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POSITION STATEMENT

2026 Update of the Core Components of Cardiovascular Rehabilitation: A Position Statement From the Australian Cardiovascular Health and Rehabilitation Association (ACRA)

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Introduction

Cardiovascular disease (CVD) remains a leading cause of death and disability both globally and in Australia [1,2]. In 2022, an estimated 1.3 million Australian adults were living with CVD [2]. Up to 57% of CVD cases and 22% of all-cause deaths are attributable to key modifiable risk factors, highlighting the substantial potential for prevention [3]. Cardiovascular rehabilitation and secondary prevention programs are highly effective strategies for reducing repeat cardiac and new stroke events, improving quality of life, and supporting long-term cardiovascular health [4–6]. The benefits of cardiovascular rehabilitation are well established and widely endorsed by national [4] and international clinical practice guidelines [5,6].

Cardiovascular rehabilitation has traditionally been delivered via structured, multidisciplinary programs that provide comprehensive risk factor management through supervised exercise training, education, psychosocial support, and by supporting adherence to evidence-based medical therapy [4,7,8]. Programs are delivered across a range of healthcare settings (public, private and community health) and through different modes, including in-person, telehealth, and digital/virtual formats. Models of care also vary and may include centre-based, home-based, hybrid and hub-and-spoke approaches [9].

Contemporary thinking frames cardiovascular rehabilitation within the broader concept of lifelong cardiovascular health, rather than as a time-limited intervention [10]. The 2026 World Heart Federation Roadmap on cardiac rehabilitation [9] defines a cardiovascular health programme as:

> *"...the systematic provision of ongoing care and support for individuals with, or at elevated risk of, CVD, which in combination with all aspects of evidence-based prevention and rehabilitation will lead to lifelong cardiovascular well-being. Care should be person-centred and encompass all aspects of lifestyle optimisation, clinical management of risk factors, psychosocial support, and adherence to guideline-directed medical therapy."*

This definition reinforces the central role of cardiovascular rehabilitation in supporting lifelong cardiovascular health [10].

In 2014, the Australian Cardiovascular Health and Rehabilitation Association (ACRA) published the inaugural national core components for cardiovascular rehabilitation and secondary prevention to guide practice and promote consistent, high-quality care [11]. Over the past decade, remote and hybrid models, including telehealth, virtual platforms, digital programs and wearable technologies, have gained widespread acceptance, accelerated by the COVID-19 pandemic and rapid technological advances [12]. These contemporary delivery modes offer opportunities to improve equity of access, flexibility, and person-centred care, while addressing evolving workforce and health system needs [13]. Regardless of delivery format, all cardiovascular rehabilitation programs should comply with all core components and evidence-based best practices. Maintaining robust standards is essential to ensure quality, consistency, and equity of care across diverse settings.

The aim of this position statement was to update the core components of cardiovascular rehabilitation in Australia to reflect societal, technological, and health system changes since its first iteration in 2014 [11], whilst reaffirming the fundamental principles and enduring evidence base. Recognising variation in local contexts and resources, this document is not intended to be prescriptive and does not function as a clinical guideline. Rather, it informs the delivery of evidence-based, context-sensitive cardiovascular rehabilitation and defines the core components needed to promote lifelong preventative care following a cardiovascular diagnosis.

Methods

This position statement was developed by a nationally representative, multidisciplinary writing group composed of clinician and academic ACRA members convened through an expression-of-interest call. Additional subject matter experts and two consumers were also appointed. The group reviewed the 2014 version, identified areas requiring update, and undertook an iterative process of evidence gathering and literature synthesis. Subgroups were assigned to draft specific sections based on their areas of expertise. They critically appraised the most current and highest-quality evidence, including meta-analyses, systematic reviews, randomised controlled trials, international guidelines and relevant Australian clinical guidelines or guidance documents to ensure national coherence. Although a comprehensive, systematic search was not conducted, the co-authors used a structured, consensus-driven approach to identify and assess available evidence, drawing on their disciplinary expertise to ensure that the most contemporary and methodologically robust sources informed each section. This process included cross-checking key evidence across subgroups to maintain consistency and rigour. All authors contributed to iterative revisions and resolved discrepancies through discussions. The position statement was internally peer reviewed by three independent international experts. The final manuscript was reviewed and endorsed by the 2026 ACRA Executive Management Committee.

Core Components

The updated core components, which define the essential elements required to deliver safe, effective, and equitable cardiovascular rehabilitation across diverse settings, are presented in Figure and summarised in Box 1. For a summary of the main updates from the 2014 core components, please see Box 2.

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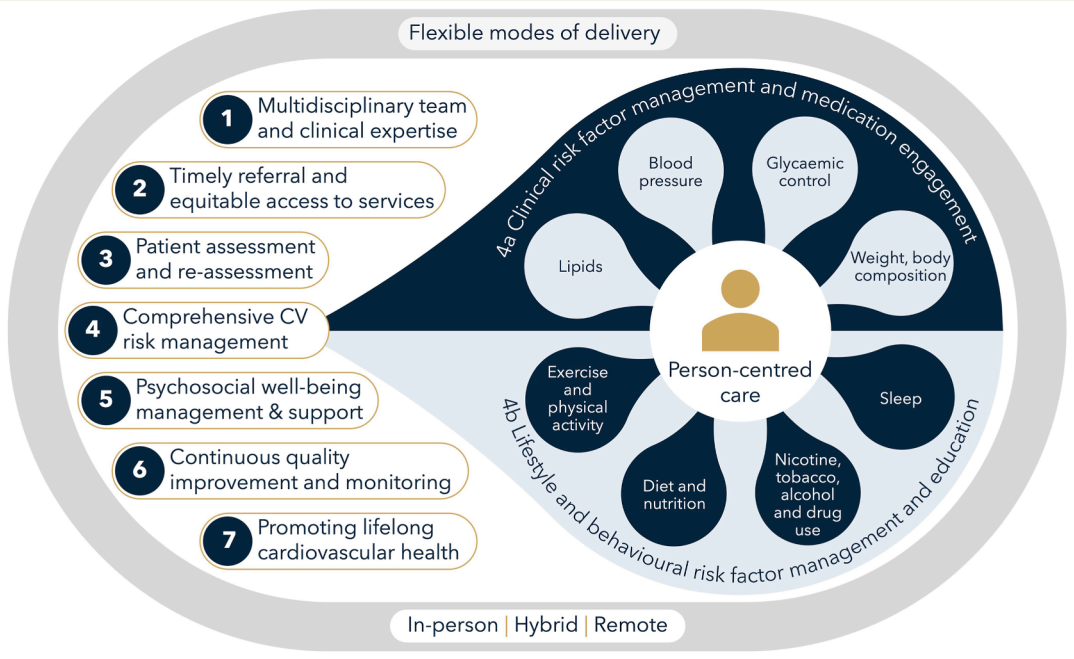

Figure The 2026 updated Australian Cardiovascular Health and Rehabilitation Association (ACRA) core components of cardiovascular rehabilitation.
Abbreviation: CV, cardiovascular.

Core Component 1: Multidisciplinary Team and Clinical Expertise

The quality of cardiovascular rehabilitation is driven by the knowledge, skills, and experience of the health professionals who deliver it. Cardiovascular rehabilitation personnel characteristically possess broad clinical expertise, including understanding of cardiac physiology, chronic and complex care, investigations and interventions, behaviour change, comorbidities, medications, psychological impacts, and the safe assessment and prescription of exercise based on functional capacity. Effective communication and interpersonal skills are crucial in supporting meaningful engagement with patients, families/carers, and the multidisciplinary team. Equally important is the ability to recognise and respond to individual needs, including providing culturally safe care for Aboriginal and Torres Strait Islander Peoples and people from culturally and linguistically diverse backgrounds.

Ongoing training and professional development of clinicians working in cardiovascular rehabilitation settings help support high-quality, evidence-based delivery. Skills in group facilitation, adult learning, data management, program evaluation, service coordination, and individualised exercise prescription support consistent delivery and enable continuous quality improvement [14–17]. In many programs, specific competencies such as Basic or Intermediate Life Support, electrocardiogram (ECG) rhythm interpretation, and physical assessment form part of patient and program safety. While postgraduate cardiac-related qualifications are valuable, access to continuing professional development, mentorship, and peer-to-peer learning is important. For small-scale services or those with limited staffing, this is vital and can be supported through collaboration with larger centres or through professional development offered by organisations such as ACRA and the International Council of Cardiovascular Prevention and Rehabilitation (ICCPR) [18].

Safe and effective delivery of exercise-based cardiovascular rehabilitation relies on adequate program staffing and appropriate patient supervision. Staffing arrangements are typically adapted to the patients clinical complexity, stage of recovery, exercise prescription, prior exercise experience, as well as staff expertise, and cardiovascular rehabilitation location [19–21]. In many outpatient programs, group formats allow tailored supervision, often achieved with a staff to patient ratio of 1:5, with additional staff support available when required. Participants with more complex needs, such as patients with heart failure, advanced age, or frailty, may benefit from more individualised supervision, with staffing adjusted accordingly to maintain safety and quality of care for all patients. Staffing for technology-augmented delivery should consider technology-specific capabilities, objectives for such delivery mode, clinical skill sets, and resourcing [22,23]. Some may align closely with requirements for in-person delivery modes (e.g., remote delivery of group exercise classes), while others may require adaptation (e.g., 1:1 telephone consultations) [24].

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Box 1. Summary of the 2026 Core Components

2026 ACRA Core Components

1. Multidisciplinary Team and Clinical Expertise
2. Timely Referral and Equitable Access to Services
3. Patient Assessment and Re-Assessment
4. Comprehensive Cardiovascular Risk Management
4a. Clinical Risk Factor Management and Medication Engagement
Lipids
Blood pressure
Glycaemic control
Weight/body composition
4b. Lifestyle or Behavioural Risk Factor Management and Education
Exercise and physical activity
Diet and nutrition
Nicotine, tobacco, alcohol, and drug use
Sleep
5. Psychosocial Well-Being Management and Support
6. Continuous Quality Improvement and Monitoring
7. Promoting Lifelong Cardiovascular Health

Core Component 2: Timely Referral and Equitable Access to Services

Referral to cardiovascular rehabilitation is important for patients across a range of different cardiovascular conditions. Primary and secondary indications are shown in the Table [11,25], and while two levels of indications are presented, cardiovascular rehabilitation programs should strive to include all patients with secondary indications, where possible. Referral is most effective when made early, ideally before hospital discharge for inpatients, and when clinicians clearly explain the benefits to support patient engagement [6,11,26]. Patients are encouraged to follow up with their referring clinician or their General Practitioner (GP), and to be referred to a GP if they do not already have one, to support continuity of long-term care [11]. Self-referrals are also accommodated. Where multiple services or delivery modes are available, shared decision-making help align program selection with individual preferences, capacities, and values [4]. The National Heart Foundation of Australia maintains a national directory (https://www.heartfoundation.org.au/your-heart/cardiac-services-directory) to assist clinicians and consumers in identifying local cardiovascular rehabilitation programs [27].

Automated referral, often through centralised electronic systems, can support more consistent and equitable referral where available [4,28]. When automation is not available, strong clinician endorsement is pivotal [5,29]. Evidence suggests that combining inpatient education, pre-discharge referral, early contact from rehabilitation staff to schedule the first appointment, and patient choice of program location or delivery mode can substantially increase referral rates [30].

Meeting the Needs of Aboriginal and Torres Strait Islander Peoples and All Australians

Ensuring equity in cardiovascular rehabilitation requires recognising that sub-optimal referral and participation rates are common across several groups, including women, Aboriginal and Torres Strait Islander Peoples, culturally and linguistically diverse communities, people with socioeconomic disadvantage, those living in rural and remote areas, and older adults [4,31,32]. These groups experience both distinct and overlapping barriers related to access, cultural safety, communication, health literacy, caregiving responsibilities, age-related needs, and service models that may not reflect their values or circumstances. Women may also encounter under-recognition of conditions such as spontaneous coronary artery dissection (SCAD), pregnancy-related CVD manifestations, and microvascular angina, all of which require specific education, exercise prescription, and would benefit from tailored program delivery [33]. Socioeconomic constraints, older age, and rurality also shape participation, with transport limitations, digital connectivity issues, workforce shortages, and fewer local resources highlighting the need for flexible delivery options. Equitable care requires attention not only to clinical needs but also to cultural and community contexts, making culturally safe practice essential in cardiovascular rehabilitation [34].

Cultural competence moves beyond awareness and refers to a set of consistent behaviours, attitudes, and policies across the health ecosystem that work effectively in cross-cultural situations [35]. Building this capability is an ongoing responsibility of healthcare professionals. Key considerations include Aboriginal and Torres Strait Islander Peoples leadership in program design, delivery, evaluation, promotion, and governance; authentic co-design; trustworthy partnerships; and alignment with cultural values and diverse models for Aboriginal and Torres Strait Islander communities. The *Heart Health—For our people by our people* initiative illustrates the value of a culturally appropriate, well-engaged, effective cardiovascular rehabilitation program. This program is delivered in a socially supportive environment within an Aboriginal Medical Service, the Derbarl Yerrigan Health Service on the lands of the Whadjuk Noongar People of Western Australia [36,37]. For people from culturally and linguistically diverse backgrounds, strategies such as language support, culturally adapted materials, and culturally competent care can enhance engagement.

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Box 2. Summary of key additions and changes from the 2014 Core Components [11].

What's New in the 2026 ACRA Core Components

- **Expansion from five to seven core components**, reflecting contemporary evidence and explicitly recognising multidisciplinary expertise, psychosocial well-being, and a stronger focus on lifelong cardiovascular health.
- **Reframing of cardiovascular rehabilitation as the foundation for lifelong secondary prevention**, rather than a time-limited program, aligning with contemporary international frameworks.
- **Increased focus on equity, person-centred care, and cultural safety**, with expanded consideration of Aboriginal and Torres Strait Islander Peoples, culturally and linguistically diverse communities, people with socioeconomic disadvantage, women, older adults, and people living in rural and remote areas.
- **Comprehensive clinical and lifestyle risk factors** with a greater focus on medication engagement, and inclusion of sleep as a modifiable risk factor.
- **Stronger emphasis on continuous quality improvement,** supported by nationally endorsed quality indicators, benchmarking, and data-driven service evaluation across all models of care.
- **Formal recognition of diverse delivery models**, including in-person, hybrid, and remote programs, while maintaining consistent standards for quality and safety.

Approaches that support 'meeting people where they are' can improve accessibility and outcomes for all populations. By integrating practical considerations such as cultural relevance, gender-specific needs, financial and social challenges, age-related requirements, and rural access barriers into routine care, programs are better positioned to reach people historically excluded from cardiovascular rehabilitation and improve outcomes for all.

Core Component 3: Patient Assessment and Re-Assessment

Patient assessment and re-assessment are central to delivering safe, person-centred, and effective cardiovascular rehabilitation. Systematic assessment upon program entry and throughout the program informs risk stratification, goal setting, care planning, and timely adjustment of interventions in response to changing clinical needs.

Initial Assessment

Initial assessment establishes the patient expectations, goals, and values, and informs an individualised care plan [8]. It includes gathering information on medical history, clinical and lifestyle risk factors, medications, exercise capacity, psychological status, socio-demographic characteristics, and patient goals, needs, and preferences [34]. Whenever possible, the initial assessment is best conducted in-person, although remote methods remain an acceptable alternative [38]. Programs should aim to commence within 28 days of hospital discharge [39], with earlier engagement encouraged, where feasible. For further guidance on assessment items, see current Australian recommendations [8].

The initial assessment is an important opportunity to build trust and rapport with patients and their families or carers. It allows clinicians to begin shared decision-making, individualised goals, and provide tailored education. This stage also helps identify early needs or expectations, such as return-to-work planning or referral to multidisciplinary services. Communication with the patient's treating physician and GP–at commencement of the program, and again at completion, non-completion, or as required–is also essential to ensure coordinated care. These processes support patient engagement, improve adherence, and contribute to better clinical outcomes [39].

Information collected in the initial assessment may be directly entered into an electronic database to support easy review of patient goals, progress, and outcomes [8] and to provide capacity for data extraction, analysis, outcome evaluation, and report generation [40]. In the absence of a national electronic data platform, use of standardised assessment templates incorporating Australian cardiovascular rehabilitation quality indicators is strongly encouraged to ensure consistency of data collection [8,38,41,42].

Ongoing Assessment

Ongoing assessment throughout cardiovascular rehabilitation supports monitoring of progress, identification of unmet needs, and adjustment of care, including exercise progression. Sharing progress and outcomes with patients and the wider care team helps reinforce program benefits, while evaluation of knowledge and skills can identify areas requiring further clarification or support. When resources are limited, elements of ongoing assessment can be integrated into routine sessions. Longer term follow-up may also be used to support sustained cardiovascular risk reduction.

Exit or Discharge Assessment

The exit or discharge assessment is an opportunity to review patient progress and outcomes at the conclusion of the cardiovascular rehabilitation program, including changes in clinical status, adherence to medication, relevant action plans (chest pain or heart failure exacerbation), exercise

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Table **Primary and secondary indications for cardiovascular rehabilitation referral.**

Primary indications:
Obstructive coronary artery disease
Acute myocardial infarction
Coronary revascularisation (coronary artery bypass graft surgery, percutaneous coronary interventions)
Stable angina (medically managed coronary artery disease)
Non-atherosclerotic causes, such as spontaneous coronary artery dissection (SCAD)
Other surgical and device indications
Heart valve repair or replacement (surgical or transcatheter)
Heart transplant and mechanical circulatory support devices
Cardiac defibrillators and resynchronisation devices
Cardiac surgery (myectomy, removal of myxomas etc)
Heart failure and cardiomyopathy conditions
Out of hospital cardiac arrest (where cardiac aetiology suspected/confirmed)
Secondary indications:
Vascular diseases
Stroke, transient ischaemic attack
Peripheral vascular disease
Pulmonary arterial hypertension
Aortic dissection
High risk conditions
High risk of coronary artery disease as assessed by the AusCVDRisk Calculator [25]
Familial hypercholesterolaemia
Atrial fibrillation and other cardiac arrhythmias
Congenital heart disease
Myocardial infarction with non-obstructive coronary arteries (MINOCA)
Ischaemic with non-obstructive coronary arteries (INOCA) and Angina with non-obstructive coronary arteries (ANOCA)
Coronary vasospasm, microvascular dysfunction

capacity, cardiovascular risk factors, and patient-reported outcomes and experiences. It also provides an ideal setting to reinforce key self-care behaviours such as healthy eating habits, regular physical activity, smoking cessation, medication adherence, and recognising and responding to symptoms. Comparing initial and discharge assessments helps demonstrate benefit and identify ongoing care needs. The discharge assessment also supports transition to lifelong cardiovascular health by reinforcing self-management strategies, confirming follow-up arrangements, and communicating outcomes to the patient's physician and GP. At a service level, discharge data, including patient experience surveys inform program evaluation, quality improvement, and service planning.

Core Component 4: Comprehensive Cardiovascular Risk Management

Comprehensive cardiovascular risk management is foundational to cardiovascular rehabilitation and focuses on modifiable factors that contribute to disease progression and recurrent events. These can be grouped into (1) clinical or (2) lifestyle or behavioural factors (psychological factors are discussed separately under Core Component 5 given bi-directional influence on CVD). Care and support should be individualised to address the risk factors most relevant to each patient and align with their goals and preferences, recognising that these factors are interconnected and require coordinated management.

Core Component 4a: Clinical Risk Factor Management and Medication Engagement

Management of key clinical cardiovascular risk factors includes lipids, blood pressure (BP), glycaemic control, and weight and body composition. Each of these risk factors will be addressed in the following section and outline their assessment and evidence-based management.

A cornerstone of clinical risk factor management is consistent medication adherence, alongside lifestyle and behaviour change. However, beyond medication *adherence* (i.e., simply following instructions to take medications),

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medication *engagement* includes understanding the purpose of medications, recognising and managing side effects, knowing when to seek review, and advocating for optimisation. It is a complex behaviour influenced by individual, social, and system factors, and often requires tailored strategies to address suboptimal use [42].

No gold-standard tool is currently recommended for measuring medication adherence and engagement [43], and approaches range from simple self-report measures (e.g., visual analogue scales) to assessing whether medications align with guideline-recommended therapy [44]. More structured instruments, such as the Short Medication Adherence Scale (SMAS) and the Medication Adherence Report Scale, help identify behavioural, economic, and memory-related barriers to adherence [45]. Regardless, proactive medication discussions should remain central in cardiovascular rehabilitation programs, with assessment tools used to guide the identification of specific barriers [46]. Clinicians play a key role in medication education, reconciliation, and early identification of non-engagement by reviewing discharge prescriptions, clarifying any changes, and reinforcing understanding of benefits and risks. All clinicians support medication engagement through routine discussions and referrals, with pharmacists particularly well-positioned to offer additional reviews via MedsChecks, Home Medicine Reviews, and outpatient clinics [43].

Lipids

High cholesterol, specifically low-density lipoprotein cholesterol (LDL-C), is a well-established leading risk factor for recurrent cardiovascular events [47] and contributes to the progression of atherosclerosis. For patients with established coronary artery disease, intensive lipid-lowering therapy, including multiple drug classes is recommended to reduce the risk of recurrent cardiovascular events. Consideration should also be given to inherited and non-traditional lipid-related risk factors, including familial hypercholesterolaemia and elevated lipoprotein(a) [48,49], which influences risk stratification and management.

Assessment

Annual or more frequent LDL-C/lipid profile checks, e.g., 6-weeks post-acute coronary syndrome, are common, particularly after commencing new medications, to assess treatment effectiveness. The treating physician or GP is best placed to arrange and monitor the individual's lipid profile.

Management

Statins (HMG-CoA reductase inhibitors) are first line therapy for individuals with elevated cholesterol profiles. Concomitant lifestyle changes including following a healthy eating pattern (such as the "Dietary Approaches to Stop Hypertension" [DASH] or Mediterranean eating plans), regular physical activity, and smoking cessation are important components of a comprehensive cholesterol management strategy. In patients with established coronary disease, the recommended target for LDL-C is <1.4 mmol/L and a reduction of at least 50% from baseline, and 'the lower, the better' [4]. For those who do not achieve these targets with maximally tolerated statin therapy, contemporary secondary prevention strategies following the 'start earlier, treat more aggressively' principle, increasingly incorporate adjunctive non-statin lipid-lowering therapies to support more intensive risk reduction [4]. In addition, given the strong heritable basis of familial hypercholesterolaemia and elevated lipoprotein(a), consideration for cascade screening of relatives may be warranted as an important preventive health strategy [50]. For further guidance on current lipid therapy, see the latest Australian gudelines [4].

Blood Pressure

Effective BP control is essential for lowering the risk of new or repeat myocardial infarction, stroke, worsening heart failure and premature death. However, poor BP control is common in individuals attending cardiovascular rehabilitation [51]. Modest reductions in systolic BP of 5–10 mmHg, with a target below 130 mmHg, are beneficial [51]. Routine, accurate BP assessment within cardiovascular rehabilitation programs provides a critical opportunity to identify, support, and reinforce optimal BP control.

Assessment

Cardiovascular rehabilitation clinicians help guide patients through long-term BP management. Validated automated oscillometric devices are appropriate for most patients when verified through recognised registries such as STRIDE BP (https://www.stridebp.org/bp-monitors/). Auscultatory measurement is recommended for patients with atrial fibrillation to overcome limitations of automated devices. For guidance on BP measurement; see current Australian and international guidelines (2016) [51–53].

Management

Cardiovascular rehabilitation clinicians can support optimal BP management through education, medication adherence support, exercise prescription and lifestyle modification. Education should emphasise the risks of uncontrolled hypertension, adherence to therapy, and the value of regular clinic and home BP monitoring [51,53]. Lifestyle guidance includes increased physical activity, weight management, heart-healthy eating patterns such as the DASH eating plan, reducing salt intake or using salt substitutes, increasing potassium intake, limiting alcohol consumption, ceasing smoking or other stimulants, and stress reduction [51,53].

Exercise is also a pillar of BP management, comparable to first-line antihypertensive medications [54], and should include both aerobic and resistance training [55]. Isometric exercise may provide potent BP-lowering effects beyond other exercise types and is strongly supported in hypertension guidelines, yet underused in cardiovascular rehabilitation [56]. However, it is also important for

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clinicians to reinforce avoidance of breath-holding (Valsalva Manoeuvre) during exercise and daily activities as this can exaggerate acute blood pressure elevations [57].

Glycaemic Control

Poor glycaemic control, including diabetes, is a common comorbidity and major risk factor for non-fatal and fatal CVD [55]. Women with diabetes are at higher risk of fatal CVD than men [58]. Additionally, women who develop gestational diabetes are at significantly increased risk of latent CVD, even if diabetes resolves post-pregnancy [59].

Assessment

Glycaemic control is assessed via a laboratory blood test diagnosed when glycated haemoglobin (HbA1c) is ≥6.5% (48 mmol/mol), fasting plasma glucose ≥7.0 mmol/L, random plasma glucose ≥11.1 mmol/L in patients with classic symptoms of hyperglycaemia (e.g., thirst, polyuria, weight loss), or 2-hr glucose ≥11.1 mmol/L on a 75g oral glucose tolerance test [60,61].

Management

Cardiovascular rehabilitation offers an opportunity to optimise diabetes care and prevention. Taking prescribed medication is essential, whilst exercise training and regular physical activity can enhance muscle insulin sensitivity and promote reduction in adipose tissue [61–63]. Educational approaches include: daily physical activity; nutrition (such as implementing a low glycaemic index diet or evidence-based, DASH diet or Mediterranean eating plan) that emphasise increased intake of vegetables, fruit, wholegrains, unsaturated fats and oily fish/lean fresh meat/poultry, with or without low fat dairy [61]. People requiring more tailored support may benefit from referral to a pharmacist for medication engagement assessment, a diabetes educator for self-monitoring skills, or a dietitian for nutrition education and behaviour change support.

Weight and Body Composition

Overweight/obesity remains a recognised CVD risk factor. Although body weight often correlates with fat mass, it is only a crude indicator of adiposity. Weight-based measures, particularly body mass index (BMI), have limitations; BMI does not distinguish between fat and lean mass or assess fat distribution and does not fully capture the differing contributions of muscle and fat to cardiovascular risk. As a result, contemporary approaches have shifted from focusing solely on weight or BMI to incorporating body composition measures that more accurately reflect cardiovascular risk [64].

Assessment

Waist circumference, measured at the mid-point between the iliac crest and the 12th rib, is a simple and practical measure in cardiovascular rehabilitation settings [65,66]. It provides an indication of abdominal obesity and excess visceral fat and has stronger prognostic value for atherosclerotic risk than total or subcutaneous fat [62,63]. Risk increases when waist circumference is above 94 cm for men and over 80 cm for women, although these thresholds may vary across ethnic groups [64]. These measures remain responsive to changes over time, supporting their use for longitudinal monitoring [67]. Dual-energy X-ray absorptiometry (DEXA) scans, bioelectrical impedance analyses and emerging body composition technologies can further assess and more accurately quantify body fat percentage and distribution [68].

Management

Effective weight/body composition management strategies include lifestyle (diet, exercise, sleep, stress) [69] and psychological support where appropriate [70]. In selected cases, surgical approaches (such as bariatric surgery) or pharmacological therapies may be used either as primary treatment or as adjuncts to lifestyle change [71,72]. Emerging evidence showing that some weight-loss medications such as glucagon-like peptide-1 (GLP-1) agonists can also reduce cardiovascular risk [71,72] but should be prescribed in conjunction with resistance exercise to counter skeletal muscle loss, and referral to a dietitian for nutrition guidance [73]. Importantly, approaches to weight and body composition management should prioritise informed, shared decision-making between patients and healthcare professionals, and incorporate practices that reduce weight stigma and support sustainable, person-centred care.

Core Component 4b: Lifestyle or Behavioural Risk Factor Management and Education

The term 'lifestyle' is used for certain modifiable risk factors, but these behaviours are recognised as being influenced by social, cultural, environmental, and clinical factors rather than personal choice alone. The use of this term does not place blame on individuals.

Evidence-based and personalised patient education is a cornerstone in supporting lifestyle and behavioural risk factor management, as well as symptom recognition [74]. Patient education that aligns with patient goals and incorporates approaches such as motivational interviewing can strengthen self-efficacy and support sustainable lifestyle and behavioural change [8]. When introduced early in the secondary prevention pathway, including during hospitalisation, education improves disease-related knowledge, enhances quality of life, and reduces hospital readmissions [75]. Effectiveness of patient education is maximised when it is tailored to health literacy and cultural context, and delivered according to adult learning principles that recognise readiness to change, prior experience, and intrinsic motivations [76].

Health literacy is an important consideration when developing educational interventions aimed to address lifestyle and behavioural risk factors. Comprehensive health

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literacy is more than reading and understanding information, and includes the ability to appraise advice, access services, and engage meaningfully with healthcare professionals [77]. Patients attending cardiovascular rehabilitation who have limited health literacy [78] especially benefit from clear communication, and education that uses plain language and visual or interactive supports as required. Education may also be delivered through a range of formats, including individual or group sessions and face-to-face or remote modes, with the involvement of family or carers, where feasible, to reinforce behaviour change [79,80]. Culturally responsive education, particularly when co-designed with Aboriginal and Torres Strait Islander communities, can improve cardiovascular outcomes [81–84], although evidence gaps remain for some culturally and linguistically diverse populations [85].

Educating cardiovascular rehabilitation patients and their family or carers on self-management is critical to build self-efficacy, which supports long-term behaviour change. Education should include topics such as anatomy and physiology of the heart and how this relates to each patient's condition, how to return to normal activities, risk factors, and essential action plans for chest pain or heart failure [8].

Exercise and Physical Activity

Exercise training is a predominant feature of cardiovascular rehabilitation programs, supported by a strong evidence base [86]. It accelerates physical recovery, improves mental health, and supports secondary prevention. Aerobic exercise, such as walking/running or cycling, improves cardiorespiratory fitness, a strong predictor of future cardiovascular events, readmissions, and mortality [86]. It also provides cardiometabolic benefits including BP control, improved glycaemic regulation, and lipid metabolism [55]. Resistance, or strength training, such as lifting weights or using resistance bands, improves muscular strength, mass, and functional capacity [55,87], and helps counter frailty and sarcopenia [87,88]. Both aerobic exercise and resistance training can also reduce symptoms of depression, anxiety and psychological distress [89]. Combining resistance and aerobic exercise have complementary improvements on strength, functional capacity and cardiorespiratory fitness, and is best-practice in cardiovascular rehabilitation [90]. Importantly, promotion of ongoing physical activity complements structured exercise training by supporting the integration of regular movement into daily life and reinforcing lifelong cardiovascular risk reduction beyond supervised sessions. For further guidance on exercise prescription, see current Australian recommendations [55].

Aerobic Exercise Training

Assessment

Aerobic exercise assessment enables the prescription of an individualised exercise program based on the patient's exercise tolerance and capacity. Cardiopulmonary exercise testing is the gold-standard assessment for cardiorespiratory fitness [91]; however, if equipment or expertise for respiratory gas analysis is not available, exercise capacity can also be assessed via alternative modalities. Depending on the individual cardiovascular rehabilitation program, alternatives may include a graded exercise test, functional tests such as the six-minute walk test or incremental shuttle walk test [55]. When objective assessment of exercise capacity is not feasible, validated self-report tools such as the Specific Activity Questionnaire (SAQ) [92] or Duke Activity Status Index (DASI) [93] may be used to estimate functional capacity, providing an indication of metabolic equivalents (METs).

Management

Exercise management in cardiovascular rehabilitation involves building to at least 150 minutes of moderate-high intensity (rate of perceived exertion [RPE] 12–16) aerobic exercise over three or more days per week [55]. Patients who are severely deconditioned, have symptoms, and/or high clinical complexity may need to start with intervals of light-moderate intensity exercise (RPE 10–13) [94]. After an initial period of moderate intensity exercise, some patients may progress to higher intensity exercise (RPE 14–16) where clinically appropriate. High intensity interval training (HIIT) has also been shown to be safe and feasible for patients with stable CVD [95,96,97] and may further improve exercise capacity [91] with helpful implementation recommendations available [98]. Gradually increasing exercise intensity at the commencement of exercise (warm-up) and reducing intensity at the conclusion of exercise (cool-down) reduces the risk of adverse responses to exercise [55].

Resistance Training

Assessment

Baseline screening helps determine whether any contraindications to resistance exercise are present, such as sternal instability, impaired musculoskeletal integrity, or other conditions that limit safe load-bearing. Importantly, baseline and recurrent assessments of muscular strength, such as 1 repetition maximum (RM), isometric strength or repeated chair stands, help individualise resistance exercise training prescription to optimise program outcomes [55].

Management

Resistance training in cardiovascular rehabilitation reflects principles of individualisation and gradual progression. Programs often commence with light weights, while good technique and confidence is being established, before progressing to light-to-moderate intensity resistance exercises (50%–60% 1RM, 5–7 OMNI-RPE) targeting major muscle groups, with volume and intensity adjusted over time in response to tolerance, functional capacity, and recovery (up to 80% 1RM) [55]. Progression is typically achieved by increasing resistance, volume, or both, as strength and confidence improve, while maintaining a focus on safety and functional relevance.

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Following median sternotomy, resistance training approaches frequently incorporate strategies that minimise sternal loading during early recovery, such as the *Keep Your Move in the Tube* principle for patients without sternal instability [99]. As pain-free movement and tolerance improve, external loading may be gradually introduced. Initial sessions generally emphasise technique, supported by demonstration, coaching, and feedback, with education around breathing, expected muscle effort, and transient post-exercise soreness to support confidence and safe participation.

Physical Activity Promotion

Beyond structured and supervised exercise, promoting regular physical activity and reducing sedentary time is essential for lowering cardiovascular risk and supporting lifelong health. Any amount of physical activity lowers the risk of repeat CVD events and premature death for people with coronary disease, recognising it is never too late to become active [100,101]. Individuals are encouraged to meet physical activity guidelines of at least 150 minutes of moderate-to-vigorous intensity physical activity per week or 7,500 steps per day and avoid long periods of being sedentary [55].

Assessment

Physical activity and sedentary behaviour can be assessed subjectively (e.g., questionnaire) or objectively (e.g., pedometer, accelerometer) to determine whether an individual is meeting recommended guidelines [55].

Management

Counselling and education about ways individuals can increase physical activity and minimise sedentary time in their daily routine should be provided throughout cardiovascular rehabilitation. Clinicians are well placed to provide individually tailored general physical activity advice [55]. For more specific physical activity advice, exercise specialists such as physiotherapists and exercise physiologists may be consulted.

Wearable activity trackers, including smartphone apps, are effective tools in increasing physical activity in people with CVD and those attending cardiovascular rehabilitation [55,102,103]. Clinicians can maximise the effectiveness of wearables by encouraging, educating, monitoring and providing effective feedback loops to promote individual engagement and autonomy beyond the cardiovascular rehabilitation setting. Social prescribing of community activities such as *parkrun*[104] or Heart Foundation Walking groups [105] can increase physical activity [106] in addition to increasing social and peer support.

Diet and Nutrition

Poor nutrition is a leading cardiovascular risk factor and adherence to heart healthy eating patterns may reduce relative risk of CVD [64]. Nutrition also influences other key risk factors, including hypertension, dyslipidaemia and diabetes [107]. Evidence supports dietary approaches that focus on overall eating patterns and whole foods, such as the Mediterranean and DASH diets, rather than a focus on individual nutrients [108,109]. These dietary patterns rich in fruit and vegetables are naturally low in sodium, saturated fats and added sugars while favouring wholegrains, lean protein and unsaturated fats [108,109].

Assessment

Dietary assessment in cardiovascular rehabilitation commonly includes dietary intake and eating patterns alongside anthropometric measures. This assessment may explore usual food choices, meal patterns, cultural practices, access to food, and nutrition-related goals.

Management

Cardiovascular rehabilitation clinicians can provide general nutrition advice aligned with the Australian Dietary Guidelines [110] or Heart Foundation Heart Healthy Eating Principles [111]. Nutrition behaviour change strategies should be flexible and individualised, acknowledging patient preference, cultural context, and values [108,112,113]. For more complex nutritional needs, referral to a dietitian is recommended and may be particularly beneficial in patients with multiple comorbidities, malnutrition, or overweight/obesity [114].

Nicotine, Tobacco, Alcohol and Drug Use

Legal and illegal drug use significantly impacts cardiovascular health [115]. Nicotine and tobacco use (e.g., cigarettes, vapes, shisha, hookah, snuff) accelerates atherosclerosis, hypertension, and promotes clot formation, increasing risks of heart attack and stroke [116,117]. Higher alcohol intake increases the risk of hypertension, stroke, heart failure, arrhythmias, overweight/obesity, and coronary artery disease [118]. Additionally, cannabis (marijuana), vaping, and misuse of drugs are emerging cardiovascular risk factors [115], with cardiovascular effects including arrhythmias, increased risk of myocardial infarction and cardiomyopathy, valvular infections, and cardiac toxicity [119,113].

Assessment

Direct communication with patients about their nicotine, tobacco, alcohol and other substance use is an important part of assessment. Specific tools for smoking and vaping are available and provide guidance on appropriate management pathways [120]. Similarly, the Australian Alcohol guideline from National Health and Medical Research Council provides resources for both clinicians as well as patient-friendly resources [121]. All potentially harmful substance use should be documented and managed in partnership between the patient and their treating physician or GP, with cardiovascular rehabilitation and specialist teams involved where appropriate.

Management

In cardiovascular rehabilitation settings, addressing tobacco, alcohol, and other drug use focuses on prevention, education,

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brief intervention, and referral to appropriate support services. Tobacco cessation is the single most effective intervention for reducing cardiovascular risk and is supported through behavioural counselling, nicotine replacement therapy, and pharmacotherapy where clinically indicated [120]. Management of alcohol and other drug use similarly involves education, psychosocial support, pharmacotherapy, cardiovascular risk reduction strategies, and referral to specialised addiction services to support sustained recovery. Cessation resources and programs tailored for Aboriginal and Torres Strait Islander Peoples and culturally and linguistically diverse communities are available and should be used where appropriate to support culturally safe care [25,122,123].

Sleep

Sleep plays an important role in cardiovascular health, with short sleep duration, poor sleep quality, and sleep disorders associated with increased cardiovascular risk, poorer cardiometabolic control, and reduced quality of life [124]. Sleep also affects other modifiable risk factors, including BP, glycaemic regulation, weight, mental health, and a person's capacity to engage in physical activity and behaviour change. While these relationships are well-established, the current evidence shows that traditionally structured cardiovascular rehabilitation has only a modest impact on improving sleep outcomes [125]. The primary focus within cardiovascular rehabilitation programs should be on screening, evaluating sleep problems, and arranging appropriate referral or co-management.

Assessment

Sleep duration, quality, timing, and regularity, as well as symptoms such as insomnia, excessive daytime sleepiness, snoring, or witnessed apnoea may be discussed in cardiovascular rehabilitation settings [126]. Brief screening tools and patient-reported measures, for example, the STOP-Bang questionnaire [127] can help identify sleep concerns including obstructive sleep apnoea and guide further assessment or referral, particularly where sleep-disordered breathing or persistent insomnia is suspected. Wearable technologies may also provide objective estimates of sleep duration and variability that may highlight potential issues warranting further clinical investigations [128].

Management

Education and behavioural strategies that focus on sleep commonly include healthy sleep habits, including consistent sleep-wake routines, sleep-conducive environments, and alignment of daily activity, light exposure, and caffeine or alcohol intake. Where sleep problems persist or clinical sleep disorders are suspected, referral to a clinician that specialises in the management of sleep disorders for treatment may be appropriate [129]. Integrating sleep health into broader lifestyle and behavioural support can enhance engagement, recovery, and long-term cardiovascular risk reduction.

Core Component 5: Psychosocial Well-Being Management and Support

Psychosocial well-being is a core pillar of cardiovascular rehabilitation due to the strong, bidirectional relationship between CVD and mental health. Common psychological conditions such as depression and anxiety, as well as social factors, including loneliness and social isolation, not only increase cardiovascular risk but also frequently emerge or worsen following a cardiac event [130,131]. Emotional responses including fear, sadness, anger, vulnerability, and loss of confidence are common, often described collectively as *cardiac blues*. Ensuring patients and carers have the psychosocial readiness to resume daily activities [4] including returning to work and resuming sexual activity, is important. Group-based rehabilitation also offers valuable peer support, improving self-management and self-efficacy [132].

Mood and Emotional Well-Being

Transient changes in mood and emotional well-being, or *cardiac blues* [133], are common after a cardiac event. It is therefore important to give cardiovascular rehabilitation participants an opportunity to discuss this emotional response to their cardiac event. For many individuals, these feelings resolve over the early recovery period; however, approximately one in five individuals will go on to develop a major depressive disorder [134–136], which is associated with poorer quality of life, reduced engagement with secondary prevention, and increased risk of recurrent cardiac events and mortality [137,138].

Assessment

Routine psychosocial assessments are best undertaken at program entry and completion, with additional review as needed [6,139]. Validated and widely-used screening tools such as the Patient Health Questionnaire (PHQ-2) [140,141], the Generalised Anxiety Disorder scale (GAD-2) [142,143], Depression Anxiety and Stress Scale (DASS) [144] or the Hospital Anxiety and Depression Scale (HADS) [145], can identify symptoms requiring further assessment. Other health-related quality of life measures also often include mental health subscales, which can help identify patients with elevated symptoms while also assessing overall quality of life.

Broader factors, including social support, loneliness, coping capacity, and role changes, should also be explored. Individuals with persistent, severe, or complex symptoms, or those at higher risk (e.g., previous mental health history, limited social support, financial stressors, heavy illness burden) [146], should be prioritised for monitoring and referral [133,147]. Where feasible, embedding clinicians with mental health expertise, such as psychologists, within the cardiovascular rehabilitation team, or at least referral pathways, can enhance identification and support.

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Management
Education about typical emotional responses, normalising help-seeking, and recognising persistent symptoms reduces stigma and supports engagement [8]. Exercise, diet, and healthy lifestyle changes can improve mood [148], while opportunities for peer interaction help alleviate loneliness and provide emotional support [132]. Where psychosocial symptoms persist or significantly affect functioning, coordinated referral pathways to psychological therapies, social supports, and community services are important to support recovery and long-term secondary prevention.

Return to Usual Activities

Assessment
Focused conversations should explore a person's readiness to resume daily activities, with guidance on returning to work, driving, and other routine tasks that reflect their health status, job demands, and safety considerations. Assessment may also consider readiness to re-engage in hobbies, leisure pursuits, and sexual activity. When more detailed assessment or targeted support is needed, timely referral to an occupational therapist or other allied health professionals will be beneficial [8].

Management
Where available, occupational therapists can guide a graded return to work, liaise with employers, and recommend adjustments to duties or hours. Although no formal assessment exists for resumption of sexual activity, it is important to normalise conversations and provide space for questions [8]. Supporting patients to gradually resume meaningful hobbies and enjoyable activities can help rebuild confidence, improve mood, and reinforce engagement in recovery. Returning to driving should be guided by the Austroads Assessing Fitness to Drive (AFTD) [149].

Core Component 6: Continuous Quality Improvement and Monitoring

The effectiveness of cardiovascular rehabilitation is strongly influenced by the quality of program delivery and content, regardless of setting, as demonstrated by the INTERASPIRE study [150]. Evidence from international [151] and national [152] studies shows substantial variation in program intensity, duration, and comprehensiveness, which contributes to differences in patient outcomes. Embedding systematic evaluation and continuous quality improvement within programs is therefore essential to ensure minimum standards are met and gaps in care are identified and addressed; however, this requires adequate and sustained funding, staffing, and resourcing to be achieved.

Continuous quality improvement relies on the routine collection of patient- and service-level data, supported by structured audit and feedback approaches such as Plan-Do-Study-Act (PDSA) cycles, DMAIC (Define, Measure, Analyze, Improve, Control), or Lean Six Sigma [153]. When applied consistently, these approaches have been shown to improve referral processes, reduce waiting times, and increase attendance [154]. Collaboration in quality improvement efforts across services and jurisdictions helps to increase motivation and amplify impact [155].

The collection of uniform quality indicators enables these improvement efforts at both program and system levels [156]. In Australia, a nationally endorsed set of quality indicators for cardiovascular rehabilitation, supported by a data dictionary and implementation resources, have been developed as a feasible and internationally benchmarked framework for monitoring performance and guiding improvement [38,157]. These indicators are endorsed by the National Heart Foundation of Australia and ACRA and are freely available on both organisations' websites. The use of these indicators supports benchmarking, shared learning, and coordinated quality improvement initiatives across programs. These indicators have been incorporated into quality improvement platforms and initiatives across Australia [38,154,155,157]. High-quality cardiovascular rehabilitation services are characterised by comprehensive, multidisciplinary and patient-centred care, alignment with evidence-based core components, and a culture of measurement and continuous improvement [42,114,158]. Tracking patient outcomes and experiences, and service performance [42,114,158,159], alongside external evaluation against minimum standards, supports consistent delivery and helps identify and recognise excellence in cardiovascular rehabilitation [160].

Core Component 7: Promoting Lifelong Cardiovascular Health

Advances in revascularisation, implantable devices, and medical therapies have improved survival and shortened hospital stays [4,10,161]. This positions cardiovascular rehabilitation as the *starting point* of lifelong secondary prevention rather than a standalone, time-limited intervention [162,163]. Cardiovascular rehabilitation equips patients with the skills, confidence, and support they need to understand their condition, engage in risk-factor management, and build habits that can be sustained long after the program ends [10,164].

Promoting lifelong cardiovascular health involves helping patients transition from structured *rehabilitation* to applying what they have learned in their everyday lives. This support includes developing realistic, long-term physical activity routines, adapting lifestyle behaviours over time (such as healthy eating), engaging confidently with medication management and follow-up care, and recognising early signs of disease progression that warrant review. Because most patients will lose access to specialised equipment and supervised facilities after cardiovascular rehabilitation, clinicians should also help them adapt exercise routines to practical,

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enjoyable options such as walking, home-based strength exercises, or community resources. Goal-setting that extends beyond program completion, education focused on problem-solving and relapse prevention, and clear plans for maintaining activity, monitoring risk factors, and staying engaged with healthcare can further support lifelong self-management [163].

A helpful framework for reframing cardiovascular rehabilitation toward lifelong cardiovascular health is the "five P's": personalisation, processes and systems, patient-centred care, parlance, and partnership [10]. This approach builds on the strong evidence base for cardiovascular rehabilitation and draws on lessons from survivorship models in other chronic conditions, where long-term health promotion is integrated with targeted secondary prevention strategies such as risk-factor modification and sustained engagement with medications and exercise [10].

Clear communication of this shift is essential for referrers, GPs, nurse practitioners, practice nurses, primary care pharmacists, and community clinicians who are critical for ongoing secondary prevention after cardiovascular rehabilitation. These clinicians need a practical understanding of what the patient has achieved and what the next steps should be. A concise, useful handover summarising goals, progress, exercise plans, risk-factor targets, medication considerations, and issues requiring monitoring helps embed recommendations into routine care and supports continuity. By reorienting cardiovascular rehabilitation from a time-limited program to the starting point of lifelong cardiovascular health, and by giving clinicians a clear roadmap for ongoing management, services can better meet the needs of the growing number of people living with CVD who require sustained engagement with secondary prevention.

Overall Considerations for Mode of Delivery

Cardiovascular rehabilitation can be delivered through a range of modes which can be offered alone or in combination (i.e., hybrid or multi-modal delivery) [5,9,26]. Programs may be delivered in hospital outpatient or community health settings, in the home or other remote settings, in group or individual formats, synchronously with real-time clinician-patient interaction or asynchronously, and with or without augmentation from digital technologies. Importantly, the mode of delivery should align with patient preference, capacity, and context, ensuring people can choose an option that best meets their needs [162]. Regardless of mode, the aim is to deliver all core components of cardiovascular rehabilitation; notwithstanding resource availability [26].

In-person or centre-based cardiovascular rehabilitation delivered in healthcare settings has traditionally been the predominant mode and has the most extensive evidence base [5,6,165]. However, persistently low participation rates demonstrate it does not meet all patient needs and preferences. Remote and home-based models, including those supported by digital tools, address unique needs and have been shown to achieve comparable clinical, functional, and patient-reported outcomes for selected populations, while improving accessibility and engagement [166–170]. These models may be delivered as standalone alternatives [171] or integrated in parallel or sequentially with centre-based care [172] to optimise supervision, tailor exercise intensity, and support continuity. Across all formats, the goal remains to deliver evidence-based, multidisciplinary, person-centred care that reduces barriers to uptake, adherence, and completion, and develops behaviours or lifestyle that supports optimal heart health for sustainable lifelong preventative engagement.

Technology-Enabled Delivery

Technology can support and extend cardiovascular rehabilitation delivery by improving flexibility, reach, and data-informed care [173]. Digital approaches include telehealth (including videoconferencing, remote monitoring) [169,174,175], mobile health (mHealth) applications (apps) [176–178], text messaging programs [179–181], wearable devices [182,183], and use of electronic decision support tools [184–186]. Evidence suggests that well-designed digital interventions can support physical activity, risk factor management, quality of life, and psychosocial well-being, particularly when they are simple to use, personalised, grounded in behaviour change principles, and supported by clinician input [178,187,188]. For further guidance on telehealth and remote delivery, see the current Australian recommendations [34].

The evidence base for remote models continues to evolve. The adoption of these models is increasingly promoted in Australian and international guidelines [166–170]. They have also demonstrated safety profiles comparable to traditional delivery [166,167,174,189] when supported by appropriate risk stratification and monitoring [171]. Hybrid models that combine in-person and digital care can further enhance accessibility while retaining face-to-face support for those who prefer or require it. Implementation requires consideration of digital literacy, access to equipment, language, and cultural safety to avoid widening inequities. Furthermore, remote and telehealth models must meet regulatory requirements, such as the Australian Health Practitioner Regulation Agency (Ahpra) standards for professional practice [190] and Therapeutic Goods Administration (TGA) oversight for digital technologies [191], and avoid the use of non-registered digital products. While no single model suits all patients, technology expands the range of delivery options available, enabling services to tailor care to different subgroups while retaining in-person delivery as an important and valued option [26].

Emerging technologies, including early applications of artificial intelligence [192], may offer future opportunities to enhance personalisation in cardiovascular rehabilitation, such as through more precise risk stratification or adaptive

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support. However, these applications remain largely experimental, with limited evidence for effectiveness, safety, equity, or clinical integration [193]. Any future use will require rigorous evaluation, strong governance, transparency, and clear regulatory oversight to ensure they do not introduce new risks or widen disparities. At this stage, their potential remains speculative and should be approached with caution.

Conclusions

Cardiovascular rehabilitation is a highly effective secondary prevention strategy for people with CVD. Its delivery across diverse settings requires services to be adaptable to individual needs, capabilities, and circumstances, with flexible options where feasible. The core components of cardiovascular rehabilitation in Australia include: 1) multidisciplinary team and clinical expertise; 2) timely referral and equitable access to services; 3) patient assessment and re-assessment; 4) comprehensive cardiovascular risk management; 5) psychosocial well-being management and support; 6) continuous quality improvement and monitoring; and 7) promoting lifelong cardiovascular health. Clinicians involved in cardiovascular rehabilitation, along with referrers, primary care teams, community health providers, and others who support patients across the care continuum, are encouraged to use this core components document to support high-quality, evidence-based, and person-centred care that improves equity, sustains engagement, and promotes lifelong cardiovascular health.

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Declaration of Competing Interests

J.C.R. declares they are a telehealth technology inventor (intellectual property owned by Deakin University, Australia; no financial benefits received over and above a regular research salary).

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