

Clinical Services Capability Framework

Cardiac Services

Module Overview

Please note: This module must be read in conjunction with the [Fundamentals of the Framework](#) (including glossary and acronym list).

Cardiac services are a specialised area of medicine involved in the diagnosis, management and treatment of complications of patients with a wide range of cardiac and/or coronary artery disease—hereafter referred to collectively as cardiac disease.

The management of patients with cardiac disease encompasses the full continuum of care from treatment of early symptoms and risk factors through to the diagnosis and management of chronic disease. It requires high-level and prompt management of acute and critical symptoms to minimise mortality and maximise individual long-term health. Highly specialised management of complex issues necessitates subspecialty expertise to ensure patients receive the highest quality healthcare service.

The cardiovascular continuum of care and management is complex and requires a high degree of specialisation. This continuum includes prevention, screening, diagnosis, acute or ongoing medical care, surgery, rehabilitation and palliative care. As a result, evidence-based care is delivered in a range of settings by a diverse range of health professionals and requires documented processes among providers—including those in the community—across secondary care and among multidisciplinary groups.

The range of settings for the delivery of cardiac services includes public or private hospitals, stand-alone facilities, community healthcare settings and the patient's home. Increasing degrees of patient complexity, acuity and critical illness impact on staffing and service requirements, resulting in complex service delivery implications for facilities.

Children have specific needs in health services—please refer to the relevant children's services modules.

This module outlines four levels of complexity for cardiac service provision: Levels 3 to 6. It is accepted emergency presentations may occur at any facility, requiring temporary management of the patient. In a lower level facility, such care and stabilisation should occur in consultation with a higher level service prior to timely transfer. The focus of this module is on specialised cardiac services.

The Cardiac Services module contains six sections which should be read collectively, and include:

Section 1: Cardiac (Coronary) Care Unit Services (Levels 4 to 6)

Section 2: Cardiac Diagnostic and Interventional Services (Levels 3 to 6)

Section 3: Cardiac Medicine Services (Levels 3 to 6)

Section 4: Cardiac Rehabilitation Services (Levels 4 to 6, including Ongoing Prevention and Maintenance Services)

Section 5: Cardiac Surgery Services (Level 6)

Section 6: Cardiac Outreach Services

Across the sections, it is a general expectation Level 3 services have access to a registered medical specialist with credentials in internal medicine, have provision for electrocardiography and may provide exercise stress testing. As the levels develop increasing sophistication, it is expected Level 4 services provide echocardiography, exercise stress testing and a cardiac care unit, along with a registered medical specialist with credentials in internal medicine and a registered medical specialist with credentials in cardiology. Level 4 services should have defined pathways to transoesophageal echocardiography (TOE) and cardiac catheterisation, but these services, as well as percutaneous coronary intervention, are expected to be provided at Level 5 and 6 services, along with the development of electrophysiology services. A registered medical specialist with credentials in cardiology is also required at a Level 5 service, along with an on-call echocardiography and catheter lab service. As Level 6 typically provides super-specialty services, cardiac surgery services are provided at this level.

Section 1: Cardiac (coronary) care unit services

Cardiac (coronary) care units (hereafter referred to as cardiac care units) are specialised areas providing intensive care for emergency and acute cardiac illness at a high level of expertise. Cardiac care units receive patients from a variety of sources, including directly from the community, via ambulance services and emergency departments, and as internal and external referrals and transfers. Cardiac care units have advanced monitoring and diagnostic equipment, and access to a variety of multidisciplinary healthcare professionals to ensure provision of the full range of appropriate clinical and associated care.

Section 2: Cardiac diagnostic and interventional services

Cardiac diagnostic and interventional services include the full range of cardiac diagnostic and interventional services. Cardiac diagnostic services vary from exercise stress testing, Holter monitoring and transthoracic echocardiography to radioisotope stress testing, magnetic resonance imaging and positron emission tomography. These non-invasive means of diagnosing a patient's possible cardiac condition are further supported by invasive methods of investigation, including cardiac catheterisation (also known as cardiac angiography) and electrophysiology studies. Highly invasive methods of investigation require teams of specialised medical, nursing and allied health staff, often with specific training and dedicated equipment.

Cardiac catheterisation, electrophysiology or multipurpose laboratories are specialised clinical areas providing advanced monitoring, mapping, radiological, and diagnostic and interventional equipment to support the range of procedures for routine and emergency cardiac care. All cardiac catheterisation, electrophysiology or multipurpose laboratories must have the capacity to provide resuscitation, the stabilisation of emergencies, and access to a variety of multidisciplinary healthcare professionals to ensure the provision of the full range of appropriate clinical and associated care. Patients requiring these services come from a variety of sources, including directly from the community via ambulance services and emergency departments, and as internal and external referrals and transfers.

Section 3: Cardiac medicine services

Cardiac medicine provides an array of preventative, screening, diagnostic, treatment and rehabilitative services across general and specialised cardiac medical problems. Some services may be provided with a close observation area for patients with more complex conditions, whilst others may be provided with videoconferencing support from specialists.

Section 4: Cardiac rehabilitation services, and ongoing prevention and maintenance services

Cardiac rehabilitation services, both inpatient and outpatient, encompass all measures used to help people with cardiovascular disease return to an active and satisfying life, and to prevent future cardiac events. Cardiac rehabilitation should be tailored to meet the information, education, support and cultural needs of patients and their families, and align with best practice, such as the National Heart Foundation's 2004 framework.¹

The provision of cardiac rehabilitation services includes a number of elements: physical activity, health education, counselling, behaviour modification strategies and support for self-management. These should be routinely integrated into the management of all patients. Cardiac rehabilitation should be routinely provided to all patients (on an 'opt out' basis), unless there are clinical contraindications. Not all elements of a rehabilitation program may be utilised for every cardiac patient during the inpatient period. However, individuals may access cardiac rehabilitation services at varying stages. Routine referrals to outpatient cardiac rehabilitation programs are increasingly important as part of the cardiovascular health continuum. Ongoing prevention and maintenance services involve longer term services and/or programs aimed at helping people with cardiovascular disease maintain an active and satisfying life, and decreasing the risk of future cardiovascular events. Telephone and web based services can also provide support as appropriate.

Section 5: Cardiac surgery services

Cardiac surgical services act as referral services for cardiac surgical patients and are capable of providing a range of cardiac surgical services with the associated comprehensive cardiac care services, including perioperative and post-operative care, and multisystem life support.

Section 6: Cardiac outreach services

Cardiac outreach services have been established to help improve health outcomes for rural Australians by increasing access to medical specialist services in metropolitan, regional, rural and remote communities. Visiting specialist services in geographical areas of identified need assist in addressing the burden cardiac disease places on people in rural and remote communities.

Service Requirements

In addition to the requirements outlined in the [Fundamentals of the Framework](#), specific service requirements include:

- > compliance with SA Health policy directives and guidelines that are referenced at:
 - > [SA Health Policy Directives](#)
 - > [SA Health Policy Guidelines](#)
 - > [SA Health Clinical Directives and Guidelines](#)

Services not within the scope of the Cardiac Services module include:

- > primary prevention of cardiac disease
- > screening, detection and management of early coronary artery and cardiac disease by primary healthcare providers
- > cardiac services for children, which are addressed separately in the Children's Services modules.

Workforce Requirements

The CSCF does not prescribe staffing ratios, absolute skill mix, or clerical and/or administration workforce requirements for a team providing a service, as these are best determined locally and in accordance with relevant industrial instruments. Where minimum standards, guidelines or benchmarks are available, the requirements outlined in this module should be considered as a guide only. All staffing requirements should be read in conjunction with the *Health Care Act 2008*, Awards and relevant Enterprise Agreements including, but not limited to:

- > SA Health Salaried Medical Officers Enterprise Agreement 2013
- > SA Health Visiting Medical Specialists Enterprise Agreement 2012
- > SA Health Clinical Academics Enterprise Agreement 2014
- > Nursing/Midwifery (South Australian Public Sector) Enterprise Agreement 2013
- > SA Ambulance Service Enterprise Agreement 2011
- > SA Public Sector Wages Parity Enterprise Agreement Salaried 2014

Section 1 Cardiac (Coronary) Care Unit Services

Cardiac (Coronary) Care Unit Services	Level 4	Level 5	Level 6
<p>Service description</p>	<ul style="list-style-type: none"> > may be collocated within an intensive care service or may be stand-alone unit. > capable of providing high standard of general cardiac care, but does not have level of service to care for critically ill cardiac patients e.g. patients requiring advanced haemodynamic support. > unit managed by registered medical specialist with credentials in cardiology or internal medicine and experience in cardiology. > has on-site non-invasive diagnostic procedures, including exercise stress testing and echocardiography > has access to high quality CT or angiography, located offsite in a related level 5 or 6 facility. > has defined pathways to higher level services located offsite in level 5 or 6 service, including diagnostic cardiac catheterisation, and transfer of patients to cath-lab for primary PCI. 	<ul style="list-style-type: none"> > provides comprehensive cardiac care to critically ill and complex cardiac patients. > access—24 hours—to on-site diagnostic and interventional services (cardiac catheterisation and/or multipurpose suite), and undertakes percutaneous coronary intervention on all but highest complexity patients. > may be referral centre for lower level services. > has clearly defined pathways to cardiac surgery on a 24/7 basis 	<ul style="list-style-type: none"> > provides highest level of complex care for patients with serious cardiac conditions requiring continuous cardiac and haemodynamic monitoring. > provides advanced heart failure therapies and pre/post transplantation work-up (including consideration of left ventricular devices). > provides care for advanced structural disease. > on-site access to cardiac surgery. > service is staffed by specially trained medical and nursing staff, enabling close monitoring and early intervention. > may be referral service for all lower level coronary care services.

Cardiac (Coronary) Care Unit Services	Level 4	Level 5	Level 6
<p>Service requirements</p>	<p>As per module overview, plus:</p> <ul style="list-style-type: none"> > access to diagnostic cardiac angiography for low-complexity adult patients, via transfer to an associated level 5 or 6 site. > on-site non-invasive diagnostic procedures, including transthoracic echocardiography and exercise stress testing. > access—24 hours—to troponin testing. > cardiac medications, including thrombolytics, on-site 24 hours. > all patients admitted under care of registered medical specialist with credentials in cardiology or internal medicine and experience in cardiology. > where patient throughput is less than recommended by relevant standards, thereby threatening ongoing competence, episodes of practice at higher level service may be required. > desirable for all registered nurses in CCU to be trained in advanced life support. 	<p>As per Level 4, plus:</p> <ul style="list-style-type: none"> > on-site access to diagnostic and interventional services (cardiac catheterisation). > on-site access—24 hours—to surgical and medical services. > capacity to provide invasive monitoring and intra-aortic balloon pump management. > access to cardiac surgery via documented processes in place with nearest public or suitably licensed private health facility performing cardiac surgery > patients advised in advance of potential risk of delayed surgical intervention for complication arising from catheterisation procedure due to requirement for emergency transfer of patient to affiliated health facility for cardiac surgery. > evidence of comprehensive, ongoing medical, nursing, allied health and support service education programs, as appropriate, relevant to specialised facilities of the unit. > demonstrable and documented formal audit and review of cardiac care units and quality activities, including at least two targeted clinical audits, annually. > on-site access—24 hours—to general imaging services, including portable x-ray and computerised tomography (CT) with automatic film processing and/or picture archiving and communications system (PACS) and mobile image intensifier in designated units. > transthoracic echocardiography accessible on-site 24 hours. > on-site access—during business hours—to transo-esophageal echocardiography. > access to cardiac viability assessment via nuclear medicine in addition to exercise stress testing. > access to electrophysiology services may be accessible. > conduct regular multidisciplinary 'heart team' meetings 	<p>As per Level 5, plus:</p> <ul style="list-style-type: none"> > access to electrophysiology services in addition to full range of diagnostic and interventional services (cardiac catheterisation and coronary intervention). > on-site cardiac surgery allowing service provision to higher risk patients (Section 5, Level 6 Cardiac Surgery Service).

Cardiac (Coronary) Care Unit Services	Level 4	Level 5	Level 6
<p>Workforce requirements</p>	<p>As per module overview, plus:</p> <p>Medical</p> <ul style="list-style-type: none"> > access—24 hours—to registered medical specialist with credentials in either cardiology or internal medicine and relevant experience in cardiology. > all medical staff trained in advanced life support. <p>Nursing</p> <ul style="list-style-type: none"> > staffing levels in accordance with the relevant industrial instruments. > suitably qualified and experienced nurse manager (however titled). > suitably qualified and experienced registered nurse in charge on each shift with ability to interpret 12-lead ECG and administer thrombolysis. > other suitably qualified and experience nursing staff appropriate to the service being provided. <p>Allied health</p> <ul style="list-style-type: none"> > access to allied health professionals, as required. <p>Other</p> <ul style="list-style-type: none"> > access to technical support staff (e.g. technical, biomedical and radiation safety specialists), as required. 	<p>As per Level 4, plus:</p> <p>Medical</p> <ul style="list-style-type: none"> > access—24 hours—to registered medical specialist with credentials in cardiology. > sufficient supporting registered medical specialists with credentials in cardiology to provide sustainable coverage of cardiac care unit. <p>Nursing</p> <ul style="list-style-type: none"> > staffing levels in accordance with the relevant industrial instruments. > nursing staff with qualifications and/or experience in cardiac care nursing. <p>Allied health</p> <ul style="list-style-type: none"> > access to identified radiographer and echocardiographer or cardiac scientist. > access to identified pharmacist and physiotherapist. 	<p>As per Level 5 service.</p> <p>Medical</p> <ul style="list-style-type: none"> > access—24 hours—to registered medical specialist with credentials in cardiology, and advanced scope of practice for advanced heart failure and structural heart disease.
<p>Specific risk considerations</p>	<ul style="list-style-type: none"> > Nil 	<ul style="list-style-type: none"> > Nil 	<ul style="list-style-type: none"> > Nil

Support service requirements for Cardiac (Coronary) Care Unit Services	Level 4		Level 5		Level 6	
	On-site	Accessible	On-site	Accessible	On-site	Accessible
Anaesthetic		4	4		6	
Cardiac (cardiac diagnostic and interventional)			5			
Cardiac (cardiac surgery)				6	6	
Intensive care		4	4		6	
Medical			4		5	
Medical imaging	4		4		5	
Nuclear Medicine			4		4	
Palliative Care		4		5		5
Pathology	3		4		4	
Pharmacy	4		4		5	
Surgical			4		6	

Section 2 Cardiac Diagnostic and Interventional Services

Cardiac Diagnostic & Interventional Services	Level 3	Level 4	Level 5	Level 6
<p>Service description</p>	<ul style="list-style-type: none"> > provides ambulatory and inpatient diagnostic service to low-risk patients. > no interventional service, including cardiac catheterisation, is provided at this level. > access to limited support services and may be collocated with other clinical areas. > non-invasive diagnostic services include exercise stress testing and Holter monitoring and transthoracic echocardiogram. > able to assess, treat and stabilise the patient prior to timely transfer to higher level specialist services, where required. > delivered predominantly by medical practitioner and registered nurses with visiting, day-only, registered medical specialist consultation services. 	<ul style="list-style-type: none"> > provides non-invasive diagnostic services including transthoracic echocardiogram. > must have capacity to provide resuscitation and stabilisation of emergencies. 	<ul style="list-style-type: none"> > provides comprehensive diagnostic and interventional services to all patients except those at highest level of complexity. > provides transoesophageal echocardiogram, cardiac catheterisation and electrophysiology. > on-site access—24 hours—to diagnostic and interventional services (cardiac catheterisation suite), and may have designated electrophysiology or multipurpose laboratory. > undertakes elective (and may provide emergency) percutaneous coronary intervention. > access to inpatient cardiac care unit services providing invasive monitoring, intra-aortic balloon pump management and access to transoesophageal echocardiography, but does not have on-site cardiac surgical services. 	<ul style="list-style-type: none"> > provides diagnostic and interventional services for patients with highest level of complexities, and provides on-site access—24 hours—to cardiac surgery to enable safe service provision for these patients. > acts as referral service for all lower level services. > on-site cardiac catheterisation suite, and/or designated electrophysiology and/or multipurpose laboratory. > elective and emergency percutaneous coronary intervention and electrophysiology services on adult patients may also be available.

Cardiac Diagnostic & Interventional Services	Level 3	Level 4	Level 5	Level 6
<p>Service requirements</p>	<p>As per module overview, plus:</p> <ul style="list-style-type: none"> > access—24 hours—to range of medical services. > on-site access—24 hours—to clinician training in advanced life support. > access—24 hours—to troponin testing. Result within 30-60 mins 24/7, POCT where not routinely available in this time frame > on-site access—24 hours—to cardiac medications, including thrombolytic. > access to cardiac medicine and cardiac rehabilitation service (Section 3, Level 3 Cardiac Medicine Service and Section 4, Level 3 Cardiac Rehabilitation Service). > performance and interpretation of non-invasive monitoring and 12-lead ECG. > Holter monitoring and interpretation, or facilities to transfer data for off-site interpretation. > performance and interpretation of exercise stress testing. > may provide and interpret transthoracic echocardiography. > agreed clinical pathways and/or equivalent care guideline protocols, including use of documented processes for referral to allied health professionals in acute and community settings. > Cardiac marker testing and other necessary blood tests as per management protocols 	<p>As per Level 3, plus:</p> <ul style="list-style-type: none"> > documented processes with nearest public or suitably licensed private health facility performing cardiac surgery. > all clinical staff have knowledge of radiation and protection practices. > all staff have access to radiation safety documentation and attend radiation in-service annually. > ongoing training and competency to ensure radiation safety and safe femoral arterial and venous sheath removal. > access to post-procedure clinics or post-procedure specialist review. > access to cardiac medicine or cardiac care unit service at minimum (refer to Section 1, Level 3 Cardiac Medicine Service or Section 2, Level 4 Cardiac Care Unit Service). 	<p>As per Level 4, plus:</p> <ul style="list-style-type: none"> > referral service for lower level units. > access to cardiac viability assessment. > on-site access—24 hours—to Level 5 cardiac care unit at minimum (Section 1, Level 5 Cardiac Care Unit Service). > capacity to provide invasive monitoring, and intra-aortic balloon pump insertion and management. > on-site access—24 hours—to transthoracic echocardiography. > on-site access—during business hours—to transoesophageal echocardiography. > on-site access—24 hours—to diagnostic and interventional services (cardiac catheterisation suite). > may have designated electrophysiology or multipurpose laboratory. > patients have follow-up in 24 hours post-procedure. > patients with new pacemaker insertion receive ongoing cardiac telemetry until pacemaker function checked. > patients advised in advance of potential risk of delayed surgical intervention for complication arising from catheter procedure due to requirement for emergency transfer to affiliated health facility for cardiac surgery. 	<p>As per Level 5, plus:</p> <ul style="list-style-type: none"> > on-site access—24 hours—to cardiac surgery services (Section 5, Level 6 Cardiac Surgery Service). > on-site access—24 hours—to cardiac care unit (Section 1, Level 5 Cardiac Care Unit Service). > access—during business hours—to electrophysiology services, including epicardial and chronic lead extraction requiring on-site cardiac surgery. > Angiography, biopsy/pathology, EP and MRI

Cardiac Diagnostic & Interventional Services	Level 3	Level 4	Level 5	Level 6
<p>Workforce requirements</p>	<p>As per module overview, plus:</p> <p>Medical</p> <ul style="list-style-type: none"> > medical practitioner available. > all medical practitioners supervising exercise stress testing trained in advanced life support. <p>Nursing</p> <ul style="list-style-type: none"> > staffing levels in accordance with the relevant industrial instruments. > suitably qualified and experienced nurse manager (however titled). > suitably qualified and experienced registered nurse or other appropriately trained health professional in charge on each shift with ability to interpret 12-lead ECG. > all registered nursing staff supervising exercise stress testing trained in advanced life support. <p>Allied health</p> <ul style="list-style-type: none"> > access to allied health professionals, as required. <p>Other</p> <ul style="list-style-type: none"> > access to cardiac scientist or other appropriately trained health professional with ability to interpret 12-lead ECG. 	<p>As per Level 3, plus:</p> <p>Medical</p> <ul style="list-style-type: none"> > registered medical specialists with credentials in invasive cardiology appropriate to the service being provided > all medical practitioners trained in advanced life support. <p>Nursing</p> <ul style="list-style-type: none"> > staffing levels in accordance with the relevant industrial instruments. > suitably qualified and experienced registered nurse in charge on each shift trained in advanced life support. <p>Allied health</p> <ul style="list-style-type: none"> > access to allied health professionals, as required. <p>Other</p> <ul style="list-style-type: none"> > access to technical support staff (e.g. technical, biomedical and radiation safety specialists), as required. 	<p>As per Level 4, plus:</p> <ul style="list-style-type: none"> > access—24 hours—to health professionals in team with qualifications or experience in cardiac diagnostic and interventional procedures, as well as ongoing clinical competency relevant to service being provided, including expertise in managing balloon pump insertion. <p>Medical</p> <ul style="list-style-type: none"> > access—24 hours—to registered medical specialist with credentials in invasive cardiology. > access—during business hours—to registered medical specialist with credentials in electrophysiology procedures and/or pacing procedures where electrophysiological procedures and/or pacing procedures provided. > sufficient supporting registered medical specialists with credentials in interventional / invasive cardiology to provide sustainable service 24 hours. <p>Nursing</p> <ul style="list-style-type: none"> > staffing levels in accordance with the relevant industrial instruments. > access—24 hours—to adequate registered nursing staff. > all registered nurses trained in advanced life support desirable. <p>Allied health</p> <ul style="list-style-type: none"> > access to radiographer and echocardiographer or cardiac scientist with relevant qualifications and/or experience appropriate to service being provided (e.g. device implantation). > Access to identified pharmacist and physiotherapist. 	<p>As per Level 5 service.</p>

<p>Specific risk considerations</p>	<p>> Nil</p>	<p>In addition to risk management outlined in the Fundamentals of the Framework, specific risk management requirements include:</p> <ul style="list-style-type: none"> > where patient throughput is less than relevant standard, threatening staff skill maintenance and ongoing competence, episodes of practice at higher level service may be required. > in this setting, if minimum case load cannot be achieved, documented process with another cardiac catheter unit is required to ensure staff skill levels maintained. > continued functioning of service will be conditional on acceptable performance, as determined by formal and timely peer-review auditing of institutional and individual procedures. 	<p>In addition to risk management outlined in the Fundamentals of the Framework and set out in the module overview, specific risk management requirements include:</p> <ul style="list-style-type: none"> > demonstrate processes for formal audit and review of interventional and structural heart services and quality activities, including: <ul style="list-style-type: none"> – at least two targeted clinical audits annually – compliance with available guidelines, network and/or any external death review processes > service should provide at least 12 months of cardiac diagnostic procedures and then at least 12 months of cardiac therapeutic procedures prior to performing emergency low-risk cases. 	<p>> Nil</p>
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Support service requirements for cardiac diagnostic & interventional services	Level 3		Level 4		Level 5		Level 6	
	On-site	Accessible	On-site	Accessible	On-site	Accessible	On-site	Accessible
Anaesthetic		3	4		4		6	
Cardiac (coronary) care unit		4	4		5		5	
Cardiac (cardiac surgery)				6		6	6	
Intensive care			4		4		6	
Medical	3		4		4		5	
Medical imaging	3		4		4		5	
Nuclear medicine					4		4	
Palliative care		3		4		5		5
Pathology		2		3	4		4	
Perioperative (relevant section/s)							5	
Pharmacy	4		4		4		5	
Surgical			4		4		6	

Section 3 Cardiac Medicine Services

Cardiac Medicine Services	Level 3	Level 4	Level 5	Level 6
Service description	<ul style="list-style-type: none"> > provides ambulatory and inpatient services that may require subspecialty outpatient referral. > assesses and stabilises patients, and initiates care, prior to transfer for specialist assessment and treatment where appropriate. > patients who require complex diagnostic investigation will also be referred to higher level cardiac medicine services. > may be collocated within a general ward or general clinical area, and may have an acute or observation area or access to high-acuity care / beds. > predominantly delivered by medical practitioner and registered nurses with visiting, day-only, registered medical specialist consultation services. 	<ul style="list-style-type: none"> > provides inpatient and outpatient care services to patients with moderate level of complexity, delivered by variety of health professionals, including medical, nursing and allied health. > may be collocated within a general medical unit with on-site access to intensive care service and/or cardiac care unit, but does not have level of service to care for critically ill cardiac medicine patients. > patients admitted are managed by cardiologist or internal registered medical specialist with experience in cardiology. 	<ul style="list-style-type: none"> > manages all but most highly complex cardiac medicine patients and procedures. > designated cardiology beds providing comprehensive subspecialty services, with advanced range of supporting clinical and diagnostic services to match complexity of patients admitted and referred, > all admitted patients managed by designated registered medical specialist with credentials in cardiology. > may be referral centre for lower level services. 	<ul style="list-style-type: none"> > provides highest level of care for complex and critically ill cardiac patients in designated cardiology beds, with full range of support services accessible on-site 24 hours a day. > acts as referral service for all lower level cardiac medicine services.

Cardiac Medicine Services	Level 3	Level 4	Level 5	Level 6
<p>Service requirements</p>	<p>As per module overview, plus:</p> <ul style="list-style-type: none"> > performs and interprets non-invasive monitoring and 12-lead electrocardiogram (ECG). > stabilisation of patient where required prior to transfer to higher level service. > agreed clinical pathways and/or care guideline protocols used, including use of referral pathways to allied health professionals who may be hospital- or community-based (including cardiac rehabilitation). > minimum data set of patient information recorded that aligns with facility protocols. > provision of formal patient education regarding patient's condition, lifestyle risk factors and medication management. > access on-site— 24 hours— to individual trained in advanced life support and undertakes refresher training annually. > cardiac medications, including thrombolytics, on-site 24 hours. > defibrillator. > access—24 hours—to troponin and B-type natriuretic peptide testing. > access to specialised medical outreach services providing exercise stress testing, and echocardiography and cardiac consultations. > access to cardiac medicine and cardiac rehabilitation service (Section 3, Level 3 Cardiac Medicine Service and Section 4, Level 3 Cardiac Rehabilitation Service). > access to videoconferencing support for exercise stress testing > access close to home for Holter monitoring and 24 hour blood pressure service 	<p>As per Level 3, plus:</p> <ul style="list-style-type: none"> > on-site cardiac care unit (Section 1, Level 4 Cardiac Care Unit Service); if on-site intensive care service provided, requirement for an on-site cardiac care unit will be met. > access to non-invasive monitoring. > non-invasive diagnostic procedures, including transthoracic echocardiography and exercise stress testing. > access to qualified staff to provide echocardiography and exercise stress testing. > access to related support services. 	<p>As per Level 4, plus:</p> <ul style="list-style-type: none"> > patients individually managed by designated registered medical specialist with credentials in cardiology, with support from multidisciplinary team to enable management of complex patients and multiple comorbidities. > on-site access—24 hours—to diagnostic and interventional services (cardiac catheterisation and/or multipurpose suite). > designated cardiac medicine wards and on-site cardiac care unit (Section 1, Level 5 Cardiac Care Unit Service). > access to cardiac and general surgery (Section 5, Level 6 Cardiac Surgery Service). > access to endocrinology, gastroenterology, infectious diseases, neurology, rehabilitation, renal, urology and vascular services. > admitted patients referred to designated registered medical specialist with credentials in cardiology for management of care. > documented audit and review of service-based activity, and outcomes and quality activities, including at least two targeted clinical audits, annually. > in addition to providing general cardiac medicine services, including to patients with heart failure and coronary heart disease, subspecialty service may include, but is not limited to, providing services for adult congenital disease, valvular disease, pulmonary hypertension and genetics, and may provide obstetric cardiac services. > may act as referral service for lower level services. 	<p>As per Level 5, plus:</p> <ul style="list-style-type: none"> > on-site 24 hours Level 5 cardiac care unit (Section 1, Cardiac Care Unit Service). > Level 5 diagnostic and interventional service (Section 2, Cardiac Diagnostic and Interventional Services). > access to cardiac surgical service (Section 5, Cardiac Surgery Services).

Cardiac Medicine Services	Level 3	Level 4	Level 5	Level 6
Workforce requirements	<p>As per module overview, plus:</p> <p>Medical</p> <ul style="list-style-type: none"> > medical practitioner available. > access—24 hours—to registered medical specialist with credentials in internal medicine. > all medical practitioners trained in advanced life support. <p>Nursing</p> <ul style="list-style-type: none"> > staffing levels in accordance with the relevant industrial instruments. > suitably qualified and experienced nurse manager (however titled). > suitably qualified and experienced registered nurse in charge on each shift with ability to interpret 12-lead ECG. > at least one registered nurse with current training in advanced life support <p>Allied health</p> <ul style="list-style-type: none"> > access to allied health professionals, as required. 	<p>As per Level 3, plus:</p> <p>Medical</p> <ul style="list-style-type: none"> > access—24 hours—to either registered medical specialist with credentials in cardiology or registered medical specialist with credentials in internal medicine and relevant experience in cardiology. > access—24 hours—to at least one medical practitioner. > Access – to ICCnet SA Cardiologist for urgent consultations. <p>Allied health</p> <ul style="list-style-type: none"> > access to qualified staff to provide echocardiography and exercise stress testing. 	<p>As per Level 4, plus:</p> <p>Medical</p> <ul style="list-style-type: none"> > access—24 hours—to registered medical specialist with cardiology credentials. > sufficient supporting registered medical specialists with credentials in cardiology to provide sustainable 24-hour coverage. > nominated cardiac medicine unit lead clinician with responsibility for clinical governance of service. <p>Nursing</p> <ul style="list-style-type: none"> > staffing levels in accordance with the relevant industrial instruments. > all nursing staff with qualifications and/or experience in cardiac nursing. <p>Allied health</p> <ul style="list-style-type: none"> > access to identified radiographer, cardiac scientist or echocardiographer, physiotherapist and pharmacist. <p>Other</p> <ul style="list-style-type: none"> > access to technical support staff (e.g. biomedical engineers and scientific officers), as required. 	<p>As per Level 5 service.</p>
Specific risk considerations	> Nil	> Nil		> Nil

Support service requirements for Cardiac Medicine services	Level 3		Level 4		Level 5		Level 6	
	On-site	Accessible	On-site	Accessible	On-site	Accessible	On-site	Accessible
Anaesthetic		3		4	5		6	
Cardiac (cardiac care unit)		4	4		5		5	
Cardiac (cardiac diagnostic and interventional)					4		5	
Cardiac (cardiac surgery)						6		6
Intensive care		4		4	5		6	
Medical imaging	3		3		4		4	
Palliative care		3		4		5		5
Pathology		2		3	4		4	
Pharmacy	3		4		5		5	
Surgical						4	6	

Section 4 Cardiac Rehabilitation Services – Inpatient, Outpatient and Ongoing Prevention & Maintenance Services

Cardiac Rehabilitation Services – <i>Inpatient</i>	Level 4	Level 5	Level 6
<p>Service description</p>	<ul style="list-style-type: none"> > encompasses all measures used to help people with heart disease return to active and satisfying life, and prevent recurrence of cardiac events (also known as phase 1 cardiac rehabilitation). > should begin as soon as possible after admission to hospital. > core group of people eligible for cardiac rehabilitation are those who have had: <ul style="list-style-type: none"> – myocardial infarction – cardiovascular diagnostic and interventional procedures – cardiac surgery – stable or unstable angina – stable heart failure – Atrial fibrillation – other cardiovascular or coronary heart disease. > in absence of clinical contraindications for participation in inpatient cardiac rehabilitation, all eligible patients should be routinely offered this service. > all cardiac patients and their families require information, education and support based on their individual needs, aimed at identifying and reducing cardiac disease risk, appropriate to their cardiac diagnosis and/or intervention. > medical or formal assessment of patient’s level of risk should be performed and documented in the patient chart to enable identification of eligibility and referral to appropriate outpatient cardiac rehabilitation service. 	<p>As per Level 4 inpatient service.</p>	<p>As per Level 5 inpatient service.</p>

Cardiac Rehabilitation Services – Inpatient	Level 4	Level 5	Level 6
Service requirements	<p>As per module overview, plus:</p> <ul style="list-style-type: none"> > structured education program delivered on needs basis. > cardiovascular patient risk assessment and management plan (verbal and/or written). > patient empowerment to adopt self-management strategies. > basic information on condition and reassurance of common reactions (physiological). > guidelines for return to work and/or driving, activities of daily living and home exercise. > standardised education resource with risk-assessment capacity (e.g. My Heart My Life or equivalent and culturally sensitive resources). > culturally appropriate advice (preferably verbal explanation as well as written documentation), including return to work, activities of daily living and any driving restrictions. > documented processes for referral and/or access to allied health professionals, who may be hospital- or community-based. > documented processes for referral to outpatient cardiac rehabilitation service or alternative, which subsequently contacts clients either in person prior to discharge and/or within 2 weeks of discharge from inpatient service via follow-up telephone call and/or home visit and/or letter. 	<p>As per Level 4 inpatient service, plus:</p> <ul style="list-style-type: none"> > structured education program facilitated by multidisciplinary team delivered during set times and dates. > inpatient or timely access to allied health professionals, as required. 	<p>As per Level 5 inpatient service</p>

Cardiac Rehabilitation Services – Inpatient	Level 4	Level 5	Level 6
Workforce requirements	<p>As per module overview, plus:</p> <p>Medical</p> <ul style="list-style-type: none"> > access to registered medical specialist with credentials in cardiac care medicine. <p>Nursing</p> <ul style="list-style-type: none"> > staffing levels in accordance with the relevant industrial instruments. > access to registered nurse. <p>Allied health</p> <ul style="list-style-type: none"> > access to a range of allied health professionals, as required. > access to allied health professional with exercise qualification (e.g. physiotherapist, physiologist, occupational therapist). 	<p>As per Level 4 inpatient service, plus:</p> <p>Nursing</p> <ul style="list-style-type: none"> > staffing levels in accordance with the relevant industrial instruments. > registered nurse with designated time for provision of cardiac rehabilitation services. 	<p>As per Level 5 inpatient service.</p>
Specific risk considerations	> Nil	> Nil	> Nil

Support service requirements for cardiac rehabilitation services - Inpatient	Level 4		Level 5		Level 6	
	On-site	Accessible	On-site	Accessible	On-site	Accessible
Pharmacy	4		5		5	

Cardiac Rehabilitation Services - Outpatient	Level 4	Level 5	Level 6
<p>Service description</p>	<ul style="list-style-type: none"> > recognised focal point for development of life-long approach to prevention of cardiovascular disease (also known as phase 2 cardiac rehabilitation). > empowering patients to adopt self-management strategies is key objective. > indications for outpatient cardiac rehabilitation services include people who have experienced a recent cardiac event, known cardiovascular disease, and, increasingly, those at high risk of developing cardiovascular disease. > core group of people eligible for outpatient cardiac rehabilitation are those who have: <ul style="list-style-type: none"> – coronary heart disease (i.e. myocardial infarction, coronary artery bypass graft surgery, percutaneous transluminal coronary angioplasty and stable angina) – had valvular surgery – heart failure – congenital heart disease – heart and lung transplants – pacemaker or implanted automatic cardioverter defibrillator. > referrals to outpatient cardiac rehabilitation come from variety of sources, including medical practitioners, Aboriginal and Torres Strait Islander health workers, endorsed cardiac specialists, primary healthcare centres, community health centres, and inpatient or outpatient hospital clinics. > may be provided in range of settings, including hospitals, community health facilities, recreation centres and general medical practice, or combination of these. > may also be provided on individual basis in patient’s home, and may include combination of home visits, telephone support, videoconferencing and telehealth, or specifically developed self-education materials. > may be conducted by single health professional with documented, annually reviewed emergency protocols where available, consistent with recommendations for facility offering rehabilitation after cardiovascular disease (ACRA Practitioner Guidelines for Cardiac Rehabilitation, 2008).² > Level 4 outpatient service includes: <ul style="list-style-type: none"> – structured program delivered on needs basis – documented entry and exit assessment – clinical pathway or equivalent – education on risk factors and prevention strategies – support to empower patient / client to adopt self-management strategies – exercise component (not mandatory) – standardised education resource (e.g. My Heart My Life or equivalent) and other culturally sensitive resources – follow-up processes / referrals by telephone, by mail or in person. 	<ul style="list-style-type: none"> > conducted by multidisciplinary team of health professionals in accordance with recommendations for the facility. > programs designed to empower patient / client to adopt self-management strategies. > as per Level 4 service, but must also include: <ul style="list-style-type: none"> – structured education and exercise program facilitated by multidisciplinary team and delivered per group during set times and dates – access to exercise equipment – formalised, individualised and comprehensive assessment covering physical, psychological and social parameters – discharge letter to lead health practitioner, as nominated. 	<ul style="list-style-type: none"> > as per Level 5 service, with additional provision of psychosocial counselling, cognitive behavioural therapy, motivational interviewing, psychology or social work services.

Cardiac Rehabilitation Services - Outpatient	Level 4	Level 5	Level 6
Service requirements	<p>As per module overview, plus:</p> <ul style="list-style-type: none"> > documented emergency management protocols (reviewed annually). > access to oxygen and resuscitation equipment (bag and mask at minimum) and, if providing outpatient cardiac rehabilitation service involving exercise component, minimum of semi-automatic external defibrillator within facility. > access to monitoring equipment (blood pressure and blood glucose). 	As per Level 4 outpatient service, plus:	As per Level 5 outpatient service.
Workforce requirements	<p>As per module overview, plus:</p> <p>Medical</p> <ul style="list-style-type: none"> > access to medical practitioner who has access, via documented processes, to registered medical specialist with credentials in cardiac care / rehabilitation medicine to provide advice and guidance, as required. <p>Cardiac Rehabilitation Coordinator</p> <ul style="list-style-type: none"> > qualified health professional with degree, diploma or certificate of registration in medicine, nursing, physiotherapy, occupational therapy, exercise physiology, psychology, social work, pharmacy or nutrition, and additional qualifications and/ or work experience in cardiac rehabilitation, adult education principles and physical activity programs. > in some instances, only one qualified health professional where there is access to medical guidance and availability of referral for medical opinion. <p>Allied health</p> <ul style="list-style-type: none"> > access to range of allied health professionals, as required. 	As per Level 4 outpatient service.	As per Level 5 outpatient service.
Specific risk considerations	> Nil	> Nil	> Nil

Cardiac Rehabilitation – Ongoing Prevention & Maintenance Services	
Service requirements	<ul style="list-style-type: none"> > ongoing maintenance of behaviour change beyond period of time of ambulatory and/or inpatient rehabilitation critical for long-term health benefits. > services or programs offered within this period have emphasis on supporting behaviours and decreasing risks of future cardiovascular events. > where programs provided, both patient needs and available resources will determine type of program or service provided.
Service requirements	<p>As per module overview and outpatient cardiac rehabilitation programs, plus:</p> <ul style="list-style-type: none"> > follow-up processes and/or referrals by telephone, mail or in person, as required. > may include ongoing assessment and management of individual's goals. > may include involvement of medical practitioner as an integral part of an ongoing management plan. > may include access to exercise equipment.
Workforce requirements	<p>As per module overview, plus:</p> <ul style="list-style-type: none"> > designated health professional with credentials in, and knowledge of, cardiac rehabilitation or health behaviour / physical activity.
Specific risk considerations	<ul style="list-style-type: none"> > Nil

Section 5 Cardiac Surgery Services

Cardiac Surgery Services	Level 6
Service description	<ul style="list-style-type: none">> provides comprehensive surgical cardiac care, including complex multisystem life support, to critically ill patients, and on-site access—24 hours—to intra-aortic balloon pump insertion and management.> access to on-site intensive care service to provide pre- and post-operative care for cardiac surgical patients, and access to on-site interventional cardiac services (Section 2, Cardiac Diagnostic and Interventional Services) also available.> therapeutic and diagnostic procedures performed at all levels of patient complexity, as cardiac surgery is available on-site and cardiopulmonary bypass can begin within 2 hours where necessary.> access within the state to extracorporeal membrane oxygenation and/or ventricular assist devices.> AF ablation> Pacemaker related procedures
Service requirements	As per module overview, plus: <ul style="list-style-type: none">> documented processes for referral to subspecialist services (e.g. ventricular assist devices, transplant and medical specialists).> access—24 hours—to perfusionist where extracorporeal membrane oxygenation services provided.> documented processes for referral to allied health professionals who may be hospital or community-based.> Royal Australasian College of Surgeons (RACS) accreditation if providing cardiac registrars' surgical training (see www.surgeons.org).> access to cardiac rehabilitation (Section 4, Cardiac Rehabilitation Services).> access—24 hours—to relevant equipment to support intra-aortic balloon insertion, extracorporeal membrane oxygenation and ventricular assist devices.

Cardiac Surgery Services	Level 6
Workforce requirements	<p>As per module overview, plus:</p> <p>Medical</p> <ul style="list-style-type: none"> > access to registered medical specialists with credentials in cardiac surgery to provide 24-hour cover for cardiac surgical services. > access—24 hours—to registered medical specialist with credentials in cardiac surgery for consultation and emergency procedures. > access—24 hours—to registered medical specialist with credentials in cardiology. > all medical staff trained in advanced life support. <p>Nursing</p> <ul style="list-style-type: none"> > staffing levels in accordance with the relevant industrial instruments. > suitably qualified and experienced nurse manager (however titled) in charge of unit. > at least one registered nurse trained in advanced life support. > all nursing staff with qualifications and/or experience in post-operative cardiac surgical nursing. <p>Allied health</p> <ul style="list-style-type: none"> > access to allied health professionals, as required. <p>Other</p> <ul style="list-style-type: none"> > access to technical support staff (e.g. biomedical engineers), as required.
Specific risk considerations	<p>In addition to risk management outlined in the Fundamentals of the Framework and set out in the module overview, specific risk management requirements dictate a Level 6 cardiac surgery service must:</p> <ul style="list-style-type: none"> > demonstrate processes for formal audit and review of cardiac surgical services and quality activities, including: <ul style="list-style-type: none"> – at least two targeted clinical audits annually – compliance with available guidelines, network and/or any external death review processes
Support service requirements for cardiac surgery services	Level 6

Support service requirements for cardiac surgery services	Level 6	
	On-site	Accessible
Anaesthetic	6	
Intensive care	6	
Medical imaging	5	
Palliative care		5
Pathology	5	
Perioperative (relevant section/s)	6	
Pharmacy	5	
Surgical	6	

Section 6: Cardiac Clinical Networks and Cardiac Outreach Services

Service description:

Cardiac Clinical Network

- > provides essential Consultant Cardiologist support 24/7 primarily to GPs, and in some circumstances general physicians and nurses, in regional, rural and remote health services providing emergency cardiac care to their communities
- > ensures that all patients regardless of location of residence or presentation receive best practice acute care for cardiac disease in an appropriate timeframe with the aim of achieving equality of clinical outcomes with metropolitan patients
- > provides a single statewide roster of Consultant Cardiologists from Level 5 and 6 sites with a single access telephone number closely aligned to the State Retrieval, Aeromedical and Ambulance Service (MedSTAR/RFDS)

Cardiac Outreach services

- > support for the provision of essential cardiovascular disease consulting services in regional, rural and remote communities without resident specialists or with inadequate specialist capacity
- > includes provision and ongoing support for non-invasive cardiac investigation in these communities including standard exercise ECG testing, trans-thoracic echocardiography, Holter monitoring and ambulatory BP monitoring
- > coordinated provision of Cardiac Rehabilitation across regional, rural and remote settings utilizing the various models of care
- > provide CME support, clinical support and up-skilling of medical, nursing and other clinical staff in cardiovascular disease management across the continuum of care in local health settings

Service requirements

- > telehealth support for ECG interpretation, initial triage and treatment decisions, further investigation, and seamless transfer to Level 5 or 6 cardiac services
- > electronic recording of clinical information and sharing through digital communications technology (ICT) and networked electronic clinical databases
- > POCT pathology for cardiac markers and associated emergency pathology parameters
- > agreed evidence-based clinical pathways.
- > integrated provision of emergency medical transport and hospital services
- > standard cardiac drug formulary for all hospital and associated services in CHSALHN
- > video consultation infrastructure (Digital Telehealth network)
- > provision and technical support of non-invasive cardiac investigational equipment in regional, rural and remote sites
- > provision of comprehensive cardiac CME, clinical audit and in-service training and accreditation locally and through other channels
- > 24/7 clinical telephone hotline/ paging service with multiple levels of redundancy and continuous performance monitoring to ensure fail safe contact within prescribed timeframes

Workforce requirements

Medical:

- > Consultant Cardiologists experienced in provision of level 5 and 6 cardiac services, with a knowledge of the capacity and limitation of non- metropolitan Health services and staff and with a knowledge of aeromedical transport logistics

Nursing:

- > Staffing levels in accordance with the relevant industrial instruments.
- > experienced Cardiac Nurses for provision of telephone Cardiac Rehabilitation coaching services to eligible patients from a centralised location

Other

- > clinical network scientist support to maintain essential clinical infrastructure and to educate, train and certify regional, rural and remote medical staff in the operation of necessary equipment

Specific risk considerations

- > adequate digital bandwidth connectivity and access to ICT infrastructure and support is necessary for proper functioning of the clinical network
- > appropriate levels of support for travel, accommodation, practice absence, and provision of professional upskilling and support to regional, rural and remote clinical staff are required for providers of cardiac outreach services
- > a centralized bed management system covering level 5 and 6 cardiac services would assist in timely transfer of regional, rural and remote patients to these services and assist in optimising clinical outcomes
- > adequate access to and integration with emergency medical transport and retrieval services is necessary for proper functioning of the network

Non-mandatory standards, guidelines, benchmarks, policies and frameworks

Non-mandatory standards, guidelines, benchmarks, policies and frameworks (not exhaustive & hyperlinks current at date of release of CSCF)

In addition to what is outlined in the [Fundamentals of the Framework](#), the following are relevant to **cardiac medical services**:

- > Australasian Society for Ultrasound in Medicine. Policies and Statements B1. Policy on Diagnostic Ultrasound Services. ASUM; 1999. www.asum.com.au/newsite/files/documents/policies/PS/B1_policy.pdf
- > Therapeutic Goods Administration. Regulatory guidelines and standards for medical devices. www.tga.gov.au/

In addition to what is outlined in the [Fundamentals of the Framework](#), the following are relevant to **cardiac diagnostic and interventional services**:

- > Australasian Sonographer Accreditation Registry. Program Accreditation Guidelines. ASAR; 2007. www.asar.com.au/program-accreditation
- > Australian College of Operating Room Nurses. Standards for Perioperative Nursing for Registered and Enrolled Nurses in Australia. www.acorn.org.au/
- > Cardiac Society of Australia and New Zealand. Guidelines for Ambulatory Electrocardiographic Monitoring. CSANZ; 2009. www.csanz.edu.au/
- > Cardiac Society of Australia and New Zealand. Guidelines for Competency in Adult Diagnostic Cardiac Catheterisation and Coronary Angiography. CSANZ; 2008. www.csanz.edu.au/
- > Cardiac Society of Australia and New Zealand. Guidelines for Competency in Percutaneous Coronary Intervention. CSANZ; 2008. www.csanz.edu.au/
- > Cardiac Society of Australia and New Zealand. Guidelines for Training Requirements to Insert Implantable Defibrillators for Primary Prevention Indications. CSANZ; 2005. www.csanz.edu.au/
- > Cardiac Society of Australia and New Zealand. Guidelines on Support Facilities for Coronary Angiography and Percutaneous Coronary Intervention including Guidelines on the Performance of Procedures in Rural Sites. CSANZ; 2008. www.csanz.edu.au/
- > Cardiac Society of Australia and New Zealand. Recommended Guidelines for Subspecialty Training in Adult Cardiac Electrophysiology. CSANZ; 2007. www.csanz.edu.au/
- > Cardiac Society of Australia and New Zealand. Recommended Guidelines for Subspecialty Training in Cardiac Implantable Electronic Devices: Selection, Implantation and Follow Up. CSANZ; 2005. www.csanz.edu.au/
- > Cardiac Society of Australia and New Zealand. Training Guidelines in Adult Echocardiography. CSANZ; 2009. www.csanz.edu.au/
- > Heart Foundation. Australian Acute Coronary Syndromes Capability Framework (2015). www.heartfoundation.org.au/
- > The Australian and New Zealand Society of Cardiac and Thoracic Surgeons. Guidelines for the Establishment of an Adult Cardiac Surgery Unit (CSU). anzscts.wpengine.com/wp-content/uploads/2015/06/Guidelines_CSUs.pdf
- > The Australian and New Zealand Society of Cardiac and Thoracic Surgeons. Guidelines for the Myocardial Revascularisation and Transcatheter Valve. www.anzscts.org

Reference List

1. Nation Heart Foundation of Australia and Australian Cardiac Rehabilitation Association. Recommended Framework for Cardiac Rehabilitation '04. National Heart Foundation, 2004. <https://heartfoundation.org.au/images/uploads/publications/Recommended-framework.pdf>
2. Australian Cardiovascular Health & Rehabilitation Association (ACRA). Practitioner's Guide to Cardiac Rehabilitation. ACRA; 2008. <http://www.acra.net.au/wp-content/uploads/2015/01/Practitioner-Guidelines-Section-1.pdf>

For more information

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