

CHAPTER 9

RISK STRATIFICATION

The concept of risk stratification in cardiac rehabilitation is related to the possible hazards of exercise in cardiac rehabilitation programs. Risk stratification as a guide to level of exercise becomes relatively unimportant if the exercise training component of the cardiac rehabilitation program is conducted at low or moderate intensity.

High risk groups

It is recognised that during high intensity exercise there is an increased chance of sudden death through ventricular fibrillation²²⁶ and possibly myocardial infarction²²⁷. However, available evidence shows that overall, those who are active are less likely to die than those who are physically inactive²¹⁰⁻²¹⁴. Thus, it is desirable that patients should be active and that they should acquire some fitness²²⁸, but without exercising at a level at which ventricular fibrillation could occur²²⁶. Risk of ventricular fibrillation is greatest in those who have significantly impaired left ventricular function, namely, those who have had large myocardial infarction, past multiple myocardial infarctions or impairment of ventricular function from other causes. These other causes include valvular heart disease, cardiomyopathy, myocarditis and hypertension.

Recommendation

Clinical risk stratification based upon history, examination and resting electrocardiogram is usually sufficient. Technological investigation of patients should be limited to specific tests to answer specific clinical questions applicable to individuals.

Strength of evidence = 3

If a patient is to be enrolled in a high intensity exercise program, then risk stratification is necessary^{74,130}. High intensity exercise may be regarded as exercise at a level which is greater than 75% of the maximal heart rate (HR max) which the patient can achieve either on a treadmill or a cycle ergometer. HR max is variable between patients. As death is a possible outcome from high intensity exercise, calculation of maximal heart rate from tables related to age and sex is not adequate. Further, it could be misleading and dangerous. Thus, a symptom limited maximal exercise stress test is

required from which to calculate the target training heart rate. These issues are discussed in Chapter 8.

While poor ventricular function is the major marker of risk of death²²⁹⁻²³², there are other markers, including myocardial ischaemia and the occurrence of arrhythmias²³³. Myocardial ischaemia may be demonstrated by the production of angina during a stress test or may be inferred from the degree of ST segment depression which occurs during a stress test even in the absence of pain (so-called silent ischaemia). The possible production of arrhythmias, particularly ventricular tachycardia (which could be subsequently associated with ventricular fibrillation), may also be provoked by a stress test²³⁴. A 24 hour ambulatory electrocardiogram may also reveal arrhythmias or reveal ST-T wave abnormality, indicating a tendency to arrhythmia or ischaemia^{235,236}. It appears, however, that induction of arrhythmia during a stress test, when it occurs as a single phenomenon, does not herald the likelihood of fatal ventricular fibrillation²³⁷. It further appears that angina or ST-T wave abnormality during a stress test does not herald risk of death^{230,238,239}. It heralds angina during exertion of normal daily activity or of exceptional activity and, in consequence, foreshadows likely coronary angiography and coronary revascularisation²⁴⁰.

Technological assessment of risk

The major value of a treadmill test in assessing risk is to determine the level of physical activity which the patient can accomplish before cessation of the test. The greatest risk is to those who are considered clinically unfit to undergo the test²⁴¹. The next level of risk is those who perform poorly on the test. Those who perform well on the test can be considered as having tolerable or good left ventricular function and therefore are of relatively low risk during high intensity exercise.

Technological risk assessment was developed in the 1980s as investigative technology progressively improved. Some still recommend that patients entering an exercise rehabilitation program should undergo investigations including a symptom limited maximal exercise test and an assessment of the left ventricular ejection fraction, both for risk assessment within the program and for overall prognostication²⁴². The ejection fraction could be determined from radionuclide left ventriculography, from two dimensional echocardiography or from angiographic left ventriculography, depending on circumstances. However, ejection fraction and exercise capacity need not correlate well in individual patients. Ambulatory Holter monitoring has recently been considered of doubtful additional prognostic value²⁴³⁻²⁴⁶.

Clinical assessment of risk

Prior to the development of the technologies, clinical correlates of risk were well recognised, including clinical evidence of past heart failure complicating myocardial infarction or occurring at other times, shortness of breath and fatigue on exertion, the

reporting of chest tightness or angina and the recognition of clinical arrhythmias. The site and size of infarction were indicated by both clinical measures and standard electrocardiography^{238,247,248}. Abnormalities in the resting electrocardiogram are regarded as a marker of significant myocardial damage. The age of the patient was incorporated into the assessment. Weighted indices were developed which accurately reflected prognosis based upon clinical observation²⁴⁹⁻²⁵³.

In the 1990s it is accepted that clinical recognition of heart failure is a powerful marker of prognosis, more powerful than the ejection fraction^{231,232}. Recent studies have also demonstrated that while the resting electrocardiogram is a good indicator of mortality, stress test ischaemia is not a good indicator of mortality²³⁸⁻²⁴⁰. It is an indicator of the possible need for revascularisation.

Conclusions

It is possible for risk stratification to be undertaken by clinical means and this has now been recommended by some bodies^{1,238}. It is of some importance to the physician and cardiologist to make an assessment of prognosis. Such assessment can be made on clinical grounds, although technological testing may well be required in specific instances to answer specific questions regarding a particular patient. If a low or moderate intensity exercise program is undertaken rather than a high intensity exercise program, technological risk stratification is not required. Determining the clinical state of the patient in terms of presence or absence of angina, the presence or absence of shortness of breath, the recent presence or absence of heart failure and other clinical indicators of the size of infarction or impairment of ventricular function is sufficient^{1,238,248,250,254}. This pattern of risk stratification removes much of the cost applicable to technological investigation without any apparent increase in hazard for the patients. It does, however, necessitate adequate clinical training and retention of clinical skills, which may be deteriorating, as costly testing supplants clinical judgement²⁵⁵.

A stress test and/or echocardiogram may be undertaken to assess residual ischaemia or ventricular function in individual patients. This is a clinical decision. Such tests are not a necessary part of cardiac rehabilitation. However, if these tests have been performed, it is desirable to forward the results to the cardiac rehabilitation program co-ordinator. In patients who have had myocardial infarction or who have been admitted to hospital with unstable angina, it is now common to perform coronary arteriography with a view to possible early revascularisation. Informing the cardiac rehabilitation co-ordinator of the results of angiography is also desirable, together with a statement regarding whether revascularisation for that patient is planned or is under consideration. Observation of the patient in the cardiac rehabilitation program could prove of value to the cardiologist in reaching a decision. The occurrence of chest pain or of breathlessness during exercise and the level of activity to produce the symptom can be of considerable clinical value.

CHAPTER 10

CONDUCTING EXERCISE PROGRAMS

Many thousands of patients have passed through low to moderate intensity exercise programs in Australia without mishap. The adequacy and safety of such low cost, low equipment programs is accepted in Australia, New Zealand and the United Kingdom^{1,5,39,40,41,49,79}. These types of program are recommended by the WHO Expert Advisory Committee for both basic and intermediate cardiac rehabilitation facilities¹. High intensity exercise training programs are thought best limited to centres where research and development in exercise physiology is being undertaken. Chapter 8 presents evidence which shows a similarity in outcomes from low and high intensity exercise programs. Recommendations in this chapter are based upon observed outcomes from low to moderate intensity exercise programs, giving strength of evidence ratings = 4.

Site of exercise program

Recommendation

Cardiac rehabilitation exercise programs should be established in all sizeable hospitals treating cardiac patients. In addition to these early ambulatory outpatient-based programs, cardiac rehabilitation programs should be established in other appropriate facilities to facilitate patient access.

Strength of evidence = 4

To date, most cardiac rehabilitation exercise programs have been developed in the outpatient areas of hospitals. Referral to such programs should be organised prior to the patient's discharge from hospital. Monitoring of attendance and follow-up should be readily achieved. A further advantage of hospital-based programs is the potential for continued support from the health professionals involved in both inpatient care and ambulatory rehabilitation, with a heightened sense of security for both staff and patients.

A potential disadvantage is the possibility of patients considering that they need to be closely linked to the hospital upon which some may develop a sense of dependence.

Another disadvantage is the centralisation of services at the hospital, with consequent problems for patient attendance, transport and distance. Thus, there is a good case for programs being sited in community centres. This latter case becomes more feasible if the intensity of exercise is at a low to moderate level.

The ideal appears to be the establishment and maintenance of programs in both hospitals and community centres. This approach has authoritative support¹ and is rapidly being developed in Australia, particularly in Victoria^{5,40,41}.

Safety protocols

Recommendation

A written emergency protocol is required for all programs, together with ready access to a telephone to summon assistance. Staff require current training in cardiopulmonary resuscitation .

Strength of evidence = 4

With low intensity exercise training programs, risk of a cardiac event is very small. However, it is essential that staff have current training in cardiopulmonary resuscitation. A written emergency protocol is required, together with a telephone accessible to staff to generate assistance if required. Access to medical and pharmaceutical support is dependent upon the availability of either an ambulance or a medical practitioner.

A simple manually controlled ventilator and plastic airways are desirable. Nitroglycerin should be available for patients who may develop chest pain and it is desirable to have oral diuretic (frusemide) on site for patients with heart failure. However, the administration of a diuretic should only be after medical advice. Staff require knowledge of the indications for and use of nitrates for patients with angina and of diuretics for heart failure.

Additional equipment and training are mandatory for high intensity exercise programs. The equipment includes a resuscitation trolley and a defibrillator, which must be regularly maintained and checked. Staff require training in the use of the defibrillator and the contents of the resuscitation trolley. Monitoring may be by heart rate, intermittent rhythm strips by electrocardiography or use of the defibrillator panels. This applies particularly to those assessed as being at high risk. Telemetered electrocardiography may be required for monitoring of the occasional patient who is thought to be subject to serious arrhythmias.

Equipment

Recommendation

Low to moderate intensity exercise training can be undertaken using little equipment and at low cost.

Strength of evidence = 4

It is possible to conduct cardiac rehabilitation exercise programs with little equipment and maintain the principles of best practice at low cost. The decision regarding equipment is partly secondary to the decision regarding the level of exercise training. For low to moderate level exercise, it is necessary to have a stethoscope and sphygmomanometer.

Exercise equipment may be limited to simple items such as buckets, bricks, boxes, baskets, cases or weights. A set of steps to accommodate several patients, or sets of steps to be used by individual patients, can be useful. Treadmills for walking are expensive and unnecessary. Stationary cycles with air or mechanical resistance occupy relatively little space and are not expensive. An indoor walking area is desirable, but outdoor walking, if feasible, may be preferred.

High intensity exercise may be undertaken using similar equipment, but additional safety equipment is required, as noted above.

Content of exercise classes

Recommendation

Low to moderate intensity exercise training is recommended for most patients, with a short warm up, that is, calisthenics and stretching exercise segments. These are followed by either a walking program and/or a light training circuit with rests between. A cool down and rest segment should complete the sessions. Limited patient monitoring by observation, perceived exertion or heart rate is maintained throughout the exercise.

Strength of evidence = 4

Low to moderate intensity exercise may be undertaken without the warm up and cool down periods required for high intensity exercise. However, it is generally desirable, particularly with older, obese or unfit patients who may have reduced flexibility, to start with a warm up period of light calisthenics and stretching of major muscle groups. Stretching may be largely limited to the legs and spine if the activity program is based upon walking, use of steps or stationary cycling. Patients after sternotomy

should include upper body flexibility exercise as a part of their warm-up. It is desirable to take patients through a series of activities before starting dynamic exercise or strength training exercise, particularly if using the arms with cranking, pushing, pulling or lifting.

The program may be largely based upon walking, which may be maintained for 20 to 30 minutes. A circuit of different activities may also be performed at levels short of breathlessness, with monitoring of perceived exertion and/or heart rate after each station where activities may be maintained for up to five minutes at a level acceptable to the patient. Patients should be observed and should also be requested to report any symptoms or difficulties in performance of individual exercises.

Blood pressure should be checked during pauses between exercise in new patients to note possible fall of blood pressure during activity. Blood pressure should also be checked in those patients known to have, or who are found in the class to have, elevated blood pressure. If significant variation of blood pressure is noted, exertion should cease until medical clearance is obtained.

A record of the exercise intensity, duration, heart rate or perceived exertion should be charted for each patient at each attendance. Any problems encountered by patients or staff related to symptoms, abnormal blood pressure or heart rate should be reported to the patient's doctor.

A cool down period with gradually lessening levels of activity, followed by a period of rest, relaxation and breathing exercises, is commonly practised and appreciated by patients.

The total duration of a low to moderate intensity exercise training session should be between 45 to 60 minutes, including rests between activities. For high intensity exercise, usually continuous, the exercise time is usually 20–30 minutes.

Staffing

Recommendation

Exercise training sessions should be conducted by suitably trained health professionals.

Strength of evidence = 4

While education groups may be conducted by a multidisciplinary team of health professionals, exercise classes are best conducted by physiotherapists, exercise physiologists or appropriately trained nurses, occupational therapists or other health professionals. In Victoria, most exercise programs are conducted by nurses and physiotherapists, with the exercise program usually designed by a physiotherapist⁵.

Low to moderate intensity exercise programs may be conducted by a single health professional, provided there is another health professional available as back up and provided patients have no medical contraindications to exercise. Such programs are suitable for small communities with a small number of patients. This represents a “basic facility”¹. The key to such programs is adequate staff training and the development of a support network for the health professional involved. Such supports are most readily available through a community health centre or local hospital.

Staff to patient ratio

Recommendation

The recommended staff to patient ratio is one staff member to 10 patients. As it is desirable to have two health professionals in each exercise session, classes should contain no more than 20 patients per class.

Strength of evidence = 4

The exercise class is usually conducted by two persons who, together, can supervise the activities of up to 20 patients. In addition, about 10 family members commonly attend to observe the class.

While it is desirable to conduct a program for all patients twice weekly (or once weekly), the numbers of patients may be sufficiently large to dictate the need for a second parallel program. This is preferred to having more than 20 patients in a single group and to having a “waiting list” for entry into the program.

Exercise testing before exercise training

Recommendation

An exercise test is not necessary before entry to a low to moderate intensity exercise program. High intensity exercise training necessitates a prior symptom-limited maximal exercise test.

Strength of evidence = 4

In Australia, where the preferred model program of low to moderate intensity exercise training is the norm, a prior exercise test is not performed nor is it needed. In the few programs where high intensity exercise is offered, a symptom limited treadmill or cycle ergometer test is required to determine the training heart rate^{74,130} and for risk stratification (see Chapter 9).

Exercise stress testing and other investigations which may reflect prognosis can also reflect the safety of high intensity exercise for an individual patient. However, these tests contribute little to risk stratification not already obtained by simple clinical measures. Such testing may be of value in medical decision making, but is not a pre-requisite for entry into a cardiac rehabilitation program with low to moderate intensity exercise training.

Patient assessment before entry to the program

Recommendation

Before entering the exercise program, each patient should have an assessment of physical and psychological status and of the patient's perceived needs for the rehabilitation program. It is desirable for the patient's spouse to attend the entry assessment.

Strength of evidence = 4

Before patients are enrolled into the program, an interview and assessment are required, either individually or together with another family member (usually the spouse). Approximately 30 minutes are required for assessment of each patient. This enrolment interview can be undertaken by either or both of the health professionals conducting the exercise class. Entry assessment is best supported by a referral note from the patient's medical practitioner, preferably with relevant clinical information. Alternatively, a hospital record should be sought to provide in-hospital data including diagnosis, symptoms, medications, advised restrictions and perceived patient difficulties. The entry assessment should address the patient's specific goals regarding resumption of work and activities of daily living, since these may influence the duration and pace of the exercise training. It should also clarify needs for specific muscle strengthening related to work, social or leisure activities. Entry assessment is further discussed in Chapter 17.

Time of starting the exercise program

Recommendation

The optimal time for the patient to begin the ambulatory exercise program is within a week of discharge from hospital.

Strength of evidence = 4

Patients may enter at any point in the program. However, it is desirable for patients attending an ambulatory program to start the exercise and education program as soon as possible after leaving hospital. Ideally, this should be within four to seven days unless ongoing physical symptoms preclude early attendance. The reason for early attendance is to reduce the patient's and family's insecurity and possible depression following the acute event. It is also to start physical reconditioning as soon as possible. Many patients and spouses remain fearful of activity until its safety is demonstrated by participation in a supervised exercise class.

Monitoring during exercise sessions

Recommendation

With low to moderate intensity exercise training, it is recommended that monitoring is by one or more of the following:

- patients' symptoms
- observation of patient's responses
- patient's rate of perceived exertion
- observer measured heart rate
- patient measured heart rate

Strength of evidence = 4

Patient monitoring in programs of high intensity exercise commonly includes at least occasional or intermittent electrocardiographic strips or telemetry. However, because most cardiac rehabilitation programs in Australia offer low to moderate intensity exercise training, it is unnecessary to undertake electrocardiographic monitoring, whether continuously by telemetry or intermittently by use of ECG rhythm strips. Patients are encouraged to be active in the group to a level where they are just aware of breathing (low intensity exercise) or aware of some breathlessness, without sweating (moderate intensity exercise). Patients are observed during group exercise to assure that they do not exceed these limits. They are also warned to cease activity and to advise staff, should unsteadiness, fatigue, muscle strain, significant breathlessness, chest pain or other symptoms develop.

Observation of each patient by the staff and the patient's own perception of the rate of exertion may be coupled with intermittent brief counting of heart rate. In many group programs, this is done by the exercise class leader. In some programs patients are trained to measure the heart rate themselves. There is no evidence as to which is the preferred method of heart rate monitoring. Some patients like to follow their own heart rate. Others prefer to have closer contact with the class leader when the leader palpates the patient's pulse. In low intensity exercise programs, most patients require only occasional heart rate monitoring. Even with moderate to high intensity exercise training, monitoring may not be required for up to 60% of patients (the so called "low risk" patients), with good performance and no abnormality on a maximal symptom limited exercise test performed prior to enrolment in the exercise group².

Exercise testing after exercise training

Recommendation

An exercise test (treadmill, cycle ergometer, steps, six or 12 minutes timed walking test) is valuable towards the end of an ambulatory rehabilitation program. The test will demonstrate the level of recovery, fitness and physical capacity to resume work and will usually reassure the patient, family, medical practitioner and, if necessary, employer.

Strength of evidence = 4

A symptom limited exercise test after several weeks in an exercise training program or on completion of the program is valuable as a part of comprehensive patient assessment³⁹. It is best coupled with a detailed medical review. This review of the patient's recovery and risk factor status should be undertaken by the patient's physician, cardiologist or other medical officer. Regimens should be clarified and reinforced. Any concerns of the patient should be discussed. An exercise test at this time may reveal impaired physical performance, with shortness of breath and fatigue at a lower than expected workload. It may also possibly indicate residual ischaemia, with development of angina or ST segment change in the ECG. These changes may lead to modification of management. The performance on the treadmill is reassuring for most patients, because performance is commonly greater than expected by the patient and spouse. As the intended test is maximal and symptom limited, the remote chance of cardiac arrest must be recognised; therefore, due safety precautions must be observed^{33,74}.

Many patients may have already demonstrated significant recovery of fitness and their physical status will be quite clear to both physician and patient without an exercise test. Thus, exercise testing at this stage remains optional. It may be limited to a small proportion of patients to clarify a specific clinical question.

High intensity exercise training

Recommendation

Patients with physically demanding work or leisure time activity may achieve added benefit from high intensity exercise.

Strength of evidence = 4

Some patients seek rapid recovery of high levels of physical functioning. This usually involves a prior symptom limited maximal stress test before entry to the program to determine a training heart rate of 70–85% of HR max, close monitoring of heart rate, consideration of clothing, temperature and of safety protocols and equipment (see other sections of this chapter and also Chapter 8). Further study is required to determine whether selected patients could attend a separate session of high intensity exercise training within a program based on low to moderate exercise or whether a centralised high intensity exercise program should be available to which selected patients may be referred.

CHAPTER 11

EXERCISE PROGRAMS FOR SPECIFIC GROUPS

Patients with heart failure and transplantation

Recommendation

All patients with heart failure should be enrolled in an exercise program as a part of comprehensive rehabilitation, including before and after transplantation.

Strength of evidence = 1

Traditional past management of patients with heart failure included a period of bed rest, which was sometimes prolonged. This led to rapid deconditioning, with muscular wasting, dependency and institutionalisation and probably contributed to early death. It is now recognised that definite benefits can be achieved through early mobilisation and early exercise, both passive and active, which is gradually progressive. Dynamic exercise such as walking and using the arms is recommended to maintain activities of daily living, as well as resistive training to increase muscular strength. Such an exercise program should be gradually introduced and may start in hospital or at any point in the patient's illness. It should lead to significant improvement in physical functioning and increased maximal oxygen uptake^{102,106,219–221,225,256,257}. These physiological and functional improvements are coupled with increase in muscle bulk and histological and chemical changes, demonstrable in the skeletal muscle^{222–224,258}.

Randomised controlled trials, all showing similar benefit, have been accompanied by multiple observational studies. Preliminary findings of meta-analysis of seven published randomised clinical controlled trials of exercise compared with usual care in patients with congestive heart failure have demonstrated a mean 18% increase in physical working capacity²⁵⁹. The available evidence significantly strengthens the view that exercise training of low intensity, tailored to each patient's capacity, has a clear benefit with a very low risk. As mentioned in Chapter 10, 31 out of 38 patients on a transplantation waiting list in one study were removed from that waiting list following improved functional capacity, through gentle progressive exercise training²¹⁸.

There is no clear demonstrated central effect of exercise on the apparent function of the heart and lungs. The benefits have been demonstrated to be in skeletal muscle function. However, two studies failed to show improvement in a subset of highly disabled patients, with the suggestion that severe cardiac dysfunction may prevent peripheral muscle conditioning²⁶⁰⁻²⁶¹.

Patients with heart failure still have a serious and potentially “malignant” disease and view their future with continued concern. One recent study showed that patients with heart failure have significantly greater levels of depression compared with patients who have had an acute myocardial infarction or who have undergone coronary artery bypass surgery²⁶². However, even small increases in exercise capacity have been associated with improvements in well-being and satisfaction with daily life^{263,264}.

The same principles which apply to patients with heart failure are used in the preparation of patients for transplantation. There is observational evidence that similar benefits from exercise training are achieved by patients who have undergone cardiac trans-plantation²⁶⁵⁻²⁷⁰.

Patients with pacemakers and implantable cardioverter defibrillators

Recommendation

Patients with pacemakers and implantable cardioverter defibrillators (ICDs) should be enrolled in a comprehensive program including low to moderate intensity exercise programs.

Strength of evidence = 4

Patients with implanted pacemakers or ICDs are often insecure about the safety of exercise. Depending upon the characteristics of the implanted pacemaker, there may be no increase in heart rate or only a small increase in heart rate with increasing levels of activity. Hence, heart rate may not be a suitable guide for control of exercise levels. In these patients, the rate of perceived exertion (Borg 10 to 12, light exertion; Borg 12 to 14¹⁹⁵, somewhat hard exertion) may be followed (see Table 6). As most patients with implanted pacemakers are elderly and as many patients with ICDs have heart failure or impaired left ventricular function, the lower level of perceived exertion and progress in small increments is usually preferred.

Patients with other forms of heart disease

Recommendation

All patients with heart disease or vascular disease are suitable for enrolment in programs of exercise, education, counselling and behavioural intervention.

Strength of evidence = 4

Patient with other forms of disease include those with cardiomyopathy, those who have had past surgery for congenital heart disease, those with non-surgical and post-surgical rheumatic heart disease and patients with cerebral or peripheral vascular disease. While these groups have not been adequately studied, there is little doubt that they can achieve the same skeletal muscle benefits of exercise training as those with manifestations of coronary heart disease¹. The educational needs of these groups are discussed in Chapter 15.

Obese patients and diabetic patients

Recommendation

A cardiac rehabilitation program, with exercise, dietary education and behavioural interventions, is effective and essential for all patients with cardiovascular disease who are overweight or obese. These patients may include those with type 2 diabetes.

Strength of evidence = 3

Interventions involving exercise alone or education alone have been reported to be relatively ineffective in achieving and maintaining weight reduction in patients with cardiovascular disease who are significantly overweight or obese, including patients with adult onset (Type II) diabetes. Achievement of mean weight loss has been reported in some randomised trials and not in others (see Chapter 7). Such trials present several difficulties. Most have been trials involving moderate or high intensity exercise, which is generally unacceptable to obese patients. Education and counselling alone may result in some subjects losing weight, but not the majority of patients. Some patients who cease smoking increase in weight. This may obscure the successful weight loss of other patients so that no significant reduction is shown in the mean weight of patients in the intervention group.

Obese patients need careful counselling, understanding and enhancement of self esteem. Limited goals which may change over time should be set for these patients. The usual short-term ambulatory program for cardiac patients is insufficient in duration and intensity to achieve significant weight loss. Longer term, multifactorial

interventions with continued participation in a light to moderate exercise program, together with education and support for behaviour change, have been demonstrated to be effective in some studies^{271,272}. Successful weight loss is critically important for the overweight, diabetic patient at high risk of developing cardiovascular disease. Reduction of weight is further discussed in Chapters 12 and 13.

Unfit patients

Recommendation

Exercise training as part of a comprehensive rehabilitation program is indicated for all patients with cardiovascular disease who have become physically deconditioned or who are otherwise unfit.

Strength of evidence = 1

Physical decondition occurs rapidly in many patients where bed rest or limited mobility are enforced through illness. This period of rest may be enforced because of complications following myocardial infarction or coronary bypass surgery, an episode of congestive heart failure or other manifestations of cardiovascular disease.

Weakness and unfitnes become apparent after a few days of inactivity. They may be recognised by overt muscular weakness, fatigue, unsteadiness or breathlessness with effort. Levels of fitness may be assessed more objectively by exercise stress testing with treadmill, cycle-ergometer, step test, or a six or 12 minute walk test. Performance may be compared to norms from nomograms. It must be recognised, however, that this same measure of unfitnes is also a measure of cardiac function which interacts with the muscular deconditioning to determine test performance.

Spontaneous recovery of fitness occurs during the ensuing few weeks following myocardial infarction or coronary bypass surgery through resumption of normal activities of daily living. The recovery may be accelerated and facilitated by graded supervised exercises, starting from a low level, during inpatient mobilisation and continued through convalescence.

For most patients, irrespective of the patient's age or gender, a low level activity program with gradually increasing levels is indicated, within the limits of shortness of breath and fatigue. Patients who are habitually inactive and who are unfit in consequence commonly have reduced muscle mass as well. Slow reconditioning with graded activity leads to progressive increase in fitness in these patients who may be regarded as similar to any other cardiac patient.

Such unfit and deconditioned patients have been included in randomised controlled trials comparing the effects upon exercise performance of exercise training and standard medical care. They are those patients who have lower levels of exercise

tolerance reported on entry to the studies. Patients with relatively reduced functional capacity demonstrated by exercise testing at entry improve in a degree similar to those with higher functional capacity at entry^{42-46,101-129,225,257}.

Elderly patients

Recommendation

Exercise, as a part of comprehensive cardiac rehabilitation, is indicated for all elderly persons with any form of cardiovascular disease.

Strength of evidence = 2

The benefits of group exercise in elderly patients, both men and women, have been demonstrated in randomised trials and observational studies²⁷³⁻²⁷⁵. Older patients have a special need for a cardiac rehabilitation program. They are more likely to have symptoms such as dyspnoea, fatigue or angina. Co-morbidity, especially from arthritis and respiratory disease, is common. Physical strength is less in older patients because of progressive muscle loss with ageing. There is a reduced ability to increase cardiac output, because of a lesser capacity to increase heart rate and stroke volume. There may also be impairment of balance and judgment. Elderly patients are aware of their relative and increasing incapacity to accomplish physical tasks with speed, strength and accuracy. They are also aware of the risks of injury. It has been reported that attempts to induce high levels of exercise (the past traditional 20 to 30 minutes of exercise at greater than 70% of HR max, three times per week) lead to musculo-skeletal injury in the majority of older patients^{202,203}. To offer such patients a high intensity exercise program is unwise. This pattern of cardiac rehabilitation exercise may be one reason for nonattendance and early dropout from programs among older patients. Common sense is supported by evidence showing that high intensity exercise is practised by less than 10% of healthy persons over 60 years of age. Moreover, less than 3% are prepared to undertake such activity on a regular basis¹⁸⁸⁻¹⁹⁰.

Cardiac rehabilitation programs for elderly patients need be little different from those offered to younger patients. A program based upon group light exercise and home walking is recommended. Individual patients can set their own pace or be encouraged to increase their level of activity gradually within the group. However, the program should include circuit exercises particularly directed towards retention of muscle strength in the arms for the execution of activities of daily living. High impact activities should be avoided. Daily walking from or at home for a minimum of 30 minutes, either in a single segment or intermittent segments, is the ideal basis for general conditioning and mobility. This is consistent with recent authoritative recommendations of the Centre for Disease Control and Prevention and American

College of Sports Medicine¹⁹¹ for all Americans and is also applicable to all adults in all communities.

Past studies have shown that older patients, especially older women²⁷⁶, are significantly less likely to attend cardiac rehabilitation programs than younger patients²⁷⁷. However, increasing numbers of patients aged over 65 years of age are now being enrolled in programs, including many in their 70's and some in their 80's. As well as achieving improvements in functional capacity²⁷⁶, older men and women can also achieve considerable psychosocial and educational benefits from all components of a rehabilitation program. Since many or most older patients are retired, they can usually attend programs over a longer period than younger patients who have work or domestic commitments. However, transport is more likely to be a problem for the elderly and it is therefore desirable to have the cardiac rehabilitation program close to home.

Continued access to group exercise programs is desirable for older patients. This could best be achieved through community exercise and support programs. The integration of cardiac rehabilitation programs into community health centres or other local community activities is therefore recommended. Maintenance of capacity for self care, self respect and independence is critically important for the elderly and their families. It is also important to those responsible for health care planning. The ageing of the population presents an expanding reservoir of patients with cardiovascular disease, ultimately with congestive heart failure (whether controlled or uncontrolled). Physical independence and capacity for self care outside hospitals and nursing homes offer great potential to control health care costs.

Female patients

Recommendation

All women with cardiovascular disease should be referred to a comprehensive cardiac rehabilitation program including exercise training.

Strength of evidence = 2

Most studies in cardiac rehabilitation have been undertaken in middle-aged men. Outcomes in women have not been extensively investigated. However, clinical data indicate that the problems facing women with cardiovascular disease are considerable. In general, women have been shown to have more adverse outcomes than men following an acute cardiac event, including greater morbidity and mortality during the first year of^{278,279}. The older age of women at the onset of their first acute cardiac event is coupled with greater degrees of co-morbidity, including osteoporosis and arthritis²⁸⁰⁻²⁸². Nevertheless, improvements in functional capacity and psychological wellbeing amongst women enrolled in cardiac rehabilitation programs

are equivalent to those demonstrated in men, although they have been less well reported^{276,283}. Women who do not attend programs have been found to report fewer lifestyle changes and to be less successful in controlling stress²⁸⁴.

Studies investigating the relationship between gender and attendance at cardiac rehabilitation programs generally report that women are less likely to attend^{54,55,276,285,286}, and are more likely to drop out from programs early²⁸⁷. As previously stated, most women with cardiovascular disease are older than men and hence are usually less mobile. Further, they are more likely to have less access to transport^{276,288} and to be widowed. If widowed, they may be more socially isolated and unwilling to seek help with transport. Thus, older women who are socially isolated are more likely to be nonattenders. Gender differences may be less apparent for younger women and women who have adequate social support²⁸⁹.

However, other motivational and psychosocial factors may also inhibit women from attending programs. As pointed out in Chapter 3, cardiac rehabilitation programs were originally devised for working men. Studies suggest that cardiac rehabilitation needs and preferences of women differ from those of men^{280,290}. Currently available programs are unsuitable in many ways for women, especially older women and those from different ethnic backgrounds. Older women dislike higher levels of exercise and hence exercise programs of low to moderate intensity suit them better²⁹⁰. Further, one study suggests that women want a range of exercise choices at the program and prefer to participate in goal setting for themselves²⁹⁰. In that study, it was also found that women desired more encouragement from team members, more frequent discussion of their progress, more social interaction and more emotional support from staff²⁹⁰.

Unfortunately, few studies have addressed the rehabilitation needs of women^{171,290–292}. Major studies are now in progress to study attendance patterns and attitudes of female patients towards rehabilitation^{52,53}. A careful review of programs, especially of the exercise component, is recommended to determine their suitability for women.

Comment

It must not be overlooked that the secondary (“quality of life”) benefits of exercise in these special groups of patients may be greatly facilitated by the better understanding and support obtained through the comprehensive nature of the rehabilitation program. While there are special problems associated with specific groups of patients with various forms of heart disease, it is apparent that all can obtain benefits from exercise training. For each of the above special groups, low levels of exercise training are preferred for the reasons given. These reasons, however, also apply to the great majority of patients with cardiovascular disease. There remain a few who prefer to exercise at high levels to achieve high levels of fitness for occupational, sporting or other purposes. High intensity exercise is addressed briefly in Chapter 10. Additional information is available elsewhere^{31,69,71,194}.

CHAPTER 12

EDUCATION, COUNSELLING AND BEHAVIOURAL INTERVENTIONS

Exercise training has traditionally been the primary focus of cardiac rehabilitation in the USA. However, in Australia, education and counselling have been considered as important as exercise training in facilitating recovery from acute cardiac events and for secondary prevention of cardiovascular disease. Exercise training, education and counselling are now universally recognised as integral components of comprehensive cardiac rehabilitation. More recently, interventions specifically designed to modify behaviours of cardiac patients have been introduced and tested. We embrace the definitions of the Clinical Practice Guideline which states that education is systematic instruction and counselling is the provision of advice, support and consultation. Behavioural interventions consist of systematic instruction in techniques to modify health related behaviours.

To facilitate a return to normal living, patients require guidelines about resuming driving, sexual activity, work and other activities. Information and advice about lifestyle change are necessary for secondary prevention of cardiovascular disease. Motivation to adhere to advice and prescribed medication is strongly influenced by patients' understanding of the disease, the acute event and the need for risk factor modification. Further, discussion and explanation about the recovery process and anticipation of possible psychological problems facilitate psychosocial adaptation.

Education and counselling of inpatients is undertaken on an individual basis and, at some hospitals, in groups as well^{5,40,41}. However, because of shortened hospital stays, inpatient education is now less comprehensive than in the past²⁹³. Education is addressed in greater detail during ambulatory cardiac rehabilitation programs. Most ambulatory group programs in Australia, and all in Victoria, include education groups^{5,41}.

Behavioural and psychosocial counselling may be delivered effectively in group settings. However, specific instruction regarding behaviour change should also be offered on an individual basis so that interventions can be tailored to the specific needs of each patient. Similarly, individual psychosocial counselling may be required for some patients.

While there is a vast amount of literature demonstrating benefit from exercise training in cardiac rehabilitation, evidence from controlled trials to confirm the effectiveness of education, counselling and behavioural interventions is less conclusive. However, some well designed controlled studies, observational studies, expert opinion and patient perceptions confirm the benefits of providing education, counselling and behavioural interventions as essential ingredients of comprehensive cardiac rehabilitation programs. This chapter discusses the available evidence concerning the impact of education, counselling and behavioural interventions upon knowledge, health behaviours and risk factors, psychosocial well-being and return to work. In Chapters 13 and 14, recommendations are made regarding the content and structure of programs, including methods of conducting group sessions. Chapter 15 describes additional interventions for specific groups.

Knowledge

Recommendation

Education and counselling increase knowledge and understanding of heart disease and should be an integral part of comprehensive cardiac rehabilitation programs

Strength of evidence = 2

Several studies, in various settings, have investigated whether education and counselling increase knowledge^{294–303}, including eight randomised controlled studies^{294,295,297–302}. Only three of these studies were conducted after hospital discharge^{295,297,300}, while others were conducted during hospital admission. Only one of these reported trials involved patient education conducted in groups³⁰⁰.

Increases in knowledge have been reported in four randomised controlled trials comparing interventions with usual care^{294,295,297,300} and in another study in which historical controls were used²⁹⁶. Other studies have compared different types of educational approaches. Some reported benefits favouring one intervention^{298,300,301,303}, while others found no differences between interventions^{299,302}.

One study comparing the effectiveness of a slide tape unit, programmed instruction and traditional lecture presentation during an outpatient program produced significantly higher knowledge scores from the slide tape approach and the programmed instruction³⁰⁰. In contrast, a further study found similar levels of knowledge between patients allocated to a group receiving traditional (instructor centred) and collaborative (patient centred) educational approaches²⁹⁹. The author recommended that in educating cardiac patients, collaborative approaches might nevertheless be preferable to traditional approaches in order to facilitate the

achievement of other important goals of education, such as reducing anxiety or improving self-efficacy²⁹⁹.

The educational level of patients can significantly influence retention of information. Many patients are unable to comprehend or retain information because of limited education^{171,304–306}. Age may also influence retention of information. In one study, a greater increase in knowledge was found in younger patients compared with older patients²⁹⁶. Failure to understand or recall information and advice may also be due to excessive anxiety, particularly during heightened phases of anxiety^{305,307}. Even where adequate advice has been given, cardiac patients often deny knowledge of important information about their illness³⁰⁸. The specific needs of patients and their receptivity to information must be considered, since some information may not be thought important by individual patients. Joint setting of priorities for educational content by the patient and educator is recommended to maximise learning³⁰⁵.

The quality of the intervention rather than characteristics of the patients may determine the effectiveness of educational and counselling programs. For example, educational strategies may be unsuccessful because the information given was too much or too general¹⁷¹. Further, educational counselling may be ineffective because contradictory information and advice are often given by different health professionals^{6,309}. Clarification is therefore required to reduce confusion. Moreover, information needs to be repeated and reinforced. Telephone follow-up after discharge from hospital has been shown to increase patient knowledge and decrease anxiety^{295,297,310}.

The teaching ability of the educator and the manner in which information is delivered are critical to patients' acceptance of the material. In one study, increased knowledge was found in the group receiving education from a primary nurse compared with a group taught by a nurse educator³⁰³. These results were attributed to greater familiarity and trust between patients and primary nurses. Further, more informal teaching was undertaken by primary nurses in response to patient enquiries, suggesting that teaching by the primary nurses may have been more relevant to patients and provided at a time of greater motivation. However, in another study, cardiac surgery patients receiving education from more academically qualified nurses had significantly higher test scores at discharge than did patients taught by nurses with lesser academic qualifications²⁹⁸.

The relevance of knowledge gain as an outcome indicator has been often questioned because increased knowledge has not been shown to significantly influence behaviour change and reduction of risk^{171,294,311}. Nevertheless, knowledge empowers patients to become involved in their own health care and has been shown to influence coping and social and emotional recovery after a major cardiac event³¹². Knowledge gain is considered by patients to be a major benefit from attending cardiac rehabilitation programs^{6,7,313}.

Comment

Relatively few well designed studies have clearly demonstrated improvements in knowledge from educational interventions offered during cardiac rehabilitation programs, especially group programs conducted during convalescence. However, the evidence from three small randomised controlled trials is consistent with improved knowledge. More rigorously designed studies are required involving larger patient numbers. In particular, studies are needed which compare the effectiveness of different educational and counselling interventions. Such interventions should be tested with a variety of patient groups.

Health behaviours and risk factors

There is evidence to show that comprehensive cardiac rehabilitation programs, including exercise training, can reduce smoking, alter lipid profiles, reduce blood pressure, favourably alter body weight and increase physical activity. Improvements in psychosocial outcomes have also been shown. The following discussion examines the impact of education, counselling and behavioural interventions alone upon risk factor modification and behavioural change.

Smoking

Recommendation

Education and counselling programs for smoking cessation and relapse prevention are enhanced by behavioural strategies. Comprehensive cardiac rehabilitation programs should combine these approaches to reduce smoking rates.

Strength of evidence = 2

Several controlled studies have been conducted to determine whether education, counselling and behavioural interventions modify risk factors, including reduced smoking, in cardiac patients^{15,104,162,171,310,314-316}.

A behavioural intervention was highly effective in a randomised controlled study of 173 consecutive patients who were smoking within the six months of myocardial infarction³¹⁴. The intervention, which was provided to patients individually, was initiated in hospital and involved strong advice to quit smoking, a workbook, relapse prevention strategies and follow-up phone calls from a nurse, initially weekly for two to three weeks and then monthly for four months. Nicotine gum was provided for those who relapsed. The biochemically confirmed cessation rate in the intervention group at 12 months was 71% compared with 32% in the usual care group. Patients who had resumed smoking within three months were unlikely to have stopped by

12 months. Intentions to cease smoking were found to be highly predictive of successful quitting.

A later and larger randomised controlled trial by the same group evaluated the efficacy of a nurse-managed, home based program of exercise training, smoking cessation strategies and dietary and drug management of hyperlipidaemia¹⁰⁴. Strategies to encourage smoking cessation consisted of physician advice, relapse prevention strategies, nicotine gum for those who relapsed and reinforcement of advice by nurses delivered by telephone. This study of 585 myocardial infarction patients found significantly less smoking at 12 months in the intervention group than in the usual care group. However, a further randomised controlled trial of a multifactorial intervention failed to reduce the smoking rate¹⁵, but since the number of smokers in that study was very low, it may have been difficult to demonstrate a benefit from the intervention.

Strong advice from physicians to stop smoking, especially in hospital, has been shown to be important³¹⁷⁻³¹⁹. In one uncontrolled study, such physician recommendations, coupled with follow-up advice from nurses, were associated with a one year self-reported quit rate of 62%³¹⁷. In another study of patients who had undergone coronary bypass surgery, reduced smoking rates were found at one year in the group randomly allocated to a program of exercise training and education, coupled with physician advice to stop smoking, compared with the control group¹⁶².

Spousal support has been shown to facilitate smoking cessation in cardiac patients. In a randomised controlled study of inpatient group education followed by weekly telephone calls for six weeks after discharge from hospital, results showed a significantly greater decrease in smoking and unhealthy eating habits, and a significantly greater increase in physical activity, among patients whose partners also participated in the program³¹⁰. While there were no overall differences at 12 months between the intervention and control groups, a greater rate of smoking cessation was found in the intervention group among patients whose partners had participated.

Two randomised controlled trials of group interventions failed to show benefit^{171,316}. In one of these studies which compared exercise, exercise plus education and counselling, and usual care, no differences were found between the three groups in smoking cessation at three and six months¹⁷¹. All groups showed high rates of quitting and reduction in the number of cigarettes smoked. Attrition rates in this study were 25% at 3 months and 34% at six months and, as noted by others, dropouts were more likely than participants to have been smokers³²⁰. In the second study, a six week outpatient program of group education for post myocardial infarction patients found smoking rates were somewhat higher in the intervention group after six months compared with a control group receiving standard individual education³¹⁶.

In another randomised study of the effectiveness of a mail-out intervention supplemented by telephone contact, no significant differences were found between the intervention and usual care groups, with both groups reporting a substantial decrease in smoking³¹⁵.

In general, evidence suggests that interventions to reduce smoking are more likely to be effective if they are initiated in hospital when patients are more highly motivated rather than after discharge from hospital^{171,314,317}. Further, a meta-analysis of controlled trials of cardiac patient education concluded that while interventions, on average, showed no significant impact on smoking behaviour, behaviourally oriented interventions generally produced better outcomes³²¹. Behavioural strategies, such as regular reinforcement of advice to stop smoking and continuing support, appear necessary³¹⁴. The positive studies described above indicate that follow-up telephone contact by nurses is a convenient, inexpensive and effective method of reinforcing physician advice to stop smoking. Lapses tend to occur when interventions cease. Instructing patients in relapse prevention methods before they lapse is therefore of critical importance³¹⁴.

Nicotine replacement treatment is important adjunctive therapy for cardiac patients^{104,314}. A review of studies of nicotine patches in the general population found that they were effective, especially when coupled with a comprehensive program which included counselling and group support³²².

Comment

Unfortunately, there have been few well designed studies testing interventions to reduce smoking in cardiac patients. However, a few studies indicate that traditional methods of educating patients, either individually or in groups, are less successful in encouraging smoking cessation than behaviourally oriented approaches, especially those which provide longterm follow-up to reinforce advice and offer support. Interventions combining multiple components are likely to be more successful but the specific components which produce beneficial effects have not been well defined³¹⁴. According to the meta-analysis by Mullen, better outcomes are achieved when smoking behaviour is the focus of the intervention, rather than being incidental to an intervention such as exercise³²¹. Further research in this area is clearly required. Given that resumption of smoking after an acute event markedly increases the risk of reinfarction and death, the development of effective interventions to reduce smoking should be accorded a high priority.

Lipids

Recommendation

Intensive nutritional education, counselling and behavioural interventions lead to lower dietary fat and cholesterol intake and, with or without pharmacological lipid-lowering therapy, result in significant improvement in blood lipid levels and should be provided as part of comprehensive cardiac rehabilitation.

Strength of evidence = 2

Several studies have investigated the benefits of education, counselling and behavioural interventions upon lipids, either alone or as part of comprehensive cardiac rehabilitation and with or without pharmacological therapy. Of 13 randomised controlled trials^{15,104,116,144,162,164,171,315,323-327}, five reported statistically significant differences in dietary fat and cholesterol intake favouring intervention groups compared with control groups^{15,144,323,325,327}. One study reported differences in dietary fat intake³¹⁵ and two studies produced negative results^{104,171}. Favourable changes in lipid or lipoprotein levels occurred in seven randomised controlled trials^{15,104,116,144,164,323,325,327}, compared with control patients and no significant changes were reported in four studies^{162,315,324,326}.

In two studies involving group exercise and education during convalescence, no significant differences in the degree of improvement in lipid levels were found between intervention and control groups^{162,171}. However, a multifactorial intervention in which individual and group counselling were provided for three months followed by a continued intervention lasting three years³²⁵, a significant decrease was reported in the intervention group in dietary fat intake and serum total cholesterol levels at follow-up after one and two years. At the six and 10 year reviews, the intervention group continued to show decreased dietary fat intake but there was no significant difference between groups in total cholesterol levels.

A controlled study of extremely intensive dietary restriction, stress management, exercise and social support produced significantly reduced total cholesterol levels and dietary fat intake in the intervention group at one year¹⁴⁴. An earlier study by the same group with short-term follow-up also reported favourable outcomes in lipid levels in the intervention group¹¹⁶. Another study of strict diet, stress management, relaxation, exercise and medication reported significant differences in mean dietary fat intake and serum cholesterol levels between the intervention and control groups after one year³²³.

Patients who participated in an educational program by mail and telephone reported a significant decrease in dietary fat intake after six months compared with a control group receiving usual care, but no significant differences were found between groups in cholesterol levels³¹⁵.

Beneficial effects upon lipid levels have been reported from interventions combining education and behavioural strategies with the use of lipid lowering drugs. A large study of a home-based multifactorial intervention combining education, counselling and lipid lowering medication achieved a significant mean reduction in total cholesterol and dietary fat intake in the treatment group after four years, compared with the control group¹⁵. Another multifactorial intervention which included lipid lowering medication also reported a significant reduction in serum cholesterol levels in the intervention group compared with the control group¹⁰⁴.

A recent randomised controlled trial studied the effects of diet alone, a combination of diet and exercise, exercise alone and usual care in men and postmenopausal women with low levels of HDL cholesterol and raised LDL cholesterol³²⁷. This study showed that the Step 2 diet of the US National Cholesterol Education Program was ineffective in lowering LDL cholesterol unless it was coupled with exercise training. Similarly, a nonrandomised controlled study reported significant improvements in lipid levels from a combination of education, counselling and exercise compared with exercise alone³²⁸.

Comment

Some reports show that education, counselling and behavioural interventions which are intensive and sustained over a long period have independent effects upon lowering lipid levels. While studies from nonrehabilitation settings support the efficacy of dietary intervention alone, it appears that many patients require pharmacological therapy in addition to dietary and exercise management to achieve their goals related to lipid levels. The degree to which studies have shown a lowering of mean total cholesterol and LDL cholesterol without the use of lipid lowering drugs is not great.

Blood pressure

Recommendation

Education, counselling and behavioural interventions alone have not been shown to control elevated blood pressure levels. However, a comprehensive program of education, counselling, behavioural interventions and exercise training can be effective in the management of hypertension and should be available as an integral part of cardiac rehabilitation programs, in addition to pharmacological therapy.

Strength of evidence = 2

The effectiveness of antihypertensive drugs in lowering blood pressure is well established. Further, beneficial effects upon blood pressure in cardiac patients have been reported from two multifactorial interventions including exercise training^{14,15}. One randomised controlled trial of a multifactorial intervention including lifestyle advice, which was reinforced during the four year follow-up, produced significant benefits in reduction of blood pressure in cardiac patients in the intervention group compared with the control group¹⁵. A significant reduction in blood pressure was also reported in a multifactorial intervention involving exercise, education and support¹⁴. However, in another randomised controlled trial of exercise training and education, there was no impact upon blood pressure levels¹⁶². A further multifactorial intervention of stress management, exercise, intensive dietary restriction and support produced no significant impact on blood pressure levels, with both the intervention and control groups showing a decrease in blood pressure at one year¹¹⁶.

There is little evidence to suggest that education, counselling and behavioural interventions without exercise training are effective in controlling blood pressure in cardiac patients². However, their effectiveness in changing behaviours and thus lowering blood pressure in other populations has been reported³²⁹. A meta-analysis of studies conducted between 1954 and 1985 showed that a 1kg fall in weight achieved a 1.6 mmHg reduction in mean systolic blood pressure and a fall of 1.3 mmHg in mean diastolic blood pressure³³⁰. The reduction was more prominent when the blood pressure was higher. In the MRFIT study, a reduction in blood pressure was also shown with reduction of body weight³³¹. In another study, a reduction in alcohol consumption alone achieved a reduction of 4.8 mmHg and 3.3 mmHg in systolic and diastolic blood pressures respectively, and together with a reduction of weight of 7.5kg, systolic and diastolic blood pressures were reduced by 10.2 mmHg and 7.5 mmHg respectively³³². Similarly, reduced sodium intake has been shown to be effective in reducing blood pressure³³³.

According to scientific evidence and expert opinion, relaxation and biofeedback alone have not been demonstrated to be effective in controlling blood pressure and stress management is not recommended as the sole intervention for hypertension control³²⁹.

Comment

Education and behavioural interventions for weight reduction, physical activity and moderation of dietary sodium and alcohol consumption are recommended as definitive or adjunctive therapy for hypertension. They are important components of a multifactorial approach to reduce hypertension in cardiac patients.

Body weight

Recommendation

Dietary education, counselling and behavioural interventions designed to reduce body weight can help patients lose weight and should be provided as part of comprehensive cardiac rehabilitation. Education as a sole intervention is unlikely to achieve and maintain weight loss.

Strength of evidence = 2

Several studies have reported a reduction in body weight as a result of comprehensive cardiac rehabilitation programs which include exercise, education, counselling and behavioural interventions^{14,15,43,144,275,334}.

A randomised controlled trial conducted over four years demonstrated a statistically significant body weight reduction of 4 % in the intervention group compared with the control group¹⁵. Patients in the intervention group received individual advice regarding lifestyle modification which incorporated goal setting, a monitored home exercise program, follow-up by mail, telephone contact and regular visits to the clinic for follow-up.

Considerable weight loss occurred amongst the dedicated subjects enrolled in a study of a one year intervention including a low fat vegetarian diet, group discussion for social support, stress management and exercise¹⁴⁴. Significantly greater weight loss was also reported in the treatment group in two further studies^{14,43}, and in another study, a reduction in body fat was achieved in subjects receiving the intervention¹⁶³. In all three studies, however, the mean weight loss was less than 3 kg. A significant reduction in body mass index, percentage of body fat and other measures was reported in one study²⁷⁴ and in another, in percentage of body fat in women²⁷⁵. Other studies involving exercise reported no changes in body weight^{45,90,143}. A randomised controlled study comparing exercise training alone, exercise training plus group education and counselling, and a control group found no significant differences between groups in weight loss after three and six months¹⁷¹.

Positive results were reported from three studies which did not involve exercise. A randomised controlled trial reported a significant reduction in mean body weight at one to 10 year follow-up in patients in the intervention group receiving nutritional counselling compared with the control group³²⁵. In that study, the intervention was intensive for the first three months, followed by a continued intervention for three years.

One observational study based on self-report achieved a reduction in body weight in overweight patients¹⁷⁷, while a nonrandomised trial involving counselling reported a significant reduction in body fat³³⁵.

Studies conducted in other settings confirm that educational and behavioural interventions to reduce weight can be effective³³⁴⁻³³⁶. According to a review of 21 studies involving obese patients, a mean weight loss of 7 to 9 kg was achieved immediately after treatment, with weight loss being related to the length of the program rather than the technique used³³⁶. While weight gain is common after interventions cease, eight of the studies reviewed reported a 75% maintenance of post treatment weight loss at one year follow-up.

Comment

Education, counselling and behavioural interventions are necessary components of a successful weight reduction intervention. However, they may not be sufficient as the sole intervention to produce sustained weight loss. Multifactorial interventions including exercise are recommended to achieve weight loss in cardiac patients.

Physical inactivity

Recommendation

Education, counselling and behavioural interventions are recommended, in addition to exercise training, to encourage and facilitate regular continued physical activity.

Level of evidence = 3

In a multifactorial trial of education, counselling, exercise and pharmacological treatment with regular follow-up, the intervention group reported higher levels of physical activity than the control group after four years¹⁵. However, education, counselling and behavioural interventions have not been shown to improve exercise tolerance and physical activity levels in the absence of exercise training^{2,15,116,337,338}. Such programs added to exercise training may nevertheless improve morale, self esteem and adherence to exercise.

Comment

Education, counselling and behavioural interventions to increase exercise tolerance and physical activity are best delivered as part of a comprehensive cardiac rehabilitation program including exercise training.

Psychosocial well-being

Recommendation

Education, counselling and behavioural interventions, either alone or as part of multifactorial interventions, improve psychological well-being and improve quality of life. They should therefore be integral parts of comprehensive cardiac rehabilitation programs.

Strength of evidence = 2

Psychological disability has long been recognised as a greater barrier to recovery than physical impairment^{14,25,34,36}. Thus, an important aim of cardiac rehabilitation programs should be to improve the psychological well-being of patients. The psychological benefits of exercise training are widely acknowledged. An important issue is whether specific education, counselling or behavioural interventions enhance psychological well-being, additional to those benefits achieved through exercise training.

Table 3 in Chapter 6 lists the number of studies reviewed by the US Agency for Health Care Policy and Research for each psychosocial outcome². These studies involved a range of different interventions, including individual counselling, group counselling, Type A behaviour modification programs, relaxation therapy, stress management, telephone follow-up and home visits. In some of these studies, exercise training was also provided. In this section, a further review is undertaken of studies investigating the impact of education, counselling and behavioural interventions upon psychosocial well-being. Two recent meta-analyses^{321,339} included several of the studies cited below. Studies specifically addressing stress management programs and the Type A behaviour pattern are separately addressed later in this chapter.

Several randomised controlled trials have been undertaken to investigate the effects of education, counselling and behavioural interventions upon psychological outcomes, including anxiety, depression, quality of life and psychological distress^{99,121,217,294,310,316,326,340–353}. A number of nonrandomised trials^{354–357} and observational studies¹⁵⁶ have also been conducted. Some studies included exercise as a part of comprehensive cardiac rehabilitation^{121,156,342,344,352,354,355,357}, or as one of two interventions being compared^{99,346}.

Most of the above studies involved group interventions^{99,121,156,294,310,316, 326,340–345,354}. Statistically significant benefits in some psychological outcomes were reported in eight studies favouring the intervention group^{121,294,340,344,354} or in subsets of patients in the intervention groups^{99,156,310,345}. Negative results were reported in five trials^{294,316,326,341–343}.

Ten reports involved interventions with individual patients, with or without spouses^{297,347–353,356,358}, with statistically significant benefits being found in seven studies in the intervention groups or in subsets of patients in the intervention groups^{297,347, 349–352,356}. Two studies^{348,353} reported no statistically significant differences in psychological outcomes between intervention and control groups.

An inpatient program of individual education and counselling delivered by nurses to 60 male patients produced significantly less anxiety and depression in the intervention group compared with control subjects. These benefits were sustained for six months after leaving hospital³⁵¹. Another smaller study involving counselling of individual inpatients and their spouses also reported a favourable impact upon psychological well-being³⁵⁰. A further, similar study of psychological counselling of couples in an outpatient setting reported an improvement in psychosocial adaptation, although the sample size was very small³⁵⁶. However, in a recent large study in which 1,173 patients were randomly allocated to secondary prevention programs conducted by nurses in general practice, no differences were found between treatment and control groups in anxiety or depression at one year follow-up³⁴⁸. However, eligible patients for this study included many with coronary heart disease who had not recently experienced an acute event. Only 14% of subjects were defined as anxious or depressed at baseline, leaving little room for improvement.

Studies of group interventions have produced conflicting results, as mentioned earlier. A significant reduction in anxiety among inpatients was produced in one study, compared with a usual care group²⁹⁴ but not in another brief outpatient program to which spouses were also invited³²⁶. In a further trial, patients in the workforce at the time of acute myocardial infarction were randomised to a three week cognitive behavioural intervention to reduce psychological distress and encourage return to work³⁴⁰. Those patients in the intervention group were significantly less distressed psychologically at three months, compared with the control group. An Australian study, however, found no significant benefit from a program of group exercise and behavioural education in patients who had undergone coronary bypass surgery³⁴².

A recent, large multicentred trial in the United Kingdom also failed to demonstrate significant differences in levels of anxiety or depression between the intervention and control groups at six months³⁴³. In this study, 2,328 patients were randomly allocated to standard medical care or to an intervention group which received education about heart disease and the recovery process, as well as instruction in relaxation skills. Conducted in both group and individual settings, the program lasted seven weeks.

Exercise training and advice regarding risk factor modification were not included in the program. Despite the absence of a measurable impact upon psychosocial outcomes, those enrolled in the rehabilitation program had somewhat less anginal frequency, requirement for medication and physical disability and reported greater leisure time physical activity. Possible explanations suggested by Mayou for the disappointing psychosocial outcomes in this study are that many patients in the control group achieved a good outcome and did not require further support. Further, the intervention may have been inadequate for those patients who did have substantial psychological problems³⁵⁹. Another deficiency in this study may well have been the absence of exercise training, which has been universally recommended in cardiac rehabilitation programs. Further, it should be noted that, of the 792 patients receiving the intervention, 72–80% described the relaxation training, cardiac education, group discussion and individual counselling as helpful or very helpful and rated the programs highly.

Two studies which have included exercise training as well as counselling and behavioural interventions produced favourable results. In one such study, a program of group exercise, counselling and education was compared with usual care in patients who had undergone coronary bypass surgery³⁴⁴. Results showed a significant decrease in depression scores in the intervention group but not the control group after eight months compared with baseline measures. In another study, significant improvements in affect and well-being were reported in male patients who attended a group program of exercise and psychosocial rehabilitation, including those experiencing minimal distress³⁵⁴. In contrast, another study comparing group exercise, individual counselling of patients together with spouses and usual care found no significant differences in psychological outcomes after one year³⁴⁶.

Some studies have tested interventions specifically targeting anxious or depressed patients. The effectiveness of exercise training and group counselling was compared in one controlled study of anxious and depressed patients with acute myocardial infarction⁹⁹. Although similar decreases in levels of anxiety and depression were noted for those participating in either the 12 week exercise program or group counselling program compared with control subjects, counselling significantly decreased mean depression scores and significantly increased measures of sociability. In an observational study, Milani also found depressed subjects achieved greater benefits in some behavioural and quality of life parameters following a 12 week exercise and education group program during convalescence compared with nondepressed subjects¹⁵⁶. Individual counselling has also been shown to be beneficial in introverted or neurotic patients³⁴⁷.

In a study of 201 patients who were either anxious or depressed after acute myocardial infarction, a small but significantly greater improvement in quality of life and decreased anxiety was found upon completion of a six week early outpatient program of group exercise and behavioural counselling compared with a usual care

group¹²¹. However, both groups improved significantly and by 12 months, no differences were found between the groups. In this study, it is possible some patients with psychological problems may not have been identified at baseline, since assessments of psychological state were made in hospital rather than during convalescence when psychological problems commonly occur³⁶⁰. Further, many patients in the control group were later recognised by their general practitioner to be anxious or depressed and, in consequence, were referred to readily available comprehensive rehabilitation programs in their city (Hamilton, Ontario), thereby possibly contributing to improvements in that control group.

The effectiveness of telephone follow-up after hospital discharge has been evaluated in several studies. In one study, telephone support provided during the first six weeks after discharge for patients who had undergone coronary artery bypass surgery produced significantly less anxiety in patients receiving the intervention²⁹⁷. In a randomised controlled study involving education, counselling and weekly telephone follow-up for six months, the intervention group reported significantly greater physical activity and improved dietary habits but no effects were found on anxiety, depression and smoking cessation³¹⁰. In this trial, benefits were significantly greater after two months if partners had participated in the program together with the patients.

A recent study involving a nurse-managed, home based multifactorial risk factor reduction program compared outcomes of 585 men and women after myocardial infarction who were randomly allocated either to the intervention or a usual care group³⁴⁹. Patients in the intervention group received counselling in hospital, followed by monthly telephone calls for six months, or more frequently, as required. Separate analyses of levels of psychological distress were undertaken. Results showed similar levels of improvements overall between groups, except for those with low levels of anxiety at baseline in the intervention group who improved significantly by 12 months. The authors suggested that the subjects enrolled in the trial (working, middle class whites with uncomplicated disease and a good prognosis) may not experience the same rate of depression and other types of psychosocial distress after myocardial infarction as other less economically advantaged populations.

A further study in which psychosocial support was delivered by telephone and individual home visits, with an average 20 contacts per patient, only a small impact upon anxiety and depression was reported³⁵³. Moreover, there was a poorer overall outcome in the intervention group, including a higher mortality rate, among the women participating in the study. The authors speculated that the monthly telephone screening to monitor psychological distress and repeated home visits for those experiencing psychological problems may have been intrusive and harmful. Serious clinical and methodological flaws in the study have been asserted by others^{361,362}. One weakness concerns the failure of the reported harmful effects upon women in the study to reach conventional levels of significance. Another concerns the use of nurses

rather than appropriately trained psychologists to deliver the program. Further, an intervention requiring frequent telephone contacts and an average five to six home visits cannot be considered cost effective as standard care. Caution should therefore be exercised in generalising the findings of this study to other more common and more effective forms of cardiac rehabilitation. In this regard, it should be noted that a meta-analysis, which included 23 trials involving 3,180 patients, found that the addition of a psychosocial intervention to cardiac rehabilitation programs produced a greater reduction in psychological distress, as well as a 41% mortality reduction over two years in those receiving the additional intervention compared with those who did not³³⁹.

Home-based self-help programs have also been tested for their effectiveness. In one such study, a rehabilitation program based upon a heart manual and tape dealing with exercise, information and stress management produced psychological benefits among patients in the intervention group compared with a control group receiving standard care³⁵². Rehabilitation patients were significantly less anxious and depressed at follow-up, with the greatest improvement being noted in those in whom anxiety and depression were greatest upon discharge from hospital. Moreover, patients in the treatment group used health services less frequently than control subjects. The authors recommended that all patients should receive rehabilitation because of the difficulty in predicting while in hospital those patients who will later experience psychological distress.

Comment

A small number of randomised or controlled trials support observations of numerous clinical papers which claim the effectiveness of various interventions upon psychosocial well-being. Moreover, patients attending rehabilitation programs, as well as the health care providers delivering them, state that the psychosocial benefits of comprehensive cardiac rehabilitation programs are considerable. However, while some studies have demonstrated improvements in psychological well-being, it is difficult to make firm recommendations about the most effective education, counselling and behavioural interventions for facilitating the psychosocial recovery of cardiac patients. Current methods of psychosocial rehabilitation remain extremely variable because of a lack of adequate scientific bases for recommending particular approaches. Many studies suffered from poor research designs, using samples of insufficient size and vaguely described interventions. Moreover, interventions varied considerably in duration, frequency and intensity. Nonuniform outcome measures and different measurement tools were used, making comparisons between studies difficult, and interventions were delivered by personnel with varying degrees of expertise. Further, there was considerable variation between studies in follow-up periods and the types of patients included in the studies. These weaknesses limit the value of the findings of some studies. More rigorous investigations are essential. In particular, additional research is required to assess the effectiveness of interventions,

such as group counselling, as sole modalities or in conjunction with other interventions. An equally important area for further research is the identification of particular interventions which can benefit specific subsets of patients. A range of different model programs is required to cater for the varying psychosocial needs of different patient groups.

Stress

Recommendation

Stress management programs, including relaxation training, may be useful adjuncts to other methods of psychosocial rehabilitation in selected patients.

Strength of evidence = 3

The aims of stress management programs are to assist the patient to identify stressors, to recognise characteristic emotional and physical responses to stress, to decrease levels of general arousal and to develop effective coping strategies. Through the use of various techniques including relaxation therapy, meditation, cognitive therapy, anxiety management and biofeedback, the patient is taught how to reduce stressful reactions by altering stress inducing perceptions of situations. By acquiring more effective coping skills, maladaptive responses to stress may be reduced.

Several studies have reported benefits from relaxation therapy^{99,363-366}. In one study, patients who received cognitive training early after myocardial infarction had greater confidence in their ability to control their stress than those who received relaxation therapy³⁶⁴. In another, relaxation training was found to enhance the psychological effects of exercise training³⁶⁵.

In a recent randomised controlled study³⁶⁶, 50 post infarction and 50 post bypass surgical patients who received a 10 week program of stress management and relaxation therapy three months after their events showed significant improvements six months later, compared with the control group, in emotional well-being, activities of daily living, satisfaction with health and perceptions of family members of the patients' emotional state. However, these patients had not attended a formal rehabilitation program and it may be that similar benefits could have been achieved from a program of group exercise and education offered during convalescence.

In a study involving monthly monitoring of stress levels of patients and home nursing visits for those with high stress scores, a significant reduction in stress scores was found as well as a significantly reduced rate of longterm recurrence of acute myocardial infarction and a marginal impact on cardiac mortality during the first year after infarction³⁵⁸. Little impact was observed on those with low levels of stress in hospital. The authors concluded that patients who can benefit from such an intervention may be identified in hospital.

Comment

Stress management and relaxation classes may help patients to feel better and less tense, and in consequence, avoid lapses in recommended behaviours. While there is some evidence to support the effectiveness of stress management programs and relaxation therapy, specific programs are not routinely required during cardiac rehabilitation programs. Further research is required to identify which patients could benefit most from such interventions.

Type A behaviour pattern

Recommendation

Specific interventions to modify Type A behaviour are not recommended as part of comprehensive cardiac rehabilitation programs .

Strength of evidence = 2

The Type A behaviour pattern was defined initially by Friedman³⁶⁷ and further developed by Rosenman³⁶⁸ and Jenkins³⁶⁹. It is characterised by rapid response to perceived time pressure, by competitive or even aggressive behaviour and by hostility.

The major evidence that the Type A behaviour pattern was an independent risk factor for coronary heart disease came from the Western Collaborative Study³⁶⁸. In this prospective cohort observational study, a clear association was demonstrated between the Type A behaviour pattern and mortality from coronary heart disease. A possible correlation was also found in a sub-study of the Framingham Study³⁷⁰. Review of this material led to the conclusion by a working party that the Type A behaviour pattern was probably an independent risk factor for coronary heart disease³⁷¹.

After the first major report³⁶⁸, a subsequent review of the Western Collaborative Study data and subjects showed a reversal of risk. Thus, Type B subjects who had lived beyond the first survey report were found to be at greater risk of cardiovascular disease than Type A subjects³⁷². As a result of this finding, the manner in which patients were originally classified as either Type A or Type B subjects has been questioned. A clinical trial conducted by Friedman and colleagues³⁶⁷ demonstrated improved outcomes from a program to modify Type A behaviour. However, the randomisation process in that study has also been questioned.

Meanwhile, several other prospective cohort studies have failed to demonstrate that the Type A behaviour pattern contributes any additional risk beyond the normal recognised risk factors for coronary heart disease or its complications. This applies to those patients who do not have coronary heart disease as well as to those who have

already had acute myocardial infarction (see Chapter 13). Thus, it appears that Type A behaviour may well not be a risk factor for coronary heart disease.

More recent studies are examining the possible link between hostility, a component of the Type A behaviour pattern, and coronary heart disease (see Chapter 13). Hostility is close to aggression and aggression is possibly related to maleness and testosterone levels or sensitivity. As a possible risk factor, it may be of no greater significance than other characteristics of maleness and hence not may not be amenable to significant change through psychosocial interventions.

Comment

Although a fashionable concept in the past, recent research has brought into question the robustness of the concept of the Type A behaviour pattern³⁷³. Thus, attempts to modify Type A behaviour probably have little or no place in current cardiac rehabilitation programs.

Return to work

Recommendation

Resumption of work should be recognised as a major aim of cardiac rehabilitation programs. Education, counselling and behavioural interventions focusing on vocational rehabilitation are recommended to facilitate return to work.

Strength of evidence = 3

In randomised controlled trials, exercise training alone has not been demonstrated to be effective in increasing the rate of return to work. Further, in randomised controlled trials, the addition of education and counselling to exercise training has also proved generally ineffective in facilitating return to work (see Chapter 11). However, in controlled studies where return to work was an aim of the cardiac rehabilitation program, significant increases in return to work and retention of working status over time have been well demonstrated^{16,91,159,160,172,174,374}. In one randomised controlled trial, the addition of vocational counselling to a comprehensive cardiac rehabilitation program was reported to have produced an increased rate of return to work¹⁶¹. Observational reports conducted from the 1940s to 1970s in Australia (where resumption of work has traditionally been a major outcome) and the United States support the beneficial effects of cardiac rehabilitation programs upon return to work and continuing in work^{20,21,25,34-37}. The emphasis in Australia on return to work is illustrated by one study of 169 unselected men who were in the workforce at the time of onset of myocardial infarction. At four months, 89% of these patients were working and after one year, 87% were working, irrespective of whether they were randomly

allocated to a high or low intensity exercise program^{94,96}. These results may be contrasted with findings of a recent study in the United Kingdom³⁴³ where, of 838 patients who were in the workforce before their acute event, only 41% of patients in both the intervention and control groups returned to work within six months. In that study, it appeared that return to work was not a major aim of the intervention and specific vocational interventions were not provided. Such an adverse occupational outcome is amongst the worst in the literature, implying that patient medical management and support, or the health care and social security system, were seriously inadequate in supporting patients in returning to work.

It has been suggested that the benefits of a cardiac rehabilitation program may lie in fostering perceptions of improved health and greater physical mobility, which, in turn, may motivate patients to continue working after their acute event. In one randomised controlled study of a comprehensive cardiac rehabilitation program including exercise, education and counselling followed by booster sessions, an increase was found in the proportion of patients allocated to the intervention group following coronary bypass surgery who were working after three years³⁷⁵. However, no differences between the intervention and control groups were evident at other follow-up points, except for those aged under 55 years who returned to work more frequently if they received a program of cardiac rehabilitation. This study found that favourable perceptions of capacity for working and a desire to work were among the most significant factors influencing return to work by one year.

A large study undertaken to identify predictors of return to work in 1,252 patients with coronary heart disease, subsequently validated in a prospective study, concluded that those at high risk of leaving the workforce prematurely can be prospectively identified at a time when it might be possible to intervene³⁷⁶. Findings of this study supported the results of other studies which showed that traditional medical factors, such as the severity of illness, have a relatively small impact upon employment outcomes.

Barriers to resuming work may be more cognitive than physiological^{377,378}. Thus, behavioural interventions designed to enhance self-efficacy, provide constructive coping strategies and modify perceptions could improve employment outcomes³⁷⁹⁻³⁸³. This recommendation is supported by Shanfield in a review of studies concerning return to work after acute myocardial infarction³⁸⁴.

Comment

The paucity of firm evidence that cardiac rehabilitation, as currently practised, favourably influences resumption of work needs explanation. The initial basis for the establishment of cardiac rehabilitation programs was to facilitate physical, psychological and social recovery, with resumption of work as one of the important outcomes. However, there are few randomised controlled trials where resumption of work has been a major outcome measure. In most cardiac rehabilitation programs

conducted in the United States, using high intensity exercise as the major intervention, the physical benefits of exercise represent the primary endpoint, with resumption of work an almost incidental possible outcome. In the USA and Canada, resumption of work has been considered largely dependent upon social, economic and occupational factors not related to the rehabilitation program itself^{2,121,161}. It may be that, if resumption of work is not regarded as a primary or important outcome measure of a cardiac rehabilitation program, then attempts to help patients to resume work will assuredly fail. For resumption of work, maintenance in work and satisfaction with work not to be major aims of cardiac rehabilitation is to deny part of the definition and purpose of cardiac rehabilitation as set out in Chapter 1. Return to work is dependent upon multiple factors including attitudes of the patient, family and employer and confidence in being able to resume work. Comprehensive programs including exercise, education, counselling and behavioural interventions may improve a patient's potential for resuming work but they may be ineffective without directly addressing return to work as a major aim of cardiac rehabilitation. These issues are further discussed in Chapter 15.

Conclusions

Unfortunately, many studies investigating the effectiveness of education, counselling and behavioural interventions in cardiac rehabilitation have been poorly designed, with inadequate sample sizes and without explicit reference to a theoretical model^{2,171,299,385-387}. Few studies have investigated outcomes of group programs conducted during convalescence. Further, most investigations have been limited to male patients, particularly those who have had acute myocardial infarction. Thus, clear recommendations regarding appropriate interventions for a broader range of patients are difficult to make. With regard to risk factor modification, it should be emphasised that changing health behaviours is usually a process rather than a single event. The process of change may take considerable time, especially if multiple changes are required. Thus, it is unrealistic to expect that ambulatory programs of six to eight weeks' duration will produce significant and sustained changes in most health behaviours. Nevertheless, ambulatory programs should help patients to initiate steps to begin the process of change by fostering a positive attitude towards change, motivating them to change, increasing their self-efficacy and teaching them skills to help them adopt and maintain healthier lifestyles. Longer programs are required to reinforce the need for change and ultimately to bring about changes successfully. Thus, maintenance programs are highly recommended, in addition to repeated, supportive advice from medical practitioners. Longterm telephone follow-up by well trained nurses or other health professionals is also recommended to monitor health behaviours and to identify those requiring referral for further assistance with psychosocial, occupational or other problems.

CHAPTER 13

CONTENT OF EDUCATION AND COUNSELLING GROUPS

In this chapter, recommendations are made regarding the content of group education and counselling sessions. The scientific literature to which reference is made is to underpin the statements in the text and is not meant to represent a comprehensive review.

Core education program

Recommendation

Education and counselling groups should cover pre-determined core topics.

Strength of evidence = 4

The education and counselling program should cover several specific, defined topics. The core topics are supported by many authoritative bodies^{1,10,69,70,74,79,388}. However, depending upon the particular groups of patients attending and their specific needs, some subjects may be omitted, addressed only briefly or expanded. For example, a session on return to work may be omitted if all the patients attending are retired. Similarly, sessions dealing with explanations about cardiac procedures, investigations and medications should be confined to those aspects relevant to the patients in the group. Topics should address questions commonly asked by patients. The following subjects represent the core content of a typical education and counselling program for patients with cardiovascular disease.

Medical topics

- anatomy, physiology and pathology of cardiovascular disease
- coronary heart disease/ischaemic heart disease
- acute cardiac events
- investigations and procedures
- symptoms and their management
- cardiac medications

Modifiable risk factors

- smoking
- raised lipids, nutrition and dietary fat
- high blood pressure
- overweight, obesity and diabetes
- physical inactivity
- other risk factors

Nonmodifiable risk factors

- older age
- male gender
- positive family history

Behavioural and psychosocial topics

- behaviour change and adherence to medication and advice
- mood and emotions
- psychosocial risk factors and social support
- stress
- impact upon the spouse and family
- sexual activity and activities of daily living
- return to work

Medical topics

Patients require simple and clear explanations of the disease process and possible causal factors. Simple and clear descriptions are also essential when explaining acute cardiac events (such as acute myocardial infarction, coronary artery bypass surgery and percutaneous transluminal coronary angioplasty) and investigations and procedures including coronary angiogram, exercise tests, electrocardiography, echocardiography and nuclear cardiography. Drawings, models and videos are helpful. Perceptions of individual patients regarding causes of their disease and the nature of the acute event should be explored so that any misconceptions can be addressed³⁸⁹⁻³⁹¹. The distinction between heart attack and stroke should be explained and the ongoing and chronic nature of cardiovascular disease emphasised. The typical recovery process should be discussed. Symptoms and their management should also be part of these sessions.

It is necessary for facilitators to be aware of the benefits of frequently prescribed drugs so that they can answer questions commonly asked by patients. Cardiac medications, their purpose and beneficial effects should be explained simply, noting common side effects and stressing the need for taking prescribed medication. Patients should be encouraged to report side effects to their doctors so that alternative

medication may be prescribed. Patients often ask for additional information concerning the following:

- aspirin
- beta blocking drugs
- calcium channel blocking drugs
 - dihydropyridines
 - diltiazem and verapamil
- angiotensin converting enzyme inhibitors and angiotensin II antagonists
- diuretics
 - frusemide (furosemide)
 - thiazides
 - others
- nitrates (tablets, sprays, patches)
- digoxin
- lipid lowering drugs
 - statins
 - others
- antiarrhythmic agents
- antiinflammatory drugs
- psychotropic drugs
- hormone replacement therapy

It is only appropriate to discuss the drugs about which patients enquire. Most patients are properly interested only in their own medications. Better understanding of medications is thought to facilitate compliance (both acceptance and adherence) with prescribed medications.

Additional medical topics may also be discussed during groups, depending upon the medical and surgical problems of the patients present. For example, other kinds of cardiac surgery including cardiac transplantation may be relevant, as well as heart failure and cardiomyopathy.

Risk factors

All major risk factors should be covered, either in separate sessions or together with discussion of several risk factors. Both modifiable and non-modifiable risk factors need to be addressed. The compounding of risk if several risk factors are present should be highlighted and the possibility of reversal of risk, coupled with stabilisation or reversal of disease, explained. Further, it should be pointed out that other common diseases, including stroke, peripheral vascular disease and diabetes, share many of the same risk factors as those for coronary heart disease.

Smoking

Patients must be made aware of the considerable risks of continued smoking, particularly the increased likelihood of further cardiac events and death. The hazards of continued cigarette smoking amongst patients with cardiovascular disease are well reported in powerful observational studies^{392,393}. Patients need to understand that many benefits accrue from stopping smoking, including a marked reduction in morbidity and the halving of mortality from coronary heart disease and stroke³⁹²⁻³⁹⁶. While smoking usually ceases with acute events and hospital admission, resumption of smoking commonly occurs soon after hospital discharge and occasionally before the patients leave hospital. In some patients, relapses occur after months or even years. The proportion of patients who continue to smoke, or who lapse after initially ceasing, has been reported to be as low as 10–20% in some studies^{66,397} and as high as 60% in others^{395,398}. Continued advice and support should be offered to current or former smokers. The effect of the culture to which the patient returns is likely to be an important influence upon adherence to non-smoking advice. In Australia, with its current anti-smoking culture, advice and support during a cardiac rehabilitation program, reinforced by advice and support from others, will usually be effective⁶⁶. Encouragement to stop smoking is especially important during convalescence when patients are most motivated³⁹⁹. In addition to providing information about the dangers of smoking and the potential benefits of ceasing, patients should also be shown how to use simple behavioural strategies for stopping smoking and for maintaining the status of a non-smoker. Patients should be encouraged to discuss any barriers they perceive to stopping smoking and techniques for quitting which they may have found helpful in the past. The use and benefits of nicotine replacement therapy should be explained^{322,400,401}. Information should be provided about sources of further assistance and counselling. Referral to smoking cessation programs (such as QUIT) should be recommended for those unable to stop smoking on their own.

Raised lipids, nutrition and dietary fat

Education and counselling programs should provide information, explanation and practical advice regarding nutritional aspects of coronary heart disease. Unfortunately, nutritional education presents a common problem for many patients who are exposed to conflicting and confusing information from advertising and the media. They also receive conflicting advice from professional sources, including different members of the rehabilitation team. Nutritional advice given by nurses and general practitioners, in particular, often conflicts with advice given by dietitians^{6,309}. It is therefore most important for team members to achieve consensus regarding what constitutes accurate nutritional information. They should also develop guidelines for specific groups of patients, such as the elderly, the overweight and those with hypercholesterolaemia, so that advice can be individualised. Since dietary advice changes over time (for example, the shifts between recommending polyunsaturated

or monosaturated oils), periodic expert review of nutritional guidelines is particularly necessary.

Sessions should include discussion of total cholesterol, LDL and HDL cholesterol levels, the nature of fat in food, hidden fat in food, the distinction between saturated, polyunsaturated and monosaturated fats, the importance of fruit, vegetables and fibre and the protective effects of “traditional” diets⁴⁰². Patients and families have little understanding of the role of saturated fat in raising total and LDL cholesterol or of the difference between fat, lipoproteins and cholesterol. They also have a poor understanding of the role of blood lipid levels in deposition of cholesterol in the arterial subintimal layer, the development of atheroma and its progress to atherosclerotic cardiovascular disease. These aspects should be clearly and simply explained, supported by visual aids. It is important to avoid unnecessary detail and complex terminology during sessions dealing with nutrition.

During acute cardiac episodes, falls in total and LDL cholesterol occur, coupled with loss of appetite and loss of weight⁴⁰³. During convalescence, appetite recovers. Weight then increases and lipid levels gradually rise. This pattern occurs with both attenders and nonattenders of cardiac rehabilitation programs. The aim of dietary advice and counselling is to induce behavioural change (reduced fat intake, increased physical activity and control of kilojoules) to minimise or reverse the natural trend to rising lipid levels. Studies have demonstrated that the trend to reversion to previous habits, with loss over time of the beneficial effects of counselling during convalescence, can be prevented or reduced if patients are reviewed and if advice and support continue over years^{14,15,16,91}. Thus, nutritional advice to cardiac patients during convalescence needs to be followed up and reinforced continuously by the patients’ doctors and other health care providers. Patients need to be motivated to continue adhering to nutritional advice and should be helped to acquire the necessary skills for making dietary changes⁴⁰⁴. They should also be advised that, in general, the lower one’s total and LDL cholesterol levels, the better^{405,406}, rather than aiming to fall below specific cutpoints for levels of cholesterol. Patients should be informed of the need to continue adhering to any prescribed drug treatment and dietary advice. The benefits of following dietary regimens can now be supported by firm evidence of reversal or slowing of coronary atherosclerosis through long term dietary self control and adherence to medication^{15,407-410}. This effect is associated with reduction of recurrent cardiovascular disease events and mortality^{15,411}.

While much of the necessary learning may be achieved in one group session, patients and family members commonly cite a need for additional education about diet and nutrition⁷. Further, during open discussion on other subjects, dietary and nutritional questions are commonly asked. Topical issues are often raised such as the role of red wine, the “French paradox”, antioxidants, fibre, vitamins, fish oil, coffee and garlic. To ensure that nutritional issues are adequately addressed, it is preferable to include

at least two sessions which deal with nutrition during the program. One should focus upon practical aspects of shopping, food label reading, preparing food and cooking. Where necessary, group sessions should be supplemented by counselling of individual patients and couples by the dietitian. Simple written nutritional information should be available, both in English and other languages.

High blood pressure

Education and counselling sessions should include explanations of the role of high blood pressure in causing coronary heart disease and stroke. The added risk from hypertension in patients with established cardiovascular disease should be discussed⁴¹²⁻⁴¹⁷. The considerable benefits arising from good blood pressure control in these patients should be emphasised^{418,419}. Many patients with previously raised blood pressure have a fall in both systolic blood pressure and diastolic blood pressure following acute myocardial infarction and coronary artery bypass graft surgery. A gradual recovery towards previous or higher levels then occurs over some months⁹⁴. This rise in blood pressure is most marked amongst those patients whose hypotensive medication was changed or stopped while they were in hospital. The most effective method of controlling this rising blood pressure is resumption of medication. Additional lowering of blood pressure, possibly with lesser dosage of medication, may be achieved through weight reduction, exercise, salt restriction and dietary change with the addition of fruit and vegetables⁴²⁰. The importance of adherence to advice regarding hypotensive medication and the need for regular blood pressure checks should be stressed. The benefits of blood pressure control through physical activity, weight control and salt restriction should also be pointed out. Further, patients should understand that it is possible that the lower the blood pressure, the better⁴²¹. Since stress, especially work-related stress, is thought by many patients to cause high blood pressure, this issue also needs to be addressed.

Overweight, obesity and diabetes

Overweight (body mass index 25–30kg/m²) and obesity (body mass index > 30kgs/m²) are significant risk factors for cardiovascular disease. Facilitators should define overweight and obesity and explain their role in the aetiology of cardiovascular disease and diabetes. They should also explain their role as risk factors for further cardiovascular events and mortality⁴²²⁻⁴²⁴, the development of Type II diabetes^{425,426} and raised cholesterol and blood pressure⁴²⁷. Reduced caloric intake, particularly reduced fat intake, together with regular, maintained or increased physical activity, has been shown to be effective and should be encouraged for all overweight patients and those with non-insulin dependent diabetes^{428,429}. In some patients, obesity may be coupled more with physical inactivity than with a high caloric intake⁴³⁰⁻⁴³². However, weight loss is hard to achieve, especially in those who have a long history of obesity. The difficulties faced by overweight and obese patients in achieving and maintaining lower weight should be recognised and

discussed^{336,433–436}. Gradual weight loss should be recommended, with limited targets over time. Psychological factors associated with overweight and obesity should be explored and the development of a supportive environment encouraged for those seeking to lose weight. Behavioural interventions can be effective for overweight cardiac patients, as discussed in Chapter 12. Such interventions are probably best implemented by a psychologist.

Physical inactivity

A sedentary lifestyle, with little or no physical activity during leisure or at work, is a risk factor for the development and progress of cardiovascular disease, almost as potent as raised blood pressure or lipid levels¹⁹¹. The role of a sedentary lifestyle as a risk factor for the development and progression of cardiovascular disease should be explained and the benefits of physical activity emphasised. Education is required concerning the need for lifetime physical activity, in addition to participation in exercise sessions during the rehabilitation program. Patients should be reassured regarding the safety and ease of undertaking physical activity outside the rehabilitation class. It should be emphasised that major health benefits can be achieved through light to moderate activity and that high intensity exercise is not necessary^{191,212,214,437}. Weekly utilisation of 1,500 to 2,200 kilocalories above the caloric utilisation of sedentary living achieves considerable protective benefit¹⁰⁵. Low or moderate levels of daily activity are readily embraced by patients during convalescence after acute cardiac events, as well as by patients with past or controlled heart failure, the obese and older men and women generally (see Chapter 8).

The cumulative benefit from all common physical activities, whether as sports, social activities (such as dancing), work or activities at home (such as housework and gardening), should be discussed. Patients should be advised that physical activity which is undertaken in several short bursts during the day (such as three walks each of 10 minutes) is as beneficial as one longer session of activity (such as a walk lasting 30 minutes)¹⁹¹. Activities which are enjoyable and which may be undertaken in company should be recommended because they are more likely to be maintained in the long term. Advice regarding physical activity should be individualised to take into account the patient's age, past habits, personal preferences and co-morbidity. For those patients who seek it, a maintained high level of activity should assure greater levels of fitness and may supply added health benefits^{210,211,438}.

Unfortunately, patients tend to revert to their previous sedentary habits over time. Patients need to be forewarned of the risk of such relapses. They may occur gradually or they may happen abruptly following an incidental event which may be of physical, social or psychological origin. Patient education is therefore important regarding the benefits of activity, how it may be achieved and the need for its lifelong continuation. Barriers to physical activity should be explored during group discussions and alternative approaches suggested. The level of unfitness parallels physical inactivity

as a risk^{213,439,440}. Those who are unfit but who successfully increase their activity and fitness improve their prognosis compared with those who remain unfit²²⁸.

Other modifiable risk factors

Alcohol

Excessive consumption of alcohol should be recognised as a contributor to hypertension and therefore as a risk factor for stroke⁴⁴¹⁻⁴⁴⁴. Patients also need to understand that alcohol may adversely affect myocardial function, particularly amongst those who are hypertensive and those who have suffered myocardial infarction^{445,446}. Further, alcohol may be a basis for resumption of smoking, physical inactivity or a previously unsatisfactory diet^{447,448}. Patients who are aware that alcohol (whether it be red wine or any other alcoholic drink) protects against subsequent myocardial infarction^{441,449-452} may use that information to increase their alcohol consumption. It is important to emphasise the multiple other hazards of exceeding the recommended daily maximum of two to four standard alcoholic drinks for men and one to two drinks for women.

Salt

Most cardiac patients leave hospital on a low salt diet. This is usually advised because of the desire to prevent fluid retention in those who had had acute myocardial infarction or coronary artery bypass surgery. Patients need to understand that a balance should be struck so that, if they are not found to have high blood pressure or incipient heart failure, then it is reasonable for them to consume a moderate amount of salt. A moderate amount of salt is already present in many foods. Hence, the general advice for all should be to avoid adding salt at the table and to minimise the addition of salt during cooking. For those who are hypertensive and found to be salt sensitive, then persistence with a low salt diet is desirable^{333,453-457}. Salt excretion may be increased by diuretic treatments, but if the intake of salt is reduced, the dose of diuretic can be less.

Non-modifiable risk factors

Age, gender, family history and existing disease

Education and counselling sessions should address non-modifiable risk factors, including the increased risks of age, male gender and positive family history. The older the patient with cardiovascular disease, irrespective of gender, the greater the risk of death and disability from cardiovascular disease. The hazards of premature cardiovascular disease are greater amongst males than females. However, late onset cardiovascular disease and death from cardiovascular disease are now more common amongst females^{278,458}.

The use of hormone replacement therapy to reduce the risk of cardiovascular disease in women has been widely canvassed in recent years. The role of hormone

replacement therapy with oestrogen alone, as in the earlier studies in the United States of America⁴⁵⁹⁻⁴⁶², or with combined oestrogen/progestin regimens⁴⁶³⁻⁴⁶⁵, should be addressed. Many female patients are aware of the reduction of mortality, cardiovascular disease episodes and acute myocardial infarction in postmenopausal women who are taking hormone replacement therapy. They are also aware of the possible benefits of hormone replacement therapy in the prevention of osteoporosis^{466,467}. For many patients, these potential gains are offset by concerns regarding the increased risk of cervical cancer^{463,468} and, possibly, breast cancer⁴⁶⁹. The mechanism whereby cardiovascular disease events and mortality are reduced through hormone replacement therapy may be largely through the beneficial effects of hormone replacement therapy on lipid levels (reducing total and LDL cholesterol, raising HDL cholesterol and other changes) and reducing fibrinogen levels, with consequent reduction in the progress of atheromatous lesions and the tendency to thrombosis^{278,470}. It is further suggested that oestrogen reduces the uptake of LDL cholesterol in the arterial wall^{278,471}. It is yet to be defined which patients should be treated with hormone replacement therapy, but current thinking suggests those postmenopausal patients with known cardiovascular disease who have low HDL cholesterol levels or high LDL cholesterol levels should take hormone replacement therapy^{278,470}.

A positive family history of cardiovascular disease is a powerful marker of risk for the development and accelerated progress of cardiovascular disease⁴⁷²⁻⁴⁷⁵. It has been clearly demonstrated that those with a positive family history for cardiovascular disease commonly have worse risk factor profiles in terms of lipids, blood pressure, obesity, diabetes and smoking habit, in addition to their non-modifiable genetic background^{66,476-481}. Hence, risk factor modification is of greater importance in patients with a positive family history than it is for those with identified modifiable risk factors without a family history.

A past history of stroke⁴⁸², other vascular disease or diabetes mellitus^{423,424,483,484} is also a powerful marker of risk for coronary heart disease and an indicator of the need for attention to all risk factors.

Behaviour change and adherence to regimens

Providing patients with information about heart disease and explaining risk factors should help patients to accept the need for changing their habits and adhering to advice in order to reduce their risk of further events. However, imparting information and increasing patients' knowledge do not necessarily produce behavioural change³¹¹. Skills need to be acquired to help patients make and maintain changes⁴⁰⁴.

It is useful during education and counselling sessions to explain the usual stages of behaviour change^{485,486} and to stress that lifestyle changes are difficult for many and can take some time. Education and counselling sessions can facilitate behaviour

change by increasing the patient's motivation to change, fostering positive attitudes towards change and strengthening intentions to make changes⁴⁸⁷. Attitudes and predictions regarding health behaviours correlate well with subsequent behaviours⁴⁸⁸.

It is important to ask participants in the group about those aspects of their lifestyles which they are finding difficult to change. Common barriers to change should be discussed and possible ways of overcoming them explored. It is usually found during discussions that several patients face the same difficulties. Perceptions of causal factors in the development of the disease may also be relevant. For example, a belief that factors outside the patient's control (such as heredity or fate) are responsible for the disease may stop patients from addressing any lifestyle factors which may have contributed to the illness. Factors which exert a negative influence upon behaviour should be discussed, as well as perceived costs and benefits of making the recommended changes³⁸³. Such perceptions may significantly influence adherence to advice regarding the modification of health behaviours. It is important to challenge patients' erroneous beliefs and negative perceptions. Patients' beliefs about causal factors and the course of the illness are important predictors of adherence³⁸⁵.

Self-efficacy or confidence has also been shown to exert a powerful influence upon successful behaviour change³¹⁴ and other outcomes, including resumption of work^{489,490}. Psychological functioning and support from others are further important determinants of compliance⁴⁹¹. In particular, spousal support increases compliance^{303,309}. The benefits of social support should be addressed during group discussions⁴⁹¹. For example, activities which patients can do together with their spouse or friends, such as daily walking, can facilitate adherence.

Simple behavioural strategies should be explained in lay terms. These may include determining realistic goals for change, planning ways of coping with any lapses and learning how to alter thoughts and feelings about habits which require change^{404,492}. A depressed mood or perceived stress, for example, can lead to lapses, such as resumption of smoking⁴⁹³. Thus, patients need to become aware of factors which trigger mood change and plan strategies for handling such stress in a more positive way. Patients should be forewarned that lapses become more common with the passage of time^{309,397}. Individual behavioural counselling may be necessary for some patients, especially those who have several changes to make.

Unfortunately, nonadherence to advice regarding behaviour change and medication is common in cardiac patients. For example, resumption of smoking among former smokers has been shown to be as high as 40–50% six to 12 months after the event^{319,397,494}. Longterm nonadherence with lipid lowering medication is also high⁴⁹⁵. A recent Australian study showed that up to 60% of patients who had been prescribed lipid-lowering medication ceased taking their medication⁴⁹⁶. Fifty percent of these patients discontinued their medication within three months and 25% within one month. Common reasons for abandoning the medication were a belief that the

drug therapy was not needed or that it produced unpleasant side effects. Nonadherence with medication among heart failure patients ranges from 20% to 60%²⁶⁴ and is commonly a cause of rehospitalisation. Such hospital readmissions are potentially preventable through improved patient education and comprehensive discharge planning²⁶⁴. Adherence to medication is especially important, since it has been demonstrated that nonadherence with medication has an independent effect on mortality in both men⁴⁹⁷ and women⁴⁹⁸. Continuing medical supervision to encourage adherence is essential. Patients need to understand the importance of regular visits to the doctor for this reason.

Mood and emotions

Patients need to understand the typical emotional responses to an acute cardiac event. It is usual for patients to pass through a period of anxiety after their acute event⁴⁹⁹⁻⁵⁰⁴, especially upon transfer to the ward and on discharge from hospital⁵⁰⁵. Common concerns include a fear of death, a further cardiac event, physical disability and unemployment. Physical symptoms such as palpitations, breathlessness and chest pain may be caused by anxiety, although patients may not recognise such symptoms as manifestations of anxiety. Anxious patients usually have little concentration and often fail to comprehend, accept or recall information provided in hospital^{305,307}. Further, anxiety may lead to a delay in resuming activities.

Depression is also common after an acute cardiac event^{360,493,502} and has been associated with increased mortality and morbidity^{358,506-509} and increased costs associated with rehospitalisation⁵¹⁰. In most cardiac patients, such depression is more a grief or bereavement reaction rather than a depressive illness^{511,512}. It is best referred to as a “depressed mood” in which a sense of real or imagined loss is experienced. Symptoms are mostly mild and transient and their manifestations are usually subtle. A depressed mood may be experienced first in hospital. However, it typically peaks during convalescence⁵¹³. Common symptoms of a depressed mood include an inability to concentrate, restlessness, disturbed sleep, early waking, irritability, a sense of fatigue, loss of interest and motivation, sentimentality or even tearfulness. Patients may become pessimistic about their recovery and fearful of a recurrence. Fatigue and weakness may be equated by them with heart damage greater than anticipated⁵⁰⁴. They may then become preoccupied with the supposed limitations of the illness. Withdrawal and irritability during convalescence are frequent symptoms of a depressed mood. Concerns are increased if there is awareness of heart action, ectopic beats or palpitation, non-cardiac or cardiac chest pains, breathlessness from hyperventilation or unfitnes or of any other symptoms of physical and psychosomatic origin. It is important to explain and discuss such symptoms during group sessions. Forewarning patients that a depressed mood commonly occurs during convalescence can also be most valuable. Anxiety and depression often co-exist⁵¹³. Several symptoms, including irritability, reduced concentration and sleep disturbances, are common to both conditions.

Patients may cope with their anxiety, depression or other symptoms by denial, convincing themselves that any problems they have are not serious and that they are not at risk of future problems. While denial may be a useful defence mechanism in the short-term for coping with anxiety and a depressed mood⁵¹⁴ it can exert a negative influence upon outcomes if patients cease to adhere to regimens regarding lifestyle, medication and other advice⁵¹⁵.

It is usual for anxiety and depression to decrease spontaneously during the months after the event^{342,349,516–518}, although they may persist for up to a year or more^{36,501,502,519}. Studies suggest women have poorer psychological outcomes than male patients^{520–524}.

Early detection and management of psychological difficulties can prevent persisting disturbances. Facilitators of group sessions need to identify those at risk of continuing psychological problems and, if necessary, refer them to appropriate team members for individual assistance. Psychological difficulties persisting for several months are usually attributable to an unrecognised and untreated depressed mood^{520,525}, which can lead to nonadherence with advice, occupational difficulties, and marital and sexual dysfunction^{309,360,385,507,520,526}. Moreover, as already stated, depression is a powerful predictor of mortality after acute myocardial infarction^{527–529}. A further loss or crisis can intensify or prolong the depressed mood⁵³⁰. In some patients, the onset of depression may be delayed⁵³¹. In these cases, the acceptance of loss and the need for change have usually been denied earlier. Those who do not display some signs of depressed mood early will often become depressed at a later stage of their recovery^{530,532}.

Psychological responses can be effectively addressed during group sessions by a skilful facilitator. When patients are able to disclose feelings during group sessions, identification with others who are experiencing similar problems can be a major benefit^{7,309}. Recognition that problems are not unique is reassuring^{7,533,534}. Facilitators of group discussions should explain that anxiety and a depressed mood are typical after acute cardiac events but that they are usually mild and transient. Fear of further cardiac episodes, anxiety about resuming work and concern about overprotectiveness in spouses may be successfully shared with others in the group. In addition to identifying with others who have similar problems, patients also gain from observing positive changes and a rapid recovery in others^{7,309}. Thus, a group should ideally contain patients at all stages of recovery, including “elders” who often adopt a preceptor role for the newer group members. Discussion groups for patients can also benefit from the occasional attendance of former patients who have made a favourable adjustment. The practice of introducing successfully rehabilitated post-surgical patients to those awaiting the operation is based on the same premise.

Small groups of about six to eight are more effective than large groups for uncovering more complex emotions and concerns of patients and spouses. Where possible, small group discussions should be available as adjuncts to the larger education and counselling sessions. It is preferable for small group discussions to be facilitated by a social worker, psychologist or other qualified counsellor with appropriate training.

Psychosocial risk factors and social support

Education and counselling groups should address psychosocial risk factors, including life events, social stresses, social isolation and depression. The ways in which social support from friends and family can minimise the impact of psychosocial stress should also be discussed. Several observational and cohort studies have demonstrated that social isolation (for example, living alone, particularly without a close friend or confidant) has a marked adverse effect upon outcomes after acute myocardial infarction, including recurrent events, cardiovascular deaths and deaths from all causes^{535–538}. Social stresses and life events (for example, bereavement, loss of job, movement of home) have also been shown to have a negative impact upon outcomes^{535,539}. Such increased morbidity and mortality are largely independent of other risk factors and other physical indicators of prognosis. Social support has been associated with improved quality of life in cardiac patients^{540,541}.

The mechanisms whereby psychosocial factors affect outcomes are not known. It has been suggested that a sense of loss associated with isolation may lead to despair, depression, nonadherence with advice and abandonment of a healthy lifestyle. These patterns of psychosocial deprivation and depression are now recognised as powerful risk factors^{528,529,535–538,542}. Patients with lower levels of education, occupational and socioeconomic status and income, coupled with limited control over their lives and working conditions^{537,543–545}, or those who live in a poor area⁵⁴⁶, have a greater risk of poor outcomes.

The role of depression and how best to develop support structures within a community for patients with cardiovascular disease and for others in an ageing population and a deteriorating family structure is an area for significant concern and research. Potentially effective interventions remain under investigation. Patients need to understand the importance of their life's circumstances upon their health outcomes. They should be encouraged to develop personal or community linkages to acquire or maintain friendships and support⁵⁴⁷.

Group sessions during cardiac rehabilitation programs can provide patients with considerable social support by helping them to be less self-absorbed and by giving them a feeling of being among others who are successfully coping with their illness. Participation in a group can lessen the sense of helplessness, particularly in patients who are depressed⁵⁴⁸. Friendships are often formed during cardiac rehabilitation programs which may be long lasting³⁰⁹. Thus, groups may be a significant source of psychosocial and motivational support⁵⁴⁹. Indeed, it has been suggested that much of the psychological benefit demonstrated to arise through group exercise programs may be due to the supportive effect of group activity⁹⁹. The emotional and social support which patients receive as members of consumer groups can be invaluable during early convalescence and for many months after ambulatory programs cease.

Stress

Patients commonly attribute their cardiac illness to stress^{309,385}. Stress and perceptions of the causal role of stress in the patient's illness should be explicitly addressed during group sessions, possibly together with discussion of mood and emotions. While life stress, as discussed above, has been shown to be a factor leading to adverse outcomes, this type of stress is not necessarily that which most concerns many patients. The perceived stress which patients typically describe arises from external pressures and demands, time constraints, work problems or adverse personal interactions and low levels of control over these stresses. There is some evidence that such stress may worsen prognosis⁵⁵⁰⁻⁵⁵⁴. Patients often perceive such "job stress" to be the main cause of their disease^{96,309}. However, there is no substantial scientific evidence to support these views^{555,556}. While "strain" may not be a significant risk, poor "control" may be so^{544,545}. Such poor "job control" may be another reflection of less education, reduced job opportunities and lower socioeconomic status⁵⁵⁷. Nevertheless, since these concerns regarding occupational stresses are so widely held by patients, the topic needs to be discussed during group sessions. Failure to address the issue can have adverse consequences. Concern about the effects of "work stress" may lead to unemployment, whether it is the concern of the patient, spouse, other family members, workmates, foreman or employer. Patients should be encouraged to talk about how they feel about resuming work and to raise any anticipated problems. Many problems can be resolved by discussion with the patient and close family members or in the group where others may have similar concerns about their work.

Facilitators should explain the two aspects of stress: the stressor and the response to the stressor. Most important is recognition that the response to the stress may influence the progression of the patient's disease. Thus, for some, occupational or domestic stress may lead to resumption of smoking or consumption of more cigarettes, food and alcohol and to physical inactivity. Alternatively, patients may handle such stress by walking or exercising during work breaks, pacing up and down rather than sitting while working and by increasing leisure time physical activity. Some patients can face stress by "switching off" or by avoiding situations which they are aware will induce a sense of stress. Patients need to understand that the evidence for stress being directly harmful is insecure. There is some evidence that it does not contribute directly and independently to the progression of cardiovascular disease⁵⁵⁶. Patients may therefore accept the presence of stress, but be led to modify their responses to embrace favourable rather than harmful behaviours. Some may also be able to modify their perception of stress and their responses to stress through stress management techniques.

Although currently a less fashionable concept than previously, the Type A behaviour pattern^{367,368,371,558} may be raised during group discussions, especially by those who do not have any of the standard risk factors. Facilitators should briefly explain that the concept has been largely discredited following further research^{372,373,506,559-563} and

discourage patients from labelling themselves as “Type A” individuals. The concept of “hostility” as a marker or cause of risk for cardiovascular disease events^{564–569} may also be addressed in the context of multiple responses to a perceived stress. Such “hostility” is associated with increased risk of all cause mortality, not cardiovascular mortality alone, and the effects appear to be mediated primarily through adverse behavioural risk factors⁵⁷⁰.

Impact upon the spouse and family

Spouses and partners of patients should be invited to participate in the education and counselling sessions, both for their own and the patient’s benefit. Spouses often receive insufficient information and support in hospital^{306,571–574} or show a limited understanding of the advice and information given to them³⁰⁶. Attendance of spouses at group discussions during convalescence is highly recommended so that they can obtain valuable information about the illness and gain insights into problems experienced by patients, such as the psychological basis of patients’ irritability and other symptoms. Education and counselling sessions can also provide opportunities for spouses to raise their own concerns. They commonly have many conflicting feelings about the patient’s illness, including anxiety, guilt, resentment and anger^{356,575,576}. Underlying their distress may be fear of a further event and possible death of the patient.

Stress reported by spouses is marked during the acute phase^{572,577–579} and typically peaks during convalescence^{580,581}. The practice of discharging patients early from hospital has been shown to contribute significantly to the insecurity of spouses at this time⁵⁸². Spouses of patients who have undergone coronary artery bypass surgery commonly experience considerable stress during the waiting period which is often prolonged⁵⁸³. Anxiety in spouses may be greater than that found in patients and may persist for some time^{534,577,579,580,584–589}. However, depression in spouses appears to be less marked⁵⁸⁴. Emotional responses of spouses should be discussed during group sessions. Other family members share similar concerns to those of spouses and can also benefit from participating in group discussions.

Marital disagreements and tensions are common during convalescence³⁰⁹ and pre-existing marital problems may be exacerbated by the illness⁵⁸⁹. There may be marked differences between patients and spouses in their perceptions of the severity of the event, expectations of outcome, the likelihood of the patient’s compliance with regimens and the level of the patient’s progress^{309,534}. There may also be considerable disagreement regarding the prescribed regimens, especially those concerning diet, activity levels and resumption of driving, sexual activity or work^{309,587}. Awareness that they are expected to be providers of support to the patient⁵⁹⁰ often leads spouses to become overprotective⁵⁹¹ so that they may attempt to limit the patient’s activities^{504,577–579}. Facilitators should raise this common scenario for discussion. Open

discussion can be useful to clarify regimens and to reassure spouses. It may be necessary to refer some couples with significant marital problems to a social worker or psychologist for further counselling. Separate groups for spouses are also recommended to provide support during convalescence, as discussed in Chapter 15.

Sexual activity and activities of daily living

Resumption of sexual activity may be dealt with during discussion of physical activity, resumption of car driving and other activities of daily living. Occasionally patients or spouses may initiate discussion about their fears of resuming sexual activity but usually the subject needs to be raised by the group facilitator. The main concerns of patients and spouses are time of resumption and the safety of sexual activity^{592,593}. A delay in resuming sexual activity after an acute event is not uncommon⁵⁹⁴ because of anxiety or depression. The issue of impotence may also be addressed during group discussions, since it is not an uncommon problem for male patients at this stage of their recovery⁵⁹⁵. It is useful to mention medications or depression as possible causes of impotence and to provide reassurance that the problem is usually temporary. Further discussion between the patient and the treating doctor should be advised. Reduced sexual activity after myocardial infarction has been shown to be significantly associated with psychological distress⁵⁹⁶.

Patients and spouses require clear guidelines about when they can resume their usual activities safely. Discussion of such matters generally occupy much time during education and counselling groups. It is important to reduce the amount of conflicting information provided by different team members. The occupational therapist or other team member should produce written guidelines regarding resumption of car driving, housework, gardening, hobbies, recreational and other activities, based upon current recommendations. Such a document should be considered to be a general guide only. Specific advice for individual patients may vary, depending on the patient's age, physical status or other factors. Possible reasons for different guidelines given to patients should be discussed in the group. As a general rule, however, patients can use the level of their perceived exertion during exercise classes as a guide to appropriate levels of activity at home. Patients can usually resume most activities when they feel confident to do so and if they have no symptoms. If they remain in doubt, patients may undergo an exercise test to determine their capacity for resuming various activities.

Return to work

The importance of returning to work for those recently in the workforce should be emphasised regularly during the program. Discussion should cover appropriate times of resuming manual and non-manual work for medical and surgical patients and the possible benefits of returning to work initially on a part-time basis. Common occupational problems after resuming work and how to handle them should also be

covered. Such problems include fatigue, reduced concentration, irritability, interpersonal tensions and perceptions of a reduced capacity for work^{96,309}.

It is usually desirable for patients to resume their former job rather than to seek a new one. Anxious patients and spouses should be reassured about groundless concerns, especially fears that stress at work may cause a further cardiac event. The possibility of retirement is often entertained by patients and spouses. A decision to retire during a period of anxiety or depression after an acute event is often regretted. Patients need to understand the processes of recovery, physically and psychologically, and to be prepared to postpone retirement or other major occupational decisions until they and others feel the patient has recovered and after a trial of return to previous work, possibly modified. Open discussion of these issues is recommended so that patients can address their future with less apprehension and probably with advantageous outcomes. Additional advice from the occupational therapist about resuming work can be most helpful. If there are several patients in the program planning to resume work, a separate session dealing with work-related issues may be appropriate. Further aspects of vocational rehabilitation are discussed in Chapter 15.

CHAPTER 14

STRUCTURAL ASPECTS OF GROUP EDUCATION AND COUNSELLING PROGRAMS

In this chapter, recommendations are provided regarding structural aspects of education and counselling groups. In Australia, ambulatory programs usually last six weeks and provide weekly group education and counselling sessions. In some programs, groups take place more frequently^{5,39,41}. While similar topics are addressed in most educational and counselling groups, there is considerable variation between programs in the depth and extent of information given. Further, the methods of delivery range from more didactic presentations to informal, interactive discussions.

Most studies report an individual, group, or combined approach to educating patients but few describe details of the content of the intervention or the style in which the information is delivered. Support for the recommendations made in this chapter largely come from expert opinion and consensus statements based upon general education and adult learning principles.

Group versus individual counselling

Recommendation

Education and counselling should be conducted in groups. Individual counselling should be available, if required.

Strength of evidence = 4

No study of cardiac rehabilitation has been found which compares the effectiveness of group versus individual education and counselling programs upon patient outcomes. However, studies involving other populations confirm the benefits of group approaches⁵⁹⁷. While specific queries and concerns of some patients require individual attention, expert opinion supports the view that most education and counselling is best delivered in a group setting. Group sessions allow patients to listen to questions asked by others which they themselves may have been too inhibited to raise. Further, group programs involve less staff time and are therefore more cost effective than individual counselling.

Principles of adult learning

Recommendation

Education groups should be based on adult learning principles and should encourage interactive discussion.

Strength of evidence = 4

The superiority of interactive discussion over didactic lectures has not been confirmed in controlled studies in cardiac rehabilitation. However, studies of other populations indicate that least is learned from didactic lectures, while most is learned from interactive group discussion⁵⁹⁸. Because education based upon interaction is a relatively slow method of covering a syllabus, didactic lectures followed by limited question time are commonly offered instead in cardiac rehabilitation programs. However, a guided group discussion, led by a facilitator rather than a lecturer, is the preferred method for educating cardiac patients. As such, the term “lecture” is best replaced with “group discussion”. More active involvement of participants achieves better understanding and learning and provides greater opportunity for clarifying misunderstandings⁵⁹⁹⁻⁶⁰² and increasing self-efficacy⁶⁰³. More direct participation of patients in their own health care has been shown to influence coping and social and psychological recovery after a major cardiac event³¹². Other basic educational principles apply in conducting education groups, such as reinforcing and individualising advice, providing feedback and ensuring that the material presented is relevant to participants³²¹.

Range of topics

Recommendation

Education and counselling groups should aim to cover a defined range of topics during the program. However, discussion should be flexible.

Strength of evidence = 4

Each session may focus on one particular topic (see Chapter 13) or combine a number of topics. However, discussion should be sufficiently flexible for participants to raise questions on other issues of concern. The focus of discussion should be on topics of relevance and interest to the participants in the group, with the patients rather than the facilitator at the centre of the learning experience⁶⁰². The specified topic for the discussion may occupy only part of the available time to permit open and almost free ranging discussion between patients and the facilitator or between patients. Participants should be encouraged to ask questions. Participants frequently refer to

topics mentioned in the media and ask for comments and explanation from the facilitators. Topics of particular interest to participants should be identified and addressed. While in some programs patients are advised in advance of the scheduled dates of topics for discussion, this may unfortunately lead some patients to miss certain sessions which they consider are not especially relevant to them. Participants in the group who seek to dominate discussion should be invited to see the facilitator at the conclusion of the session.

Duration and frequency of sessions

Recommendation

It is recommended that education and counselling group sessions lasting approximately 45 minutes should take place twice weekly for four to eight weeks.

Strength of evidence = 4

The optimal number, frequency and duration of group education sessions required to produce favourable effects upon knowledge, attitudes, behaviours or risk factors have not been investigated in controlled trials. However, a recent small study comparing programs held once, twice or three times per week suggests greater patient satisfaction with the amount of information provided in programs with two or more education sessions per week⁷. Based upon expert opinion and common practice, it is recommended that the “syllabus” should be covered in twice weekly sessions over four to eight weeks. Some patients prefer to continue attending group sessions beyond the end of the program to reinforce their understanding.

Time of entry to the education program

Recommendation

Patients should start attending education sessions within a week to 10 days of leaving hospital.

Strength of evidence = 4

Patients should enter the cycle of rotating education sessions at any time rather than waiting to attend a particular session first. The concept of conducting “closed” groups, whereby a group commences when sufficient numbers of new patients are recruited, is not recommended. As explained in Chapter 17, early entry to group rehabilitation programs is advised to facilitate physical recovery and to minimise psychological problems during convalescence.

Size of groups

Recommendation

The size of education groups may vary but ideally should include no more than 20 to 25 people.

Strength of evidence = 4

Education groups need to be limited to 20 to 25 people, including spouses or other family members, to maximise participation of individuals and to facilitate interactive discussion. The participants should sit in a semicircle or in groups to encourage discussion rather than in rows in a lecture theatre or room which generally inhibits individual participation. Smaller groups of six to eight are advised for more intensive counselling and exploration of attitudes and emotions.

Style and level of presentation

Recommendation

Information should be delivered using simple language, supported by appropriate audiovisual materials and teaching aids.

Strength of evidence = 4

Patients and family members may have limited education³⁰⁴. Those from non-English speaking backgrounds often have limited English. Use of complex terminology and jargon should be avoided during group education and counselling sessions. Unnecessary detail should also be avoided. Medical terms which may have been used about patients in hospital should be explained simply and clearly. Information regarding risk factors should be provided both orally and visually and should be coupled with practical advice regarding behaviour change. The learning process may be facilitated by the use of diagrams and audiovisual aids, including short videos. The use of a blackboard or whiteboard for diagrams or topics is much valued by patients. Studies have compared interventions such as prepared written materials⁶⁰⁴, slide and sound packages^{294,300} and self directed learning and management packages⁶⁰⁵. These studies have all shown benefits in increasing knowledge among cardiac patients. Posters on the walls are often useful. Information booklets and factsheets may be given to patients to take away to reinforce health messages, providing they are simply written and their contents appropriate for the particular group of patients (for example, patients with rheumatic heart disease usually prefer not to have information about coronary heart disease and vice versa). A resource area should be established where session materials and handouts can be stored. Some pamphlets and factsheets for patients and family members should be on display in the room used for group sessions.

Individual counselling and referrals

Recommendation

Participants requiring additional support should be identified early, referred to appropriate team members and offered individual counselling.

Strength of evidence = 4

Comprehensive assessment of the educational, psychosocial and behavioural needs of each individual patient is not feasible in most programs. However, those patients requiring additional advice or support may be identified during entry assessment to the program or later during group sessions. They should be referred for further counselling to appropriate members of the team or to another health professional in the community. In particular, additional dietary counselling is advisable for many patients, preferably together with their spouses. Such advice needs to be individualised⁴⁰⁴. Individual counselling regarding weight loss may also be necessary for patients who are significantly overweight or who need behavioural interventions to assist them in making other lifestyle changes. A social worker or psychologist should provide individual counselling for those with marital, sexual, financial or psychological problems. Work related counselling should ideally be given by the occupational therapist or other vocational counsellor. Patients should be referred to their general practitioner or specialist if they have concerns regarding diagnosis, symptoms, medication or other medical matters relating to their cardiac or other illness.

Protocol for education programs

Recommendation

Production of a written protocol of the education program is recommended.

Strength of evidence = 4

A written protocol for the education program is recommended to ensure key issues are addressed and to introduce some uniformity into sessions. It should contain an outline of the core content and main objectives of each session, as well as some factual information and suggestions regarding methods of delivery, appropriate audiovisual aids and suitable resources for patients. Common questions should be listed, together with appropriate answers. The availability of such a protocol would also enable different facilitators to lead sessions more readily.

Review of education program

Recommendation

The content of education programs should be subjected to periodic expert review.

Strength of evidence = 4

A review of the content of education sessions should be undertaken soon after the program begins and thereafter at intervals to ensure the accuracy and scientific validity of information in the light of changing policies and practices and the availability of new evidence. The review should be undertaken by persons with a knowledge of cardiac rehabilitation and secondary prevention and expertise in medical, educational, behavioural and psychosocial aspects of cardiovascular disease. Feedback from participants should also be sought to ensure that the education and counselling sessions are meeting their needs. Additional sessions covering topics recommended by participants should be incorporated, where possible.

Session facilitators

Recommendation

Education and counselling groups should be facilitated by different members of the multidisciplinary team.

Strength of evidence = 4

While most group sessions can be facilitated by one trained health care provider in smaller programs in rural and local communities, it is desirable in larger programs for different members of the multidisciplinary team to facilitate education sessions in turn. Specific areas of expertise of each team member are discussed in Chapter 16. Program co-ordinators should ensure that at least one other team member is able to take each education session, as well as the primary facilitator, should the need arise.

Training of facilitators

Recommendation

Facilitators should receive training covering the content of education and counselling sessions and effective methods of presenting material to groups.

Strength of evidence = 4

Professional development is recommended for team members conducting the education and counselling group sessions. Such training should cover key topics addressed in programs, ways of presenting material and suggestions regarding further resources to enhance facilitators' knowledge of the area. Health care providers working in cardiac rehabilitation should attend a short course⁵¹, especially those planning to remain in the field and those working in remote areas. Inhouse training of team members is also advised.

CHAPTER 15

PROGRAMS FOR SPECIFIC GROUPS

Recommendation

Additional modules or separate programs tailored to the needs of specific groups are recommended.

Strength of evidence = 4

Additional modules or separate programs are required for special groups, such as patients resuming work, those who have undergone percutaneous transluminal coronary angioplasty, patients with other forms of heart disease, and those of non-English speaking or aboriginal background. Home-based programs should be provided for patients unable to attend a group program and those living in rural or remote areas with no group programs. Separate groups for spouses of patients are recommended.

Patients resuming work

Recommendation

The goal of return to work is implicit in physical, educational and psychosocial components of cardiac rehabilitation programs. Specific attention to vocational rehabilitation is recommended.

Strength of evidence = 3

All team members should reinforce the desirability of resumption of work as an expected outcome of rehabilitation for those patients previously in the workforce. Efforts to facilitate work return should begin as early as possible, since patients who delay are less likely to resume work^{34,377,606}. Return to work has been shown to improve emotional well-being³⁷⁷.

In assessing patients for resumption of work, the Expert Committee on Rehabilitation after Cardiovascular Diseases of the World Health Organisation¹ recommends that the following two questions should be asked early in the rehabilitation program: “What is the nature of the job to which you hope to return?” and “what is the most strenuous or demanding aspect of your job?”. The exact nature of the physical demands of the job need to be assessed, preferably by the occupational therapist. General reconditioning during exercise sessions can prepare patients for resuming physically demanding work, coupled with specific muscular strength training, as discussed in Chapter 7. In this regard, repetitive exercises simulating the activities of work are recommended. However, there are commonly just a few aspects of manual occupations which require much physical effort, since most materials nowadays are handled mechanically.

Resumption of work is largely dependent upon psychological recovery and acceptance that work itself is not dangerous. Studies have found that patients’ perceptions of their illness and their ability to return to work are the most significant predictors of resumption of work^{344,385,607,608}. The significant role of doctors in fostering positive expectations of return to work has also been shown^{609,610}.

To foster greater confidence in the patient’s ability to return to work, work evaluations are recommended which closely simulate work demands, such as using a shovel, lifting heavy boxes or crawling under buildings^{39,381,611}. This approach is particularly helpful for patients who are anxious about resuming manual jobs. Such simulated work testing is best undertaken by an occupational therapist or another trained staff member. In some cases, it may be appropriate for a doctor to be present and for a defibrillator to be available. Satisfactory performance on such a test can help not only the patient. The doctor and employer can also be reassured that the patient is able to return to work safely. Similarly, a successful exercise test undertaken towards the end of the program can confirm fitness to return to work³⁹. However, there have been few studies investigating the most effective interventions for facilitating return to work and for assisting patients to remain in work. Further research in this area is required³⁸⁴.

If uncertainty about fitness for work persists, then the employer may agree to a trial at work. If the job is found to be too demanding, then modification, if feasible, may be recommended. Further assistance may be required by patients with poor motivation or other difficulties preventing resumption of work, particularly those in manual occupations who have had coronary bypass graft surgery. Work visits undertaken by the occupational therapist can often facilitate return to work. Although job opportunities may be scarce in some occupational groups, efforts should be made to find alternative employment for patients unable to resume their previous work. Referral to a special vocational rehabilitation program, such as the Commonwealth Rehabilitation Service, is recommended for such patients.

Patients who have had percutaneous transluminal coronary angioplasty (PTCA)

Recommendation

Separate programs of secondary prevention addressing behavioural change should be provided for PTCA patients. Such programs may be abbreviated and conducted outside normal working hours to facilitate attendance.

Strength of evidence = 3

In most cardiac rehabilitation programs in Australia, myocardial infarction and coronary bypass surgery patients participate in the same exercise and education sessions^{5,40-41}. Patients who have undergone PTCA are also eligible to attend these group programs but frequently fail to do so^{5,6,52,53}. Because PTCA patients have not usually experienced the crisis of an acute cardiac event such as myocardial infarction or coronary bypass surgery, they frequently deny any psychological difficulties or the need for a rehabilitation program, initiating fewer lifestyle changes than other cardiac patients⁶¹². Restenosis occurs within the first six months in over 40% of patients receiving PTCA, but is less frequent in patients where stent implantation accompanies the PTCA⁶¹³⁻⁶¹⁵. Results from randomised trials with one to five year follow-up show a significantly higher incidence of repeat revascularisation, greater prevalence of angina and greater use of medication for PTCA patients compared with those who have undergone coronary bypass surgery⁶¹⁶⁻⁶¹⁸. Moreover, many PTCA patients also have poor psychological outcomes, which demonstrates the need for more effective follow-up^{612,619}. Importantly, return to work rates have not always met expectations, with delays in resuming work ranging from 25 days to four months^{489,620,621}. If exercise testing is arranged after PTCA, it should be undertaken as soon as possible, since patients may delay their return to work until the test has been conducted⁶²¹.

A program of secondary prevention is required to encourage PTCA patients to change their behaviours in order to reduce the risk of a major cardiac event in the future⁶¹². In view of the low attendance rates of PTCA patients at standard cardiac rehabilitation programs, an alternative approach is required for this group of patients^{612,619}. It is therefore recommended that, where possible, separate programs should be provided. They should focus, in particular on education and behavioural interventions to promote behaviour change. Such programs should preferably be made available outside working hours to enable PTCA patients who have resumed work to attend. Suitable models need to be devised and fully evaluated to determine their effectiveness for widespread implementation.

Patients with other forms of heart disease

Recommendation

Patients with other forms of heart disease may attend specific programs appropriate to their particular educational needs. Small numbers may necessitate individual rather than group education.

Strength of evidence = 4

Cardiac rehabilitation programs, designed for patients with coronary heart disease, may satisfy some of the needs of patients with other forms of heart disease such as congestive cardiac failure, rheumatic heart disease, congenital heart disease, hypertensive heart disease, cardiomyopathy and inflammatory heart diseases. However, additional or separate programs are recommended. Rehabilitation for such patients aims to achieve minimal physical, psychological and social impairment, coupled with lifestyle adjustment, to delay disease progress, disability and death. It also aims to provide education about the causes, prognosis and control of the disease¹. Education regarding lifestyle change, stressing the importance of adherence to medication, is also essential. Most important is that sufficient support is given to ensure some optimism and hope about the future. This applies to both patient and family. For many, corrective or palliative surgery or transplantation may be offered.

Traditional advice for patients with cardiomyopathy or cardiac failure in the past included the imposition of physical restriction. This advice is now reversed. As discussed in Chapter 11, studies have now demonstrated that low intensity exercise training is safe and beneficial for such patients, both physically and psychologically. The benefits of physical activity and exercise training for patients with coronary heart disease also apply to these patients. While major changes in cardiac function are not usually expected, improvement in peripheral muscle function leads to lesser disability through raising the threshold of activity until dyspnoea or fatigue appear. While such improvement may be demonstrated during group exercise classes, it is also necessary to assure that patients and families learn and understand the benefits and safety of exercise.

Children with congenital or rheumatic heart disease may require specific educational and vocational training to assure they may achieve occupations which do not impose much physical demand.

Although patients with cardiac failure may join standard cardiac rehabilitation programs, the death rate is high in this category of patients which can be distressing to younger cardiac patients recovering from an acute event. If numbers are sufficiently large and resources are available, therefore, a separate group should be

formed. Patients with cardiomyopathy or cardiac failure are usually aware that they have a poor prognosis. They usually require individual counselling and may also benefit from participating in a special support group.

Overnutrition is a common feature among patients with coronary heart disease, manifested by overweight, obesity, insulin resistance and raised LDL cholesterol. However, the opposite may apply to patients with other forms of heart disease. Wasting is common amongst those with heart failure from all causes. Hence, dietary advice is required to assure adequate caloric and other nutritional intake.

Patients with rheumatic, congenital and other forms of heart disease, particularly those with heart failure or atrial fibrillation, require an understanding of different medications from those prescribed for patients with coronary heart disease. In particular, anticoagulant treatment, usually with warfarin, must be understood. Digoxin is taken by most patients with atrial fibrillation and by many others. The prevention and management of heart failure is of major importance in these patients. Angiotensin converting enzyme inhibitors and diuretics are usually taken on a long term basis. Thus, the need for balance of medication effects and fluid intake must be understood. Some patients need to learn how to steer a course between fluid retention, on one hand, and hypovolaemia and syncope on the other^{622,623}.

Patients with rheumatic heart disease must understand the need for longterm penicillin prophylaxis against further episodes of rheumatic fever and the need for antibiotic prophylactic cover to prevent infective endocarditis following dental and other procedures.

Younger patients

Recommendation

While younger patients may benefit from separate exercise classes, they may be enrolled in the same education groups with older patients.

Strength of evidence = 4

According to anecdotal evidence, younger patients frequently state that they dislike exercising in groups which include many older patients and may, therefore, drop out from programs prematurely⁶. If a number of younger patients enrol in the rehabilitation program, a separate exercise session for them is desirable. However, their educational needs may be largely met in a standard education group.

Patients of non-English speaking background

Recommendation

Patients of non-English speaking background should be encouraged to attend cardiac rehabilitation programs. Separate programs conducted in other languages are recommended, especially for education sessions. These programs may be delivered on a regional basis. Individual counselling, together with an interpreter, should be provided where necessary.

Strength of evidence = 3

A significant proportion of patients with limited English fail to attend cardiac rehabilitation programs^{5,6,52}, commonly because of language barriers and cultural attitudes. Such patients may not be invited or they might not fully comprehend the referral arrangements or the nature of the program⁶²⁴. In some cultures, there may also be a reluctance to participate in a health education program of any kind, especially one conducted in a mixed group. Patients who have some command of English can achieve considerable benefits from participating in an exercise program. However, surveys show that in general, the needs of patients of non-English speaking background are not adequately met by standard rehabilitation programs^{5,7}. Thus, consideration should be given to the establishment of separate educational programs for different groups which are culturally relevant and which can be conducted in their own languages. This is especially necessary for the delivery of educational health messages, particularly dietary advice⁴⁰⁴. The specific requirements and preferences of each ethnic group should be carefully investigated before setting up such programs. Consumer advisory groups may assist in confirming the cultural appropriateness of such ethnospecific cardiac rehabilitation programs. Similarly, the production of literature in other languages should be preceded by examination of the needs of each group. Staff working with patients of non-English speaking backgrounds should seek to understand the cultural beliefs and practices of different ethnic groups. Ideally, ethnic specific groups should be conducted in collaboration with local ethnic communities, possibly in conjunction with a local community health service. Interpreters should be available in hospital to explain follow-up procedures and the need for rehabilitation to patients of non-English speaking backgrounds.

Aboriginal Australians with heart disease

Recommendation

Separate, culturally appropriate programs delivered by aboriginal health workers should be provided for aboriginal cardiac patients.

Strength of evidence = 3

Aboriginal Australians die from cardiovascular disease at approximately twice the rate of the total Australian population⁴⁵⁸. Several behavioural risk factors for cardiovascular disease are known to be more prevalent among aboriginal Australians than non-aboriginal Australians, especially diabetes and smoking. In a study of a rural community, aboriginal people were more likely to be smokers and not to participate in vigorous exercise than the general population living in capital cities⁶²⁵. About 60% of aboriginal males and 57% of aboriginal females are classified as overweight or obese⁵⁷. Results of a survey in one region suggest that hypertension is two to three times more prevalent among aboriginal people than the general Australian population⁶²⁶. The National Health Priority Areas Report on Cardiovascular Health (1998)⁶²⁷ recommends that risk factors among aboriginal men and women should be assessed and appropriate preventive health services introduced and integrated into primary health care. The incidence of rheumatic heart disease among aboriginal Australians living in remote areas is currently the highest in the world⁶²⁸.

Major problems confronting aboriginal Australians include poverty, lower education, poor health status and cultural and racial barriers. These make access to mainstream prevention and treatment services difficult for aboriginal people. In remote areas, these problems are exacerbated by distance. Many of the problems of aboriginal Australians appear similar to those of native North Americans^{629–635}.

Anecdotal evidence indicates that standard cardiac rehabilitation and secondary prevention programs are not suitable for aboriginal patients^{5,40,41,51}, who rarely attend available programs. Separate, culturally relevant programs should be devised and aboriginal communities should be involved in the development of such programs^{636–639}, together with representatives of peak Aboriginal bodies.

As a first step, an assessment should be made of the knowledge of aboriginal health workers concerning coronary heart disease and cardiac rehabilitation. Appropriate training should be available for aboriginal health workers to deliver programs for aboriginal cardiac patients. The content and method of delivering health education to aboriginal health workers needs to take into account the learning styles and environmental and cultural differences of aboriginal people. Health workers in mainstream services in rural and remote Australia should acquire the necessary cross cultural skills to work effectively with aboriginal people.

Patients from rural and remote areas and others unable to attend a group program

Recommendation

Patients in rural areas should attend a group program if one is available in the region. Otherwise, individual follow-up should be provided by general practitioners and nurses, with regular telephone contact and use of appropriate self-help resources.

Strength of evidence = 4

The number of cardiac rehabilitation programs is rapidly increasing throughout urban and rural Australia^{5,40,41,640}. However, patients living in rural and remote areas may nevertheless find it difficult to attend a program because of distance from the program venue. There may be other patients as well who find it impossible to attend a group cardiac rehabilitation program, even if one is available locally, because of illness or other commitments⁶²⁴. For such patients, suitable audiovisual resources should be provided, including a sheet of home exercises, booklets, tapes or videos about heart disease, symptom management, lifestyle change, risk factor modification and advice regarding resumption of activities of daily living. Such self-help programs have been found to be effective³⁵². A manual has recently been produced to guide rural nurses counselling cardiac patients in remote areas in Australia⁶⁴¹. If feasible, home visits by a community nurse should be offered^{5,6,171}.

Outreach programs have been developed in the United Kingdom in recent years to provide cardiac rehabilitation to rural patients and spouses. In one such program, patients are given a heart manual in hospital and during the first six weeks after leaving hospital, patients work through the manual under the supervision of a nurse facilitator⁶⁴². Patients are telephoned or visited during this period. They are then automatically referred to an assessment clinic run by cardiologists. Patients found to be still anxious or depressed are referred for assistance. The program is considered beneficial for more remote dwellers who receive support and continuity of care from primary care staff who often have detailed knowledge of the family.

In some parts of rural Australia, outreach programs have been recently introduced by Divisions of General Practice which involve regular follow-up of individual cardiac patients by general practitioners⁶⁴³. These outreach rehabilitation programs are based on the concepts of low intensity, home based exercise and general practice supervised rehabilitation. Patients are supported with an education manual addressing recovery issues, exercise and medication. Patients visit their general practitioner within the first week of hospital discharge and then weekly or fortnightly for the next eight weeks.

While such programs provide patients living in remote areas with much needed advice and guidance, they do not provide peer support which is a major benefit of group programs. If another non-cardiac community program is available which provides group physical activity and/or health education, patients should be encouraged to attend it so that they may achieve some of the psychological and social advantages of interaction with others.

Telephone calls from hospital staff soon after hospital discharge and at intervals during the next six or 12 months are also recommended for ongoing support and to provide advice, if required. Studies have demonstrated the effectiveness of providing education and support to cardiac patients by telephone⁶⁴⁴. Significantly improved outcomes in preventive care were demonstrated in one study involving telephone support to cardiac and other patients⁶⁴⁵, and in another, improved knowledge about coronary heart disease, self care and regimens was found²⁹⁵. Telephone and mail follow-up by nurses significantly improved smoking habits, cholesterol levels and functional capacities in patients enrolled in a recent randomised controlled study¹⁰⁴. Such telephone follow-up of patients may reduce medical costs as well as achieving improved medical outcomes⁶⁴⁶.

The feasibility of establishing telephone networks with other cardiac patients should also be determined, especially in remote areas, to provide peer support. Similar telephone networks could also be used by health practitioners to provide education and counselling to a small group of individual patients linked by telephone. Further, telephone communication between groups of rural practitioners may be beneficial to provide support and to facilitate exchange of ideas about effective methods of cardiac rehabilitation for rural and remote patients. Other technologies may also be useful, including video conferencing, the internet and CD ROM programs. Isolation and limited access to continuing education have been cited as major problems among practitioners in rural areas^{5,6,51}.

Spouses of patients

Recommendation

Spouses should be invited to attend the program and encouraged to participate in exercise and education groups. Individual counselling should be available, as required. In addition, separate spouse groups are recommended.

Strength of evidence = 3

As stated in Chapter 13, spouses of cardiac patients often experience much emotional distress during the acute phase of the illness and during convalescence. Longterm studies also report that female spouses continue to have more responsibilities than

before the event and enjoy less leisure and social activities^{309,586}. Since the attitudes and behaviours of spouses are important determinants of the rate and extent of patients' recovery⁶⁴⁷, the effects of a cardiac illness upon spouses must be considered. Wives with poor coping capacities⁶⁴⁸, dependent personalities⁵⁸⁹ and fewer perceived sources of support⁶⁴⁹ are particularly vulnerable to distress and may require considerable assistance. Younger spouses who are in the workforce and those from a non-English background may also experience major difficulties³⁰⁹. The effects of a cardiac illness upon male spouses has been little studied²⁸².

Anxiety of spouses in hospital can be reduced by frequent information and reassurance about the patient's condition⁶⁵⁰ and written information about the illness⁵⁷². Family conferences before the patient's discharge from hospital may also be helpful^{651,652}. For surgical patients, pre-operative counselling for both patients and spouses is highly recommended⁵⁸³. Individual counselling of couples in hospital has been shown to be effective in reducing anxiety of spouses, with benefits persisting up to six months⁵⁸⁴. In another study, spouses who had access to a counsellor and who received a booklet reported less anxiety than others⁶⁵³.

The support of spouses during convalescence is best achieved through their participation in an outpatient group rehabilitation program. In addition to participating in education and exercise groups with the patients, group sessions for spouses alone may also be effective in meeting spouses' needs for further information and for reducing their emotional distress^{356,534,654}.

Discrepancies between patient and spouse concerning the patient's abilities can have a negative impact upon the patient's recovery^{309,534,577}. Nevertheless, perceptions of spouses regarding the patient's capacity can be modified. In one study, spouses were randomly assigned either to participating in an exercise test, observing their husbands' undergoing the test or to a control group of spouses who waited outside the exercise testing room³⁸⁰. The perceptions of the patients' exercise capacities of those spouses who underwent an exercise test themselves were similar to those of the patients. Spouses who merely observed the test were less confident than the patients about the patients' capacities, while those spouses who remained outside the room were the least confident.

In another randomised study involving patients and spouses, training in cardiopulmonary resuscitation was provided to spouses⁶⁵⁵. However, results showed that patients of spouses in the intervention group were significantly more anxious three months after acute myocardial infarction and had a poorer overall adjustment to their illness at six months.

While some studies have produced favourable outcomes, further research is required to develop and evaluate effective interventions to assist spouses of patients who have had an acute cardiac event.

CHAPTER 16

CARDIAC REHABILITATION TEAMS

The recommended model for ambulatory cardiac rehabilitation and secondary prevention programs is based upon groups, with input from a variety of health professionals. This chapter outlines the main functions of each team member. Program co-ordination, team meetings, staff training and core competencies are also addressed. Recommendations are largely based upon consensus statements of practitioners who participated in a series of focus group discussions⁶. They are consistent with recommendations of other bodies^{1,69,70}.

Membership

Recommendation

Ambulatory cardiac rehabilitation and secondary prevention programs should be conducted by a multidisciplinary team.

Strength of evidence = 4

Minimum standards for ambulatory cardiac rehabilitation and secondary prevention programs in Australia⁷⁹ state that programs may be conducted by one single health practitioner with back-up from other local or regional health practitioners, where available, consistent with recommendations for a “basic” facility of the World Health Organisation Expert Committee on Rehabilitation after Cardiovascular Diseases¹. This approach has been demonstrated to be feasible in small Australian rural communities where staffing is limited and patient numbers are low^{5,41}. However, the recommendation for best practice cardiac rehabilitation in metropolitan areas and larger rural centres is for programs to be conducted by a multidisciplinary team of health professionals^{656,657}, in accordance with recommendations for an “intermediate” facility of the World Health Organisation Expert Committee on Rehabilitation after Cardiovascular Diseases¹. The team should include a nurse, physiotherapist, dietitian, occupational therapist, social worker, psychologist, cardiologist, cardiac surgeon and general practitioner. Others who may participate as members of the team include an exercise physiologist, physical educator, diabetes educator, welfare worker,

pharmacist, psychiatrist, vocational counsellor, ethnic health worker, ambulance officer and pastoral care worker.

Roles of team members

Recommendation

Special areas of expertise amongst team members should be recognised.

Strength of evidence = 4

While many tasks can be shared by more than one member of the team, some tasks require specific skills and training and should be performed by the appropriate, designated health professional. Team members have different backgrounds and training and therefore different areas of expertise. It is important to determine in advance those tasks which should be undertaken by a designated team member and those which may be shared by several team members. Failure to do so can create tension within the team. Activities such as processing referrals, co-ordinating programs and following up patients after program discharge may be allocated to any team member who has good organisational and interpersonal skills and sufficient time available to carry out these duties.

Nurse

Recommendation

Nurses fulfil a range of functions in cardiac rehabilitation and secondary prevention programs and should be considered key members of the team.

Strength of evidence = 4

Nurses are involved in most ambulatory cardiac rehabilitation and secondary prevention programs throughout Australia. In their view, one of their important roles is to detect medical and other problems which become apparent during the program and to refer patients to other health care providers, when required^{6,658}. Nurses are also extensively involved in patient education. They commonly facilitate group discussions on heart disease, risk factors for cardiovascular disease and other medical topics. In many smaller hospitals and community health centres, especially in rural areas, nurses are responsible for a greater range of activities, including conducting exercise sessions and recruiting patients to programs⁵. Whereas some teams members rotate for a short time through a particular service in the hospital or attend outpatient programs only for specified sessions, nurses often attend patients from the time of the patients' admission to hospital. Nurses therefore provide continuity for patients after

discharge from hospital and are often perceived by patients to be the program co-ordinator. Nurses also consider they are best suited to the co-ordinating role because they are multiskilled and have an overall perspective of patients' problems. Nurses co-ordinate 72% of programs in Victoria⁵. A similar pattern prevails nationally⁴¹.

Physiotherapist

Recommendation

The physiotherapist should assess the physical needs of patients, devise exercise programs tailored to meet the requirements of the individual patient and supervise the exercise sessions.

Strength of evidence = 4

The physiotherapist is mainly concerned with the physical aspects of the patient's recovery. Specific roles of the physiotherapist include assessing the physical needs and cardiovascular fitness of patients at entry to the program, prescribing exercise to minimise the deconditioning effects of physical inactivity and promoting reconditioning. The exercise program needs to be flexible and adapted to the needs of the individual patient. It should aim to facilitate recovery to a level necessary for patients to resume their work and other activities of daily living. The physiotherapist is considered best equipped to design and conduct exercise sessions. In 52% of Victorian programs, the physiotherapist supervises the exercise sessions⁵.

While focusing particularly upon the patients' physical needs, the physiotherapist should also address emotional concerns of patients and explore any perceived barriers to exercise. For those patients who have been almost totally inactive, the physiotherapist needs to design an acceptable exercise program, encouraging such patients to initiate and continue the recommended exercises. According to physiotherapists, patients enjoy exercise sessions and place great importance upon what they can do physically. Exercise is viewed by patients as something which is tangible, measurable and understandable^{6,7}.

Other key roles of the physiotherapist include monitoring patients during exercise sessions. Pains and other physical problems reported by patients need to be assessed by the physiotherapist. The physiotherapist should provide practical advice to patients about what they can and cannot do safely, including any sporting activities. Patients seeking to exercise at high levels require particular attention and usually require medical clearance. Such patients may benefit from referral to a trained exercise therapist.

The physiotherapist may play a useful role in addressing the work requirements of patients, especially if the job is physically demanding. In this respect, the role of the

physiotherapist may overlap to some extent with that of the occupational therapist. To minimise role conflict, each team should determine which health professional has more appropriate skills for the tasks involved in promoting the physical rehabilitation of patients and allocate roles accordingly.

Dietitian

Recommendation

The dietitian is an essential member of the team, undertaking group and individual counselling about nutrition and appropriate dietary habits.

Strength of evidence = 4

Although patients receive some dietary information in hospital, dietary advice is best provided by the dietitian during the outpatient program when more time is available to follow-up advice given in hospital. Discussion over a period of weeks is highly desirable to address individual queries, especially from those with limited ability to comprehend dietary information. Moreover, several dietary sessions are recommended, because patients are generally unable to absorb all the necessary information at once.

Nearly all ambulatory programs throughout Australia involve a dietitian but the extent of the dietitian's input varies considerably between programs^{5,41}. In some programs, dietitians facilitate several sessions³⁹, whereas in other programs, only one session is devoted specifically to dietary issues. Research findings suggest that cardiac patients generally want more dietary advice than they currently receive⁷.

Regardless of their cholesterol levels, patients require counselling about healthy dietary habits and explanations about food labels in order to make informed choices about their diet. Practical advice about the preparation of food is also vital. Dietary information needs to be realistic, simply presented and easy to follow. The dietitian needs to provide individualised advice, where possible. Information provided in a group setting can be confusing if there is a significant disparity in the ages and cultural backgrounds of participants. For example, information for an overweight, prediabetic 40 year old patient with lipid abnormality might be quite inappropriate for a 70 year old female with average lipid levels whose major risk factor was hypertension. According to dietitians, general practitioners tend to give the same advice to all patients⁶. For example, they may prescribe unnecessarily restrictive low fat diets to elderly, female patients whose cholesterol is above some publicised, arbitrary cutpoint (such as 5.5 mMol/L) and give no advice to a young man whose cholesterol level is below the same cutpoint.

Referral of patients from non-English speaking backgrounds to dietitians of similar ethnic origin is desirable. Apart from language barriers, most dietary information available to cardiac patients remains oriented towards Australian habits and thus may not be relevant to patients from other cultures. Dietitians from other ethnic backgrounds may be employed at community health centres or attached to general medical practice in the region.

An important function of the dietitian is to clarify misconceptions about diet and nutrition. Team members agree that there is considerable confusion in the community, among health care providers, and even among dietitians themselves, about dietary guidelines. Moreover, guidelines seem to change intermittently. As a result, patients receive conflicting dietary advice from different health care providers⁶ and are understandably confused about which advice they should follow.

According to dietitians, dietary advice provided by general practitioners and nurses, in particular, is often at variance with advice given by dietitians⁶. To avoid conflicting and inaccurate dietary information being imparted by different members of the team, dietitians need to ensure that all team members follow the same general guidelines concerning diet and reinforce the dietitian's advice. To encourage more consistent and relevant dietary advice to patients, it is desirable for team members to receive regular inhouse training and updating regarding appropriate dietary advice for cardiac patients. The problem could be minimised further by having regular team meetings and producing or having available written guidelines and formal protocols for nutritional education sessions. Specific dietary advice should be delegated to the dietitian, with other team members providing general information only.

Counselling regarding weight loss may also need to be individualised and appropriate. Dietitians expressed concern that other team members commonly provide incorrect information about weight loss and recommend fad diets to patients, putting pressure on them to lose weight quickly when slow loss is considered more appropriate⁶.

Occupational therapist

Recommendation

The occupational therapist has important roles in the team, especially in facilitating return to work and assisting the patient to function effectively and independently.

Strength of evidence = 4

The occupational therapist's role in cardiac rehabilitation programs is oriented towards assisting the patient to function effectively and independently in employment, family, social and recreational activities. Where this is not possible or appropriate, the occupational therapist should assist the patient to live as productive a life as possible within any constraints imposed by disablement.

The occupational therapist has specific training to undertake vocational assessments to determine the feasibility and capacity of the patient to resume work at a reasonable level of physical or other occupational demand. To prepare the patient for resuming work, the occupational therapist undertakes work conditioning and, if required, may also conduct simulated work tests, liaise with the employer and visit the worksite⁶¹¹. Occupational therapists state that doctors are often unaware of the nature of the patients' jobs and may give the patient inappropriate advice about resuming work. Thus, communication is recommended between the treating physician and the occupational therapist regarding plans for return to work.

The occupational therapist also assesses the patient's functional status and potential for resuming usual activities of daily living. Leisure and social activities are assessed. Realistic goals are set and activities are prescribed which are functionally based. The skills acquired by the patient can then be transferred to the home or work setting.

The roles of the occupational therapist are poorly defined⁶⁵⁹ and are commonly misunderstood by other team members^{6,40,41}. While occupational therapists have a particular role in facilitating occupational recovery of the patient, their training is broadly based and they can contribute to the program in several areas and back up other staff⁶⁶⁰. For example, stress management sessions are sometimes conducted by the occupational therapist^{5,641}. Occupational therapists are involved in patient education and counselling and are trained in group dynamics and facilitating groups. In some programs, the occupational therapist participates in the group exercise sessions^{5,41}. Occasionally the occupational therapist co-ordinates the overall program^{5,41}. It is important for other team members to refer patients to the occupational therapist, if there are perceived occupational problems.

Although the roles of the occupational therapist and physiotherapist may overlap, their primary functions differ, with the physiotherapist using exercise and physical

modalities to improve physical status, while the occupational therapist's approach is a functional one, which applies the patient's skills to perform a wide range of activities of daily living or at work. However, as revealed by surveys of cardiac rehabilitation programs, many tasks may be undertaken by either team member^{5,40,41}. Typically, however, the occupational therapist is more involved in the later stages of the patient's recovery rather than in hospital.

Social worker

Recommendation

The social worker plays an important role in the team by promoting the psychosocial recovery of the patient and supporting the patient's family.

Strength of evidence = 4

The social worker can make an important contribution to the psychosocial adaptation of the patient and family through education and intervention^{661,662}. The social worker's primary role is to detect any psychological or social problems and to undertake counselling, if required.

Issues commonly addressed during counselling include grief and stages of loss; the development of coping strategies to handle emotional responses such as anxiety and depression; the impact of the illness on the family; and sexual activity, a concern commonly raised with the social worker during individual counselling rather than with other team members, and return to work and the future. Ideally, the social worker should have access to patients in hospital to assess the need for counselling, rather than awaiting referral from other staff. Detection of psychosocial problems may be difficult because of their subtle presentation.

In many programs, the social worker is responsible for attending to the practical needs of patients including discussion of the patient's financial status, and where necessary, facilitating the patient's access to social security benefits, liaising with employers and arranging for interpreters^{5,40,41,663}. The social worker may also facilitate access to community services such as meals on wheels and home care nursing agencies. In some hospitals, these functions may be carried out by a welfare worker.

The social worker also has an important linking function^{661,663}, communicating with patient's spouse and family, especially during the acute phase of the illness, and offering assistance. A family meeting may be organised by the social worker to assess and assist with the patient's and family's adaptation to the illness⁶⁵¹. Another useful role played by the social worker is to organise and conduct separate spouse groups during convalescence to address any psychological problems and concerns they may

have. The social worker may also follow up the patient during convalescence and, if the patient dies, offer support to the spouse.

Greater involvement of the social worker in addressing the needs of special groups is recommended. Such groups include those patients from other cultures and those who are insecure about resuming work. The social worker can make a positive contribution to teamwork by providing feedback about how the patient is coping with the illness. Instructing patients in stress management and relaxation techniques may also be undertaken by the social worker.

While the social worker's role is especially important during the acute phase, some emotional, family and other problems may only become apparent during convalescence. Thus, it is essential for a social worker to be involved in the ambulatory program. Social workers perceive that, unfortunately, there is a far greater emphasis upon the physical aspects of rehabilitation during outpatient programs, with insufficient time allocated to psychosocial aspects⁶. This deficiency is becoming more pronounced with shortened hospital stays. At present, social workers participate in 56% of the education groups provided in Victorian ambulatory programs.

Social workers report that doctors and other members of the team do not always understand the roles of the social worker, often encroaching upon their territory without the necessary skills to do so⁶. They state that while nurses may undertake counselling of patients, they are more limited in their approach. Welfare workers also counsel patients but have relatively little training to do so. According to social workers, welfare workers are less aware of the dynamics of psychosocial aspects of rehabilitation⁶. Apart from the psychiatrist and psychologist, the social worker is the only member of the team with training in psychosocial counselling in individual, group and family settings.

Psychologist

Recommendation

The psychologist should be involved in cardiac rehabilitation and secondary prevention programs to assist with psychosocial aspects of the patient's rehabilitation and to facilitate behavioural changes.

Strength of evidence = 4

Psychologists have a role in conducting relaxation or stress management sessions^{664,665}. The psychologist may also be trained in individual and group counselling and can therefore facilitate sessions with patients and spouses⁶⁶⁶. In undertaking counselling and stress management, the psychologist's role overlaps to some extent with that of the social worker and the occupational therapist. The roles of the psychologist may

also include assessing the psychological status or cognitive functioning of cardiac patients and relaying the results to the doctor and other team members. Such information can be useful in developing the patient's rehabilitation plan. Relatively few cardiac rehabilitation and secondary prevention programs in Australia include a psychologist at present⁵⁴¹ and their involvement in programs in European countries varies considerably⁶⁶⁷. However, clinical psychologists can also make a significant contribution by using behavioural strategies to help patients acquire skills to change and maintain healthier behaviours. This aspect of secondary prevention needs further development in cardiac rehabilitation programs. Psychologists should be more extensively involved in programs to address this need.

Cardiologist

Recommendation

The cardiologist should define the medical parameters of the program, review the medical content, encourage patients to attend the program, facilitate the roles of other team members and support the program.

Strength of evidence = 4

Cardiac rehabilitation and secondary prevention programs include a significant component of education concerning medical topics, as discussed in Chapter 13. These topics include cardiovascular disease risk factors, the development of coronary heart disease, acute cardiac events, procedures and investigations. It is essential that patients and family members receive accurate medical information from team members. Thus, the cardiologist should define the medical parameters of the program from the outset, reviewing the medical content at intervals to ensure information is current and accurate. Some cardiologists have expressed concern that inaccurate medical information is given by nurses and allied health workers during cardiac rehabilitation and secondary prevention programs⁶. Further, they maintain that restrictive dietary advice is often given to patients by nurses and that information provided to patients by general practitioners often conflicts with advice from cardiologists. Better communication between cardiologists, general practitioners and other team members could minimise the amount of conflicting and inappropriate advice, as recommended in Chapter 17.

While cardiologists do not generally play an active role in group cardiac rehabilitation programs²⁷⁶, they can make a significant contribution by referring patients to programs, encouraging them to attend, enquiring about the patient's progress at the program and supporting the roles of other team members⁶⁶⁸.

Where possible, it is highly desirable for the cardiologist to facilitate an occasional group discussion during the outpatient program. Occasional brief visits by the

cardiologist to a group discussion or an exercise session are also much appreciated by patients⁶. Patients perceive the cardiologist as an authoritative figure. The cardiologist's participation in, or visit to, the group enhances patients' acceptance of the program as being important to their recovery. Further, the cardiologist should supervise the discharge review and, if undertaken, the discharge exercise test. In some larger city hospitals, the registrar or resident may participate in place of the cardiologist⁵.

In a few programs, a cardiologist with a special interest in cardiac rehabilitation may be appointed as Director of Cardiac Rehabilitation. However, such programs are usually managed by an appointed co-ordinator.

Although most hospitals have a policy of automatic referral of eligible patients to ambulatory programs^{5,41}, some cardiologists claim that certain patients (such as those with atypical chest pain with no confirmed diagnosis of coronary heart disease) who are unsuitable for the program are sometimes enrolled by nurses or other team members⁶. If cardiologists consider certain individual patients unsuitable for rehabilitation, they should advise the program co-ordinator and include a written note to this effect in the patient's medical records.

Cardiac surgeon

Recommendation

The cardiac surgeon should support cardiac rehabilitation and secondary prevention programs by referring patients and encouraging them to attend.

Strength of evidence = 4

While cardiac surgeons do not actively participate in cardiac rehabilitation and secondary prevention programs in Australia^{5,40}, they should endorse the program, referring patients and encouraging them to attend. Most cardiac surgeons endorse automatic referral of almost all patients who have undergone coronary artery bypass surgery⁶.

General practitioner

Recommendation

The general practitioner should refer patients to group rehabilitation programs and manage the long-term medical follow-up of patients.

Strength of evidence = 4

Referral to an ambulatory rehabilitation program should be organised before the patient is discharged from hospital. However, the general practitioner should confirm referral to the program at the patient's first visit and encourage the patient to attend²⁷⁶. Failure of medical practitioners to advise or encourage patients to attend a cardiac rehabilitation and secondary prevention program is a major reason for poor participation rates^{6,40,288}. According to one study, the strength of the primary physician's recommendation to attend a cardiac rehabilitation program was the most powerful predictor of attendance²⁸⁸. The general practitioner should reinforce the goals of rehabilitation, ensuring that the patient understands the expected benefits of the program and the functions of other team members. To fulfil these roles adequately, the general practitioner needs sufficient information about the aims and content of cardiac rehabilitation and secondary prevention programs. As recommended in the following chapter, information about available programs should be circulated to general practitioners.

General practitioners consider that their role in cardiac rehabilitation has been limited to date and that they are underutilised as a resource⁶. In their opinion, cardiac rehabilitation offers opportunities for a shared care approach in which their input could be very valuable. While recognising that the cardiologist is in charge of the medical management of patients in hospital, the general practitioner is in an ideal position to put follow-up plans into action and to coordinate the patient's medical management after discharge from hospital. To maximise the contribution of the general practitioner, the cardiologist should involve the general practitioner in the early stages of each patient's recovery and provide clear guidelines on how to manage patients following their acute events⁶. Follow-up of patients by the general practitioner may be further improved if the general practitioner was informed of the patient's admission to hospital and was able to visit the patient in hospital.

The general practitioner is primarily responsible for the long-term medical follow-up of patients and for assisting patients to maintain healthy lifestyle changes⁶⁶⁹⁻⁶⁷¹. Thus, the general practitioner has an important educational role, especially after the patient completes the ambulatory group program. The program co-ordinator should ensure that the general practitioner receives a discharge summary about what the patient has achieved at the program. Any difficulties the patient is experiencing on completion of the program should also be communicated. This information should be sent to the

general practitioner directly, as well as recorded on a card for the patient to take to the general practitioner. A patient held record may encourage patients to take increased responsibility for their health. Early communication with the general practitioner should minimise the likelihood of patients receiving conflicting information.

The general practitioner has continuing responsibility for ensuring that there is longterm satisfactory control of patients' symptoms, lipids, smoking habit, blood pressure, diabetes, weight and well-being. This may necessitate intermittent or regular testing, as indicated by national or other current guidelines.

Team members should emphasise the importance of the general practitioner's role and encourage patients to see their general practitioner at regular intervals. While the general practitioner is often close to the patient and family, other health care providers may have more time to devote to handling the patient's nutritional, psychosocial and other concerns. The general practitioner should refer the patient to other health care providers, such as dietitians and social workers, as required⁶.

In a few programs in Australia, especially in community settings, a general practitioner facilitates occasional education group discussions at cardiac rehabilitation and secondary prevention programs^{5,40}. However, as a general rule, it may not be feasible for the general practitioner to be an active participant in the group program because of time constraints⁶.

Exercise physiologist

Recommendation

The exercise physiologist has advanced training in exercise prescription and should design and conduct exercise sessions which involve high intensity exercise training.

Strength of evidence = 4

In a few parts of Australia, an exercise physiologist conducts exercise sessions instead of a physiotherapist⁴⁰⁻⁴¹. Exercise physiologists are more likely to be employed in exercise programs providing high intensity exercise training.

Exercise therapist

Recommendation

An appropriately trained exercise therapist may conduct exercise sessions as part of ambulatory cardiac rehabilitation and secondary prevention programs.

Strength of evidence = 4

A physical educator may conduct exercise sessions and supervise patients with cardiovascular disease, providing appropriate additional training has been obtained. Previous experience with cardiac patients, especially those who have recently suffered an acute cardiac event or those who are aged and infirm, is also required.

Diabetes educator

Recommendation

A diabetes educator is a valuable member of the team and may provide individual or group counselling.

Strength of evidence = 4

Many cardiac patients suffer from diabetes mellitus or are at high risk of developing diabetes because they are overweight or obese. Diabetes educators occasionally facilitate education groups in ambulatory programs but are more commonly involved in the counselling of individual patients who are referred to them by other team members^{5,41}.

Welfare worker

Recommendation

A welfare worker, with additional training or experience, may fulfil some of the roles of the social worker.

Strength of evidence = 4

Some hospitals employ a welfare worker as well as, or instead of, a social worker. The welfare worker's training lies more in attending to practical issues, such as arranging payment to the patient of any social security benefits and liaising with employers about matters concerning return to work^{5,40}. These issues are of great importance to some patients. The welfare worker may also assist the patient with financial problems arising during periods of unemployment and provide family support.

Rehabilitation physician

Recommendation

A rehabilitation physician who has experience managing patients with cardiac illness may participate in the team conducting the cardiac rehabilitation and secondary prevention program.

Strength of evidence = 4

In some countries, the rehabilitation physician is actively involved in inpatient and ambulatory cardiac rehabilitation programs. In Australia, however, the rehabilitation physician is rarely involved in programs conducted during convalescence, apart from a few which are provided for patients admitted to rehabilitation hospitals^{5,40,41}.

Pharmacist

Recommendation

The pharmacist can play an important role by providing information and advice to the patient regarding medications and encouraging compliance with regimens.

Strength of evidence = 4

Patients attending cardiac rehabilitation programs typically have many questions concerning the purpose of their medications and common side effects. These issues can be effectively addressed either by a pharmacist, doctor or nurse, providing that simple terms are used and complex pharmacological jargon avoided. Pharmacists are currently involved in 65% of ambulatory programs in Victoria. In country programs, pharmacists facilitate education groups more frequently than in metropolitan centres⁵.

Psychiatrist

Recommendation

A psychiatrist should be available to the team for referral of cardiac patients with psychiatric problems.

Strength of evidence = 4

The psychiatrist's role in cardiac rehabilitation programs is primarily to manage patients with a psychiatric illness or psychiatric symptoms. Psychiatric referrals are appropriate only for a minority of patients, such as those with a premorbid

psychiatric illness which is exacerbated by the cardiac event or illness⁶⁷². The social worker, psychologist and other staff trained or experienced in counselling are able to help most patients who are experiencing psychological problems, referring them to a psychiatrist if it is indicated.

Vocational counsellor

Recommendation

A vocational counsellor should be available to team members for referral of patients requiring vocational advice, support and possible retraining.

Strength of evidence = 4

As discussed in Chapter 15, patients who need specialised vocational counselling may be referred to special vocational rehabilitation centres in the region, such as Commonwealth rehabilitation centres. Here they are prescribed an exercise program specifically tailored to their job requirements. They also receive help in resuming work or finding new employment. For most cardiac patients, however, assistance from an occupational therapist is usually adequate.

Community health worker

Recommendation

The community health worker can provide ongoing support to patients and families, especially during later stages of the patient's recovery.

Strength of evidence = 4

The community health worker commonly has a nursing background and is generally multiskilled. He or she can provide ongoing support and assistance to patients and families, referring to other health care providers, as required. Teams delivering hospital-based cardiac rehabilitation and secondary prevention programs should strengthen links with community health services and encourage patients to use these services for further support and advice.

Other health practitioners

Recommendation

Other personnel may occasionally participate in cardiac rehabilitation programs, including such health professionals as medical interpreters, ethnic health workers, ambulance officers and pastoral care workers.

Strength of evidence = 4

Medical interpreters should be available to assist patients with little or no English. Occasionally, an ethnic health worker may also attend programs to support such patients. In some ambulatory programs, an ambulance officer may be included among facilitators of group discussions. The pastoral care worker may offer support to patients during the acute phase of their illness or subsequently.

Program co-ordinator

Recommendation

One member of the team should be designated the co-ordinator to ensure proper organisation of the program. Any member of the team with appropriate skills may be the program coordinator.

Strength of evidence = 4

A designated program co-ordinator is essential to ensure efficient running of the program. The co-ordinator requires good organisational, management and interpersonal skills, the time to devote to the tasks involved and a commitment to the program. Team members should approve the choice of co-ordinator.

It has been traditional for nurses to co-ordinate programs in Australia^{5,40,41}, in part because there are more nurses available to fulfil this role. Nurses have usually had previous contact with patients and have established empathy with them⁶. While some cardiologists and general practitioners consider that the cardiologist should co-ordinate the program, they also recognise that the cardiologist does not have the time to carry out the many duties of program co-ordinator⁶. Other team members, such as occupational therapists, consider that in some respects, nurses are less suitable to be the program co-ordinator because their backgrounds are generally in acute health, whereas others, including occupational therapists, are trained in rehabilitation⁶.

An important function of the co-ordinator is to organise referrals, liaise with general practitioners and forward discharge summaries to them when patients complete the program. The co-ordinator should also be responsible for referring patients to

appropriate community services during or following the program and maintain contact with patients, if possible, to follow-up their long term progress. The co-ordinator requires good record-keeping skills for these tasks.

Another responsibility of the co-ordinator is organising team meetings and ensuring all team members are familiar with the program. The co-ordinator should identify specific roles within the team, minimising any conflict between team members and avoiding duplication of effort. However, some overlapping of roles may be beneficial if it reinforces advice from other team members. In-house training of team members should be organised by the co-ordinator, as required.

The co-ordinator requires enthusiasm, confidence and a commitment to cardiac rehabilitation. Another important attribute is the ability to motivate others in the team. Further, the co-ordinator needs to have a sound knowledge of coronary heart disease and other cardiac conditions, as well as the relevant terminology. A good knowledge of each stage of recovery from an acute cardiac event and of the rehabilitation process is also required.

Regional co-ordinator

Recommendation

In regions where several programs are offered, it may be appropriate to appoint a regional co-ordinator of programs.

Strength of evidence = 4

A regional co-ordinator may be necessary in certain regions to facilitate referrals between programs in the same area or within the same health care network and to encourage uniformity in the structure and content of programs.

Team meetings

Recommendation

Meetings of the rehabilitation team should be held at regular defined times

Strength of evidence = 4

Team meetings are recommended to facilitate communication between team members and to provide regular opportunities to discuss patients who have recently enrolled and those who are experiencing problems. The specific input of each team member in relation to individual patients can also be clarified during meetings to avoid overlapping of roles. Team meetings should be held at least monthly, and preferably

weekly. They should be attended by all team members. As well as addressing the needs of individual patients, these meetings should also review the program, refining it as required.

Core competencies and staff training

Recommendation

Team members should have appropriate qualifications and core competencies.

Strength of evidence = 4

Core competencies of health professionals involved in best practice cardiac rehabilitation and secondary prevention programs in Australia have not yet been defined and require further study. However, it is generally accepted that team members should hold a recognised qualification, such as a degree or diploma. Nurses should ideally have coronary care training in addition to general nursing qualifications. Additional qualifications for program co-ordinators or other team members who plan a longer career in the field may also be appropriate, such as a tertiary qualification in health education or cardiac rehabilitation, if available. A minimum requirement should be attendance at a short course in cardiac rehabilitation⁵¹, together with observation of some established programs. Continuing education by attending national and state conferences and workshops is highly desirable. As previously stated, all team members should participate in some form of periodic inhouse training to acquire an understanding of the aims and content of each component of the program and to appreciate the roles of other team members. While certain team members may be primarily responsible for specific tasks, it is useful for all team members to have some knowledge and skills in areas such as the following:

- counselling patients
- facilitating behaviour change
- supervising exercise sessions
- conducting interactive discussion groups
- discharge planning
- program management
- patient follow-up
- nutrition education
- emergency procedures (all staff should have current CPR training)

It is also advantageous for program co-ordinators and other team members to acquire basic skills in data collection and documentation, and the use of a personal computer. Such skills should facilitate systematic record keeping of patients' progress, contacts with attending doctors and other health care providers, and periodic auditing of the program.