

Maintaining Physical Activity in Cardiac Rehabilitation

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Chapter outline

This chapter describes an intervention that has been used to encourage individuals to remain regularly physically active in exercise-based CR in phases III and IV. The principles of this intervention are also appropriate for all phases of CR. This intervention, called the exercise consultation (EC), is based on the Transtheoretical Model of behaviour change and Relapse Prevention Model (pp. 197–205), and uses cognitive and behavioural strategies to increase and maintain physical activity (Loughlan and Mutrie, 1995, 1997).

The strategies used in this EC include: assessing stage of change, decisional balance, overcoming barriers to activity, social support, goal setting, self-monitoring and relapse prevention. It involves a client-centred, one-to-one counselling approach and encourages individuals to develop an activity plan, tailored to their needs, readiness to change and lifestyle. The EC aims to encourage accumulated physical activity accumulating at least 30 minutes of moderate intensity activity on five days per week (Pate, *et al.*, 1995, stage one, as discussed in Chapter 4). In addition, this level of physical activity may be easier for cardiac patients to incorporate into their daily routine and to sustain in the long term. Thus, the exercise consultation encourages individuals to integrate moderate intensity activity into their daily lives. In addition, EC can help maintain involvement in structured exercise in phases III and IV (SIGN, 2002).

ADHERENCE IN CR EXERCISE

It is well documented that exercise-based CR accrues many benefits in patients with established coronary artery disease (US Department for Health and

Human Services and Agency for Health Care Policy and Research, 1995; Balady, *et al.*, 2000; SIGN, 2002; Leon, *et al.*, 2005). Achieving these benefits depends on good adherence to cardiac rehabilitation exercise programmes. In addition, sustaining these benefits requires maintenance of physical activity after phase III programme completion. Evidence suggests that improvements in exercise capacity, physical activity and quality of life decline over time following completion of CR exercise programmes (Bock, *et al.*, 1997, Stahle, *et al.*, 1999). Stahle, *et al.* (1999) reported a significant improvement in exercise capacity and physical activity in a group of cardiac patients after three months of supervised exercise training, compared with usual care. However, physical activity levels and exercise capacity had declined in the rehabilitation group 12 months after programme completion (Stahle, *et al.*, 1999). Other studies have found that 50% to 75% of patients do not continue to exercise regularly after completion of formal programmes (Lidell and Fridlund, 1996; Bethell, *et al.*, 1999). Thus, it is important for exercise leaders to implement strategies which encourage adherence to long-term exercise for CR participants to benefit from exercise.

Supervised exercise training in phase III is important in teaching patients to self-monitor their exercise intensity and increase their confidence for exercise. It is unlikely that participation in a supervised exercise programme will facilitate independent exercise after programme completion (SIGN, 2002). This is reflected by the low proportion of patients who continue to engage in regular physical activity after completion of supervised exercise programmes. Therefore, cardiac rehabilitation guidelines recommend that participants in supervised exercise programmes should also incorporate moderate intensity activity into their daily lifestyle in order to encourage regular physical activity in the long term, once the formal programme has ended (Balady, *et al.*, 2000; SIGN, 2002). In addition, the transition from phase III exercise-based cardiac rehabilitation to phase IV can be a challenging time for cardiac patients if they do not receive the support and follow-up from cardiac rehabilitation staff that they received during phases I to III. Instead, patients have to remain physically active independently.

Membership of cardiac support groups that offer group exercise or attendance at phase IV community exercise programmes may help patients to remain active in the long term. However, these exercise opportunities are not available in all areas. Furthermore, some patients may not be able to attend community programmes due to barriers associated with supervised exercise training, including transportation problems, access difficulties (especially in rural areas), inconvenient timing of programmes and work and domestic responsibilities. However, research is limited on effective and practical interventions to encourage individuals to remain active in phase IV.

Behaviour interventions in CR

Exercise consultation was developed in the UK setting. In the US, a similar procedure is termed physical activity counselling. A recent systematic review concluded that physical activity counselling was effective in increasing physical activity and fitness in the general population (Kahn, *et al.*, 2002). Physical activity counselling is also based on the Transtheoretical Model and uses behaviour change strategies similar to those employed in the exercise consultation process. In addition, American CR guidelines recommend that physical activity counselling should be a core component of CR programmes to promote an active lifestyle for patients with CHD (Balady, *et al.*, 2000).

This guideline recommends that physical activity counselling should include an evaluation of the individual's current physical activity level, stage of change for exercise behaviour, self-efficacy, barriers to increasing physical activity and social support in making positive changes. Interventions should include providing support, advice and counselling about physical activity needs, and setting goals to increase physical activity to 30 minutes per day of moderate physical activity on at least five days a week. In addition, patients' daily schedules should be explored in order to suggest how physical activity can be incorporated into their daily routine, e.g. parking further away than usual from entrances, walking up two or more flights of stairs and walking for 15 minutes during lunch breaks. In addition, the use of behaviour change interventions for structured exercise and other health behaviour is recommended in the UK (SIGN, 2002).

BEHAVIOUR CHANGE MODELS

Several behaviour change models have been used to understand exercise behaviour in non-clinical and clinical populations. In addition, these models provide a theoretical framework for developing practical and effective interventions to improve physical activity participation. Although many other models of behaviour change exist, the Transtheoretical Model and Relapse Prevention Model, which are briefly described here, have been extensively studied in exercise settings and provide the basis for many physical activity interventions, including exercise consultation and physical activity counselling (Biddle and Mutrie, 2001).

Transtheoretical Model

The Transtheoretical Model (TTM) was originally developed to understand behaviour change related to smoking cessation (Prochaska and DiClemente, 1983), but has since been applied to exercise behaviour (Prochaska and Marcus, 1994). Interventions based on the TTM have been effective in

promoting and maintaining physical activity (Marcus, *et al.*, 1992a; Marcus, *et al.*, 1998a, 1998b; Bock, *et al.*, 2001). The model proposes that individuals attempting to change their physical activity behaviour progress through five stages (Marcus and Simkin, 1994). The stages differ according to an individual's intention and behaviour and have been labelled as follows:

- Precontemplation (inactive and no intention to change);
- Contemplation (inactive, but intending to change in the next six months);
- Preparation (engaging in some activity, but not regularly);
- Action (regularly physically active, but only began in the past six months);
- Maintenance (regularly active for more than six months).

Movement through these stages often occurs in a cyclic pattern because many individuals relapse to an earlier stage when attempting behaviour change.

Three components of the TTM are hypothesised to mediate the behaviour change process: the decisional balance, self-efficacy and the processes of change. Decisional balance involves a comparison of the perceived pros and cons of engaging in behaviour. Studies have demonstrated a significant relationship between exercise adherence and perceived pros and cons of exercise in patients with CHD (Tirrell and Hart, 1980; Robertson and Keller, 1992; Hellman, 1997). A recent meta-analysis (Marshall and Biddle, 2001) found that the decisional balance is related to the stage of exercise behaviour change as depicted in Figure 8.1.

The pros of exercise increase with advancing stage of change, with the largest increase evident from the precontemplation to the contemplation stage. The perceived cons of change decrease across the stages, with the most pronounced decline occurring from precontemplation to contemplation. Therefore, it seems that increasing perception of the pros and decreasing perception of the cons of exercise are important to increase physical activity. Similarly, Hellman (1997) reported a decline in the perceived costs of exercise and an increase in the perceived benefits of exercise, with advancing stage of change in a group of patients who had previously attended in-patient CR.

Self-efficacy was integrated into the TTM from Bandura's Self-Efficacy Theory (Bandura, 1977), and is defined as an individual's confidence in his or her ability to perform a specific behaviour. Self-efficacy is an important determinant of exercise compliance in cardiac rehabilitation settings (Robertson and Keller, 1992; Vidmar and Rubinson, 1994). Findings from the meta-analysis (Marshall and Biddle, 2001) demonstrated a significant relationship between exercise self-efficacy and stage of change, as illustrated in Figure 8.1. The graph shows that confidence to be active increases with each forward movement in stage of change. Individuals in the precontemplation stage demonstrate the lowest self-efficacy, whereas those in maintenance have the highest self-efficacy. Furthermore, the relationship between exercise self-efficacy and stage of change is non-linear, and self-efficacy seems to be

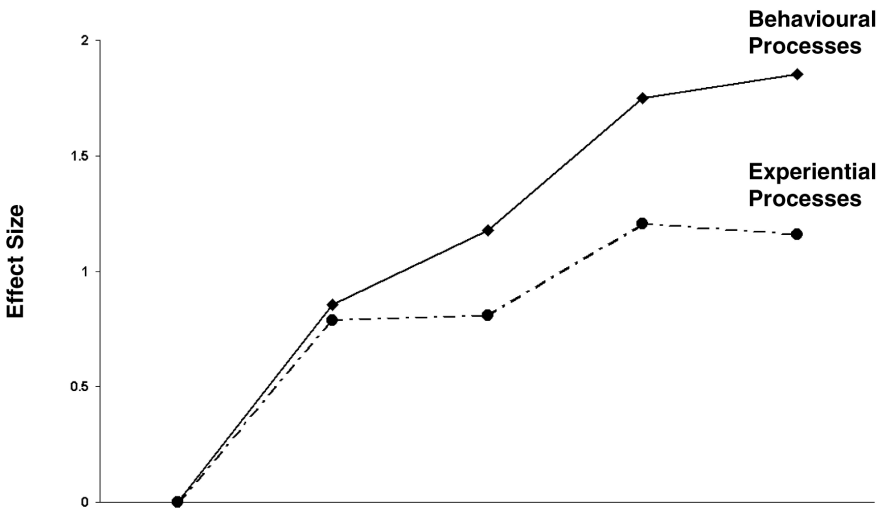
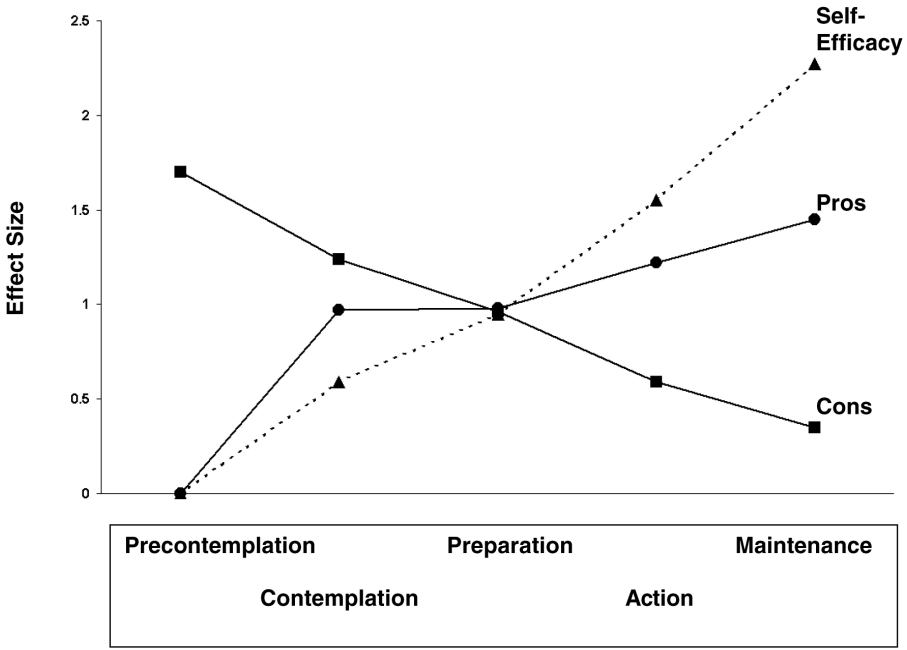


Figure 8.1. Relationship between the stages of change and decisional balance, self-efficacy and processes of change.
 (Adapted from Marshall and Biddle, 2001.)

Table 8.1. Processes of Exercise Behaviour Change

Process of Change	Definition (adapted from Marcus, <i>et al.</i> , 1992b)
Experiential	
Consciousness raising	Providing information about the benefits of physical activity and discuss the current physical activity recommendations
Dramatic relief	Discussing the risks of inactivity
Environmental reevaluation	Emphasise the social and environmental benefits of physical activity
Self-reevaluation	Review current physical activity status and assess values related to physical activity
Social liberation	Raise awareness of potential opportunities to be active and discuss how acceptable and available they are to the individual
Behavioural	
Counterconditioning	Discussion of how to substitute inactivity for more active options (e.g. taking the stairs instead of the lift)
Helping relationships	Seeking out friends, family and work colleagues who can provide support
Reinforcement management	Rewarding successful attempts at being active
Self-liberation	Making commitments for activity (e.g. goal setting)
Stimulus control	Control of situations that may have a negative impact on physical activity and developing ways to prevent relapse during these situations

especially important when moving from action to maintenance. Similarly, Hellman (1997) reported that exercise self-efficacy is significantly related to stage of exercise behaviour change in CR participants.

The processes of change are strategies and techniques that individuals use when changing their exercise behaviour (Marcus, *et al.*, 1992b). There are ten processes: five experiential and five behavioural. A description of each is provided in Table 8.1.

The meta-analysis (Marshall and Biddle, 2001) found that the frequency of using the processes of change varies across the five stages of change (see Figure 8.1). The use of experiential and behavioural processes increases with advancement through stages, with the largest increase occurring from pre-contemplation to contemplation and preparation to action. Furthermore, the frequency of using the behavioural processes is more important than that of experiential processes, from the contemplation stage onwards. There is little change in process use from the action to maintenance stages, implying either that maintenance of physical activity does not require further change in experiential and behavioural strategies, or that individuals use additional strategies to those proposed by the processes of change. Similarly, an observational study of patients who had previously attended a cardiac rehabilitation programme

found that the experiential and behavioural processes were used more frequently with advancing through the stages of exercise behaviour change (Hellman, 1997).

Changes in the stages and processes of change for exercise behaviour from baseline to six months were measured in a longitudinal study of a group of healthy individuals (Marcus, *et al.*, 1996). At six months, individuals were categorised into four groups: stable sedentary (remained in either precontemplation or contemplation at both assessments), stable active (remained in preparation, action or maintenance at both assessments), adopters (progression from precontemplation, or contemplation to preparation, action or maintenance) and relapsers (regression from preparation, action or maintenance to either contemplation or precontemplation). This study found that behavioural change process use did not change for individuals in the stable active or stable sedentary categories. However, behavioural change process use was significantly greater for individuals who remained active, compared to those who stayed inactive over the study period. Adopters reported a significant increase in the use of experiential and behavioural processes, whereas relapsers reported a significant decline in the use of all behavioural processes and one experiential process (dramatic relief). These findings suggest that continued use of behavioural strategies may be important to prevent relapse. Furthermore, a significant decline in dramatic relief among relapsers suggests that either belief in the health benefits of physical activity decreases considerably when individuals are no longer physically active, or that inactivity is no longer viewed as an emotional issue.

Application of the TTM in CR setting

Bock, *et al.* (1997) measured the components of the TTM and physical activity in 62 cardiac patients at the beginning and end of a 12-week phase II supervised exercise programme and at three months follow-up. At the beginning of phase II, 43% of participants were in the action and maintenance stages (i.e. accumulating a minimum of 30 minutes of moderate activity on most days per week). At the end of the programme, 96% of participants were in the action and maintenance stages, and self-reported physical activity had significantly increased. Moreover, there were significant increases in exercise self-efficacy and the use of behavioural processes, and a significant reduction in the perceived cons of exercise, with no change in the use of experiential processes or perceived pros of exercise. Three months after programme completion, the proportion of patients in the action and maintenance stages had decreased to 80%, and nearly 50% of participants had reduced their physical activity compared to the end of the phase II programme. Individuals who had regressed at the three-month follow-up had significantly lower scores for self-efficacy and use of behavioural processes, and they had more negative decisional balance scores at the end of the phase II programme, compared to participants

who remained physically active at three months. Thus, maintenance of physical activity after completion of a CR exercise programme appears to be associated with changes in self-efficacy, decisional balance and behavioural processes. These findings suggest that interventions based on components of the TTM may promote maintenance of physical activity after CR programme completion.

Application of the TTM in the general population

Interventions based on the TTM are effective in promoting and maintaining physical activity in the general population (Marcus, *et al.*, 1992a; Marcus, *et al.*, 1998a, 1998b; Bock, *et al.*, 2001). Marcus randomised 194 sedentary adults to receive either an individualised, stage-matched intervention or a standard intervention over a six-month period (Marcus, *et al.*, 1998a). The stage-matched intervention involved providing participants with individualised feedback about their physical activity behaviour and stage-matched self-help manuals that were designed to apply the components of the TTM. The intervention involved providing participants with typical self-help health promotion booklets to promote physical activity. At six months, a significantly greater proportion of participants in the stage-matched group were regularly active and had progressed to the action stage, compared to those receiving standard treatment. In addition, the stage-matched group were significantly more active than the standard group at six months. Six months after the intervention period had ended, a greater proportion of participants who had received the stage-matched intervention were regularly active and in action or maintenance stages, compared to subjects who received the standard intervention (Bock, *et al.*, 2001). These findings suggest that an intervention tailored to an individual's stage of exercise behaviour change is more effective than a standard intervention to promote and maintain physical activity in a group of sedentary healthy adults. Table 8.2 describes appropriate strategies for each stage of change.

Table 8.2. Appropriate strategies to use in each stage of exercise behaviour change (Adapted from Biddle and Mutrie, 2001)

Stage of Change	Suggested Strategies
Precontemplation	Raise awareness of benefits of activity and risks of inactivity
Contemplation	Decisional balance (perceived pros and cons of activity)
Preparation	Decisional balance, overcoming barriers to activity, set goals for increasing activity, seeking support
Action	Set goals for regular activity, seeking support, rewards, relapse prevention
Maintenance	Varying activities to prevent boredom, seeking support, rewards, relapse prevention

In summary, the transtheoretical model proposes that by identifying an individual's stage of exercise behaviour change, key components such as the processes of change, exercise self-efficacy and decisional balance can be influenced to encourage stage progression and relapse prevention. For example, maintaining physical activity and preventing relapse may require continued use of behavioural processes and enhancing self-efficacy. A description of how each component of the TTM is addressed during exercise consultation is provided in Table 8.3 (p. 204).

Relapse prevention model

Relapse is a breakdown or setback in a person's attempt to change or modify target behaviour. The relapse prevention model was developed to treat addictive behaviours, such as alcoholism and smoking (Marlatt and Gordon, 1985). The model proposes that relapse may result from an individual's inability to cope with situations that pose a risk of return to the previous behaviour. For example, a former smoker finds himself or herself in a social situation with lots of smokers and is tempted to smoke. Thus, helping the individual to acquire strategies to cope with high-risk situations will both reduce the risk of an initial lapse and prevent any lapse from escalating into a total relapse. Simkin and Gross (1994) assessed coping responses to high-risk situations for exercise relapse (e.g. negative mood, boredom, lack of time) in 29 healthy women who had adopted exercise without formal intervention. The participants' activity levels were measured weekly for 14 weeks. The study found that 66% of participants experienced a lapse (defined as not exercising for one week) and 41% experienced a relapse (defined as not exercising for three or more consecutive weeks) over the 14 monitored weeks. Participants who experienced a relapse reported significantly fewer behavioural and cognitive strategies to cope with high-risk situations, compared to participants who did not relapse. These findings suggest that acquiring effective strategies to cope with high-risk situations may prevent relapse.

Relapse prevention training (Simkin and Gross, 1994) involves teaching individuals that a lapse from exercising (e.g. missing an exercise session) need not lead to a relapse (e.g. missing a week without exercising) and a lapse can be prevented from escalating into a complete relapse (e.g. return to a sedentary lifestyle). The individual is encouraged to identify situations that are likely to cause a lapse. Potential high-risk situations relevant to exercise can include bad weather, an increase in work commitments, change in routine, injury or illness. Individuals are encouraged to develop a plan to cope with these high-risk situations. For example, increased work commitments could be overcome by rescheduling an activity session or engaging in a shorter bout of activity. Such coping is believed to prevent escalation of a lapse into a relapse.

Studies have used relapse prevention strategies to improve exercise adherence in the general population (King and Fredrickson, 1984; Belisle, *et al.*, 1987;

Table 8.3. Description of how each component of the TTM is addressed during exercise consultation

Component of TTM	Exercise Consultation Strategy	Description of Strategy
Decisional balance	Decisional balance table	Perceived pros and cons of being active
Self-efficacy	Exploring activity options and setting goals	Providing realistic opportunities for success and achievement
Experiential Processes		
Consciousness raising	Decisional balance table	Providing information about the benefits of physical activity and discuss the current physical activity recommendations
Dramatic relief	Decisional balance table	Discussing the risks of inactivity
Environmental reevaluation	Decisional balance table	Emphasise the social and environmental benefits of physical activity
Self-reevaluation	Review current physical activity status and assess values related to physical activity	Review current physical activity status and assess values related to physical activity
Social liberation	Exploring suitable activity options	Raise awareness of potential opportunities to be active and discuss how acceptable and available they are to the individual
Behavioural Processes		
Counterconditioning	Exploring suitable activity options	Discussion of how to substitute inactivity for more active options (e.g. taking the stairs instead of the lift)
Helping relationships	Seeking social support	Seeking out friends, family and work colleagues who can provide support
Reinforcement management	Relapse prevention strategies	Rewarding successful attempts at being active
Self-liberation	Goal setting	Making commitments for activity (e.g. goal setting)
Stimulus control	Relapse prevention	Control of situations that may have a negative impact on activity and develop ways to prevent relapse in these situations

King, *et al.*, 1988). Belisle, *et al.* (1987) reported that relapse prevention training increased attendance at a ten-week exercise programme and improved maintenance of exercise for 12 weeks following programme completion (Belisle, *et al.*, 1987). Another study evaluated the effect of relapse prevention techniques to maintain physical activity for six months after completion of a six-month home-based exercise programme (King, *et al.*, 1988). Fifty-one subjects were randomised either to receive strategies for improving exercise adherence, including daily self-monitoring of activity and relapse prevention, or to a comparison group who underwent weekly self-monitoring of activity. The intervention group engaged in significantly more exercise sessions over the six-month period, relative to the comparison group. Therefore, daily self-monitoring of activity levels and relapse prevention training is associated with exercise adherence.

Overall, these behaviour change models have been used to understand exercise behaviour change in non-clinical and, to a lesser extent, in clinical populations. These theories have identified factors influencing physical activity participation: exercise self-efficacy, perceived pros and cons, use of cognitive and behavioural processes and ability to cope with high-risk situations. In addition, evidence suggests that interventions based on these models are effective in increasing and maintaining physical activity.

CONDUCTING AN EXERCISE CONSULTATION

In 1995, Loughlan and Mutrie published guidelines for health professionals on conducting an exercise consultation (Loughlan and Mutrie, 1995). This intervention was originally aimed at sedentary healthy individuals. However, more recently it has been adapted for use with clinical populations, including people with Type II diabetes and CR participants (Hughes, *et al.*, 2003; Kirk, *et al.*, 2004a). This section describes the components involved in delivering the exercise consultation to cardiac rehabilitation participants.

Counselling skills

A key element of the intervention is that the consultation is client-centred, which means that individuals should consider their own reasons for being active and should choose their own activity goals. Individuals may be more likely to achieve their goals if they have devised them. In addition, the activity goals should be tailored to the individuals' needs and lifestyle. Good interpersonal skills are essential, which consist of communication (verbal and non-verbal), active listening and expressing empathy. Correct non-verbal communication can be achieved through an open posture (e.g. avoid crossing arms or legs), leaning towards the client, use of appropriate eye contact and a relaxed style to put the participant at ease and to convey interest and atten-

tion. Active listening shows the individual that the consultant has listened carefully and understands what he or she has said. This can be demonstrated by ‘parroting’ (i.e. repeating the key words and phrases that the client used) and paraphrasing (i.e. summarising what the participant has said in your own words). Empathy involves showing individuals that you understand what it is like to be in their world. Empathy can be expressed using examples of other patients who have been in a similar situation to the individual.

As the exercise consultation is a client-centred approach, the consultant should try to avoid preaching, lecturing or providing solutions for the client. The consultant can offer suggestions, such as how to overcome a certain barrier to activity, but this is best achieved by using examples of how other individuals overcame this barrier. Further information on the client-centred approach and the interpersonal skills involved in behaviour change counselling is provided in guidelines on exercise consultation (Loughlan and Mutrie, 1995), and there is also a variety of books on this topic (Rollnick, *et al.*, 1999; Miller and Rollnick, 2002).

COMPONENTS OF AN EXERCISE CONSULTATION

Assessing stage of exercise behaviour change

The consultation should begin by assessing the individual’s stage of exercise behaviour change in order to select the most appropriate strategies to use in the consultation. Table 8.4 demonstrates how to assess an individual’s stage of change moving from phase III to IV. Those who have recently completed a phase III exercise programme are likely to be either regularly physically active (i.e. in the action or maintenance stage) or doing some activity, but not enough to meet current physical activity guidelines (i.e. preparation stage).

Table 8.4. Assessing stage of exercise behaviour change
(Adapted from Lowther, *et al.*, 1999)

Stage of change	Description
Precontemplation	I am not regularly active and do not intend to be so in the next 6 months.
Contemplation	I am not regularly active but am thinking about starting in the next 6 months.
Preparation	I do some physical activity but not enough to meet the description of regular physical activity given above.
Action	I am regularly active but only began in the last 6 months.
Maintenance	I am regularly active and have been doing so for longer than 6 months.

- Assess stage of change
- Assess current physical activity status (e.g. using a questionnaire or diary)
- Discuss past and present activities to establish likes and dislikes

Decisional Balance Table

<i>Pros</i>	<i>Cons</i>
1. Feel fitter	1. Lack of time
2. Improved well being	2. Don't like walking in bad weather
3. Increased confidence	

Barriers to activity

Barriers to remaining active	Strategies to overcome barriers
1. Less time now returned to work	1. Add some activities into daily routine (e.g. walking part of journey to work)
2. Bad weather (e.g. rain, cold)	2. Do an indoor activity instead

- Review physical activity recommendations
- Explore activity options
- Seek support for activity plan

Goal Setting

1 month	3 month	6 month
1. Brisk walk for 15 mins 3 days/wk	1. Increase brisk walk to 25 mins 3 days/wk	1. Sponsored walk
2. Attend phase IV programme 1 day/wk	2. Attend phase IV programme 1 day/wk	2. Attend phase IV programme 1 day/wk
	3. Swimming once per week for 15 mins	3. Swimming once per week for 25 mins

Preventing relapse

High-risk situations	Coping strategies
1. Busy at work, not enough time to attend class or go swimming	1. Reschedule the swim session or go out walking instead
2. Bad weather, don't want to go out walking	2. Do an indoor activity instead (e.g. swimming or exercise video)

Figure 8.2. Example of an exercise consultation delivered to patients at the end of phase III.

Definition of regular physical activity:

- A minimum of 20 minutes of moderate intensity exercise on three days per week.
and/or
- Accumulated 30 minutes or more of moderate intensity physical activity on at least five days per week.

The aims of the consultation for individuals in action and maintenance are ensuring that they remain regularly physically active in phase IV and prevent relapse. Figure 8.2 shows an example of an exercise consultation at the transition from phase III to IV.

Individuals in preparation should be encouraged to become regularly physically active. Physical activity recommendations for phase IV participants are similar to the physical activity guidelines for healthy adults: individuals should be encouraged to accumulate at least 30 minutes of moderate intensity activity on most days of the week (Pate, *et al.*, 1995) and engage in a minimum of three 20-minute sessions of moderate to vigorous intensity exercise per week (ACSM, 1990; 2001).

Assessing current activity levels

Assessing the individual's current physical activity levels can be carried out using a questionnaire, such as the Stanford Seven-Day Physical Activity Recall (Blair, *et al.*, 1985), International Physical Activity Questionnaire (IPAQ) (Craig, *et al.*, 2003) or an activity diary. This assessment provides the exercise consultant with information on the individuals' actual activities and can be used to identify possible opportunities for physical activity in their daily routine (e.g. parking the car further away and walking part of the journey to work). In addition, daily recording of activities in a diary can help individuals monitor their progress as they make changes to their exercise behaviour, and it can provide them with feedback on whether they have achieved their set goals.

This assessment should be followed by a discussion on the individuals' past and present activities to discover their likes and dislikes (e.g. if the patient enjoyed exercising in a group setting, they could attend an exercise class in the community).

Decisional balance

Participants are asked to complete a decisional balance chart, which involves comparing the perceived pros and cons of being active. Patients should be encouraged to identify the benefits gained during the phase III exercise programme. Examples of benefits stated by patients include increased fitness, improved well being, increased confidence and weight management. The importance of remaining active in order to maintain these benefits should be emphasised.

Then individuals should consider additional benefits they would gain by remaining active in the long term: preventing another heart attack, improving quality of life, living longer and controlling weight. Patients are also asked to explore their perceived cons (costs) of being active: examples of perceived costs of being active experienced by patients include having to make time for exercise and not liking to walk in bad weather. The aim of the decisional balance chart is to help individuals realise that the pros of being active outweigh the cons. This is an effective technique for improving exercise adherence (Nigg, *et al.*, 1997).

Overcoming barriers to activity

Patients are also asked to identify possible barriers that may prevent them from remaining active. Some of the individual's perceived cons of activity will be similar to their barriers to remaining active. Many patients return to work after completing phase III exercise training. Thus, lack of time may be a potential barrier to activity in phase IV. This should follow with a discussion on ways to overcome potential barriers to activity. Possible solutions to time constraints include using the stairs, walking part or the entire journey to work or taking a brisk walk at lunchtime.

Social support

Social support is a major determinant of adherence to exercise in CR (Andrew and Oldridge, 1981; Oldridge, *et al.*, 1992). Thus, an important part of the consultation is to encourage individuals to seek support for their activity plan. For example, family or friends could engage in some activity with the individual or praise them for continuing with an active lifestyle. Alternatively, joining a group exercise programme will provide a supportive environment for some individuals. In addition, the involvement of family and partners can help CR participants gain social support to attend phase III programmes.

Exploring activity options

The next part of the consultation involves a discussion with the individual on activities they could do to remain active. The individual's home and work environment should be reviewed in order to see where they could incorporate activity into their daily routine. It may be helpful to have information on physical activity opportunities in the local areas that are suitable for CR patients. For example, the times and locations of indoor shopping centres for indoor walking, or of phase IV community exercise programmes and the times of adult-only swim sessions. Previous discussions on likes and dislikes of activity, current activity status and barriers to physical activity should also be considered. The recommended amounts of physical activity and exercise required to improve and maintain health and fitness, and ways to achieve these recommendations, should also be discussed. As discussed in Chapter 4 the combination of stage one (accumulated activity) and stage two (structured exercise) should be reinforced and discussed.

Goal setting

Setting goals for increasing and maintaining activity in CR is important to help individuals stay motivated. The client should be encouraged to set short-term (one month), intermediate (three month) and long-term (six-month) specific

activity goals. The consultant should assist the individual with goal setting to ensure **smarter** goals are set (i.e. **s**pecific, **m**easurable, **a**ceptable and **r**ealistic to the individual's lifestyle, **t**ime-phased, **e**njoyable and **r**ecorded). The goals should meet the client's needs and take into account factors discussed during the consultation, such as solutions to barriers, likes and dislikes, and current activity status. Participants should be given a copy of the activity goals to take away with them.

Preventing relapse

Relapse prevention training (Simkin and Gross, 1994) is an important component of the exercise consultation process for patients completing supervised exercise programmes. Relapse prevention training involves teaching individuals that a lapse from exercising (e.g. missing an exercise session) need not lead to a relapse (e.g. missing a week without exercising), and a lapse can be prevented from escalating into a complete relapse (e.g. return to a sedentary lifestyle).

Individuals should be encouraged to identify high-risk situations that may cause a lapse from activity, for example bad weather, increased work commitments or illness. These lapses can accumulate and may lead to a return to a sedentary lifestyle. Developing a plan to cope with these risky situations can reduce the likelihood of a lapse in activity and an overall decline in physical activity, for example, having an alternative indoor activity in bad weather, or rescheduling an activity session or engaging in a shorter bout of activity in order to meet increased work commitments.

REPEAT EXERCISE CONSULTATIONS

Some of the studies evaluating the effectiveness of the exercise consultation have used a repeat exercise consultation at six months. If individuals attend repeat consultations, information recorded during the first exercise consultation should be reviewed. For example, participants should be asked if they achieved the activity goals set during the previous consultation. If clients did not achieve their goals, then the reasons for this should be explored and new goals set. For example, did they encounter any barriers to activity or risky situations that caused a lapse or relapse from activity? Assessing the individuals' current activity levels and comparing them to the first activity assessment can inform individuals if their activity levels have increased, been maintained or declined over the past six months. Individuals who have increased their activity or remained regularly active should be praised for their achievements. However, barriers to activity, problem solving, goal setting and relapse prevention strategies should be discussed with all individuals to ensure they have acquired the necessary skills to help them remain active in the future.

Phone calls can also be used to provide individuals with support for remaining active after an initial exercise consultation. The information recorded during the exercise consultation should be used to guide the phone calls. The phone call may involve discussing any problems the individuals are experiencing in achieving their activity goals, attending community exercise programmes and remaining active.

EFFECT OF EXERCISE CONSULTATION TO INCREASE AND MAINTAIN PHYSICAL ACTIVITY

Several randomised controlled trials have found the exercise consultation to be effective in promoting and maintaining physical activity in non-clinical and clinical populations (Loughlan and Mutrie, 1997; Lowther, *et al.*, 2002; Hughes, *et al.*, 2002, 2003, Kirk, *et al.*, 2004a, 2004b). Lowther, *et al.* (2002) compared the effect of fitness assessment, exercise consultation and standard exercise information on physical activity levels in a group of sedentary healthy individuals. Lowther, *et al.* (2002) found that participants who had received an exercise consultation were significantly more active at 12 months. A recent study of sedentary people with type II diabetes found that the exercise consultation was more effective than standard exercise information in promoting and maintaining physical activity for 12 months (Kirk, *et al.*, 2004b).

Current research provides support for the exercise consultation in CR settings (Hughes, *et al.*, 2002; 2003). A pilot study found that the exercise consultation improved short-term (four weeks) adherence to physical activity after completion of a phase III supervised exercise programme (Hughes, *et al.*, 2003). A recent randomised controlled trial compared the longer-term effect of the exercise consultation with standard exercise information on maintenance of physical activity in 70 cardiac patients who had completed an 11-week phase III supervised exercise programme (Hughes, *et al.*, 2003). Physical activity was assessed using a questionnaire, stage of change for exercise behaviour and accelerometry at baseline (immediately after programme completion), at six and 12 months follow-up. At baseline, both groups were regularly physically active (determined by questionnaire and stage of change), as patients had recently completed an exercise programme. Participation in moderate to vigorous physical activity, measured by questionnaire and accelerometry, was maintained in the experimental group over the 12-month study period. In contrast, self-reported physical activity significantly decreased in the control group from baseline to six and 12 months and total accelerometry counts per week decreased by 8% from baseline to 12 months. Furthermore, a higher proportion of experimental patients was regularly physically active (i.e. in the action and maintenance stages of change) at 12 months, compared to controls. These findings suggest that the exercise consultation

successfully maintained physical activity for 12 months after completion of a phase III exercise programme.

Implementing the exercise consultation

Research suggests that the exercise consultation is an effective intervention for maintaining physical activity for 12 months following completion of phase III exercise-based cardiac rehabilitation (Hughes, *et al.*, 2002; Hughes, *et al.*, 2003). Presently, patients completing phase III can attend phase IV maintenance exercise programmes in the community. However, these exercise opportunities are not available in all areas. Furthermore, some patients may not be able to attend structured phase IV programmes due to barriers associated with supervised exercise training, including transportation problems, limited access, work and domestic conflicts. Furthermore, the intervention could be used to facilitate patients' progression from phase III hospital-based exercise programmes to community-based programmes or independent exercise. Thus, the exercise consultation could be routinely provided to cardiac patients on completion of phase III to encourage maintenance of physical activity in phase IV. In addition, exercise consultation has the potential to help patients at all transitions of CR, for example, from phase I to phase II.

Applying exercise consultation to CR

Is it feasible to incorporate the exercise consultation into current CR services? First, the consultations are relatively inexpensive in terms of time, resources and personnel. Exercise consultations last approximately 20 to 30 minutes and the support phone calls five to 10 minutes. In addition, it is possible that patients could record their physical activity habits and the pros and cons of physical activity before attending the consultation, in order to reduce time spent on the consultation. Resources required to conduct the exercise consultation include recording materials (e.g. goals sheet, and guidelines for physical activity) and a quiet room. The exercise consultation could be delivered by a number of health professionals. In the UK, physiotherapists play a central role in the exercise component of cardiac rehabilitation (Thow, *et al.*, 2003).

Physiotherapists have an ideal opportunity to deliver the exercise consultation to patients, as they have good insight, i.e. they are in a position to facilitate the patient's progress from phase I to phase III cardiac rehabilitation and could incorporate exercise consultation into existing programmes. In addition, the transition to the less clinical and supervised phase IV is an ideal opportunity to use exercise consultation. In addition, BACR-trained phase IV exercise staff can use the exercise consultation to provide support to patients who are having difficulty remaining active. In order to be qualified to deliver the exercise consultation, BACR phase IV leaders and exercise leaders require knowledge of the behaviour change theories on which the consultation is

based (i.e. Transtheoretical Model and Relapse Prevention Model), and should develop the counselling skills and strategies required to deliver the intervention. This knowledge and skills development can be achieved by appropriate in-service training and/or postgraduate continual professional development (CPD). In addition, individuals need to practise the consultation process.

Training in exercise consultation

Examples of training in exercise consultation have been included in two postgraduate courses for health professionals involved in delivering cardiac rehabilitation services; the first of these is the Rehabilitation in Cardiology at Glasgow Caledonian University aimed at specialist nurses, physiotherapists and other members of the health care team delivering phases I to III CR programmes. The training involves a three-hour lecture on theories of exercise behaviour change, counselling skills and strategies required to deliver the intervention. In the second course, MSc module in Cardiac Rehabilitation for Physiotherapists, there is also a four-hour practical session, where the students have the opportunity to practise the exercise consultation process with cardiac patients.

The exercise consultation has been incorporated into the British Association of Cardiac Rehabilitation (BACR) phase IV training course (Bell, 2000). This course trains exercise instructors to deliver phase IV maintenance exercise programmes in the community for cardiac rehabilitation patients. This course involves a two-hour lecture on theories of exercise behaviour change and the exercise consultation process. In November 2004, the British Association of Sport and Exercise Science (BASES) provided a one-day workshop on physical activity counselling in general and clinical populations, and it is hoped that this workshop will be repeated in the future. Exercise consultation is also taught in several undergraduate and postgraduate Sport and Exercise Science degrees in the UK.

Future research

Many studies have examined the factors influencing uptake of and adherence to supervised CR exercise programmes (Oldridge, *et al.*, 1992; Pell and Morrison, 1998; Dorn, *et al.*, 2001). However, the factors that contribute to maintenance of physical activity during and between phases of CR programmes have not been fully explored. Understanding these factors is an important step in the development of interventions to improve maintenance of physical activity and exercise. Further research in this area is warranted. Similarly, few studies have examined the effect of interventions to encourage long-term maintenance of physical activity following completion of phases II and III CR exercise programmes. Thus, research is needed to test different forms of intervention aimed at improving long-term compliance to physical activity.

Areas that are ripe for further research: Can the exercise consultation maintain physical activity for more than 12 months? Are repeat exercise consultations required? Could the exercise consultation be delivered successfully in a group or by post, telephone or World Wide Web?

The possibility of delivering this intervention to patients in a group setting at the end of phases II and III is a promising area for further study. First, delivering this intervention to groups of patients as an alternative to one-to-one consultations would be more feasible for CR services in terms of time and staff resources. In addition, conducting an exercise consultation in a group setting would provide patients with the opportunity to discuss issues with each other, such as potential barriers to remaining active, problem solving for these barriers and identifying high-risk situations for relapse. Furthermore, group discussion on exercise opportunities in the community, such as phase IV classes, might encourage patients to attend these programmes together. In general, patients routinely receive a discharge interview at the end of phase III that provides cardiac rehabilitation staff with an ideal opportunity to review the patients' goals for remaining active, devised during the group consultations. Studies using physical activity counselling in the general population and other clinical groups have successfully delivered this type of intervention in a group setting (Dunn, *et al.*, 1999; Underwood, *et al.*, 2000).

The exercise consultation may be useful between all phases of CR both to improve adherence to supervised exercise programmes and to encourage patients to participate in physical activity outside of the exercise classes. Patients at the start of phase III are likely to be in the contemplation or preparation stages, and the focus of the consultation should be on encouraging these individuals to increase their physical activity. A pilot study found that web-based and one-to-one exercise consultations were equally effective in increasing physical activity in a group of patients participating in a phase III supervised exercise programme (McKay, *et al.*, 2003).

Other strategies could be included in the exercise consultation to increase its efficacy. Recently, physical activity intervention programmes have found the addition of pedometers to be effective in promoting physical activity (Chan, *et al.*, 2004; Tudor-Locke, *et al.*, 2004). Thus, pedometers, in conjunction with exercise consultation, may be a promising strategy for encouraging participation in physical activity.

SUMMARY

Many benefits are associated with participation in exercise-based CR for patients with established coronary heart disease. Sustaining these benefits requires maintenance of regular long-term physical activity. However, many patients find it difficult to maintain exercise participation and an active lifestyle. The exercise consultation is an effective intervention for maintaining

physical activity and could be applied through all phases of CR. In addition, several randomised controlled trials have shown the exercise consultation to be successful in promoting and maintaining physical activity in the general population and for people with type II diabetes. Exercise consultation is based on established theoretical models of behaviour change, and it uses strategies to increase and maintain physical activity. This intervention is practical and could feasibly be incorporated into all phases of CR programmes to encourage patients to remain active. With minimal training, any member of the cardiac rehabilitation team could deliver the exercise consultation. However, in order to be trained to deliver the exercise consultation, exercise leaders need to understand the behaviour change theories on which the consultation is based and the counselling skills and strategies required to deliver the intervention. This would mean that the exercise consultation could be routinely provided to cardiac patients.

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