

From Cardiac Rehabilitation to Cardiovascular Prevention

a report by

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Coronary heart disease (CHD) is the leading cause of death in most countries. It is also a major cause of physical disability, particularly in the rapidly growing population of elderly people. The prevention of subsequent coronary events and the maintenance of physical functioning in such patients are major challenges in preventative care.

Cardiac rehabilitation (CR) programmes were first developed in the 1960s. Benefits of ambulation during prolonged hospitalisation for coronary events have been recognised. After hospital discharge, the process of physical reconditioning was continued at home. Programmes for supervised highly structured exercise regimes have been developed due to concern over the safety of unsupervised exercise. The focus of the programmes was almost exclusively on exercise. During the past 20 years it has been increasingly recognised that most patients in CR programmes suffer from the consequences of atherosclerosis, and that this condition is a lifelong process in patients likely to be affected by cardiovascular (CV) risk factors and are not genetically protected against it. At the same time, the physical condition of patients after cardiac surgery and coronary interventions improved considerably. It is therefore still an important goal of CR to prevent disability resulting from CHD, particularly in older people and those with occupations involving physical exertion. The primary goal of current CR programmes is to prevent subsequent CV events, hospitalisation and death from cardiac conditions.

Secondary Prevention Through CR

Secondary prevention through CR is an essential component of the contemporary management of patients with various presentations of CHD and with heart failure and it should be integrated into the long-term care of all patients with cardiovascular disease (CVD). Comprehensive CR has well-documented effects on symptoms, exercise tolerance, blood lipid levels and global risk profiles, cigarette smoking, psychosocial wellbeing, progression of atherosclerosis and subsequent coronary events resulting in reduced hospitalisation and decreased morbidity and mortality.

Target Population

After the initial concentration on post-infarction patients and patients recovering from coronary artery bypass graft (CABG), percutaneous transluminal coronary angioplasty (PTCA) or other forms of myocardial revascularisation and changes in demography led to the expansion of cardiac rehabilitative care to older patients, many of whom had severe and complicated coronary illness and serious associated pathologies. Many patients once considered to be too high-risk for structured rehabilitation programmes (e.g., patients with residual myocardial ischaemia, compensated heart failure, serious arrhythmias and implantable cardiac defibrillators (ICDs)) currently derive benefit from more gradual, protracted and often supervised exercise training. CR is also appropriate for patients with chronic heart failure and those who have undergone cardiac transplantation.

Programme Components

There is convincing evidence that the combination of regular exercise with interventions for lifestyle changes and modification of risk factors favourably alter the clinical course of CVDs. Exercise interventions are therefore combined with education, counselling, behavioural strategies and other psychosocial interventions and vocational counselling strategies. These are designed to assist the patient in achieving coronary risk reduction and other CV health-related goals, so that these programmes function as comprehensive secondary prevention services.

The Integration of Acute Care, In-patient and Out-patient Programmes

Different patterns of rehabilitative care are currently delivered by specialised hospital-based teams – residential CR for more complicated, disabled patients and out-patient CR for more independent, low risk and clinically stable patients requiring less supervision. There may be variations of individual or group programmes and centre-based or home-based activity programmes.

While the objectives are identical to those of the out-patient CR programmes, residential rehabilitation programmes are specifically structured to provide more intensive and/or complex interventions and have the advantage of starting early after the acute event, including more complicated high risk or clinically unstable patients and more severe incapacitated and/or elderly patients (particularly those with co-morbidity), thus facilitating the transition from hospital phase to a more stable clinical condition, which may allow the maintenance of an independent life at home. One major disadvantage of in-hospital programmes is the relatively short duration of intervention with regard to risk factor management and lifestyle changes. Residential CR programmes should therefore be followed-up by a long-term out-patient risk reduction and secondary prevention programme, with appropriate clinical and functional monitoring.

Formal Requirements for In-patient and Out-patient CR Programmes

CR/secondary prevention programmes should be delivered under the guidance of a cardiologist experienced in the exercise testing and exercise training of patients with various forms of CVD suitable for such programmes, with a specific knowledge in all important aspects of rehabilitative and secondary preventative care.

The staff should include a cardiologist, physiotherapists or sport teachers, nutrition counsellors or dieticians, psychologists or psychiatrists and preferably also a social worker or vocational counsellor.

There are no formal requirements on an international level for equipment, logistics and

certification; however, there are national guidelines and recommendations in most European countries. Although life-threatening CV complications are rare during formal CR programmes, a well designed and regularly controlled emergency concept is crucial for each programme. Staff members should be regularly trained in cardiopulmonary resuscitation (CPR) and basic life support, an alarm system has to be established and also regularly tested, and very early defibrillation and rapid access to advanced life support have to be assured. With regards to equipment, there is consensus in most European countries that easy access to 12-lead echocardiogram (ECG), ergometry with either bicycle or treadmill ergometer, two-dimensional (2-D)-doppler echocardiography, chest X-ray and telemetry or Holter-ECG is needed.

The Science Behind the Practice

Potential benefits of CR and secondary prevention have been shown by numerous scientific papers. Four meta-analyses of exercise-based CR programmes show a reduction in overall and CV mortality by 25% to 30% during one to three years of follow-up.⁶⁻⁹ Five prospective randomised studies indicate that the slowing of progression of the atherosclerotic process can be achieved by either lifestyle intervention alone or by lifestyle interventions combined with preventative medical therapy.¹⁻⁵ Two prospective randomised studies indicate that rates of subsequent coronary events and rehospitalisations have decreased – therefore CR is a cost effective treatment. Within the measures applied in CR exercise training is the cornerstone of treatment: CV fitness has become one of the most powerful predictors for mortality in CV patients.

Guidelines

In 2003 the European Working Group on Cardiac Rehabilitation and Exercise Physiology of the

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European Society of Cardiology (ESC) published a position paper in the *European Heart Journal* on “Secondary prevention through cardiac rehabilitation”. Just a few weeks previously, from the time of press, an expert panel of the American Heart Association (AHA) released a scientific statement from the Council on Clinical Cardiology on Cardiac Rehabilitation and Secondary Prevention of Coronary Heart Disease. Secondary prevention through comprehensive CR should become an essential component of the contemporary management of patients with CHD and with heart failure. It should be integrated into the long-term care of all patients with CVD.

The Gap Between Scientific Evidence and Clinical Practice

Despite the well-established benefits of exercise and nutritional counselling, physicians are generally not well trained enough to provide this type of instruction and do not have the time to provide effective nutritional advice, guidance about weight management and prescriptions for exercise. The provision of all these services at cardiac-rehabilitation centres, with the use of well-established algorithms to set goals for risk reduction and in co-ordination with the primary care physician, is efficient and effective.

Only 10% to 20% of appropriate candidates in the US and a minority in most other countries worldwide (with a somewhat higher percentage in Europe) currently participate in formal rehabilitation programmes. The reasons for low participation rates include the geographic maldistribution of available programmes and the failure of physicians to refer patients, particularly elderly people and women, to the

programmes. Home-based rehabilitation programmes directed by physicians and co-ordinated by nurses have been developed as a way of expanding the delivery of secondary prevention services.

Future Directions

CV medicine is confronted by an increasing number of patients with obesity and/or diabetes. Patients with these diseases need similar risk factor intervention programmes including lifestyle changes and optimised medical treatment like other CV patients. Treatment of obese and diabetic patients can be relatively easily integrated into existing outpatient secondary prevention programmes; however, the special needs of these patients have to be considered and the secondary prevention programmes have been provided in close co-operation with diabetes specialists and experts with specific knowledge of the difficult approach to severely overweight patients. It seems clear that in the future more overweight patients with and without diabetes will participate in CV prevention programmes. Another initiative aims to offer similar programmes to patients after transient ischaemic attacks or minor strokes. This is because these patients also usually have similar risk factors and need similar lifestyle changes and secondary prevention interventions as CV patients. Finally, the growing number of patients after ICD implantation has to be recognised. These patients often have specific needs with regards to psychological support, which should be addressed in specific CR programme components. Furthermore, a growing number of adults with congenital heart disease need specific attention and CR programmes adapted to their needs. ■