999) www.scts.org.
3. Staffing the CTUs: developing a workforce for the 21st century; S. Livesely & T. Barkley. NHS (2007).
4. Grown up Congenital Hearts' patient association: Sept 2007, UK.
5. Asian Cardiovascular and Thorac Annals 2005:13:299 Setting up of new CTUs.
6. Cost versus effectiveness in setting up new CTUs: NEJM 1978:299:179-181.
7. Setting up new CTU. Dr A. Banerjee. (Book chapter). In Open Heart Surgery (K R Shetty & G B Parulkar), 1987. Page 822.
8. Eur Heart J (2005); 26: 1676-82 Recommendations for the structure, organisation, and operation of intensive cardiac care units.
9. Pennsylvania department of Health: Health facility licensure regulations: Chap 136: open heart surgical services.
10. EJCTS 2003; 24 (3) 343. Optimal structure of a Congenital Heart Surgery Department in Europe.
11. Maintenance of quality in small CSU Heart Lung Circulation 2008 (17).
12. Guidance on the provision of cardiac and thoracic anaesthetic services: Royal College of Anaesthetists guidelines (UK) 2009.
13. Guidelines for standards in Cardiac surgery. American College of Surgeons. October 1996.
14. 2007. West Virginia: Governor's document on establishing new CSUs.
15. Michigan department of Community health: Review of the standards for Open Heart surgery. 2007-2008.
16. NHS improvement Heart. 2010. A guide to commissioning cardiac surgical services
17. Cardiac surgical services in New Zealand. Cardiac Surgery Service Development Working Group Report, September 2008.
18. Previous document by Mr Peter Skillington
19. The Heart Surgery Forum #2009-1033. Planning a cardiovascular Hybrid operating room: the Technical point of View.
20. Accountability and Quality assurance in Paediatric Cardiac Surgery. Editorial: Annals of Cardiac Anaesthesia 2005; 8: 15-20.
21. Asian Cardiovascular Thoracic Annals 1999; 7: 255-258. Editorial: Developing a Cardiothoracic Surgical Registry in Asia.
22. ASCTS Cardiac Surgery Database project, 2009.
23. Super specialty service guidelines for acute cardiac interventions: A report by the Australian Health Technology Advisory Committee, March 1995.

# Appendix 5: Cardiac Rehabilitation Minimum Data Set

It is strongly recommended that a state-wide minimum data set be developed in Tasmania whereby all programs collect the same information regarding their service. This can then be benchmarked against like programs both intrastate and interstate.

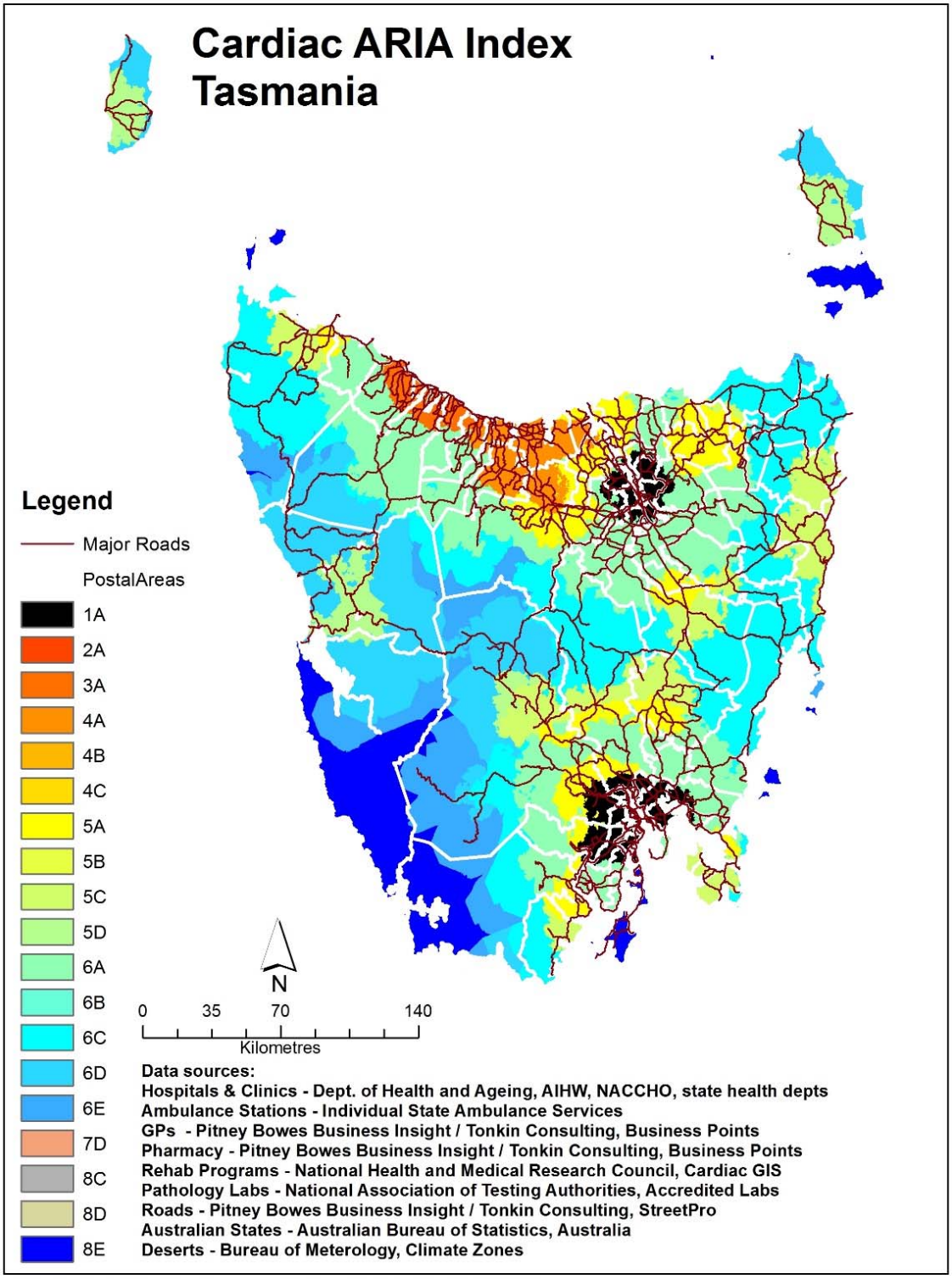
Minimum data collected should include:

- the number of eligible patients
- the number referred to programs
- the number who attend a comprehensive pre-program assessment, and
- the number completing the program.
- Clinical data collection regarding patient outcomes:
    - smoking status
    - physical activity
    - biomarkers (lipids, BP), and
    - medications.

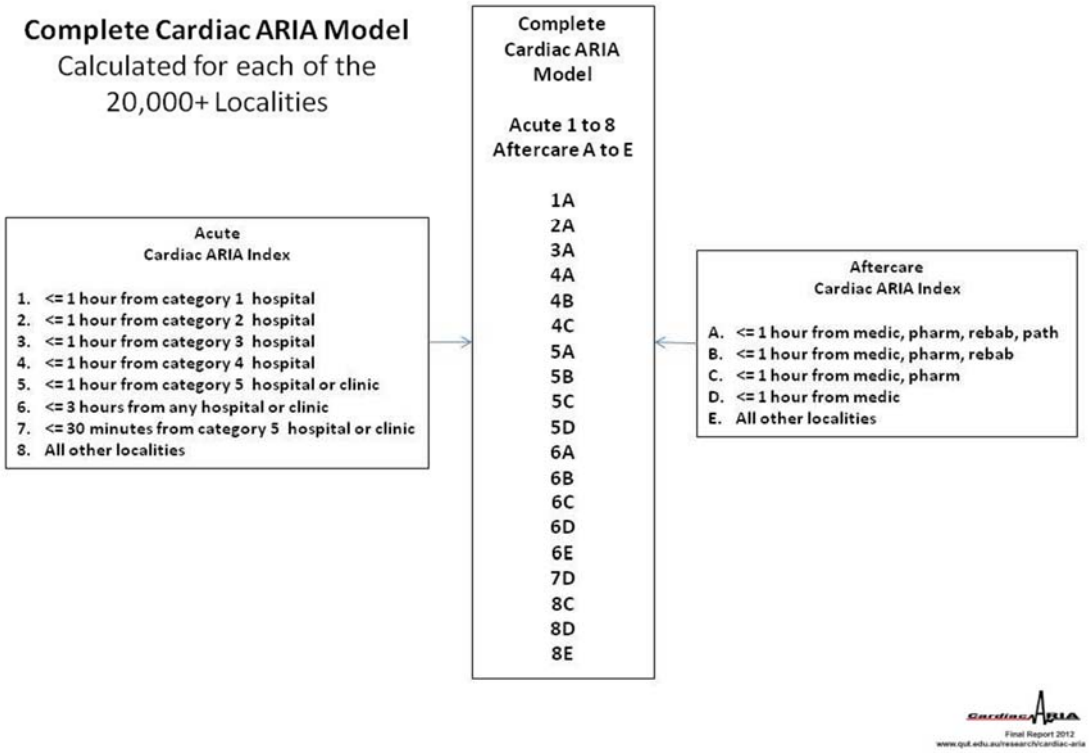
Support to collect, input and analyse data should also be provided ideally at each service location, but at a minimum, by a designated person to manage all data for the state. Data collection should occur at pre- and post-program completion and again at 6 and 24 months to assess adherence. Cardiac rehabilitation services should be adequately resourced to achieve this goal.

# Appendix 6: Cardiac Aria

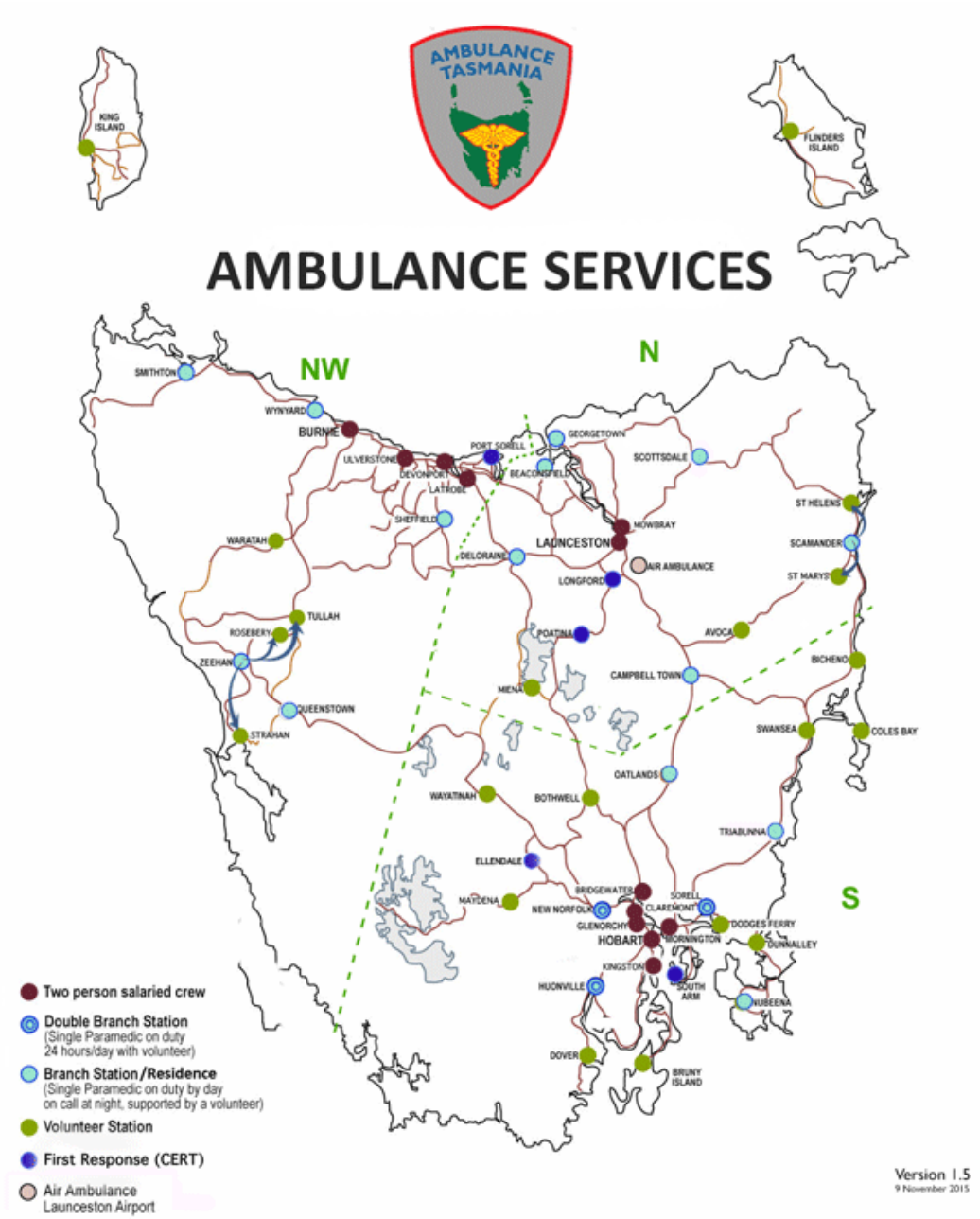
Service availability - Tasmania




Source: Cardiac ARIA, Australian Research Council Linkage Grant LP0775217


Complete Cardiac ARIA Model
Calculated for each of the 20,000+ Localities
Acute
Cardiac ARIA Index
1. <= 1 hour from category 1 hospital
2. <= 1 hour from category 2 hospital
3. <= 1 hour from category 3 hospital
4. <= 1 hour from category 4 hospital
5. <= 1 hour from category 5 hospital or clinic
6. <= 3 hours from any hospital or clinic
7. <= 30 minutes from category 5 hospital or clinic
8. All other localities
Complete Cardiac ARIA Model
Acute 1 to 8
Aftercare A to E
1A
2A
3A
4A
4B
4C
5A
5B
5C
5D
6A
6B
6C
6D
6E
7D
8C
8D
8E
Aftercare
Cardiac ARIA Index
A. <= 1 hour from medic, pharm, rebab, path
B. <= 1 hour from medic, pharm, rebab
C. <= 1 hour from medic, pharm
D. <= 1 hour from medic
E. All other localities
CardiacARIA
Final Report 2012

# Appendix 7: Ambulance Services Tasmania




- There are 14 stations in and around Tasmania's major cities; these stations are staffed by salaried officers only.
- 16 stations are staffed by salaried officers and volunteers working together. These stations tend to be in larger regional towns.
- 20 stations are staffed solely by volunteers. In larger rural communities volunteers remain at the station when on duty; in smaller communities they often respond from home or work. Paramedic backup is provided from the nearest salaried station as required.
- 5 Community Emergency Response Team (CERT) units are staffed by volunteers who respond by car and provide immediate care including defibrillation in life-threatening cases prior to the arrival of a crewed ambulance.

# Appendix 8: Abbreviations

| | |
|---|---|
| ACHD | Adult Congenital Heart Disease |
| ACRA | Australasian Cardiovascular Health and Rehabilitation Association |
| ACS | Acute Coronary Syndromes |
| AED | Automated External Defibrillator |
| AIHW | Australian Institute of Health and Welfare |
| AMI | Acute Myocardial Infarction |
| AVL | Automatic Vehicle Location |
| CABG | Coronary Artery Bypass Graft |
| CAG | Clinical Advisory Group |
| CALD | Culturally and Linguistically Diverse |
| CAHD | Comprehensive Adult Heart Disease service |
| CCHD | Critical Congenital Heart Disease |
| CHD | Coronary Heart Disease |
| CHF | Chronic Heart Failure |
| CNC | Clinical Nurse Consultant |
| COMPAC | Community Palliative Approach for Aged Care |
| CPR | Cardiopulmonary Resuscitation |
| CSANZ | Cardiac Society Australia New Zealand |
| CVD | Cardiovascular Disease |
| DHHS | Department of Health and Human Services |
| ECG | Electrocardiograph |
| ED | Emergency Department |
| FTE | Full Time Equivalent |
| GP | General Practitioner |
| GTN | Glyceryl Trinitrate |
| ICC | Integrated Care Centre |
| KPI | Key Performance Indicator |
| LGA | Local Government Areas |
| LGH | Launceston General Hospital |
| MBS | Medical Benefits Schedule |
| MIMR | Menzies Institute for Medical Research |
| MRI | Magnetic Resonance Imaging |
| NP | Nurse Practitioner |
| NSTEMI | Non-ST Elevation Myocardial Infarction |
| NSTEACS | Non-ST Elevation Acute Coronary Syndromes |
| PAH | Pulmonary Artery Hypertension |
| PBS | Pharmaceutical Benefits Scheme |
| PCI | Percutaneous Coronary Intervention |
| PCP | Primary Care Partnership |
| PEPA | Program of Excellence in the Palliative Approach |
| PET | Positron Emission Tomography |
| PHN | Primary Health Network |
| PHT | Primary Health Tasmania |
| PIP | Practice Incentive Payment |
| PTAS | Patient Travel Assistance Scheme |
| RACGP | Royal Australian College General Practitioners |
| RAHD | Regional Adult Heart Disease service |
| RHD | Rheumatic Heart Disease |
| RHH | Royal Hobart Hospital |
| RWH FMU | Royal Women's Hospital Fetal Medicine Unit |
| SEIFA | Socioeconomic Indexes for Areas |
| 6MWT | Six Minute Walk Test |
| STEMI | ST Elevation Myocardial Infarction |
| TAVI | Transcatheter Aortic Valve Implantation |
| TCCN | Tasmanian Cardiac Clinical Network |
| THO | Tasmanian Health Organisation |
| THS | Tasmanian Health Service |
| UTAS | University of Tasmania |

# References


[1] Australian Bureau of Statistics 2015, *4364055001DO002_20142015 National Health Survey: First Results, 2014-15*, ABS, Canberra.

[2] Department of Health and Human Services, (2015). *One State, One Health System, Better Outcomes: Rebuilding Tasmania's Health System Issues Paper*. Available at: https://www.dhhs.tas.gov.au/__data/assets/pdf_file/0006/170565/Rebuilding_Tasmanias_Health_System_-_Issues_Paper.pdf Accessed 16 Dec 2016

[3] Department of Health and Human Services 2014, *Heart health: Improved services and better outcomes for Victorians,* Available at: www2.health.vic.gov.au%2FApi%2Fdownloadmedia%2F%257BF51F4275-41AD-4FEF-98EC-026D7793E046%257D&usg=AFQjCNEqXyfe_ViiSx5Siw_YDNoUlVvoOw Accessed 1 Sep 2016.

[4] Australian Bureau of Statistics, *Australian Demographic Statistics,* December 2014, Available at: http://www.abs.gov.au/AUSSTATS/abs@.nsf/Lookup/3101.0Main+Features1Dec%202014?OpenDocument Accessed 15 Sep 2015

[5] Department of Treasury and Finance, *2014 Population Projections: Tasmania and it's Local Government Areas*, Hobart. Available at: http://www.treasury.tas.gov.au/economy/economic-data/2014-population-projections-for-tasmania-and-its-local-government-areas Accessed 10 Nov 2017.

[6] Australian Bureau of Statistics 2016, *3303.0 Causes of death, Australia, 2015*, ABS, Canberra.

[7] Australian Bureau of Statistics 2015, *3303.0 Causes of death, Australia, 2014*, ABS, Canberra.

[8] National Heart Foundation of Australia website, Available at: www.heartfoundation.org.au/information-for-professionals/data-and-statistics?Pages/default.aspx Accessed 1 Sep 2016.

[9] National Heart Foundation of Australia website, Available at: www.heartattackfacts.org.au/heart-attack-facts Accessed 1 Sep 2016.

[10] Australian Bureau of Statistics 2015, *4364055001DO002_20142015 National Health Survey: First Results, 2014-15*, ABS, Canberra.

[11] Australian Bureau of Statistics 2013, *4364.0.55.005 - Australian Health Survey: Biomedical Results for Chronic Diseases, 2011-12*, ABS, Canberra.

[12] Tasmanian Government, *Tasmanian Health Organisations Act 2011*. Available from: http://www.austlii.edu.au/au/legis/tas/num_act/thoa201151o2011346/ Accessed 8 Sep 2016.

[13] Department of Health and Human Services, (2015). *Delivering Safe and Sustainable Clinical Services - White Paper*. Available at: http://www.onehealthsystem.tas.gov.au/wp-content/uploads/2015/07/OHS-White-Paper-Final-Release-vf4-Press.pdf Accessed 4 Mar 2016.

[14] Department of Health and Human Services, (2015). *Tasmanian Clinical Services Profile - Implementation Plan* Available at: http://www.onehealthsystem.tas.gov.au/wp-content/uploads/2015/09/implementation-plan.pdf Accessed 4 Mar 2016.

[15] Department of Health and Human Services, (2015) *Role Delineation Framework* Available at: http://www.onehealthsystem.tas.gov.au/wp-content/uploads/2015/06/Tasmanian-Role-Deliniation-Framework-as-at-28-June-2015.pdf Accessed 4 Mar 2016.

[16] Britt H, Miller GC, Henderson J, Bayram C, Harrison C, Valenti L, Wong C, Gordon J,

Pollack AJ, Pan Y, Charles J. *General practice activity in Australia 2014–15. General practice series no. 38*. Sydney: Sydney University Press, 2015., Available at: https://ses.library.usyd.edu.au/bitstream/2123/13765/4/9781743324530_ONLINE.pdf Accessed 19 Dec 2016

[17] National Vascular Disease Prevention Alliance (2012) *Guidelines for the management of absolute cardiovascular disease risk*, Melbourne. Available at: https://strokefoundation.com.au/~/media/strokewebsite/resources/treatment/absolutecvd_gl_webready.ashx?la=en Accessed 8 Mar 2016.

[18] Primary Health *Tasmania, Primary Health Networks After Hours Activity Work Plan 2016 – 2017*, Available at: http://www.primaryhealthtas.com.au/sites/default/files/2016-18%20Annual%20Plans_Core%20and%20After%20Hours%20Activities.pdf Accessed 23 Dec 2016.

[19] National Heart Foundation of Australia & Australian Cardiac Rehabilitation Association, *Recommended framework for cardiac rehabilitation,* 2004, National Heart Foundation of Australia, Melbourne.

[20] National Heart Foundation of Australia, *My heart, my life. A manual for patients with coronary heart disease*, 2012, National Heart Foundation of Australia, Melbourne.

[21] Primary Health Care Advisory Group (2015) *Better Outcomes for People with Chronic and Complex Health Conditions*, Department of Health, Commonwealth of Australia, Available at: http://www.health.gov.au/internet/main/publishing.nsf/Content/76B2BDC12AE54540CA257F72001102B9/$File/Primary-Health-Care-Advisory-Group_Final-Report.pdf Accessed 29 Aug 2016.

[22] Australian Commission on Safety and Quality in Health Care. *Acute Coronary Syndromes Clinical Care Standard*. Sydney: ACSQHC, 2014, Available at: http://www.safetyandquality.gov.au/wp-content/uploads/2014/12/Acute-Coronary-Syndromes-Clinical-Care-Standard.pdf Accessed 31 Jul 2015.

[23] Australian Commission on Safety and Quality in Health Care. *Indicator Specifications: Acute Coronary Syndromes Clinical Care Standard*. Sydney: ACSQHC, 2014, Available at: http://www.safetyandquality.gov.au/wp-content/uploads/2015/12/Indicator-Specification-Acute-Coronary-Syndromes-Clinical-Care-Standard-PDF.pdf Accessed 10 Mar 2016.

[24] Commission on Social Determinants of Health (CSDH), *Closing the gap in a generation: health equity through action on the social determinants of health*. Final report of the Commission on Social Determinants of Health. 2008, World Health Organization: Geneva.

[25] Raphael D. *Social justice is good for our hearts: why societal factors - not lifestyles - are major causes of heart disease in Canada and elsewhere*. Toronto: CSJ Foundation for Research and Education, 2002.

[26] Beauchamp A, Peters A, Tonkin A, Turrell G. *Best practice for prevention and treatment of cardiovascular disease through an equity lens: a review.* European Journal of Cardiovascular Prevention and Rehabiliation. 2010;17(5):pp 599-606.

[27] Capewell S, Graham H. *Will cardiovascular disease prevention widen health inequalities?* PLoS Med. 2010;7(8):e1000320.

[28] Lorenc T, Petticrew M, Welch V, Tugwell P. *What types of interventions generate inequalities? Evidence from systematic reviews.* Journal of Epidemiology and Community Health. 2012;doi:10.1136/jech-2012-201257.

[29] Whitehead M, Dahlgren G. *Concepts and principles for tackling social inequities in health: Levelling up part 1*. Geneva: World Health Organization, 2006.

[30] Mendis S, Banerjee A. *Cardiovascular disease: Equity and social determinants*. Equity, Social Determinants and Public Health Programs p31-48: World Health Organization; 2010.

[31] Friel S. *Health Equity in Australia - A policy framework based on action on the social determinants of obesity, alcohol and tobacco*, The Australian National Preventative Health Taskforce, 2009, Available at: http://www.preventativehealth.org.au/internet/preventativehealth/publishing.nsf/Content/0FBE203C1C547A82CA257529000231BF/$File/commpaper-hlth-equity-friel.pdf, Accessed 30 Sep 2016.

[32] Sudbury & District Health Unit. *10 promising practices to guide local public health practice to reduce social inequities in health: Technical briefing*, Sudbury & District Health Unit, 2011.

[33] Barten F, Mitlin D, Mulholland C, Hardoy A, Stern R. *Integrated approaches to address the social determinants of health for reducing health inequity.* J Urban Health. 2007;84(3 Suppl):i164-73.

[34] Australian Bureau of Statistics, *Health Literacy, Australia*, *2006*, (ABS cat. no. 4233.0) Available at: http://www.ausstats.abs.gov.au/ausstats/subscriber.nsf/0/FA7C7D82F1747560CA2575E40018DF51/$File/41020_healthliteracy.pdf Accessed 3 Oct 2016

[35] Department of Health and Human Services 2015, *Healthy Tasmania Five Year Strategic Plan,* Available at: http://www.dhhs.tas.gov.au/__data/assets/pdf_file/0008/224567/Healthy_Tasmania_Strategic_Plan_Web_v8_LR.pdf Accessed 4 Aug 2016.

[36] National Heart Foundation of Australia 2012, *For all hearts – making a difference to Australia's heart health. Our strategy for 2013-2017*, National Heart Foundation of Australia, Melbourne.

[37] Zodgekar P, Ingles J, Yeates L, Macciocca I, McGaughran J, Semsarian C, Fatkin D 2011, *Guidelines for genetic testing of inherited cardiac disorders*, Cardiac Society of Australia and New Zealand, Sydney.

[38] Australian Institute of Health and Welfare 2004, *Heart, stroke and vascular diseases: Australian facts 2004*, AIHW, Canberra.

[39] National Heart Foundation of Australia 2013, *Warning signs: sentinel site data analysis*. 2009–2012,
National Heart Foundation of Australia, Melbourne (unpublished).

[40] National Heart Foundation of Australia 2011, *Warning signs: sentinel site data analysis*. 2009–2011,
National Heart Foundation of Australia, Melbourne (unpublished).

[41] Bray, J. E., Stub, D., Ngu, P., Cartledge, S., Straney, L., Stewart, M., Keech, W., Patsamanis, H., Shaw, J. and Finn, J. (2015) *Mass Media Campaigns' Influence on Prehospital Behavior for Acute Coronary Syndromes: An Evaluation of the Australian Heart Foundation's Warning Signs Campaign*, *Journal of the American Heart Association,* 4(7).

[42] Sivagangabalan G, Ong AT, Narayan A, Sadick N, Hansen PS, Nelson GC, Flynn M, Ross DL, Boyages SC, Kovoor P 2009, *Effect of prehospital triage on revascularization times, left ventricular*
*function, and survival in patients with ST-elevation myocardial infarction*, American Journal of Cardiology, vol. 103, no. 7, pp 907–912.

[43] National Heart Foundation of Australia and Cardiac Society of Australia and New Zealand, *Australian Clinical Guidelines for the Management of Acute Coronary Syndrome*, Available at: http://heartfoundation.org.au/images/uploads/publications/PRO-174_ACS_guidelines_2016-WEB.pdf Accessed 1 Sep 2016

[44] Clark, Robyn. A., Coffee, Neil., Turner, Dorothy., Eckert, Kerena. , Bamford, Errol., van Gaans, Deborah., Astles, Peter., Milligan, Marian., Smail, Tricia., Stewart, Simon., Coombe, David., Sutcliffe, Carmel., Wilkinson, David., & Tonkin, Andrew (2011) *Cardiac ARIA Index: Measuring Accessibility to Cardiovascular Services in Rural and Remote Australia via Applied Geographic Spatial Technology*. Cardiac ARIA. Available at: http://eprints.qut.edu.au/49163/ Accessed 23 Dec 2016.

[45] Cardiac Society of Australia and New Zealand (CSANZ) (2014) *Performance and Support Facilities for a Primary PCI Service*, Available at: http://www.csanz.edu.au/wp-content/uploads/2014/12/Performance-and-Support-Facilities-Primary-PCI-Service_2014-Aug.pdf Accessed 10 Aug 2016.

[46] Cardiac Society of Australia and New Zealand (CSANZ) (2014) *Guidelines on Support Facilities for Coronary Angiography and PCI including Guidelines on the Performance of Procedures in Rural Sites*, Available at: http://www.csanz.edu.au/wp-content/uploads/2014/12/Support_Facilities_Coronary_Angio_PCI_inc_rural_sites.pdf Accessed 10 Aug 2016.

[47] Cardiac Society of Australia and New Zealand (CSANZ) (2014) *Position Statement for the Operator and Institutional Requirements for a Transcatheter Aortic Valve Implantation (TAVI) program* Available at: http://www.csanz.edu.au/wp-content/uploads/2014/08/TAVI-Guidelines_final.pdf Accessed 10 Aug 2016.

[48]Cardiac Society of Australia and New Zealand (CSANZ) (2013) *Adult Congenital Heart Disease (ACHD) Recommendations for Standards of Care* Available at: http://www.csanz.edu.au/wp-content/uploads/2013/11/ACHD-Guidelines.pdf Accessed 10 Aug 2016.

[49]Cardiac Society of Australia and New Zealand (CSANZ) *Standards of Practice for Paediatric Cardiology Statement,* Available at: http://www.csanz.edu.au/wp-content/uploads/2013/11/Paediatric-Cardiology-Standards-of-Practice-Statement-2011.pdf Accessed 10 Aug 2016.

[50] National Heart Foundation of Australia and Cardiac Society of Australia and New Zealand (NHFA and CSANZ) (2016) *Australian Clinical Guidelines for the Management of Acute Coronary Syndromes*, Available at: http://www.heartfoundation.org.au/images/uploads/publications/PRO-174_ACS_guidelines_2016-WEB.pdf Accessed 11 Aug 2016

[51] Australian Cardiovascular Health and Rehabilitation Association (ACRA) (2015) *Core Components of Cardiovascular Disease Secondary Prevention and Cardiac Rehabilitation 2014*, Available at: http://www.heartlungcirc.org/article/S1443-9506(14)00822-1/pdf Accessed 11 Mar 2016.

[52] National Heart Foundation of Australia (2010), *Secondary Prevention of Cardiovascular Disease*. Available at: https://www.heartfoundation.org.au/images/uploads/publications/Secondary-Prevention-of-cardiovascular-disease.pdf Accessed 23 Dec 2016

[53] Krum H, Abraham WT. *Heart Failure*. Lancet 2009; 373:941-955

[54] National Heart Foundation of Australia (2013), *A Systematic Approach to Chronic Heart Failure Care: a consensus statement*, Available at: https://heartfoundation.org.au/images/uploads/publications/HF_CHF_consensus_web_FINAL_SP.pdf Accessed 11 Mar 2016.

[55] Strömberg A, Mårtensson J, Fridlund B, Levin LA, Karlsson JE, Dahlström U, 2003. *Nurse-led heart failure clinics improve survival and self-care behaviour in patients with heart failure. Results from a prospective, randomised trial*, European Heart Journal, no. 24, pp. 1014–1023.

[56] de la Porte PW, Lok DJ, van Veldhuisen DJ, van Wijngaarden J, Cornel JH, Zuithoff NP, Badings E, Hoes AW, 2007. *Added value of a physician-and-nurse-directed heart failure clinic: results from the Deventer–Alkmaar heart failure study*, *Heart*; no. 93, pp. 819-825 doi:10.1136/hrt.2006.095810.

[57] National Heart Foundation of Australia 2011, *Guidelines for the prevention, detection and management of Chronic Heart Failure in Australia*. Available from: https://www.heartfoundation.org.au/images/uploads/publications/Chronic_Heart_Failure_Guidelines_2011.pdf Accessed 23 Dec 2016.

[58] National Heart Foundation of Australia 2010, *Multidisciplinary care for people with chronic heart failure: Principles and recommendations for best practice*. National Heart Foundation of Australia, Melbourne. Available from: https://www.heartfoundation.org.au/images/uploads/publications/Multidisciplinary-care-for-people-with-CHF.pdf Accessed 9 Nov 2017.

[59] Australian Government Department of Health and Ageing (2011). *Guidelines for a Palliative Approach for Aged Care in the Community Setting — Best practice guidelines for the Australian context*, Australian Government Department of Health and Ageing, Canberra. Available from: https://www.caresearch.com.au/caresearch/Portals/0/Documents/WhatisPalliativeCare/NationalProgram/ComPAC/COMPAC%20Vol%201%20RTF%20accessible%20WEB.pdf Accessed 23 Dec 2016.

[60] Primary Health Tasmania, 2015. *Shared Transfer of Care*. Available at: http://www.primaryhealthtas.com.au/sites/default/files/Guidelines%20for%20Shared%20Transfer%20of%20Care.pdf Accessed 23 Dec 2016.

[61] New South Wales Health, 2015, NSW Guidelines for *Deactivation of Implantable Cardioverter Defibrillators at the End of Life*, Agency for Clinical Innovation. Available at: http://www.aci.health.nsw.gov.au/__data/assets/pdf_file/0008/179990/ACI-Deactivate-ICDs.pdf Accessed 22 Apr 2016.

[62] National Heart Foundation of Australia 2015, *Australian Acute Coronary Syndromes Capability Framework*. National Heart Foundation of Australia, Melbourne. Available at: http://www.heartfoundation.org.au/images/uploads/publications/ACS_framework.pdf Accessed 4 Aug 2016.

[63] Australian Commission on Safety and Quality in Health Care (2015) *Indicator Specification: Acute Coronary Syndromes Clinical Care Standard*. Available at: http://www.safetyandquality.gov.au/wp-content/uploads/2015/12/Indicator-Specification-Acute-Coronary-Syndromes-Clinical-Care-Standard-PDF.pdf Accessed 12 Aug 2016.

[64] Australian Cardiovascular Health and Rehabilitation Association (ACRA) (2014), *Core Components of Cardiovascular Disease Secondary Prevention and Cardiac Rehabilitation.* Available at: http://www.acra.net.au/wp-content/uploads/2015/03/Woodruffe-et-al-2015-ACRA-core-components.pdf Accessed 12 Aug 2016.

[65] See www.betterhealth.vic.gov.au

[66] Australian Institute of Health and Welfare: Mathur S, Moon L, Leigh S 2006, *Aboriginal and Torres Strait Islander people with coronary heart disease: further perspectives on health status and treatment*. Cardiovascular diseases series no. 25. Cat. no. CVD 33. AIHW, Canberra.

[67] Australian Bureau of Statistics 2015, *Causes of Death 2014*. Available at: http://www.abs.gov.au/ausstats/abs@.nsf/Lookup/by%20Subject/3303.0~2014~Main%20Features~Potentially%20Avoidable%20Mortality%20~10043 Accessed 3 Oct 2016.

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ISBN 978-1-74345-129-8
PRO-186-1117

Suggested citation: National Heart Foundation of Australia. Improving the Hearts of Tasmanians: Tasmanian Statewide Cardiac Services Plan 2018-2022, 2017.

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