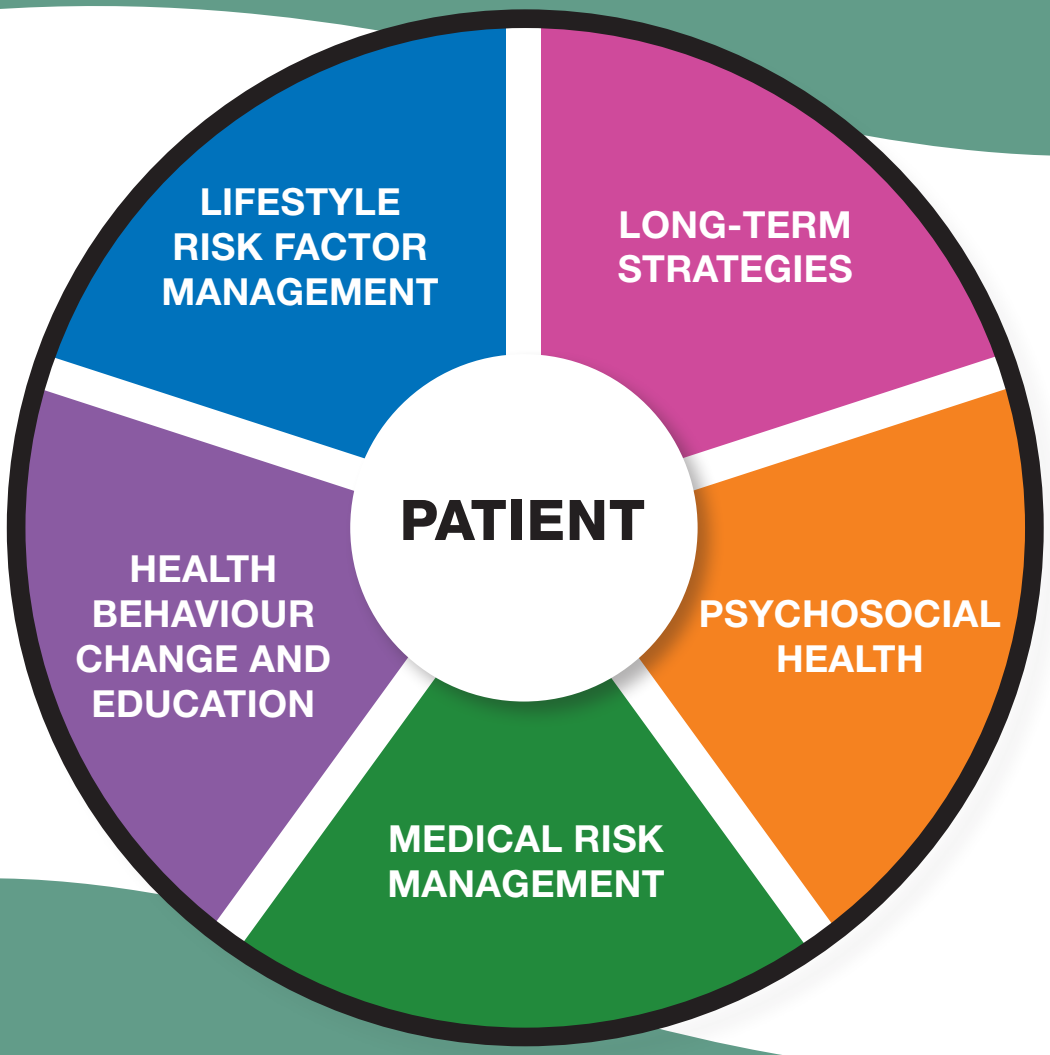
BACPR
BRITISH ASSOCIATION
FOR CARDIOVASCULAR
PREVENTION AND REHABILITATION

The **BACPR Standards and Core Components** for

Cardiovascular Disease Prevention and Rehabilitation 2023

(4th Edition)



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British Cardiovascular Society

Foreword from BACPR

Healthcare professionals strive to provide high quality, evidence-based care so that patients and their families have the best possible outcomes. Knowing how effective cardiovascular prevention and rehabilitation programmes (CPRPs) are for patients, health and exercise professionals have for many years promoted their uptake and completion. Although the benefits of cardiovascular prevention and rehabilitation programmes (CPRPs) are proven, referral, uptake, participation and completion rates are low and so many patients are missing out. For example, females, people from ethnic minorities and those from lower socioeconomic classes are less likely to attend. Without fundamental reimagining of services it was unlikely that participation in CPRPs would improve. Consequently, those involved in the care of people with cardiovascular disease were at a cross roads with tireless efforts to entice more people to attend to meet the ambitious targets set out by the NHS and UK governments without additional resource or indeed the time and space to consider how services could be enhanced.

Whilst the COVID-19 pandemic was extremely challenging for everyone for many different reasons, it provided a catalyst for change in how cardiovascular prevention and rehabilitation was delivered. Changes literally had to be made overnight and this brought lots of novel approaches and innovative ways of delivering CPRPs were developed. Healthcare professionals worked tirelessly to ensure care continued during the COVID-19 pandemic and that is testimony to their dedication and commitment. Never before had such radical change occurred so quickly. Now nearly three years later, it is important to learn and understand what has worked well and consider how services could be further enhanced. While not all of the innovations that came about as a result of the pandemic had a significant evidence-base demonstrating effectiveness, that evidence is now being gathered to determine the impact on patient outcomes. These updated standards and core components are therefore underpinned with the current best available evidence.

It is essential as we go forward to share best practice to promote and strive for excellence in cardiovascular disease prevention and rehabilitation. BACPR will continue to provide leadership in this and to support its multidisciplinary membership to ensure services are optimised and enhanced to promote the best possible outcomes for patients.

Professor Susan Dawkes
BACPR President (2019 - 2021)

Foreword from British Heart Foundation

There are around 7.6 million people living with heart and circulatory diseases in the UK - an ageing and growing population and improved survival rates from heart and circulatory events could see these numbers rise still further.

Cardiac rehabilitation is one of the best researched examples of long-term condition management. It has a strong clinical evidence base and is a cost effective intervention that results in improved outcomes for the patient with heart and circulatory disease.

The fourth edition of the BACPR Standards and Core Components for Cardiovascular Disease Prevention and Rehabilitation comes after a period of monumental changes to the way cardiac rehabilitation is delivered following the impact on services because of the COVID-19 pandemic. It is imperative that following this period of significant transition that cardiac rehabilitation services have new updated guidance and service delivery frameworks to align with as they operate in a post pandemic landscape.

We at the British Heart Foundation are delighted to see that the 2023 edition of this important resource is reflective of these changes and represents a significant shift in the delivery of cardiac rehabilitation. It is encouraging to see a focus on a more individualised and patient centred approach with a greater sense of balance between the physical and mental wellbeing components.

If we can take a positive from the last two years, it should be the resilience and versatility shown by our colleagues delivering this valuable intervention and the new offerings we now have in the cardiac rehabilitation space that have the potential to drive improvement in uptake and ensure clinical quality is maintained.

Cardiac rehabilitation is not going to simply return back to its previous way of delivery. Together we can create a future state-of-the-art cardiac rehabilitation programme that is personalised to the patients' needs and preferences, is menu based and flexible.

Professor Sir Nilesh J Samani
Medical Director
British Heart Foundation

Contents

1. Introduction

This is the updated (fourth) edition of the BACPR Standards and Core Components which are underpinned by the best available current evidence and examples of best practice. While the Standards and Core Components do not seek to replicate the work of organisations such as the National Institute for Health and Care Excellence (NICE), the Scottish Intercollegiate Guidelines Network (SIGN), and the European Society of Cardiology (ESC), they are underpinned by the evidence-based clinical guidelines from these organisations as well as other international guidelines and best available evidence to provide a pragmatic overview of the recommendations for how cardiovascular disease prevention and rehabilitation programmes (CPRPs) should be delivered in the UK and the standards they should expect to achieve. This updated and revised fourth edition has once again been designed to build upon the success of the earlier versions of the standards and core components.

Although advocated in the previous version of the standards and core components, it seems clear that there is an even greater need to promote a more individualised approach to cardiovascular disease prevention and rehabilitation to ensure patients' needs are being met. Cardiovascular disease prevention and rehabilitation is not care that the patient passively receives but a comprehensive programme of rehabilitation that is designed in partnership with the patient, with agreed and co-produced goals that the patient is supported to achieve. A 'one size fits all' approach will not meet the individual needs of patients and so there is a necessity to offer patients more choice in how, when and where their CPRP is delivered and this theme is woven throughout the standards and core components.

With the greater emphasis on individualised cardiovascular prevention and rehabilitation, the core components in this fourth edition have been revised to provide greater focus on the patient. The aim is to ensure that cardiovascular disease prevention and rehabilitation provides a truly tailored (biopsychosocial) approach that is designed to take account of individuals' needs and preferences as well as being culturally appropriate and inclusive. Set out in the core components is what each patient should expect to be included in a coordinated sum of activities, designed to improve patient outcomes by improving quality of life as well as reducing morbidity and mortality. While early CPRPs focused on supervised exercise to counter deconditioning post myocardial infarction and after cardiac surgery, the need for a comprehensive approach is essential and so there should be equal importance on all lifestyle risk factors.

Audit and evaluation provide a measure of performance of each individual CPRP to determine equity of access to and delivery of comprehensive CPRPs across the UK. The data and findings from any audit and evaluation should be used to enhance service quality. The standard expected is that CPRP teams will do this routinely and regularly. Consequently, audit and evaluation have been placed firmly in the standards but have been removed from the core components to reflect the shift of core components being more centred around the patient.

The previously described six standards remain. Greater emphasis has been placed on offering patients a choice of when, where and how their CPRP is delivered to ensure individual needs are met. The standards seek to be more inclusive of patients with other cardiac conditions as they too are known to benefit from participating in a CPRP.

Many CPRP teams made fundamental changes to their services during the COVID-19 pandemic and while there is already evidence which underpins the continuation, not all evidence is yet available. The overarching aim of these standards and core components remains unchanged in that they will provide an evidence-based blueprint for commissioners, health and exercise professionals, politicians and the public upon which all effective cardiovascular prevention and rehabilitation services are designed and a template through which the quality of the service and any variation in that can be assessed.

1.1 Definition

There are many definitions of cardiac rehabilitation.[1-3] The following definition outlined in the previous edition is still relevant and presents their combined key elements:

> *"**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."*
>
> ***The BACPR core components** for cardiovascular disease prevention and rehabilitation constitute the coordinated sum of activities.

1.2 Evidence

The evidence base that supports the merits of comprehensive CPRPs is robust and consistently demonstrates a favourable impact on cardiovascular mortality and hospital re-admissions in patients with coronary heart disease[4] although there remains some uncertainty regarding the effect of cardiovascular prevention and rehabilitation on all-cause mortality.[5-10] For patients who have experienced myocardial infarction (MI) and/or coronary revascularisation, attending and completing the exercise-based component of a CPRP is associated with an absolute risk reduction in cardiovascular mortality from 10.4% to 7.6% when compared to those who do not receive CPRP, with a number needed to treat (NNT) of 37. In terms of recurrent MI and repeat revascularisation, the effect of CPRP would appear to be neutral, however, there is a significant reduction in acute hospital admissions (reduced from 30.7% to 26.1%, NNT 22) which is a key determinant of the intervention's overall cost-efficacy.[6]

For individuals with a diagnosis of heart failure, cardiovascular prevention and rehabilitation may not reduce total mortality but does impact favourably on hospitalisation, with a 25% relative risk reduction in overall hospital admissions and a 39% reduction (NNT 18) in acute heart failure related episodes.[11] The consequences of relapse and readmission are enormous in terms of quality of life, associated morbidity and financial impact thus the importance of CPRP for heart failure patients within national and international guidelines.[12,13,14] In terms of direct measures of anxiety, depression and quality of life, CR demonstrates consistently favourable outcomes for all patient groups and for those with heart failure, a clinically relevant (and highly statistically significant) change in the Minnesota Living with Heart Failure questionnaire point score of 5.8.[11]

It is evident that patients with other manifestations of cardiovascular disease may benefit from attending CPRP. Evidence from studies focused on exercise-based cardiac rehabilitation (rather than the comprehensive approach advocated by BACPR) found that patients who have an implantable cardioverter defibrillator, those post cardiac transplant, adults with congenital heart disease and patients with stable angina may have an improvement in their exercise capacity when participating in CPRP.[8,15-17] The benefits of CPRP in patients with implantable ventricular assist devices and those after heart valve surgery are less clear.[18,19] That said, functional capacity was found to improve in those post left ventricular assist device implantation who participated in CPRP.[20,21] Consequently, patients with these conditions should be offered cardiac rehabilitation routinely. Participating in CPRPs may also be of benefit to other patient

groups (e.g. those with atrial fibrillation, microvascular angina, spontaneous coronary artery dissection) but the evidence is less strong.[9,22-24]

Robust research shows that those with Peripheral Artery Disease (PAD) may benefit from participating in CPRPs from a primary prevention of cardiovascular disease perspective.[25] That said, we are cognisant that currently these people are not traditionally seen by cardiologists and CPRPs would not typically include them in the programmes. Consequently, we conclude that the evidence is such that people with PAD may benefit from a CPRP and so it would be desirable for them to be included. The significant prevalence of multi-morbidity in patients may mean that for some, the primary diagnosis may not necessarily be the cardiovascular disease and so the importance of patient-centred care and an individualised CPRP is paramount.

Finally, there are persuasive data supporting the benefits of different modes of CPRP delivery (e.g. centre-based, home-based, web-based, app-based, multi-modal approach) with no apparent difference in either clinical or quality of life outcomes when comparing supervised centre-based CR with that undertaken in a domestic environment, nor any major variation in healthcare costs.[26] This should allow CPRPs to be patient-centred in that they can offer more flexibility in their offer which may enhance participation particularly of those patients who typically are harder to reach.

CPRP reduces both cardiovascular mortality and episodes of acute hospitalisation whilst also improving functional capacity and perceived quality of life. CPRPs support an early return to work and the development of self-management skills,[27] and can be delivered effectively in a variety of formats, including traditional supervised centres as well as remote or virtual delivery. Given that CPRP remains one of the most clinically and cost-effective therapeutic interventions in cardiovascular disease management,[6] it is vital that systems are in place to maximise uptake and adherence. There is continued emphasis (supported by these updated standards) placed upon the importance of early CPRP, commencing within two weeks of either hospital discharge or confirmed diagnosis. Starting within this timeframe has been shown to be both safe and achievable, as well as improving patient uptake and adherence.[28-33] In addition, there is evidence to suggest that if a member of the CPRP to which a patient has been referred is able to make contact with the patient during the in-hospital stay and begin the process of personalised goal-setting, then this may lead to greater uptake of prevention/rehabilitation services.[34,35]

It is evident that cardiac rehabilitation is a clinically effective and cost-effective intervention for people with cardiovascular disease. While clinical guidelines for cardiac rehabilitation have been in place across the world for many years, access to cardiovascular prevention and rehabilitation services can be challenging.[36] It is clear that uptake and participation rates are far from ideal, with some patient groups having particularly low participation rates.[37] Consequently, there is a greater need to promote an patient-centred approach in CPRPs to enhance participation and improve patient outcomes.

1.3 Funding of cardiovascular prevention and rehabilitation programmes

Different models of commissioning CPRP provision exist within the UK. It is essential for commissioners to consider and ensure services meet the set out standards and encompass all of the core components to ensure patients are afforded the most clinically effective CPRP service. Only by ensuring this will the benefits of cardiovascular prevention and rehabilitation be realised.

2. The Standards

STANDARD 1
Identification and referral

a. Patient Identification.

- **It is recognised that local policy may be required to address priority groups in the first instance to reduce variation, ensuring consistency and equity of access.** These standards however advocate investment in cardiovascular prevention and rehabilitation services so as to ensure that all patient groups ultimately benefit.
- The following patient groups are known to benefit and so should be offered a CPRP irrespective of age, sex, ethnic group and clinical condition.
    - acute coronary syndrome
    - coronary revascularisation
    - heart failure
    - stable angina
    - pre and post-implantation of cardiac defibrillators and resynchronisation devices
    - post-heart valve repair/replacement
    - post-heart transplantation and ventricular assist devices
    - adult congenital heart disease (ACHD)
- There is evidence that other patient groups may also benefit from a CPRP.
    - atrial fibrillation
    - non-obstructive coronary artery disease (NOCAD)
    - peripheral artery disease (PAD)
    - spontaneous coronary artery dissection (SCAD)
- It is recognised that many individuals without a diagnosis of CVD may be identified as high risk for the development of CVD and therefore benefit from the same professional lifestyle interventions and risk factor management as those who are currently qualify for CPRPs. In addition, risk factors for cardiovascular disease are largely shared with the wider spectrum of non-communicable diseases such as cancer, and chronic obstructive pulmonary disease. Existing cardiovascular prevention and rehabilitation services, if appropriately resourced, are in a strong position to provide high quality, cost-effective interventions to individuals both with and without established CVD. CPRPs should demonstrate an ambition to broaden their offer and initiate discussions with commissioners locally.

b. Patient Referral.

- An agreed and coordinated patient referral and/or recruitment process shall be in place so that all eligible patients are identified and invited to participate.
- ALL eligible patients shall be referred to a CPRP and if in the hospital setting, this should occur prior to or at the time of discharge. Ideally, patients should simultaneously be provided with the referral details.
- It is the responsibility of ALL healthcare professionals to promote the benefits of attending and completing a CPRP to their appropriately identified patients.

c. Recruitment.

- Upon receipt of referral, all patients deemed eligible, shall be contacted within 5 working days to review their progress and discuss enrolment.
- A mechanism of re-offer and re-entry should be put in place where patients initially decline.

STANDARD 2
Multidisciplinary team

- Each CPRP shall deliver the five essential core components to ensure clinically effective care and achieve sustainable health outcomes.
- When designing, evaluating and developing programmes, service users should also be included in this process.
- The team shall include a senior clinician who has responsibility for coordinating, managing and evaluating the service. This also includes: resource and financial management for the service, planning, and implementing quality improvement initiatives, collaboration with NHS data analysts to evaluate the service, and engagement with funding and commissioning bodies.
- There shall be an appropriately qualified and competent named lead for each of the core components. The practitioners who lead each of the core components should be able to demonstrate that they have the necessary knowledge, skills and competencies to meet the standards. Practitioners should use the BACPR Competencies Frameworks, where available.
- The team shall include a physician who has sustained interest, commitment and knowledge in cardiovascular disease prevention and rehabilitation.
- The delivery of the core components requires expertise from a range of different professionals working within their scope of practice. The composition of each team may differ but it is essential that collectively the team has the necessary knowledge, skills and competencies to meet the standards and deliver all core components. Patients benefit from access to a wide range of specialists, which most typically may include (in alphabetically order):
    - Counsellor
    - Dietitian
    - Exercise specialist
    - Nurse specialist
    - Occupational therapist
    - Pharmacist
    - Physician with special interest in prevention and rehabilitation
    - Physiotherapist
    - Practitioner Psychologist
- There shall be dedicated administrative support.
- The cardiovascular prevention and rehabilitation team shall actively engage and collaborate with the patient's/client's wider care team across primary/community, secondary and tertiary care (e.g. general practitioners, practice nurses, pharmacists, cardiovascular disease specialist nurses and physicians, sports and leisure instructors, and social workers) as well as the voluntary sector involved with patients with CVD to create a truly comprehensive and integrated approach to CVD prevention.

STANDARD 3
Initial assessment

- The purpose of the initial assessment is to agree a defined pathway of care which meets the individual patient needs, participation preferences and choices and this assessment should be started within ten working days of referral to the CPRP.
- The initial assessment is deemed complete when documentation of all the following has taken place:
    - Demographic information and social determinants of health;
    - Medical history, current health status and symptoms, together with a review of any relevant investigations;
    - Lifestyle risk factors (exposure to tobacco, adherence to a cardioprotective diet, body composition (height, weight, waist circumference), physical activity status and exercise capacity);
    - Psychosocial health (anxiety, depression, illness perception, social support, psychological stress, sexual wellbeing and quality of life);
    - Medical risk management (control of blood pressure, heart rhythm identification, lipids and glucose, use of cardioprotective therapies and adherence to pharmacotherapies).
- Additional parameters should be assessed on an individual basis and may include psychosocial factors such as trauma, anger, hostility, substance misuse, occupational distress and financial distress safeguarding.
- Even if the initial assessment cannot be completed in its entirety (e.g. exercise capacity assessment temporarily contraindicated) this shall not delay the assessment of the remaining elements or the commencement of a formal CPRP.
- The initial assessment shall identify each individual's needs, using validated measures that are culturally sensitive and also take account of associated co-morbidities.
- The assessment shall identify any physical, psychological or behavioural issues that have the potential to impact on the patient's ability to make the desired lifestyle changes.
- Patients shall receive on-going assessment throughout their CPRP and a regular review of their goals, with adjustments agreed and documented where required.

STANDARD 4
Delivery of programme

- A CPRP shall be deemed underway once the initial assessment had been completed and the patient priorities have been agreed. The CPRP should be commenced as soon as possible following the initial assessment.
- Initiate management strategies in all relevant core components excepting that certain core components may need to be postponed or delayed (e.g. exercise).
- In order to maximise uptake, completion and outcomes, CPRPs shall deliver a person-centred approach to meet an individual's needs, priorities and preferences. Efforts should be made to alleviate barriers to CPRP participation.
- CPRPs can be delivered using a variety of modes (e.g. centre-based, home-based, web-based, app-based, multi-modal approach etc.). Irrespective of programme delivery:
    - Patients should be offered options of the modes of CPRP;
    - Interventions provided are evidence-based and address the individual's needs across all the relevant core components ;
    - Patients shall have access to the multidisciplinary team as required.

STANDARD 5
Final assessment

- In order to demonstrate effective health outcomes and ascertain the extent to which as patient's goals have been achieved, a formal assessment shall be performed at programme completion, which includes all the initially assessed components:
    - Lifestyle related risk factors (exposure to tobacco, adherence to a cardioprotective diet, body composition, physical activity status and exercise capacity);
    - Psychosocial health (anxiety, depression, illness perception, social support, psychological stress, sexual wellbeing and quality of life);
    - Medical risk management (control of blood pressure, lipids and glucose, use of cardioprotective therapies and adherence to pharmacotherapies).
- Any additional parameters assessed initially should be re-assessed formally upon programme completion. For example, additional psychosocial factors such as trauma, anger, hostility, substance misuse, and occupational distress.
- Data from the final assessment shall be formally recorded for evaluation of outcome measures and audit.
- Final assessment shall be used to identify any unmet goals as well as any newly developed or evolving clinical issues. This shall assist the formulation of long-term strategies.
- Within 10 working days of programme completion, the primary care provider (and the referral source where relevant) shall be provided with a pre/post comparison of the patient's risk factor profile together with current medications and a summary of the long-term strategies proposed. A copy shall also be provided to the patient.

STANDARD 6
Audit and evaluation

- Formal audit and evaluation of the cardiovascular disease prevention and rehabilitation programmes shall include individual data on clinical outcomes and patient experience and satisfaction as well as data on service performance.
- CPRP teams will regularly collect data, and where possible, submit the data to a national registry (e.g. NHS Digital).
- Each CPRP team should ensure the core components are available to all eligible patients.
- Each CPRP should meet the Standards set out.
- Where relevant, CPRPs should meet the minimum standards of the National Certification Programme.
- Where service resources and service design permits, the BACPR encourages CPRP teams to provide one-year follow-up data as part of audit.
- Service level audit should include the collection of data to meet the following aims:
    - Monitor and manage patient progress
    - Evaluate CPRPs in terms of clinical and patient-reported outcomes
    - Benchmark against local, regional and national standards
    - Provide measures of performance and quality for commissioners and providers of cardiovascular prevention and rehabilitation services
    - Contribute to the national audit functions
    - Present and share cardiovascular prevention and rehabilitation outcomes, including patient experience feedback in both clinical and patient formats.

3. The Core Components

3.1 Introduction

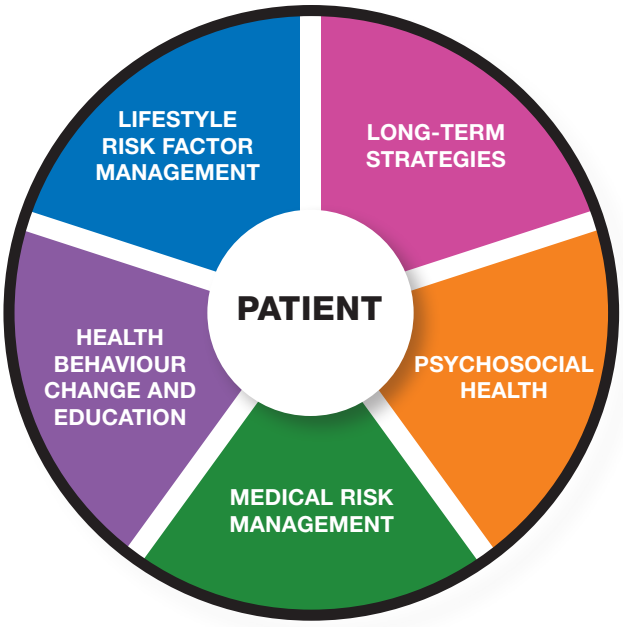
It is essential that healthcare providers implement national guidance on cardiac rehabilitation (e.g. National Institute for Health and Care Excellence and Scottish Intercollegiate Guidelines Network) and national strategic policies (e.g. the NHS England Long Term Plan / NHS Scotland Heart Disease Action Plan which prioritise CPRP participation and individualised care).

A key aim of a CPRP, through the core components, is not only to improve physical health and quality of life but also to equip and support people to develop the necessary skills to successfully self-manage. Delivery should adopt a biopsychosocial evidence-based approach, which is culturally appropriate and sensitive to individual needs and preferences.

Figure 1 illustrates the five core components, which include:

- Health behaviour change and education
- Lifestyle risk factor management
    - Physical activity and exercise training
    - Healthy eating and body composition
    - Tobacco cessation and relapse prevention
- Psychosocial health
- Medical risk management
- Long-term strategies

Figure 1: The BACPR model for Cardiovascular Disease Prevention and Rehabilitation core components



Practitioners who lead each of the core components must be able to demonstrate that they have appropriate training, professional development, qualifications, skills and competency for the component(s) for which they are responsible (Standard 2)[50]. BACPR aims to be a resource for providing guidance on the knowledge, skills and competences required for each of the components.

3.2 Health behaviour change and education

In meeting individual needs, health behaviour change and education are integral to the other components of cardiovascular prevention and rehabilitation. Adopting healthy behaviours is the cornerstone of prevention and control of cardiovascular disease.

Health behaviour change

To facilitate effective behaviour change, CPRP services should ensure:

- The use of health behaviour change interventions and key behaviour change techniques are underpinned by an up-to-date psychological evidence-base.[38]
- CPRP commences with an exploration of patients' understanding of their condition as well as how much control they perceive they have.[39-42]
- Priority and goal setting is done co-productively between the patient, their significant other and the CPRP professional.
- Patients are offered evidence-based information that is appropriate to their literacy level. Information is available in a variety of media to afford patients the opportunity to select those which best suit their needs.[26,43,44]
- Patients have choice in what support they will access to facilitate any behaviour change (i.e. hospital / home-based CPRP team, leisure services, mobile tech, wearable devices).
- Patients' self-management skills and self-efficacy are assessed to ensure sufficient and effective support is provided prior to referral back to primary care.
- Assessment of individuals' confidence in self-managing their condition is conducted.
- Patients are offered follow up to assess / review progress and explore and identify their needs (for specific details see long term management core component section).
- Where possible, the patient identifies someone best placed to support him/her (e.g. a partner, relative, close friend). The accompanying person should be encouraged to actively participate in CPRP activities whenever possible, to maximise patient recovery and health behaviour change, whilst also addressing their own health behaviours.[45,46,47]

Education

Education should be delivered not only to increase knowledge but also importantly to restore confidence and foster a greater sense of perceived personal control. It should be person-centered based on a discussion between the CPRP professional and the patient. As far as possible, education should be delivered in a discursive rather than a didactic fashion. It is not enough to simply deliver information in designated education sessions. Attention should be paid to establishing existing levels of knowledge and to assessing learning needs (of individuals and groups), and subsequently tailoring information to suit assessed needs. It should also be culturally sensitive. Patients (and significant supporting others) should be encouraged to play an active role in the educative process, sharing information in order to maximise uptake of knowledge. The key aims of the education component are:

- To increase knowledge and understanding of risk factor reduction.
- To utilise evidence-based health behaviour change theory in its delivery.[48]

Incorporation of both these aspects of the education component increases the probability of successful long-term maintenance of change and self-management of their condition.

The key factors to consider in relation to preparing and delivering the educational component of a CPRP are:

- The educational component should be delivered using high quality and varied teaching methods which take account of different learning styles and uses the best available resources to enable individuals to learn about their condition and management.
- Information should be presented in different formats using plain language and clear design and tailored to the learning needs identified during assessment.[48] This could be delivered to groups or individuals.
- The education material should be reviewed regularly, be current and relevant.
- The education component of cardiovascular prevention and rehabilitation should empower individuals to better manage their condition.
- The CPRP educational component should be tailored to patients' individual CPRP needs.

The following list of topics[47] provides areas where the educational input may be focused:

- Pathophysiology of cardiovascular disease and symptoms;
- Physical activity, healthy eating and weight management;
- Tobacco cessation and relapse prevention;
- Self-management and behavioural management of other risk factors including blood pressure, lipids and glucose;
- Medical and pharmaceutical management of blood pressure, lipids and glucose;
- Psychological and emotional self-management;
- Stress management techniques (e.g. relaxation, mindfulness);
- Social support and other contextual factors;
- Activities of daily living;
- Occupational/vocational factors;
- Resuming and maintaining sexual relations and dealing with sexual dysfunction;
- Surgical interventions and devices;
- Cardiopulmonary resuscitation;
- Additional information, as specified in other components.

3.3 Lifestyle risk factor management

Physical activity and exercise, together with a healthy diet and avoidance of obesity and exposure to all forms of tobacco represents a lifestyle that is strongly associated with good cardiovascular health. All patients should have the opportunity to discuss their concerns across all of these lifestyle risk factors as relevant. Achievement of the lifestyle targets, as defined by the most up to date Joint British Societies Guidelines[49], should utilise evidence-based health behaviour change approaches led by specialists in collaboration with the multidisciplinary team. Supporting individuals in developing self-management skills is the cornerstone to long-term CPRP.

Physical activity and exercise training

The evidence for the beneficial impact of being more physically active upon both the CVD risk profile and recovery following CVD-related events is overwhelming.

- Initial assessment of physical capacity and functional status shall be carried out to inform risk assessment, individualise the physical activity prescription and aid goal setting.[51,52]
- Cardiopulmonary maximal exercise testing (CPET) e.g. on a treadmill is the gold standard for assessing physical capacity. If a maximal test is unable to be perfomed then a submaximal exercise test e.g 6 Minute Walk Test, Incremental Shuttle Walk Test, cycle ergometry or a step test should be perfomed. In frail patients or patients unable to walk, the SPPB (Short Physical Performance Battery) or other chair-based tests should be considered.[53]
- Best practice standards and guidelines for physical activity and exercise prescription shall be used appropriate to the patient.[51,52,54]
- Risk stratification, based upon clinical features and physical capacity at initial assessment shall be undertaken. This will then determine the appropriate:
    - Exercise prescription, activities of daily living (ADL) guidance and support;
    - Staffing levels and skills to ensure patient safety;[50]
    - Resuscitation support and provision in line with current Resuscitation Council UK / BACPR guidance.[55]
- A menu-based approach to delivery of the physical activity component should be used to support patient engagement; this includes choice of venue (community/hospital/home) and delivery (face-to-face/virtual). Staff should use their professional judgment in guiding patients to the safest, most appropriate option. For all options, a face-to-face physical capacity assessment is essential prior to exercise prescription.
- Patients should be offered individual guidance and supported to co-produce an individualised plan, including ADLs, physical activity and structured exercise with the overall aim to reduce sedentary behaviour, increase overall energy expenditure and improve physical fitness. The plan should take account of their co-morbidities and should be sensitive to their physical and psychosocial (cognitive and behavioural) capabilities, and socioeconomic status.
- Any patients presenting with multi-comorbidity may need further specialist advice and so should be referred on as appropriate.
- Maintaining guideline levels of blood pressure and glucose is important for safe exercise.
- Any individual plan should include strategies to support long-term adherence to physical activity.

Healthy eating and body composition

- A lifelong approach to cardiovascular health should be promoted, encouraging regular physical activity (including both aerobic and resistance training) and a healthy body mass index throughout the life course.
- All patients should have a baseline assessment of their dietary habits, including adherence with a cardioprotective diet and measurement of their weight, body mass index and waist circumference.
- Body mass index categories used for underweight, healthy weight, overweight and obese must be specific for different ethnicities.[56]
- Dietary advice should be tailored to the individual, and should reflect the individual's culture, needs capabilities and co-morbidities, coupled with support to help them achieve and adhere to a prescribed diet pattern.[57]
- The focus of dietary advice should be on making healthy dietary choices to reduce total CVD risk and improve body composition.
- Waist circumference is an essential component of understanding cardiometabolic risk and should be a routine measure for baseline assessment and monitoring.[58] Waist circumference should be measured as per NICE recommendations.[59]
- Weight management may form an important component in both primary and secondary prevention of CVD, and could include advice for some patients to gain weight and increase muscle mass (i.e. those underweight or inactive), to reduce excess body fat and maintain or gain muscle mass. These are best achieved through a combination of increased physical activity (not solely focussing on exercise) and alterations in energy intake.
- Weight maintenance may also be an important aspect to support, especially in those who have recently stopped smoking.
- It may be appropriate to refer to appropriate tier 2 or tier 3 weight management services for pharmacotherapy and/or bariatric surgery in order to co-manage weight loss, or if the CPRP service is unable to provide the required level of dietary intervention and follow-up.[59,60]
- Misconceptions about nutrition, dieting and weight cycling should be addressed and corrected.[61]
- Patients with additional co-morbidities leading to more complex dietary requirements should be assessed and managed individually by a registered dietitian.
- In those patients who are at risk of malnutrition or malnourished (as determined through Malnutrition Universal Screening Tool - MUST), nutrition support should be provided by a registered dietitian and should be prioritised over making cardioprotective diet changes.[62]
- For those individuals with hypertension, dietary strategies to lower blood pressure should be encouraged as per clinical guidance.[63] Specifically, considering diet and exercise pattern, alcohol consumption, sources of sodium, in addition to weight loss in those with overweight or obesity.
- Dietary approaches to stop hypertension (DASH), Nordic, and Mediterranean-style cardioprotective diets may be effective at reducing systolic and diastolic blood pressure.[64-67] Low carbohydrate diets and plant-based diets may also be effective.[68,69]
- For those individuals with elevated lipids, dietary strategies to reduce low-density lipoproteins and triglycerides should be encouraged as per clinical guidance.[70-73] Specifically, the reduction of saturated fat and replacement with unsaturated fat, replacement of refined carbohydrates with wholegrain or fibrous types, and reduced consumption of free sugars should be encouraged. However it is important to acknowledge food-based effects when making such recommendations.[57]

- A traditional cardioprotective diet is recommended post-MI.[71,73] However, it must be recognised that additional diet patterns such as DASH, plant-based diets and even low-carbohydrate diets may be appropriate for some patients.[57] These options should be discussed with patients allowing them to make an informed decision.
- For patients with heart failure, advice regarding sodium and fluid restrictions must be tailored to the individual.[74] This advice should be mindful that such restrictions on sodium and fluid may have unintended consequences on energy and protein intake, potentially increasing the risk of malnutrition, if not supported and guided appropriately. Malnutrition is strongly linked with poor outcomes in those with chronic heart failure.[75]
- In addition to information on a cardioprotective diet, heart failure patients may need specialist dietetic advice on potassium intake (restriction/supplementation) as a result of hyper/hypokalaemia. Optimisation of heart failure medication relies on maintenance of blood potassium levels in a tight range (e.g. 4.0-5.0mmol/l).[76] Common co-morbidities in heart failure patients include iron deficiency, diabetes and kidney dysfunction, which may also require specialist dietetic support. It may be appropriate to refer patients with poor appetite, oedema and worsening shortness of breath to the GP or specialist heart failure team for a medicine review.
- Hospitalised heart failure patients should receive tailored nutrition support to prevent malnutrition and deterioration of nutritional status.[77]

Tobacco cessation and relapse prevention

- Current and past tobacco use should be assessed in all patients including whether they are a current user or recent quitter, their history of tobacco use, past quit attempts and exposure to second hand smoke.
- In patients who are currently using tobacco, frequency and quantity of use should be quantified. In addition, motivation to quit and a measure of nicotine dependence should be assessed, together with identifying psychological co-morbidities like depression and tobacco use by others at home.
- At the first assessment, medical advice to quit should be reinforced and a quit plan discussed which proposes the use of pharmacological support and follow up counselling within the CPRP service. Every effort should be made to assist individuals to achieve complete cessation of all forms of tobacco use, with repeat assessment of progress with cessation at every visit.[79-81]
- Patient preference is a priority regarding the choice of aids to use in tobacco cessation. The use of evidence-based therapies and combination long- and short-acting nicotine replacement therapy (NRT) is considered the gold standard, however non-medical nicotine delivery devices like e-cigarettes should also be considered as evidence is building for their efficacy. Guidance for cessation advisers can be found in the National Centre for Smoking Cessation and Training e-cigarette briefing.[82]
- Preventing relapse is vital and may include prolonging the use of NRT and possibly evidence-based therapies beyond the usual duration, and/or e-cigarettes in cases where cessation has been problematic. Risk of relapse is higher when an individual lives, socialises or works closely with others who use tobacco, therefore encouraging quit attempts in partners, spouses, friends or children may be helpful.
- Referral to specialist smoking cessation services should be considered where necessary and appropriate.

3.4 Psychosocial health

Assessment of psychosocial health

People taking part in CPRPs may have many different emotional issues, and a comprehensive, holistic assessment is crucial to identify the needs of the individual. Every patient should be screened for psychological, psychosocial and sexual health and wellbeing as ineffective management can lead to poor health outcomes.[83-86]

- All patients should undergo a valid assessment of:
    - Psychological distress, for example, anxiety and depression (using an appropriate tool – Hospital Anxiety and Depression Scale (HADS)[87] or Patient Health Questionnaire (PHQ);[88]
    - Post Traumatic Stress Disorder;
    - Quality of life (using an appropriate tool - Dartmouth Primary Care Cooperative (COOP)[89] and Minnesota Living With Heart Failure (MLWHF);[90]
    - Psychological stressors - Illness perceptions and self-efficacy for health behaviour change;[91]
    - Adequacy of social support (covered in COOP);
    - Alcohol and substance misuse;
    - Cognitive issues.
- CPRPs should adopt a trauma (PTSD) informed approach while carrying out such assessments to incorporate trust, safety, choice and collaboration to support recovery.[92]
- CPRPs should be mindful of how equality and diversity issues may impact on an individual's rehabilitation (including gender issues and language and cultural barriers).[91]
- Issues such as social deprivation and social economic status should be taken into account as these may also impact on engagement and recovery.[93,94]
- CPRPs should help patients to increase awareness of ways in which psychological development, including illness perceptions, stress awareness and improved stress management skills can affect subsequent physical and emotional health.
- Attention should be paid to social support, as social isolation or lack of perceived social support is associated with increased cardiac mortality.[90] Whereas appropriate social support is helpful, overprotection may adversely affect quality of life.[95]

Psychosocial interventions

- There are varying levels of psychological intervention (for psychological distress):
    - CPRPs are best placed to deal with the normal range of emotional distress associated with a patient's precipitating cardiac event;
    - CPRP teams should be able to recognise and refer when a person may benefit from a Post Traumatic Stress Disorder (PTSD) specialist intervention. The presence of PTSD can lead to poorer recovery and higher mortality risk;[85]
    - Where appropriately trained psychological practitioners and trauma (PTSD) specialists exist within the CPRP team, individuals with clinical levels of anxiety or depression related to their cardiac event can be managed within the service.

- In the absence of dedicated psychological practitioners in the team, individuals with clinical signs of anxiety and depression, or post traumatic stress disorder (PTSD) unrelated to their cardiac event, or with signs of severe and enduring mental health problems, should have access to appropriately trained psychological practitioners and their GP should be informed.[96,97,98]
- CPRP teams should be aware of patients with problems related to alcohol misuse or substance misuse and offer referral to an appropriate resource.
- During cardiac rehabilitation other important considerations include: vocational advice, financial implications, occupational balance and rehabilitation. Services are encouraged to establish agreed referral pathways to provide appropriate support, signposting and advice.[99]
- Sexual health issues are also common with CVD and can negatively impact quality of life and psychological wellbeing.[100,101]
    - Every patient should be provided with the opportunity to raise any concerns they may have in relation to sexual activity and/or function. Assessment of patients' sexual concerns can be beneficial;[102]
    - Concerns or issues raised on assessment should be addressed through sexual counselling and medical management where indicated;[102-104]
    - Patients dealing with longstanding or complex sexual health issues should be offered referral to an appropriate resource.[102-104]

3.5 Medical risk management

The assessment, treatment and monitoring of medical risk factors is challenging, time-consuming and resource-intensive but is critical in order to maintain disease stability and to ensure optimum prognostic benefit. CPRPs are ideal vehicles through which medical risk factors can be managed although with the advent of multiple modes of CPRP delivery (including home-based/digital) close alignment with community and hospital-based services will be required and the adoption of remote-monitoring technologies likely to be essential. Staff leading the medical risk management component of a CPRP should be appropriately qualified, skilled and competent and should develop robust links with local health-care colleagues in the hospital and community sectors.

An independent prescriber should be part of the multidisciplinary team and should consider developing appropriate treatment algorithms for the wider team. CPRPs that ensure the complete assessment and optimisation of medical risk factors appear to produce more favorable long-term patient outcomes.[105]

Best practice standards and guidelines for medical risk factor management (atrial fibrillation, blood pressure, lipids and glucose),[106-112] optimisation of cardioprotective therapies and management of patients with implantable devices should be used.[113,114]

Initial assessment should include:

Baseline values for blood pressure, heart rate, lipid profile, blood glucose & HbA1c in all patients (via referring organisation / primary-care / on-site / home monitor).

- Current medication use, including the patient's belief(s) about medication as this affects adherence to drug regimens.[115]
- Inquiry about sexual activity / function (pending patient's willingness to discuss).
- Implantable device settings where applicable.

- For patients with established essential hypertension ensure that appropriate blood pressure goals are agreed and strategies discussed which allow adequate blood pressure surveillance throughout the CPRP. This may involve remote monitoring, continuous ambulatory monitoring and ad hoc measurements taken during in person sessions.
- For patients with inadequate blood pressure (BP) control, provide lifestyle advice and pharmacological interventions according to local / national guidelines / algorithms. Ensure that primary care is advised of any changes to medical therapy and any remaining issues concerning BP control.
- For patients with possible hypertension (according to referral BP values or initial assessment readings), offer systematic home BP monitoring, provide appropriate advice / interventions and liaise with primary-care colleagues accordingly.
- All patients should have an up to date measurement of HbA1c and blood glucose level taken within six weeks of referral. Provide appropriate lifestyle and dietary advice to all patients with either impaired glucose tolerance, a new diagnosis of diabetes mellitus (DM) or established DM.
- Key cardioprotective medications should be prescribed according to available guidance and should be up-titrated during the CPRP so that evidence-based dosages are achieved. Primary-care and secondary-care colleagues should be advised of any interventions made and any issues or concerns.
- All patients should have a check of their lipid profile performed around the time of their final assessment. As a minimum, total cholesterol and HDL-cholesterol levels should be obtained. Ensure that appropriate guidance is in place for the identification and onward referral of possible/probable familial hypercholesterolaemia. Offer advice regarding lipid modification according to local policies, algorithms and/or national clinical guidelines.
- CPRP staff should be involved with initiation and/or titration of appropriate pharmacotherapy either directly through independent prescribing by a member of the multi-disciplinary team or agreed protocols / patient group directives or through liaison with an appropriate healthcare professional (e.g. cardiologist, primary care physician).
- Atrial fibrillation (AF) is a common cardiac arrhythmia which occurs frequently in patients with CVD and CVD risk factors such as hypertension and overweight/obesity. Ensure that pathways are in place to identify AF in patients with symptoms (usually palpitations) and/or with irregular pulse on palpation. Erroneous or erratic blood pressure readings on automated BP devices may also suggest the presence of AF. The gold-standard for the diagnosis of persistent AF is via a 12-lead ECG. Paroxysmal (intermittent) AF may be diagnosed using wearable ECG monitors, home ECG recording via commercially available devices or the use of smartphone enabled applications.[116] All CPRPs should have access to these diagnostic modalities.
- Erectile dysfunction in cardiovascular patients typically is multifactorial with vascular disease, psychogenic factors and medication being potential contributors. Individuals with erectile dysfunction should be considered for medication review and appropriate referral made where indicated.
- Liaison with specialist cardiac services is important (e.g. arrhythmia nurse specialist, electrophysiologist and cardiac physiologist).
- CPRPs also provide an opportunity to identify patients who may benefit from an implantable device.[117]
- In people with implantable devices, such as implantable cardiac defibrillators and/or cardiac resynchronization therapy:
    - Devices can have an impact on psychological and physical function, which should be considered within the individualised CPRP and may require additional expertise.[113,118,119]

3.6 Long-term strategies

At the point of completion of the CPRP, a reassessment including all components assessed at the initiation of the CCRP should be undertaken. This should include a formal assessment of patients' long-term management needs on completion of the CPRP, including relevant lifestyle risk factors (physical activity, diet, alcohol consumption and tobacco / drug use), psychological and psychosocial health status, medical risk factors (blood pressure, heart rhythm, lipids and glucose), use of cardioprotective therapies and in conjunction with the patient, agree long-term management goals.

This could include signposting patients, and their families, where appropriate, to join:

- local heart support groups;[120]
- community exercise and activity groups;[6]
- community dietetic and weight management services;
- tobacco and smoking cessation services.

Where deemed beneficial, signposting to tools (e.g. mobile applications, wearable technologies) for self-monitoring purposes.[6] Healthcare professionals should discuss the quality and validity of self-monitoring tools with the patients to allow informed decision-making regarding which is most appropriate.

Effective and timely communication as well as collaboration between primary / community healthcare providers and those in secondary / tertiary healthcare settings is essential in order to help patients achieve their long-term goals. Healthcare professionals should aim to work within an integrated care system as set out in strategic national policies (e.g. NHS England Long Term Plan[121] / NHS Scotland Heart Disease Action Plan[122]).

Patient responsibilities

By the end of the CPRP the patient should have:

- Been encouraged and supported to develop full biopsychosocial self-management skills and so be empowered and prepared to take responsibility to pursue a healthy lifestyle to minimise their risk of cardiovascular disease progression.[123,124]
- In conjunction with their healthcare professional, agreed their long-term management goals.
- Encouraged their carers, spouses and family members to contribute to long-term management by helping and encouraging the individual to achieve their goals.[125]
- Made contact with their GP/ primary or community health care provider to ensure long-term follow up and support for self-management of cardiovascular disease is in place.

CPRP professional responsibilities for long term management

- Promptly communicate the findings of the final assessment to the patient, the healthcare professional who referred the patient for CPRP, the patient's GP as well as to any others directly involved in the continuation of healthcare provision. Ideally this should be done in an electronic format using a structured discharge letter.
- Share relevant information such as medical risk factors with the patient's GP (e.g. transfer data to the GP / primary care Quality and Outcome Framework (QOF) computer held data).

Healthcare professional responsibilities for long term management

- Add patients to primary care CHD/CVD registers to allow effective and efficient follow-up of their long-term conditions as part of the GP contract in England, Wales and Northern Ireland.[126]

4. Review and updating

These standards replace the previously published standards of 2017. We anticipate a further review of these standards in three to five years.

5. The writing group and acknowledgements

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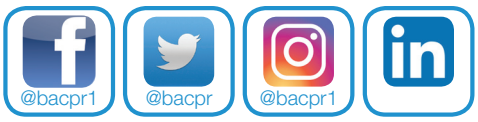

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