REVIEW

Australian Cardiovascular Health and Rehabilitation Association (ACRA) Core Components of Cardiovascular Disease Secondary Prevention and Cardiac Rehabilitation 2014

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Background	Research on Australian cardiovascular disease secondary prevention and cardiac rehabilitation to guide practice needs updating to reflect current context of practice. It is timely therefore to review the core components that underpin effective services that deliver maximum benefits for participants.
Methods	The Australian Cardiovascular Health and Rehabilitation Association (ACRA) convened an inter-agency, multidisciplinary, nationally representative expert panel of Australia's leading cardiac rehabilitation clinicians, researchers and health advocates who reviewed the research evidence.
Results	Five core components for quality delivery and outcomes of services were identified and are recommended; 1) Equity and access to services, 2) Assessment and short-term monitoring, 3) Recovery and longer term maintenance, 4) Lifestyle/behavioural modification and medication adherence, and 5) Evaluation and quality improvement.
Conclusions	ACRA seeks to provide guidance on the latest evidence in cardiovascular disease secondary prevention and cardiac rehabilitation. Clinicians should use these core components to guide effective service delivery and promote high quality evidence based care. Directors of hospitals and health services should use these core components to aid decision-making about the development and maintenance of these services.
Keywords	Core Components • Quality Delivery • Outcomes • Cardiovascular Disease • Secondary Prevention • Cardiac Rehabilitation

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Introduction

Cardiovascular disease (CVD) is the biggest killer of Australians [1]. A large proportion of these deaths are premature and preventable [1]. Australians in lower socioeconomic groups, Aboriginal and Torres Strait Islander people and those living in remote areas have the highest rates of hospitalisation and death from CVD [2]. There is Level 1, Grade A evidence, defined according to National Health and Medical Research criteria [3], that attendance at cardiovascular disease secondary prevention and cardiac rehabilitation (CR) after a cardiac event decreases morbidity and mortality and improves quality of life [4].

CR is eloquently defined by the World Health Organisation as "the coordinated sum of activities required to influence favourably the underlying cause of cardiovascular disease, as well as to provide the best possible physical, mental and social conditions, so that the patients may, by their own efforts, preserve or resume optimal functioning in their community and through improved health behaviour, slow or reverse progression of disease" [5]. Worryingly, equity and access to CR in Australia remains alarming low, with the recent SNAPSHOT study demonstrating that only 47% of eligible patients were documented as referred and that fewer still were discharged on a minimal level of effective secondary prevention [6].

There are barriers to CR participation that are unique to Australia [7]. These include diverse cultural and linguistic needs; a third of Australia's population have emigrated from other countries [8] and transportation logistics associated with a rapidly ageing population [8]. The vast geographical area further complicates CR provision, particularly given the dominance of facility-based CR services [9]. There is clear access disparity between those living in densely populated urban areas and those in the most remote regions of Australia [9]. Specific barriers also exist for Aboriginal and Torres Strait Islander people, including the lack of cultural sensitivity and safety within the Australian health care system and paucity of services designed specifically for their needs [7]. The aims of this paper are to summarise the current evidence for CR with reference to the Australian setting and to establish core components, which should underpin all CR services in Australia.

Material and Methods

The Australian Cardiovascular Health and Rehabilitation Association (ACRA) convened an inter-agency, multidisciplinary, nationally representative expert panel of Australia's leading cardiac rehabilitation clinicians, researchers and health advocates who reviewed the research evidence. A detailed review of national and international guidelines and position statements was undertaken [10–13]. Core components from the review were drafted and revised iteratively by the writing panel. The 2014 ACRA executive management committee has endorsed this paper.

Core Components

The core components (Box 1) for Australian CR services have been grouped into five areas for service delivery.

1. Referral and access to services
2. Assessment and short-term monitoring
3. Recovery and longer term maintenance
4. Lifestyle/behavioural modification and medication adherence
5. Evaluation and quality improvement

Referral and Access to Services

Core Component 1: All eligible patients must be offered referral to a CR service which best suits their individual needs, as soon as possible after diagnosis or before discharge from hospital including a referral to a General Practitioner (GP) for long-term care.

Eligibility

Patients eligible for CR, as defined by the National Heart Foundation of Australia, include [14]:

- Acute Myocardial Infarction (MI) – both ST elevation and Non-ST elevation; including patients with and without

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Box 1

Summary of core component descriptions.

Core Component 1: All eligible patients must be offered referral to a CR service which best suits their individual needs, as soon as possible after diagnosis or before discharge from hospital including a referral to a General Practitioner (GP) for long-term care.

Core Component 2: All eligible cardiac patients to receive an individualised initial assessment that includes physical, psychological and social parameters with referral on to appropriate services (internal or external to the CR service) based on patient needs; followed by ongoing review, discharge assessment and follow-up.

Core Component 3: CR services should facilitate patients to return to, or to improve on, baseline everyday functioning, including employment, driving, resumption of sexual activity, and other activities of daily living and maintain lifelong. When the cardiac condition or other co-morbidities preclude this, the CR service should focus on maximising potential and providing coping strategies.

Core Component 4: CR services should be tailored to provide education and skill development to motivate and enable patients to self-care and make changes in their lifestyle, to address multiple cardiovascular risk factors, and to ensure adherence to prescribed medications

Core Component 5: All CR services must collect a minimum set of data and report on key performance indicators to ensure to promote continuous quality improvement of services and benchmarking.

post-MI revascularisation, e.g. those medically-managed only

- Revascularisation procedures
  - Coronary artery bypass graft surgery
  - Percutaneous coronary interventions
- Medically-managed coronary artery disease (CAD), e.g. stable angina
- Heart failure and cardiomyopathy conditions
- Valve device, replacement and repair
- Permanent pacemaker and implantable defibrillator insertion
- Heart transplant and ventricular assist device

More recently evidence has determined that people with other conditions are likely to benefit from CR. Where possible, people with the following conditions should be included in CR services:

- Atrial fibrillation [15]
- Those at high risk for coronary artery disease [16]
- Other vascular or heart diseases and interventions [17]
- Familial hypercholesterolaemia [18]

For the purposes of this document, individuals identified as eligible for CR will be termed *patients*.

Reasons for non-participation may include severe dementia, terminal illness, and patient refusal. All reasons for non-participation should be recorded, for example language other than English. Evidence of specific areas of need can then be used to support a case for increased resources, e.g. interpreters or translated resources.

Specific considerations in relation to Aboriginal and Torres Strait Islander peoples

Aboriginal and Torres Strait Islander peoples have higher rates of heart disease compared to non-Aboriginal people of the same age by an average of at least 6% [19]. Despite this, many Aboriginal and Torres Strait Islander peoples do not receive ongoing management of their cardiac or other chronic comorbidities after discharge from hospital [20]. Rates of participation in CR by Aboriginal and Torres Strait Islander peoples are extremely low due to extended family responsibilities, sociocultural inappropriateness of services, poor understanding of CR, the connection between colonialism and health services, negative heart health messages in the media, and the younger age of the affected population [21]. Aboriginal and Torres Strait Islander peoples need an understanding of their medical condition, and require education regarding medication use, wound care (as appropriate), risk factor modification, potentially reduced functional capacity, and prognosis. In order to optimise care and assertively address the current disparities in outcomes, Aboriginal and Torres Strait Islander peoples should expect coordinated, culturally-appropriate education, involving families [7]. This should be initiated during hospital admission and supported by local Indigenous cardiac coordinators, Aboriginal liaison officers and health workers with effective follow-up care and access to relevant CR services and resources after return to the community [7].

Systems of referral and recruitment

A combination of automatic referral using electronic patient records or standard discharge orders as a systematic prompt before hospital discharge, and liaison, where a member of the CR team visits the cardiac patient during the hospital admission, is most likely to increase CR participation [22]. If a patient requires referral to another service, ACRA has detailed, up-to-date national CR directories [23]. Where possible, patients should receive a detailed initial assessment (See core component 2) shortly after referral is received.

Models of service delivery

Location or local resources may limit service delivery; however it is imperative that all CR services strive to provide the most comprehensive care within the resources available [13]. Example CR models of service delivery include:

- Facility-based exercise, education and psychosocial components or combination services
- Home-based services
- Telephone-based services
- Mobile phone and internet-based services

Expertise and qualifications of the multidisciplinary team

Cardiac patients have complex physical, social and spiritual needs [24]. Skilled CR professionals can facilitate recovery, identify health care needs, changes in health status and prevent deterioration in condition [25]. Many patients will have comorbid illnesses and CR professionals need sufficient knowledge and expertise to manage these [10]. CR professionals must be able to demonstrate ongoing professional development in areas of relevance to their role. The CR team may comprise a cardiologist, physician or general practitioner with special interest, nurse specialist, physiotherapist, exercise physiologist, dietician, psychologist, occupational therapist, social worker, pharmacist, clerical administrator, dependent on local resources and needs.

Assessment and Short Term Monitoring

Core Component 2: All eligible cardiac patients to receive an individualised initial assessment that includes physical, psychological and social parameters with referral on to appropriate services (internal or external to the CR service) based on patient needs; followed by ongoing review, discharge assessment and follow-up.

Detailed initial assessment

The purpose of the initial assessment is to gather information, during either face-to-face, video/web conference link, or telephone-based consult, about the patient's clinical, psychological and social status and to enable the initiation of an appropriate CR service. Information collected should be directly entered into an electronic database [26]. This facilitates data extraction, analysis and outcome evaluation for both the individual patient and the overall service. It also enables report generation to the patient's medical practitioners [26]. Items that should be assessed (where applicable) are detailed in Table 1. Following completion of the initial

Table 1   Core Components, Minimum Dataset and Key Performance Indicators.

Core Component and sub-items What should be measured?	Data to collect to evaluate service What data should be collected to measure the core component?	Key performance indicators (KPI)* How effective is you service? What is the target or outcome for the core component *ACRA target/national benchmarks
Core Component 1. Access to Services		
1.1 Eligibility	<u>Eligibility</u> Number of patients eligible for CR Reasons for non-attendance Residential post code to monitor catchment areas <u>Participation rates</u> No. of referred patients commencing a service	% of eligible patients not referred <u>Participation rates</u> % of referred patients commencing % of patients commencing
1.2 Aboriginal and Torres Strait Islander patients	Record number of patients who have been identified as Aboriginal and Torres Strait Islander people Number commencing Number completing	<u>Participation rates</u> % of referred Aboriginal and Torres Strait Islander patients commencing <u>Completions</u> % of Aboriginal and Torres Strait Islander patients completing
1.3 Systems of referral and recruitment	<u>Referrals</u> Number of patients referred	<u>Referrals</u> % of eligible patients referred to a service
1.4 Models of programs delivery	Record model of service delivery chosen by patient Record reason for choice Record reason for refusal	% of uptake in each type of service Summary of reasons for choice or refusal % of completion of each type of service
1.5 Expertise and qualifications of the multidisciplinary team	List of team members and qualifications	% of team with qualifications appropriate to ACRA recommendations 2014
Core Component 2. Assessment and Monitoring		
2.1 Detailed initial assessment **a) Demographic data and previous history**	1. Patient Name 2. Medical record number 3. Date of Birth 4. Gender 5. Residential Postcode 6. Employment Status 7. Living Circumstances 8. CVD risk factors 9. Family History CVD	Mean age % gender % metropolitan % rural % employed % retired % lives alone % married or lives with carer or other % risk factors % more than one risk factor
b) Ideal items of assessment	• Current diagnosis, intervention – ensure patient has adequate knowledge/awareness of his/her clinical condition, conduct measurement of radial pulse and/or heart rate/rhythm via electrocardiogram • Past and current medical history, co-morbidities and current management, including prescribed and over-the-counter medicines and natural therapies • Cultural background and any sensitivities • Symptom and wound pain review – frequency, severity, management, medical (GP) review required/conducted	% of patients assessed for these ideal items % of patients booked for following appointment

Table 1. (continued).

Core Component and sub-items What should be measured?	Data to collect to evaluate service What data should be collected to measure the core component?	Key performance indicators (KPI)* How effective is you service? What is the target or outcome for the core component *ACRA target/national benchmarks
	• Review wounds/puncture sites; appropriate healing, sternal assessment for movement/non-union • Explanation about availability of further aspects of the CR service; exercise sessions, education sessions, ongoing phone contact, text messaging or web based follow-up sessions • Assessment of functional capacity • Scheduling of next appointment (e.g. exercise session, education session, review assessment) – attempt to book following appointment as soon as practicable after initial assessment	
2.2 Structured ongoing review, discharge and follow-up process a) **Collect clinical data:** • **At commencement of service** • **At completion of service** • **At 6 month follow-up** • **At 12 month follow-Up**	Entry in hospital medical record patient has received My Heart My Life (or similar) and information about local CR services. Entry in medical records regarding referral to CR services Document clinical course (e.g. procedures/interventions and Major Adverse Cardiovascular Events (MACE)) which occur during CR and any related management plan Communicate with GP and cardiologist about clinical outcomes and plan for ongoing management	% of patients with documented evidence of CR referral in hospital medical record % of letters written to GP and Cardiologists within two weeks of CR completion including clinical outcomes and plan for ongoing management % of patients achieving recommended goals for each clinical outcome
b) **Definitions of completion**	<u>Completions</u> No. of patients completing CR service Reasons for non-completion *Definitions of completion include:* • *Achievement of a patient's goals consistent with lower risk profile (e.g. improvement in diet, exercise capacity, smoking cessation, taking medications as prescribed)* • *Attendance at an agreed number of exercise and/or education sessions in line with the patient's goals and services available* • *Attendance at an agreed number of phone/web/video-conference based consultations with emphasis on the patient's goals and services available*	<u>Completions</u> % of patients completing
2.3 Inclusion of the family	Attendance of spouses or significant others attending education/counselling sessions	% of spouses or significant others who attended education/counselling sessions
Core Component 3. Recovery and Longer Term Management		
3.1 Return to normal functioning	1. Return to work (as applicable) and time after event	% patients formerly in the workforce who resume work

Table 1. (continued).

Core Component and sub-items What should be measured?	Data to collect to evaluate service What data should be collected to measure the core component?	Key performance indicators (KPI)* How effective is you service? What is the target or outcome for the core component *ACRA target/national benchmarks
Return to work **Normal activities of daily living** **Driving** **Sexual activity**	2. Return to driving (as applicable) and time after event 3. Resumed sexual activities and time after event 4. Record reasons for not achieving above	% return to driving and time % return to sexual activity and time after event
3.2 Exercise Programming	1. Baseline physical functioning assessed by validated measures. 2. Referral to specialist exercise physiologist or physiotherapist	% of patients who received ''Exercise'' education session % of patients whose lower body strength is assessed % of patients whose upper body strength is assessed % of patients whose functional capacity for daily activities is assessed % Referral to Exercise physiologist or physiotherapist
3.3 Life-long management	Prepare a plan with patient and family for long-term maintenance. Give copy to patient and send copy to GP.	% long term maintenance plan completed
Core Component 4. Lifestyle/Behavioural Modification and Medication Adherence		
4.0 Medication adherence	1. List all medication (dose and frequency) 2. Measure adherence using a validated self-reported tool	% of patients who received education on the importance of adherence to cardiovascular medicines including rationale and barriers to adherence. % of patients adhering to recommended pharmacotherapy at every interaction with patient.
4.1 Importance of incidental physical activity	1. Validated self-report- physical activity assessment tool 2. Physical limitations/co-morbidities history 3. Referral to specialist exercise physiologist or physiotherapist	% of patients who received education session % of patients achieving individually prescribed physical activity at the end of CR program % Retention of knowledge and self-care skills at 6 months and 12 months % Referral to exercise physiologist or physiotherapist
4.2 Smoking cessation	1. Measure of nicotine dependence using validated tool 2. Carbon monoxide levels 3. Referral to Quitline 4. GP – Nicotine Replacement Therapy	% of smokers who stopped smoking % of patients who received smoking cessation education (as applicable to individual patient), including referral to smoking cessation support programs e.g. Quit line % of smokers who are still reformed smokers at 6 months and 12 months
4.3 Diet and nutrition	1. Validated assessment of nutritional status 2. Alcohol intake (self-report) 3. Caffeine use (self-report) 4. Referral to dietician	% of patients who received education on the recommended Australian Guide to Healthy Eating % of patients who made changes in dietary pattern % Referral to dietician

Table 1. (continued).

Core Component and sub-items What should be measured?	Data to collect to evaluate service What data should be collected to measure the core component?	Key performance indicators (KPI)* How effective is you service? What is the target or outcome for the core component *ACRA target/national benchmarks
4.4 Weight Management	1. History (self-report) 2. Height, weight, waist circumference 3. Referral to dietician	% of patients who received weight management education % of patients who achieved weight loss or reduction in waist measurement % retention of knowledge and self-care skills at 6 months and 12 months % referral to dietician
4.5 Blood pressure management	1. Assessed according to best practice guidelines 2. Sitting/standing blood pressure	% of patients who received blood pressure education session % referred for medication titration % of patients who achieve and maintain a BP of < 130/80 mmHg at 3, 6 & 12 months % referral to GP
4.6 Cholesterol/lipid management	Access pathology data 1. Total Cholesterol 2. Low density lipoprotein (LDL) 3. High density lipoprotein (HDL) 4. Triglycerides 5. Referral to GP	% of patients whose cholesterol or LDL lowered to recommended levels % of patients who received education on cholesterol management % retention of knowledge and self-care skills at 6 months and 12 months % referral to GP
4.7 Diabetes management	Access pathology data 1. Glycosylated Haemoglobin (HbA1c) 2. Fasting Blood Glucose Level (BGL) 3. Review patient diary	% of patients achieving recommended HbA1c or improvement in glycaemic control % of patients who received education and referral to credentialled diabetes educator % of patients who are self–monitoring at 6 months and 12 months % referral to GP % referral to diabetes educator
4.8 Psychological status	1. Health related quality of life assessed using a validated score 2. Depression and Anxiety assessed using a validated score	% of patients with improvement on a quality of life measure % of patients with improvement on anxiety and depression score % of patients referred for professional psychological counselling or other follow-up % patients referred to GP
4.9 Obstructive sleep apnoea	1. Sleep apnoea assessed with validated tool 2. Referral to GP/specialist as appropriate	% patients referred to GP
4.10 Alcohol and illicit drug use	1. Self-report 2. Referral to drug and/or alcohol rehab	% referred to drug and/or alcohol rehab
4.11 Action plans	1. Lifestyle management action plan E.g. ''Managing My Heart Health'' – an interactive self-management resource that provides lifestyle, medical and psychosocial strategies to reduce the risk of further heart problems	% patients received and reviewed action plan appropriate to their clinical status

Table 1. (continued).

Core Component and sub-items What should be measured?	Data to collect to evaluate service What data should be collected to measure the core component?	Key performance indicators (KPI)* How effective is you service? What is the target or outcome for the core component *ACRA target/national benchmarks
	2. Chest Pain action plan E.g. ''Will you recognise your heart attack?'' – a concise action plan that lists the warning signs of a heart attack and provides direction to patients on how and when to use prescribed nitrate medicine (e.g. anginine) and when to call '000' for an ambulance 3. Heart failure action plan E.g. ''My heart failure action plan'' – included within the ''Living everyday with my heart failure'' resource (a booklet for Aboriginal and Torres Strait Islander peoples with chronic heart failure), this action plan provides patients with guidance in how to treat heart failure symptoms and when patients should see a health professional	
Core Component 5. Evaluation and Quality Improvement		
5.0 Audit KPIs and Minimum Data Collection	Bi-monthly audits to evaluate completion of minimal dataset for every patients	minimal data collected for each patient
a) Program effectiveness	Measures of CR program effectiveness	% of patients achieving goals in behavioural health or clinical outcomes % of patients with an increased awareness of chest pain recognition and management
b) Readmission	Readmission within 28 days Readmission within 3 months Readmission within 12 months	
c) Death	Death within 28 days Death within 3 months Death within 12 months	

assessment all patients should receive ongoing CR relevant to their individual needs and goals.

Structured ongoing review, discharge and follow-up process

Regular review during CR should focus on priority areas identified during the initial assessment, including patient self-selected short and long-term goals. All patients should receive a discharge assessment on completion of CR [12] and follow-up as appropriate. A standardised discharge assessment should be used for ease of data collection and review of key performance indicators (KPIs) (Table 1). Definition of completion should be clearly articulated by the CR service. See Table 1 for ACRA definitions of completion. Where

practicable, six and 12-month follow-up should be implemented to focus on the ongoing prevention of CVD. Overall care is coordinated through the patient's GP. The CR service should ensure communication with the patient's GP and cardiologist is maintained at all points of care.

Inclusion of the family

Family members should be included. Having a family member involved is culturally appropriate for many ethnic groups, increasing the likelihood of long-term maintenance of behaviour change [27]. Family members tend to have similar risk profiles and changes to the risk profile of the family is likely to have synergistic health benefits [27] and family engagement increases participation in CR [27].

Recovery and Longer Term Maintenance

Core Component 3: CR services should facilitate patients to return to, or to improve on, baseline everyday functioning, including employment, driving, resumption of sexual activity, and other activities of daily living and maintain life-long. When the cardiac condition or other co-morbidities preclude this, the CR service should focus on maximising potential and providing coping strategies.

Return to normal functioning

In the majority of individuals the goal is to return to premorbid employment or role, activities of daily living and personal pursuits. Education and support should be provided on resumption of physical activity, resumption of work or voluntary roles, driving, sexual activity, and tasks in general [13]. This education should be tailored to the individual, provided in writing and include referral for additional support as needed.

Exercise Programming recommendations

Regular physical activity is crucial in CVD management and prevention [28]. Exercise training improves fitness, quality of life, disease related symptoms, coronary risk profile, decreases symptoms of anxiety and depression and reduces mortality [29]. Unless contraindicated structured exercise training and regular physical activity is recommended for all CR patients [29]. However, many conditions can be safely accommodated through thoughtful exercise prescription.

Patients with clinically stable CVD should aim to achieve 30 minutes or more of low to moderate intensity (noticeable increase in rate of breathing while able to conduct a normal conversation), physical activity on most days of the week [29]. To enable all patients to achieve these recommendations, individualised exercise prescription with regular progression should be provided, where available. High-intensity training may be offered to individuals with a high level of premorbid fitness aiming to return to high intensity physical activity [30], where it is clinically safe to do so, and treating doctors agree. Resistance training (RT) has been shown to have positive effects on muscle strength, lean body mass, bone strength and vascular function in addition to improving quality of life [31]. RT should be included in all exercise programs and is best initiated under supervision by a trained practitioner.

Life-long management

Prevention of CVD requires life-long self-management by the individual [35], supported by the GP. For the benefits of secondary prevention to be maintained in different populations and health-care settings there must be strategies aimed at chronic disease self-management, at the provider, community and organisational level.

Lifestyle/Behavioural Modification and Medication Adherence

Core Component 4: CR services should be tailored to provide education and skill development to motivate and enable patients to self-care and make changes in their lifestyle, to address multiple cardiovascular risk factors, and to ensure adherence to prescribed medications.

Lifestyle and behaviour change is most likely to occur when the patient and the healthcare provider have formed a therapeutic alliance [32] utilising techniques of motivational interviewing [33]. Motivational interviewing encompasses empathy, interpersonal engagement, developing discrepancy between an actual behaviour and a desired behaviour and reinforcement of patient change talk [33]. Finally, a mutual commitment to the agreed change is made [33]. It is recommended that practitioners undertake training in these techniques to enable patients to modify lifestyle and biomedical risk factors.

In addition to favourable lifestyle changes, advances in cardiovascular pharmacology have contributed to improved survival after CVD diagnosis [18]. A complex array of factors contribute to medication persistence, among them: perceptions of the disease process; attitudes towards medications generally; and the therapeutic alliance with clinicians [34]. Most patients will require ongoing pharmacotherapy to manage biomedical risk factors (e.g. hypertension, dyslipidaemia, diabetes). It is important that CR professionals work in concert with the patient and the prescriber to support the patient's continuation of evidence-based pharmacotherapy.

Importance of incidental physical activity

Emerging evidence suggests that sitting time is related to poorer health outcomes independent of meeting recommended targets for moderate physical activity [35]. Appropriate guidance should be provided emphasising the importance of incidental physical activity in times of occupational, recreational and other tasks of daily living, for overall health benefits [35].

Smoking cessation

Tobacco smoking is a well-established risk factor for the development of CVD [36]. The effects of second-hand smoke seem to be almost as potent as those of actively smoking, increasing the risk of CVD [37]. Cessation and avoidance has been demonstrated to significantly reduce the risk of mortality [37]. Within CR services patients should be actively supported, to meet these aims [38] and referred to appropriate smoking cessation services as required.

Diet and nutrition

Diet and nutritional strategies for health target many of the risk factors for the development and prevention of CVD including hypertension, obesity, diabetes, and dyslipidaemia. Education and counselling should ideally target a ''healthy eating'' pattern aimed at reducing intake of saturated fats and trans fatty acids, sugar and salt while recommending increasing intake of fresh fruit and vegetables [39].

Weight management

CVD incidence and mortality increases as a result of central obesity [40]. Increased risk is indicated with waist measurements of 94 cm or more in men and 80 cm or more in women. Substantially increased risk is indicated with measurements of 102 cm or more in males and 88 cm or more in females [40]. The increases in waist circumference are largely caused by raised levels of visceral fat, which are particularly associated with

metabolic disease risk [40]. Patients should be offered individual education and counselling to support achievement of 5-10% weight reduction initially, followed by further goal setting and advice [40].

Blood pressure management

Lifestyle modification, including reduction of salt intake, limiting alcohol intake, being physically active and achieving and maintaining a healthy weight is indicated for all patients with hypertension [41]. All patients should also be advised on the importance of continuation of antihypertensive therapy, not only for antihypertensive benefits but also because some medications given for treatment of hypertension offer additional cardio-protective benefits, e.g. Beta Blockers [42]

Cholesterol/lipid management

Lowering low-density lipoprotein (LDL) through medication reduces morbidity and mortality from CVD [43]. Conversely, raised high density lipoprotein (HDL) levels have been shown to protect against CVD [43]. CR practitioners should advise patients to take lipid-lowering medications as prescribed, follow a healthy eating pattern, and have regular lipid profile studies and liver function tests (if on combination therapy) in accordance with national guidelines [44].

Diabetes management

People with diabetes have higher CVD morbidity and mortality than those without diabetes. Importantly, someone who has both CVD and diabetes has an even greater risk of MI and death than those with either CVD or diabetes alone [45]. It is well known that CVD and diabetes share similar risk factors and lifestyle modification has favourable outcomes for the management of both conditions [45]. CVD patients with diabetes should be advised to regularly monitor blood glucose levels and modify lifestyle factors (diet, exercise, weight control) to improve diabetes management.

Psychological status

Depression is common in patients with CVD and is an independent risk factor for CVD and poorer outcomes after an event [46]. Other common reactions to a cardiac diagnosis include anxiety, anger and sexual dysfunction [46]. Treatment of depression post MI improves quality of life and may improve other cardiovascular outcomes [46]. All patients should be screened for depression and anxiety with a validated assessment tool, preferably while in hospital and this should be repeated during and at completion of CR [46]. Patients screened as positive should be referred for stepped, collaborative care. This may include psychotherapy (e.g. Cognitive Behavioural Therapy) and/or prescription of antidepressant/antianxiety medications.

Obstructive sleep apnoea

The incidence of fatal and non-fatal CVD events in untreated patients with severe obstructive sleep apnoea (OSA) is significantly higher than in healthy participants [47]. Treatment with continuous positive airway pressure (CPAP) significantly reduces cardiovascular risk in patients with severe OSA [47]. Patients with CVD, stroke, diabetes, obesity or poorly-controlled hypertension are at high risk of OSA and should be screened for symptoms of OSA [47] and referred to an appropriate specialist as required.

Alcohol/illicit drug use

Patients should be advised to consume a low risk amount of alcohol in order to decrease the likelihood of the many related risk factors associated with high risk alcohol consumption [44]. Specifically, patients should be recommended to drink no more than two standard drinks per day and to have at least two alcohol free days per week [44]. Patients should be offered brief advice/counselling to encourage reduction/moderation of alcohol intake. This may be conducted during CR or via the patient's GP. In patients who are alcohol dependent, withdrawal may be complicated and referral to clinics/agencies with expertise in addiction should be considered [51].

Several cardiovascular complications are closely related to illicit drug use. The use of heroin, cocaine and methamphetamine is linked to increased risk of fatal and non-fatal CVD events, particularly in younger adults [48]. CVD patients who continue to use illicit drugs should be offered referral to clinics/agencies with expertise in drug addiction.

Action plans

Patients should routinely be provided with resources to facilitate lifestyle/behavioural modification and self-management of their cardiac disease and any co-morbidities. These resources, often known as action plans, enable patients to put into practice strategies that improve the management of their cardiac condition. These may include a chest pain management plan, heart failure management plan or diabetes management plan. When implemented appropriately, these action plans may prevent a potential hospital admission.

Evaluation and Quality Improvement

Core Component 5: All CR services must collect a minimum set of data and report on key performance indicators to ensure to promote continuous quality improvement of services and benchmarking.

Despite the overwhelming evidence of the effectiveness of CR services, they are currently underutilised in Australia [6]. As a result the National Heart Foundation of Australia put forward nine key action areas to improve equity and access, uptake and quality of services for patients with CVD [12]. Specific recommendations included the importance of identifying measures that reflect the results of care in three domains (behavioural, clinical and health) of the nationally developed KPIs for CR services. Collection of national standardised outcome data is an important part of benchmarking and ensuring standardised delivery of services [11]. Data may be used as a means of evaluation to gauge the progress, measure improvement, demonstrate value/ effectiveness and provide evidence on investment [12]. The national performance indicators included in the Heart Foundation's recommendations for cardiac patients are derived from international standards [12].

Minimum data to collect

Table 1 provides a comprehensive list of examples of data that may be collected to evaluate the quality and outcome of individual's participation performance for each of the five core components described in this paper. This list is extensive and not all services may have the capability to collect all elements.

Key performance indicators

KPIs are derived from the minimum dataset and will report process measures and summaries of service outcomes. In Table 1 ACRA has recommended some national targets for these KPIs to encourage CR providers to collect and monitor their own performance.

Audit

The collection and reporting of this data will enable CR clinicians to accurately reflect on the capabilities of their services and areas that may need to improve. This data may be used to advocate for additional resourcing where funding is limited or to maintain resources and funding where services are well established. ACRA recommends routine clinical practice data is collected and stored electronically and reviewed monthly by the coordinator/manager of the Service, with reports prepared annually.

Conclusion

CR services in Australia are diverse. CR services should be tailored to the individual patient's needs and capabilities for participation and in some instances, multiple options made available. ACRA recommends that clinicians working in the field of CVD secondary prevention and CR utilise this core components document, which presents the current evidence base for delivery of CR to inform best practice. ACRA encourages CR providers to adopt the five core components outlined within this statement to improve the delivery of CR within Australia. The authors acknowledge that this document has its limitations and proposes the collaboration of ACRA, the National Heart Foundation of Australia and the Cardiac Society of Australia and New Zealand to produce national guidelines for CVD secondary prevention and CR service delivery.

Acknowledgements

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