

# Review Article

## Core Components of Cardiac Rehabilitation Program

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### ABSTRACT:

The majority of deaths worldwide are caused by cardiovascular diseases, of which coronary heart disease is the most prevalent and fatality-causing. The cardiac rehabilitation programme is acknowledged as the primary technique of lifestyle adjustment to reduce and prevent the recurrence of heart attacks, as is the case with all cardiovascular disorders. A multidisciplinary programme that includes post-operative patient care, improved medical treatment, nutritional counselling, smoking cessation, risk stratification, stress management, hypertension management, and the management of diabetes or dyslipidaemia, this programme ensures a safe return to physical activity. The objectives for this review article were focused to aid patients in regaining their independence and strengthening their physical activity post cardiac rehabilitation programme, controlling the risk factors and aware people to take control of their own medical care and lifestyle modifications. The databases of Google scholar, Pubmed, J gate were searched with a variety of key words and Mesh terminologies using Boolean operators. Additionally, reference lists for chosen articles were checked and desired data was retrieved through snowballing. The reduction of mortality, the alleviation of symptoms, the cessation of smoking, the improvement of exercise tolerance, risk factors modification and the general psychological well-being are all advantages of cardiac rehabilitation.

**Key Words:** Cardiovascular disease, Cardiac rehabilitation programme, Risk stratification, Myocardial infarction, ischemic heart disease

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### INTRODUCTION

One of the top causes of death globally and the leading cause of death is cardiovascular disease (CVD).<sup>1</sup> In India, coronary heart disease (CHD) is a leading cause of death and morbidity. Over the past 40 years, the reported prevalence of CHD in Indian adults has increased fourfold (to a current level of about 10 percent), and even in rural regions, the prevalence has increased by twofold over the previous 30 years (to a present level of around 4 percent).<sup>2</sup>

Patients with heart conditions such as ischemic heart disease, heart failure, myocardial infarctions, or those who have had heart procedures like coronary angioplasty or coronary artery bypass grafting are eligible for cardiac rehabilitation. Cardiac rehabilitation is tailored to each patient's needs. Cardiovascular rehabilitation programmes work to lessen the psychological and physical strains that come with cardiovascular illness, lower the chance of death from it, and enhance cardiovascular function in order to help patients live as comfortably as possible.<sup>1</sup>

Cardiac rehabilitation is a sophisticated, multifaceted strategy tailored to the unique needs of individuals with heart disease. It entails physical activity promotion, health education, cardiovascular risk management, and psychological support.<sup>7</sup>

American College of Cardiology recommendations stress the value of cardiac rehabilitation as a means of achieving essential lifestyle changes following AMI (Acute myocardial infarction). Furthermore, outpatient cardiac rehabilitation programmes have increasingly expanded their scope to become a major method for secondary prevention as hospital stays for AMI have markedly decreased over time, decreasing the chance for in-hospital risk factor therapies.<sup>3</sup>

A complete cardiac rehabilitation programme must to include a few essential elements. These elements should maximise the decrease of cardiovascular risk, lessen disability, promote active and healthy lifestyle changes, and assist in maintaining these healthy routines once rehabilitation is over.<sup>1</sup>

## OBJECTIVES

Over the past 40 years Cardiac rehabilitation has evolved from a simple monitoring programme to ensure a safe return to physical activity to a multidisciplinary programme that includes post-operative patient care, better medical treatment, nutritional counselling, smoking cessation, risk stratification, stress management, hypertension management, and diabetes management and dyslipidemia. In 1993 World Health Organization (WHO) defined Cardiac rehabilitation as "the entirety of activities necessary to influence favourably the underlying cause of the disease as well as to ensure the patient is in the best physical, mental, and social conditions so that they may, by their own efforts, maintain or resume when lost, as normal a place as possible in the community life".<sup>5</sup>

In the past, the main goals of cardiac rehabilitation were to aid patients in regaining their independence and strengthening their daily physical activity. Regular exercise lowers blood pressure, lowers visceral fat, lowers glycemia, and enhances HDL cholesterol. Controlling the risk factors that can be changed is another goal of cardiac rehabilitation which includes therapeutic education that stresses the significance of the measurements of therapeutic life changes in addition to smoking cessation and medication optimization for blood pressure, diabetes, and cholesterol control. The ultimate objective is to empower people to take control of their own medical care and lifestyle modifications. Finally, another goal of cardiac rehabilitation is to assist cardiac patients in managing their emotional and professional issues. Following cardiac events, psychiatric issues including anxiety and depression are quite common and are linked to decreased exercise tolerance, exhaustion, a poorer quality of life, and a diminished sense of wellbeing. Patients receive stress management and other tools for self-regulation in cardiac rehabilitation facilities, which has an impact on risk factor control.<sup>5</sup>

## CORE COMPONENTS OF CARDIAC REHABILITATION PROGRAMME

These are the components for cardiac rehabilitation:

### ASSESSMENT OF PATIENT

Initial inspection of the patient includes documenting comorbidities, determining the patient's cardiovascular risk profile, as well as previous cardiovascular medical and surgical diagnoses. A resting 12-lead electrocardiogram is taken in addition to the usual cardiovascular physical examination being reported.<sup>4</sup>

The study looked at how cardiac rehabilitation affected older cardiac patients' daily activities. The study found that a 20-session exercise-based cardiac rehabilitation programme significantly improved the older participants' physical function. After completing the CR programme, 55 percent of the elderly patients scored over the limit, further demonstrating how the

CR programme can enhance elderly people's capacity for independent functioning.<sup>9</sup>

## NUTRITIONAL COUNSELLING

In order to provide nutritional counselling, it is necessary to collect baseline information on daily calorie intake, dietary cholesterol, sodium, saturated fat, and other nutrients. Patient's sedentary eating habits which include alcohol consumption, should be connected to the desired nutritional components based on their particular cardiac condition and relevant comorbidities. Dietary objectives and customised dietary adjustments should be a part of education and counselling, with consideration for cultural and personal factors.<sup>4</sup>

## WEIGHT MANAGEMENT

Obesity negatively affects cardiovascular risk parameters and is a solitary risk factor for cardiovascular disease. Based on patient's individual cardiovascular condition and related risk factors, both short- and long-term weight goals can be established by measuring height, weight, waist circumference and body mass index. The ideal BMI falls between 18.5 and 24.9 kg/m<sup>2</sup>, with a waist measurement of 35 inches for females and 40 inches for males. To manage weight, a behavioural programme, physical exercise, and diet are all incorporated.<sup>4</sup>

## BLOOD PRESSURE MANAGEMENT

According to the Joint National Committee's Seventh Report (JNC7), taking blood pressure should also include inspecting for orthostatic hypotension, evaluating current treatment and adherence, and finding out if non-prescription medications are being used, as these could have a negative effect on blood pressure. Blood pressure levels and the risk of developing cardiovascular and renal diseases are consistently, continuously, and independently correlated, with excellent blood pressure regulation reducing the risk of developing cardiovascular disease. Blood pressure should be 140/90 mm Hg. For high-risk individuals with coronary atherosclerotic vascular disease, stricter blood pressure control is recommended (target blood pressure 130/80 mm Hg), with a target blood pressure of 120/80 mm Hg in the case of ventricular systolic dysfunction.<sup>4</sup>

An evaluation of the impact of a cardiac rehabilitation programme on patients' functional status and some hemodynamic responses following CABG surgery was done among 32 patients. Before being admitted, all of the patients underwent cardiac surgery for two months. As a result of cardiac rehabilitation, the rehabilitation group's walking distance significantly increased when compared to the reference group, according to the study's findings. Additionally, it shows a considerable change in the hemodynamic reactions to exercise, including resting and maximum heart rates, maximum and maximum systolic and diastolic blood pressure, ejection fraction, and rate

pressure product. This study also found that post-coronary artery bypass grafting hemodynamic responses and functional capacity are greatly improved by cardiac rehabilitation. This study also found that post-coronary artery bypass grafting hemodynamic responses and functional capacity are greatly improved by cardiac rehabilitation. Patients must therefore be directed to rehabilitation facilities.<sup>10</sup>

### LIPID MANAGEMENT

A number of research trials have proven the advantages of lipid-lowering medications and lifestyle changes for people with heart disease. In order to assess current treatment and compliance, lipid management requires computing fasting measurements of total cholesterol, triglycerides, low-density lipoprotein cholesterol (LDL-C), and high-density lipoprotein cholesterol (HDL-C).<sup>4</sup>

### TOBACCO CESSATION

This evaluation covers both current and former smoking habits, with a focus on quitting within the previous 12 months. Ascertaining secondhand smoking exposure is also necessary. The readiness to stop smoking should be assessed, followed by interventions such as education, counselling, social support, and, if necessary, medication. Relapse prevention techniques ought to be taught and worked on. In people with cardiovascular disease, quitting smoking can reduce cardiovascular risk by roughly a third.<sup>4</sup>

### PSYCHOSOCIAL MANAGEMENT

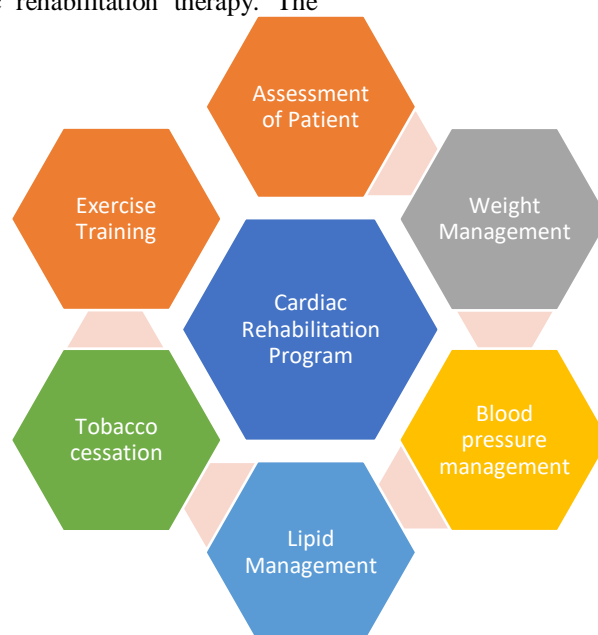
Acute cardiac events are frequently followed by depression, with 20 to 45 percent of patients experiencing substantial depression. Numerous studies show that depression, a separate risk factor for death in persons with acute MI or unstable angina, can be treated with cardiac rehabilitation therapy. The

detection of depression, anxiety, anger or hostility, sexual dysfunction, social isolation, familial distress and substance abuse using standard interview or test protocols encompasses the psychosocial assessment.<sup>4</sup> A study was done to ascertain the long-term advantages in the quality of life of myocardial infarction patients following adoption of the cardiac rehabilitation programme. Results indicate that patients' physical and psychological conditions significantly improved after attending rehabilitation, with myocardial infarction patients benefiting most from tailored instruction. Results from this study may contribute to lowering morbidity and mortality rates in this high-risk population.<sup>11</sup>

### EXERCISE TRAINING

Before beginning exercise training, the risk of cardiovascular complications should be evaluated. A structured examination should be used to identify patients who may have unstable symptoms or other characteristics that place them at an elevated risk for unfavourable cardiovascular events. Before beginning an activity-based cardiac rehabilitation programme, symptom-limited exercise testing may be necessary. The results of the test will determine the amount of supervision needed for exercise training.<sup>4</sup>

The effectiveness of a cardiac rehabilitation (CR) programme on patients with recently implanted left ventricular assist devices' functional ability and health status was investigated in a study (LVADs). The study found that the cardiac rehabilitation group experienced gains in peak oxygen uptake (10%), treadmill duration (3.1 min), 6MW distance (52.3 m), and leg strength within the group (17 percent). Patients who participated in cardiac rehabilitation programme with continuous -flow LVADs shows noticeable improvement in functional capacity and health condition.<sup>12</sup>



## INDICATIONS

Angina pectoris, post-CABG (coronary artery bypass grafting), post-myocardial infarction, PCI (percutaneous coronary intervention), post-valve replacement or repair, post-heart transplant, and indications for CHF (congestive heart failure) continue to be evaluated are a few conditions that could indicate the patient will require cardiac rehabilitation.<sup>1</sup>

## CONTRAINDICATIONS

A cardiac rehabilitation programme should not be pursued when patient is having unstable angina, a resting systolic blood pressure of more than 200 mm Hg, uncontrolled arrhythmias also known as atrioventricular block, moderate to severe aortic stenosis, recent embolism, , an acute systemic infection or fever, orthopaedic issues that would prevent activity, and uncontrolled hypertension are all causes for concern.<sup>1</sup>

## COMPLICATIONS

Patients who have CAD and/or stable chronic heart failure are not eligible for cardiac rehabilitation because they have stage IV chronic heart failure according to the WHO (World Health Organization) or cardiac arrhythmias with hemodynamic instability, but regular physical activity improves physical performance, reduces symptoms, and ultimately improves quality of life. Therefore, upon inpatient hemodynamic stabilisation, these patients should receive a cardiac rehabilitation right away. For patients who are challenging to stabilise, inpatient cardiac rehabilitation is preferable to outpatient cardiac rehabilitation. The rehabilitant's lack of desire for diagnosis and therapy can potentially be a contraindication. To enable a cardiac rehabilitation, these patients should receive thorough information and encouragement.<sup>6</sup>

## BARRIERS OF CARDIAC REHABILITATION

The availability and inclusion of rehabilitation in the comprehensive care system, patient awareness, physician education, financial support, and timing of referral/enrolment are some of the factors influencing enrolment into cardiac rehabilitation. The main obstacles to participation and adherence in the training programme include travel distance, work-family conflicts, financial constraints, fear of exercise, and financial costs. In a review that concentrated on female patients, both a lack of social support and concomitant

ailments such as arthritis, osteoporosis, and urine incontinence were mentioned.<sup>8</sup>

## CONCLUSION

Cardiac rehabilitation program mainly focuses on the major factors such as diet, physical activity, emotional support and smoking cessation among all cardiac patients to improve the quality of life.

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