Chapter 1

Cardiac Rehabilitation Overview

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Chapter outline

Cardiac rehabilitation (CR) is now established as part of cardiac care in the UK and is embedded in many government policies and national guidelines, with structured exercise as a key element. This chapter reviews the incidence and pattern of coronary heart disease presentation in the UK. In addition, the spectrum of patient groups included in CR is reviewed. The chapter defines the content of contemporary CR, reviews the evidence base for exercise in comprehensive CR and sets the scene for the chapters that follow.

DEFINITION OF CARDIAC REHABILITATION

There are many aspects to the management of coronary heart disease (CHD), including pharmacological treatment, cardiac investigations, secondary prevention and revascularisation. Secondary prevention consists of a number of activities or measures that may be taken by patients with established disease, in order to reduce their risk of a further event (Lockhart, *et al.*, 2000). Cardiac rehabilitation (CR) is acknowledged not only as integral in the management of patients with CHD, but also as the primary vehicle in delivering secondary prevention. Many definitions of CR exist, for example the World Health Organisation classifies CR as 'The sum of activities required to influence favourably the underlying cause of the disease, as well as to ensure the patient the best possible physical, mental and social conditions, so that they may, by their own efforts, preserve or resume when lost, as normal a place as possible in the life of the community' (World Health Organisation, 1993).

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More recently CR has been redefined by the Scottish Intercollegiate Guidelines Network, subsequently adopted by the British Association for Cardiac Rehabilitation (BACR) as the UK guideline, as follows: 'Cardiac rehabilitation is the process by which patients with cardiac disease, in partnership with a multidisciplinary team of health professionals, are encouraged and supported to achieve and maintain optimal physical and psychosocial health' (SIGN, 2002). This is perhaps a more succinct definition, which encompasses all the key elements of CR, such as partnership, support, and the aim of optimising and maintaining the individual's health. Furthermore, the SIGN (2002) guideline acknowledges the key role that exercise plays in contemporary CR.

CORONARY HEART DISEASE

Over the last ten years the pattern of CHD mortality and morbidity has changed with premature death rates reduced but more survivors of myocardial infarction (MI) (BHF, 2003, 2004).

CHD mortality

In 2002, there were approximately 40 000 premature deaths from CHD in the UK (BHF, 2004). This rate is amongst the highest in the world. Within the UK there are also regional differences with death rates highest in Scotland and the North of England and lowest in the South of England (BHF, 2004). There is some positive evidence that the death rates from CHD have been falling in the UK in the last ten years. For example, in adults under 65 years, the rate has fallen by 44% (BHF, 2004). This is not as fast as some other countries, with Australia and Norway both showing a decreasing death rate for men aged 35–74 of 47% (BHF, 2004). Although there is an overall improvement in the statistics for the UK, there is no room for complacency.

Fifty-eight per cent of the reduction in mortality over the past 20 years in the UK can be explained by the reduction of major risk factors, principally smoking (BHF, 2004). Other early pharmacological interventions and secondary prevention account for the remaining reduction of the mortality decline. Secondary prevention and the contribution of CR can also be associated with reduction on mortality (Jolliffe, *et al*., 2004; Taylor, *et al*., 2004; Leon, *et al*., 2005).

CHD morbidity

Studies have shown that the incidence rate of MI is between 2 and 2.5 times the mortality rate, and using data from 2002 it is estimated that in all ages, a total of 268 000 people (147 000 men and 121 000 women) in the UK had an MI in 2002 (BHF, 2004). Prevalence of MI increases with age and is higher in

men than in women; estimates show that there are about 838 000 men and 394 000 women living in the UK, who have had an MI (BHF, 2004). The prevalence of MI is disproportionately higher in Scotland: 43 per 1000 men, compared with 39 in Wales and 34 in England (Wanless, 2001; SIGN, 2002). In addition, there is an increasing number of MI and CHD subjects with chronic heart failure (HF), approximately 662 000 in the UK (BHF, 2004).

In addition, the BHF (BHF, 2004) estimate 178 000 new cases of angina in all men living in the UK and about 159 500 in women, totalling 337 500. As can be seen from the trends in the increase in morbidity, there is more need for structured secondary prevention. As CR is recognised as the prime vehicle for delivery of secondary prevention (SIGN, 2002), there will be a corresponding increase in comprehensive, patient-centred CR.

PATIENT GROUPS IN CARDIAC REHABILITATION

Traditionally post-MI and revascularisation patients were referred for CR (SIGN, 2002). There are now many more groups included in exercise-based CR. In addition, definition of MI has changed with the introduction of troponin blood tests.

Acute coronary syndromes

Acute coronary syndromes include unstable angina, non-ST-segment elevation MI (NSTE MI) and ST-segment elevation MI (STE MI) (Santiago and Tadros, 2002). It is acknowledged that with revised definition of myocardial infarction, diagnosed by cardiac troponin estimation, there will be a resultant increase in the reporting of myocardial infarction, with increased workloads for the services involved (Dalal, *et al*., 2004). In the Cochrane systematic review by Jolliffe, *et al*. (2004) the reviewers concluded that exercise-based CR is effective in reducing cardiac deaths and has many positive health-related outcomes for post-MI and CHD groups.

Post-revascularisation

Comprehensive CR is recommended for patients who have undergone revascularisation that includes coronary artery bypass grafting and percutaneous intervention (angioplasty and stenting) (SIGN, 2002). There can be a misconception by patients that the revascularisation procedure has eradicated the underlying CHD process. It is important that this group of patients continues to address their CHD risk factors. Exercise-based CR has considerable impact on physiological and psychosocial cardiac risk factors post-revascularisation (Ross, *et al*., 2000; Stewart, *et al*., 2003).

Stable angina

There have been few studies on exercise and this group of patients compared to other cardiac groups. One of the first studies to investigate exercise in angina patients was by Todd, *et al*. (1991). They found that habitual exercise had an anti-anginal effect, with the subjects experiencing up to 34% reduction in ischaemia. The authors hypothesised that exercise training enhanced myocardial collateral function. Kligfield, *et al*. (2003) further suggested that sustained habitual exercise in this patient group enhances the parasympathetic tone of the heart. A review of literature by the Scottish Intercollegiate Guideline Network (SIGN, 2002) examining CR and patients with stable angina found that this patient group should be considered for CR if they have limiting symptoms. Angina patients appropriate for exercise-based CR may be those who are not suitable for revascularisation and/or have an anginal threshold of 4 METs or more (ACSM, 2000). The aim of exercise is to raise the ischaemic threshold and thus allow patients to exercise more before their angina occurs. In addition, efficent use of anti-anginal medication can help this group to carry out more exercise (Durstine and Moore, 2003).

Chronic heart failure

There are increasing numbers of patients presenting with heart failure and being referred to CR. Because of the negative effects on quality of life for these patients due to dyspnoea on exertion and fatigue and the generally poor prognosis, the interest in optimising the management of this patient group is increasing. The review of controlled trials of physical training in chronic heart failure by the European Heart Failure Group (1998) concluded that there are positive effects of physical rehabilitation in stable heart failure patients on function and quality of life. A further systematic review of evidence by Lloyd-Williams, *et al*. (2002) found that short-term physical exercise training in selected subgroups of patients with chronic heart failure has physiological benefits and positive effects on quality of life. These findings are confirmed, with a collaborative meta-analysis, by ExTraMATCH (2004), providing evidence of an overall reduction in mortality for HF groups. The largest improvements in exercise capacity and quality of life are found in those patients with mild to moderate HF (Rees, *et al*., 2004).

Cardiac transplantation

This is likely to be a small group of patients and the research examining cardiac transplantation and cardiac rehabilitation is not extensive. In the UK only the SIGN (2002) guidelines make specific mention of this patient group. An American study by Shephard (1998) suggested that there is a need for exercise-centred cardiac rehabilitation to optimise functional gains and counter

major complications, such as hypertension, accelerated atherosclerosis and osteoporosis. The detrimental effects of muscle weakness are responsible for a substantial part of the initial functional disturbance, and rehabilitation programmes should include resistance and weight-bearing activities as well as aerobic exercise. Kobashigawa, *et al*. (1999) found that when initiated early after cardiac transplantation, exercise training increased capacity for physical work in transplant patients.

Valve surgery

This patient group includes all types of valve surgery. The typical patient in this group will be post-aortic or mitral valve replacement. The exercise part of cardiac rehabilitation plays a role in reversing the symptoms associated with deconditioning. A review by Stewart, *et al*. (2003) examining valve surgery and cardiac rehabilitation found that supervised exercise training in comprehensive CR was effective in increasing functional capacity and favourably modifying disease-related risk factors, decreasing symptoms and improving quality of life for valve patients. Although studies have been limited due to small sample size and lack of control groups, there is increasing evidence of the benefits of exercise-based CR for these patients.

Congenital heart disease

The patient group includes children and young people. Exercise and physical activity levels are dependent on the differing types of congenital heart disease. There may be barriers to exercise in this group, such as current symptoms, lack of interest in exercise and health fears (Swan and Hillis, 2000). A review by Brugemann, *et al*. (2004) found that patients with congenital heart disease should be included in multidisciplinary CR. In addition, physical training was found to be safe. A pre-training exercise test is required to determine specific and appropriate physical workload. Furthermore, education, psycho-social support and coping strategies to help reduce anxiety are essential parts of CR for this patient group. Paediatric specialists have advocated exercise-training programmes for children with congenital heart disease. A review of literature by Imms (2004) suggests that CR programmes for children should also promote occupational performance activity and integrate exercise into self-care and leisure activity.

Implanted cardioverter defibrillators

Though not all CR guidelines specifically suggest provision of cardiac rehabilitation for patients following insertion of an implanted cardioverter defibrillator, most of this patient group will have CHD in conjunction with their arrhythmic tendency. The United Kingdom-based National Institute for

Clinical Excellence (NICE) recommends a rehabilitative approach to aftercare, which includes psychological preparation for living with an implanted cardioverter defibrillator (NICE, 2000). For most cardiac rehabilitation programmes, the numbers of patients seen with an implanted cardioverter defibrillator are likely to be small. Nevertheless, it is important that these patients receive appropriate CR. It has been acknowledged that there should be larger multi-centred studies on this group (NICE, 2000). There is some evidence that comprehensive CR is safe for patients with implanted cardioverter defibrillators and can improve exercising ability and lower levels of psychological distress (Fitchet, *et al*., 2003; Vanhees, *et al*., 2004).

Under-represented groups

Special consideration should be made for the elderly, women and minority ethnic groups to ensure that their particular needs are met. These groups tend to be under-represented in CR, but systematic reviews show that both the elderly and women benefit from exercise-based CR (SIGN, 2002; Jolliffe, *et al*., 2004).

The importance of considering the elderly is even more relevant now, as almost a half of all MIs occur in those over 70 years of age, and this is projected to rise further as the number of older patients in the total population increases (Rask-Madsen, *et al*., 1997). CR may provide a chance to improve the quality of life in appropriately referred elderly patients. Thow, *et al*. (2000) found that women are poorly represented in CR and suggest that in order to improve uptake and adherence in CR, different strategies, including changes to CR programme structure, gender-specific information, environment and implementing behavioural change, are required to address the specific needs of this group.

In trials of CR the ethnic background of patients is seldom reported, but it is likely that trial participants are mainly white Caucasian, though there is no evidence to suggest that outcomes are less favourable for other ethnic groups (Beswick, *et al*., 2004). Beswick, *et al*. (2004) further suggest that specific interventions to encourage attendance of these groups could be individualised classes, buddy systems and inclusion in the programme of a significant other. It is generally acknowledged that CR should be all inclusive, with no barriers to inclusion. Strategies should be developed to recruit these previously excluded groups.

CONTENT OF CARDIAC REHABILITATION

Cardiac rehabilitation is a multifaceted intervention offering education, exercise and psychological support for patients with coronary heart disease and

their families and involves a variety of specialist health professionals (Bethell, *et al*., 2001). Cardiac rehabilitation can promote recovery, enable patients to achieve and maintain better health, and reduce the risk of death in people who have heart disease (National Health Service Centre for Reviews and Dissemination, 1998). The challenge of CR, along with all the other aspects of secondary prevention, is the prevention of subsequent cardiovascular events, while maintaining adequate physical functioning and independence and a good quality of life (Giannuzzi, *et al*., 2003).

Cardiac rehabilitation is a relatively new element in the care of the coronary patient in the UK, first being adopted around the late 1980s (Fearnside, *et al*., 1999). Cardiac rehabilitation is now embedded as an essential component in the management of heart disease in the UK (Stokes, *et al*., 1998; Walker, 2003). CR is included in many UK national guidelines and standards. For example,

- British Association for Cardiac Rehabilitation (BACR) Guidelines (BACR, 1995);
- National Service Framework for CHD (Department of Health (DoH), 2000);
- Scottish Intercollegiate Guidelines Network (SIGN, 2002) (endorsed by the BACR, 2003).

All of these have served to add validity to cardiac rehabilitation. These guidelines have been developed over the past ten years, and aim to achieve optimal outcomes for patients with CHD. Cardiac rehabilitation is now 'on the map' and is an established part of cardiac care.

EVIDENCE BASE FOR CARDIAC REHABILITATION

CR has an increasing evidence base as an intervention for secondary prevention (Dalal and Evans, 2003). The focus of research has been primarily in phase III, on post-MI and revascularised patients. The Cochrane review of exercise-based rehabilitation for CHD concluded that exercise-based CR is effective in reducing cardiac deaths, in reducing cardiac risk factors and in enhancing psychosocial factors (Jolliffe, *et al*., 2004). There is gathering evidence on the impact of CR on many of the newer groups who are being included in CR. A significant feature of CR is that individualised exercise has a positive impact on patients' ability to exercise, on physiological measures of cardiac disease and has not been found to do any harm to patients (Jolliffe, *et al*., 2004).

There is ample evidence for the later phases of CR. Mayou, *et al*. (2002) comment that there has been surprisingly little clinical and research interest

in the earlier stages of the CR programmes, specifically phases I and II. Thus, the evidence base for these phases is less robust.

Benefits of exercise

The benefits of habitual exercise can be viewed as a combination of physiological and psychosocial. In a review of CR post-MI, regular exercise was found to reduce the risk of overall mortality and cardiovascular mortality. In addition, exercise is associated with improved activity tolerance, modification of risk factors and improvement in quality of life (Gassner, *et al.*, 2003).

Physiological Benefits

Physical functioning improves after CR in all age, sex and diagnostic groups, but particularly in patients with low baseline exercise function (McArdle, *et al.*, 2001). For the cardiac patient there are many physiological benefits attributed to exercise training. Many of these changes impart a cardioprotective effect. A study by Leon (2000), reviewing the scientific evidence supporting the potential benefits of exercise post-MI, found the following:

- improvement in functional capacity (strong evidence);
- improved cardiovascular efficiency;
- reduction in atherogenic and thrombotic risk factors;
- improvement in coronary blood flow, reduced myocardial ischaemia and severity of coronary atherosclerosis;
- reduction in risk of cardiovascular disease mortality.

Psychosocial Benefits

Participation in habitual exercise not only has potential impact on physiological function, including reducing cardiac risk factors, but can also aid and enhance psychosocial outcomes. Habitual exercise has potential for the following benefits:

- reduction in depression and anxiety
- enhanced mood status
- enhanced self-efficacy
- restoration of self-confidence
- decreased illness behaviour
- increased social interaction
- resumption of chores/hobbies
- resumption of sexual activities
- return to vocation/work (Ross and Thow, 1997; Goble and Worcester, 1999).

PHASES OF CARDIAC REHABILITATION

Cardiac rehabilitation is divided into four phases, progressing from the acute hospital admission stage to long-term maintenance of lifestyle changes, as follows:

- Phase I – in-patient period or after a 'step change' in cardiac condition;
- Phase II – early post-discharge;
- Phase III – supervised out-patient programme including structured exercise;
- Phase IV – long-term maintenance of exercise and other lifestyle changes.

Phase I cardiac rehabilitation

Phase I, which in most cases is the initial stage of the patient's cardiac rehabilitation pathway, is considered as the in-patient stage, or after a 'step change' in the patient's cardiac condition. These step changes include myocardial infarction, onset of angina, any emergency hospital admission for coronary heart disease, cardiac surgery or angioplasty and/or stent, and first diagnosis of heart failure (SIGN, 2002).

Following an acute coronary event, phase I CR is important in assisting the patient's pathway to recovery. The National Service Framework for CHD (DoH, 2000) states that the aim of this phase is to offer high-quality CR before discharge from hospital, and this should begin as soon as possible after someone is admitted with CHD. Phase I will be the patient's first point of contact with the CR team, and this introduction to CR may favourably or adversely influence their perception of secondary prevention. At this stage, the patient may be anxious and depressed regarding the threat to their health (SIGN, 2002). An important aspect of phase I CR is to allay these fears and promote positive outcomes for both the patient and their significant others (Thompson, 1989).

Content of Phase I Cardiac Rehabilitation

The content of phase I CR has traditionally included assessment, education and exercise/mobilisation. There is an emphasis on reassurance and the positive aspects of recovery post-ACS, revascularisation or other CHD-related admission, specific to each individual. Partners and/or significant others are also involved (SIGN, 2002). Assessment involves identifying risk factors and risk stratification, with the educational aspect providing patients with appropriate individual information regarding CHD, risk factors and lifestyle (BACR, 1995). Mobilisation may include graduated exercise, walking programmes and stair practice.

Assessment and needs

Assessment must be carried out on an individual basis, examining each patient's personal requirements and risk factors and then producing individual tailored plans to meet these needs. The current guidelines (BACR, 1995; DoH, 2000; SIGN, 2002) generally agree that the following are addressed:

- risk stratification and lifestyle modification, as appropriate;
- educational requirements;
- psychological factors, including anxiety and depression;
- needs of significant other(s);
- social, vocational and cultural needs.

Before discharge from hospital patients should be offered, as an integral part of acute care, the following:

- assessment of physical, psychological and social needs for future CR;
- negotiation of a written individual plan for meeting these needs;
- prescription of effective medication, and education about its use, benefits and side effects;
- involvement of relevant informal carer(s);
- provision of information about cardiac support groups;
- provision of locally relevant, written information about CR.

The key elements of phase I include medical evaluation, reassurance, education regarding CHD, correction of cardiac misconceptions, risk factor assessment, mobilisation and discharge planning. In addition, the use of psychological measurement is recommended, using, for example, the hospital anxiety and depression scale (HADS) (Zigmond and Snaith, 1983).

Education

Education is an important element of phase I CR, aiming to decrease the patients' anxiety, and meet the patients' perceived learning needs (Turton, 1998). It should also enable patients to retain the information they are given (Waitkoff and Imburgia, 1990). It is imperative to remember, when working with patients, that each patient is unique, bringing with him or her past experiences, perceptions, coping mechanisms, personalities, support systems, strengths and weaknesses (Robinson, 1999). Thus, appropriate, individualised education is required. The education component should adhere to adult education principles including (SIGN, 2002):

- relevance (tailored to patients' knowledge, beliefs and circumstances);
- feedback (informed regarding progress with learning or change);
- individualisation (tailored to personal needs);
- facilitation (provided with means to take action and/or reduce barriers);
- reinforcement (reward for progress).

In addition, it is recommended that written information is given (SIGN, 2002). This may be, for example, in-house booklets, BHF booklets, or the Heart Manual, which is a comprehensive home-based programme (Lewin, *et al*., 1992). A patient-held record card or treatment plan is also recommended (BACR, 1995; DoH, 2000).

The content of this part of phase I CR should include educational advice regarding:

- risk factors (modifiable and non-modifiable);
- living with CHD;
- anatomy and physiology of the heart;
- clinical management of CHD;
- cardio-protective diet;
- sensible alcohol use;
- the benefits of exercise;
- cardiac misconceptions;
- return to driving, employment and hobbies;
- holiday advice;
- medications;
- psychological aspects of CHD and stress management;
- sexual activity;
- sleep.

Giannuzzi, *et al*. (2003) examined secondary prevention through CR and suggest much less time is now available to teach the skills required to monitor exercise activity and to cover the other phase I components. With the decreasing length of hospital stay, there is a challenge for health professionals to deliver phase I in shorter periods of time. With short phase I, physiological deconditioning is minimal (Giannuzzi, *et al*., 2003).

Exercise/mobilisation

The BACR guidelines (BACR, 1995) recommend that patients receive a programme of graduated mobilisation and exercises, so that by discharge time the patient is ambulant, able to climb stairs and attend to his or her own activities of daily living. Individualised home-walking programmes should be prescribed for phase II. Thompson, *et al*. (1996) suggest that prior to discharge, patients are taught simple ways of self-assessing the level of physical activity, using pulse rate measurement and the Borg rating of perceived (RPE) exertion scale (Borg, 1998). Early introduction to the concept and skills of self-monitoring of exercise is important (see Chapter 3). Phase I CR represents for the majority of cardiac patients their first exposure to risk factor modification and education and acts as a gateway to the next phases of CR (Spencer, *et al*., 2001).

Transition to phase II

It is imperative to optimise the network of care for patients (Robinson, 1999) and to ensure appropriate input from the CR team for each individual prior to discharge and transition to phase II. In addition, prior to discharge it is advantageous to induct and refer patients to phase III CR, for those patients who choose and would benefit from this phase. Exercise consultation and behaviour change strategies are advantageous at this stage to enhance adherence to both lifestyle change and maintenance of exercise in phase II and uptake of phase III in the future (see Chapter 8).

Phase II cardiac rehabilitation

This is the initial post-discharge stage, and can tend to be rather low key, although it is a time when patients may feel isolated and somewhat insecure, and when high levels of anxiety may be present. Thus, it is important that patients and their families/significant others have access to appropriate health care professionals. Depending on the service available, contact with the cardiac rehabilitation team may be by phone or home visit, with primary care also involved. This is the stage where modification of risk factors will start and goals set in phase I CR should start to be realised. For patients issued with the heart manual post-MI, this can be used immediately (Lewin, *et al*., 1992), and for other patients an individualised walking programme may be started at this stage. The use of pedometers can help patients and CR staff monitor home walking programmes.

Progression to phase III is important, yet despite evidence of the benefits of CR, studies have shown that uptake of the outpatient CR programmes remains low. In a study by Beswick, *et al*. (2004) between 45% and 67% of patients who were referred attended phase III.

For patients who do not proceed to phase III it is important that phase I or II is relevant to and specific for their needs. These patients and families should have information on other sources of support and information on CHD. Health professionals involved in phases I and II need to be aware of the importance of relevant, robust follow-up and of a referral system that enables progress to appropriate, accessible phase III. Utilisation of motivational interviewing and exercise consultation is one method that can be used to influence behaviour change. (See Chapter 8.)

Phase III cardiac rehabilitation

This is traditionally the outpatient education and structured exercise programme component of CR. Phase III continues risk factor changes and education established in previous phases. An individual, menu-based approach continues, with monitoring and feedback regarding risk factors and lifestyle.

There is an emphasis on addressing multi-factorial risk factor modification, appropriate to each patient. Baseline patient assessment can be carried out and outcomes reviewed and audited. Traditionally this phase is hospital-based, though it is increasingly recognised that it can be undertaken safely and successfully in the community (SIGN, 2002). Phase III can also be structured to be sited in the hospital for the first half and in the community for the second half of phase III CR (Armstrong, *et al*., 2004). This novel design assists patients to enter a community setting where phase IV will be based, thus exposing them to a more social and less medical environment.

The structure of phase III is usually at least two supervised exercise sessions per week, lasting over a period of between 6 and 12 weeks. One session of education per week may be offered. Physical training is often the key component of phase III CR, but psycho-social counselling and education regarding risk factors and lifestyle are important. Strategies to enable a reduction in depression, anxiety and uncertainty, accepting the heart disease and learning to cope with it are discussed as appropriate. As with earlier phases of CR, the involvement of family and significant others continues to be important. Risk stratification prior to patients commencing phase III exercise classes is essential and will be examined in Chapter 2.

In the UK, aerobic circuit interval training for group exercise training is commonly used and is an effective method for delivering aerobic exercise (SIGN, 2002). In addition to the aerobic conditioning phase, resistance training is part of CR exercise. Home-based exercise is also prescribed with self-monitoring skills being used by the patients. Typically an exercise class consists of a warm-up, an aerobic conditioning phase, a cool-down period and a conditioning phase. The exercise programme should be tailored to the needs of the patient. The latter is important to encourage adherence to exercise. Details regarding the exercise component of CR are provided in Chapters 3–5.

Phase IV cardiac rehabilitation

Phase IV CR is the long-term maintenance of risk factor modification, with long-term follow-up in primary care. For the benefits of physical activity and lifestyle change to be sustained, the available evidence suggests that both need to be maintained (SIGN, 2002). As clinically indicated, referral to specialist clinicians, such as smoking cessation or psychological support, may still be required (DoH, 2000). This stage is likely to be the most informal stage of cardiac rehabilitation, where there is long-term maintenance of individual goals and monitoring of clinical issues and risk factor modification, mainly by the primary healthcare team (BACR, 1995). It is important that the patient is aware of the exact nature of the follow-up system available.

Continuation and progression of appropriate physical activities are encouraged outside the hospital setting, on either a formal or informal basis. By this time it is hoped that individuals will be aware of their exercise capabilities

and be able to monitor themselves appropriately. The BACR offers a comprehensive training course in phase IV exercise for exercise professionals, such as health and fitness officers who may be involved in community-based programmes.

Phase III discharge information, including goals set, should be sent to the relevant healthcare professional in the community, and formal referral to phase IV exercise classes made. As for earlier phases of CR motivational interviewing and exercise consultation are methods that can be used to maintain behaviour change (see Chapter 8).

SUMMARY

The number and variety of subjects with CHD who are involved in exercise-based CR is increasing. Cardiac rehabilitation is now well established and is part of care of different cardiac groups. There is a growing evidence base for exercise-based CR. There are many benefits for the patient, family and community from regular, long-term participation in CR. The following chapters will address the assessment of the CR participant, design and delivery of the exercise programmes.

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