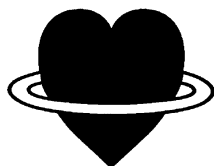


# BEST PRACTICE GUIDELINES FOR CARDIAC REHABILITATION AND SECONDARY PREVENTION: A SYNOPSIS

HEARTRESEARCHCENTRE



Principal Authors

Alan J Goble, MD, FRCP, FRACP

Marian U C Worcester, PhD, MA

## PREFACE

This Synopsis highlights the main conclusions and recommendations of the Best Practice Guidelines for Cardiac Rehabilitation and Secondary Prevention.

It has been produced to provide interested readers with an overview of the Best Practice Guidelines for Cardiac Rehabilitation and Secondary Prevention. It is not intended to be used as a substitute for the Guidelines.

# INTRODUCTION

The World Health Organisation<sup>1</sup> and the National Heart Foundation of Australia<sup>2</sup> recommend that cardiac rehabilitation, incorporating secondary prevention programs, should be available to all patients with cardiovascular disease.

Definite benefits have been demonstrated to arise from such programs, including accelerated physical and psychological recovery, social adjustments and quality of life, coupled with subsequent reduction of recurrent events, hospital readmissions and deaths. Cost savings and significant cost effectiveness have been demonstrated.

The Best Practice Guidelines for Cardiac Rehabilitation and Secondary Prevention were developed following:

- comprehensive scientific literature review of the evidence for benefits
- review of the scientific literature to determine how such programs may be delivered efficiently at low cost
- review of existing programs in Victoria and elsewhere to assess suitability, effectiveness and costs relative to outcomes
- extensive consultation with practitioners via surveys and focus groups

The Guidelines are not intended to be a practical manual on how to set up and conduct programs. However, they do present the reasoning and, where available, the scientific evidence behind the recommendations for delivering best practice programs.

The Guidelines primarily refer to ambulatory programs conducted during early convalescence, immediately after hospital discharge (“Phase 2” cardiac rehabilitation). However, they also refer to inpatient (“Phase 1” cardiac rehabilitation) and later maintenance (“Phase 3”) programs which may best be community-based. All phases of cardiac rehabilitation aim to facilitate recovery (cardiac rehabilitation) and to prevent further cardiac illness (“secondary prevention”).

The document will be useful to both purchasers and funders, agency managers, program planners and people wanting guidance on specific elements of cardiac rehabilitation and secondary prevention programs.

These Guidelines endorse the recommendations of the World Health Organisation<sup>1</sup>, the National Heart Foundation of Australia<sup>2</sup> and the United States Agency for Health Care Policy and Research (AHCPR)<sup>3</sup>. The AHCPR has produced a scientific review of the literature, covering 334 references and assessing the demonstrated strength of evidence for each recommendation concerning the demonstrable benefits of cardiac rehabilitation programs. These Best Practice Guidelines<sup>4</sup> include a review of those recommendations. However, the review for these Guidelines has been expanded to include 752 references and covers a wider field of interest, including program content, methods of delivery, duration, evaluation, organisational issues, costs, cost saving and cost effectiveness.

The Guidelines provide evidence and consensus based recommendations for best practice programs. Whereas recommendations provided in the chapters dealing with the benefits of exercise training, education, counselling and behavioural interventions were largely made on the basis of a review of the scientific literature, recommendations concerning structural issues (such as referral procedures and team roles) were mostly based upon consensus opinions and accepted practice, supported by available research findings.

Strength of evidence ratings used in making recommendations were based on those developed by the National Health and Medical Research Council (NH&MRC) of Australia.

## CARDIAC REHABILITATION AND SECONDARY PREVENTION PROGRAMS

Cardiovascular disease remains the leading cause of death in Australia. In 1995, it accounted for 46% of all deaths, with 24% being attributed to coronary heart disease. However, while age-adjusted certified deaths from coronary heart disease are falling, increasing numbers of patients are being discharged alive from hospitals after acute cardiac events and interventions. These patients constitute the major pool of those eligible to attend cardiac rehabilitation and secondary prevention programs.

Cardiac rehabilitation programs were originally introduced to facilitate recovery from acute cardiac events. In both the USA and Australia, work classification or cardiac rehabilitation units were set up in the 1950's and 1960's to encourage return to work among those with physical or psychological disabilities. In Australia, hospital-based programs were established in the mid 1970's. Since that time, many programs have been established in metropolitan and rural hospitals throughout Australia, and more recently, in community settings. Australia now has a large network of programs, particularly in Victoria.

As well as facilitating recovery, cardiac rehabilitation programs function as launching pads for secondary prevention of cardiovascular disease. Education, counselling and behavioural interventions to promote lifestyle change and modify risk factors have become an increasingly important part of cardiac rehabilitation programs.

In 1993, the National Heart Foundation of Australia produced a document to establish minimal standards for cardiac rehabilitation to guide health care providers and policy makers<sup>2</sup>. The purpose of these new Best Practice Guidelines is to provide optimal standards for cardiac rehabilitation and secondary prevention programs, particularly those conducted during convalescence. The recommendations contained within these Guidelines apply to cardiac rehabilitation programs not only in Victoria, but also elsewhere in Australia and in other countries.

These Best Practice Guidelines do not duplicate the contents of the Clinical Practice Guideline of the US Agency for Health Care Policy and Research (AHCPR) which was published in 1995. Whereas the major part of that document deals with evidence concerning exercise training, these Best Practice Guidelines focus equally on education, counselling and behavioural interventions, as well as other aspects of cardiac rehabilitation which were not extensively addressed in the AHCPR Clinical Practice Guideline. Reference is also made to the findings of studies published since the production of the AHCPR Clinical Practice Guideline.

Table 1: Comprehensive Cardiac Rehabilitation

Major benefits	Strength of evidence (NH&MRC ratings 1–4)
<b>Physical outcomes</b>	
Improved exercise tolerance	1
Increased muscular strength	1
Reduced symptoms	1
Reduced morbidity	1
Reduced mortality	2
Atherosclerosis slowed	2
<b>Risk factor outcomes</b>	
Reduced smoking	2
Improved lipids	2
Reduced weight	2
Lower blood pressure	2
Improved subsequent exercise habits	3
<b>Psychosocial outcomes</b>	
Less anxiety	1
Less depression	1
Improved wellbeing	1
Improved social functioning	1
Greater knowledge	2
Reduced stress	3
Increased return to work	3
<b>Cost benefit outcomes</b>	
Reduced recurrent events	2
Reduced hospital readmissions	2
Reduced medical costs	2
Cost savings	2
Cost effectiveness	2

All of these ratings are dependent upon demonstration of benefit from randomised controlled trials (1,2) and/or are supported by observational studies (3). While all are supported by authoritative opinion, none is solely dependent upon such opinion (4).

## Comprehensive cardiac rehabilitation

A review of the scientific literature demonstrates many benefits from comprehensive cardiac rehabilitation programs, which provide exercise training, educational and behavioural interventions and support. Those benefits are set out in Table 1. Strength of evidence ratings of the NH&MRC are also provided, which have been assigned as follows: a rating of 1 requires scientific evidence based upon a systematic review of well designed, well conducted randomised controlled trials; a rating of 2 requires evidence from at least one well designed randomised trial; a rating of 3 requires evidence from observational studies, while a rating of 4 is based upon expert opinion.

## Exercise training

There has been extensive research into the benefits of exercise training in patients with cardiovascular disease, particularly after acute cardiac events. Physical and functional outcome measures have been well defined and it is clear that exercise training produces definite physical, quality of life and secondary prevention benefits. Available evidence confirms that exercise training produces definite improvements in physical performance (exercise tolerance, muscular strength and symptoms), psychological functioning (anxiety, depression, well-being), and social adaptation and functioning. Further, exercise training produces a demonstrable reduction in mortality, morbidity, recurrent events and hospital readmissions.

In general, psychosocial outcomes have been less well studied than physical and functional effects of exercise training. Conclusions concerning psychosocial benefits, widely claimed by patients and endorsed by practitioners, have been much less well documented scientifically. It is likely that many of the psychosocial benefits of exercise training are attributable to group activities, peer support and access to professional advice rather than to the exercise itself.

It is probable that exercise training has a favourable impact upon other outcomes, including modification of risk factors. These benefits are mostly apparent when exercise is provided as part of a comprehensive program including education, counselling, behavioural interventions and support. Further, evidence indicates that for such beneficial lifestyle changes to be sustained, continued physical activity and support are required.

Studies have now confirmed that high intensity and low intensity exercise programs produce similar benefits. Nevertheless, some patients may prefer high intensity exercise. Those returning to heavy manual jobs may benefit from more intensive exercise training. For the majority of patients, however, low intensity exercise is sufficient. Further, low intensity exercise has some important practical advantages. It is more suitable for a broader population, including older men and women and patients with functional impairments, and it is more likely to be sustained in the longer term. Because low intensity programs do not require such careful supervision

and use less technology and equipment, they can be conducted at low cost. Clinical rather than technological methods can be used for risk stratification, assessment and monitoring, with considerable cost savings. Exercise conducted in groups also significantly reduces costs.

Further research is needed to determine best practice with regard to the frequency of exercise sessions and the duration of exercise programs. On the basis of both evidence and expert opinion, it is apparent that twice weekly group exercise programs are as effective as thrice weekly. While twice weekly group exercise is recommended, there is some evidence that once weekly supervised group exercise may achieve similar benefits to twice weekly group exercise, provided it is accompanied by an additional daily home walking program.

There is no scientific evidence to indicate the preferred duration of exercise cardiac rehabilitation programs. On the basis of expert opinion, most of the aims of ambulatory cardiac rehabilitation programs conducted during convalescence should be achieved with a twice weekly program lasting four to eight weeks.

It should be emphasised that individual patients vary considerably in their need for a group exercise program. Thus, it is essential to provide flexible programs to meet particular needs.

### Recommendations

Exercise programs for cardiac patients should:

- be based on low intensity exercise
- be suitable for a broad population
- be tailored to individual needs while being conducted in groups
- be preferably conducted twice per week
- be accompanied by a home walking program
- be continued for four to eight weeks
- have a ratio of no more than 10 patients to one staff member
- be designed by a physiotherapist or exercise specialist
- be conducted by a physiotherapist, exercise specialist or an additionally trained nurse or occupational therapist

## Education, counselling and behavioural interventions

Scientific evidence concerning the benefits of education, counselling and behavioural interventions is less conclusive than that concerning exercise training. Much of the research in these areas has been poorly designed. Further, the evidence base is confounded by markedly differing interventions, duration of programs and outcome measures. In some areas, evidence is nonexistent or scanty. For example, the application of behavioural approaches to modify risk factors has not been extensively tested to date in cardiac rehabilitation.

Despite these qualifications, there is now some good evidence to support the effectiveness of education, counselling and behavioural interventions in cardiac rehabilitation, whether combined with, or provided independently of, an exercise program. Available evidence confirms that education, counselling and behavioural interventions increase patient knowledge and enhance psychosocial functioning. Further, favourable effects have been demonstrated upon reduction of smoking, lipid levels and stress. However, increases in knowledge do not necessarily lead to improved health behaviours. More emphasis upon teaching patients the necessary skills for making lifestyle changes is required. Further research is needed to develop interventions which produce measurable improvements in health behaviours and modification of risk factors.

### Recommendations

Education and counselling for cardiac patients should:

- be conducted in groups
- be preferably conducted twice per week
- be conducted over four to eight weeks
- be supplemented by individual counselling as required
- follow adult learning principles and encourage interactive discussion
- apply behavioural principles, including goal setting and monitoring, to promote lifestyle changes
- involve psychologists and other appropriately trained specialists to teach patients skills for making lifestyle changes
- provide information relevant to the needs of particular patients or groups of patients
- provide scientifically accurate information
- be delivered by a multidisciplinary team of appropriately trained facilitators

### Psychosocial interventions

Cardiac patients and spouses commonly experience psychological distress following an acute cardiac event. Unfortunately, there appears to be less emphasis upon psychosocial than physical and functional aspects of cardiac rehabilitation. Participation in group exercise and education programs enhances psychological functioning. Such groups also provide social support. Cardiac rehabilitation programs conducted in groups have significant advantages over individually based programs (such as home programs) in these important respects. Stress management programs, relaxation therapy, psychosocial counselling groups, and spouse groups can also facilitate psychosocial recovery. Evidence from well designed studies to support the value of such interventions is generally lacking, although a few recent studies have shown favourable effects from stress management and relaxation therapy. Individual counselling of patients and spouses has also been shown to be effective.

## Recommendations

Psychosocial rehabilitation should offer:

- brief screening to detect patients and spouses requiring special assistance
- individual counselling by a social worker, psychologist, or other trained counsellor, if required
- participation in a group to provide social support
- additional modules, such as stress management or relaxation therapy, if required

## Vocational rehabilitation

There is limited evidence demonstrating that cardiac rehabilitation, as currently practised, has a favourable impact upon occupational outcomes. One possible explanation for this lack may be that resumption of work appears to have been set aside or forgotten as a major aim of cardiac rehabilitation in recent years. Further studies are required to test strategies to increase rates of return to work and to promote better occupational adjustment among those who successfully resume work.

## Recommendations

Vocational rehabilitation should include:

- supervision by the occupational therapist
- discussion at entry assessment of employment plans and development of appropriate vocational goals
- identification of any physical and psychological barriers to resumption of work
- modules offering tailored vocational programs, including work hardening and simulated work testing
- adequate liaison between patient, doctor and employer

## Organisational issues

There is considerable evidence to support the need for improved referral procedures, discharge planning and liaison between health care providers so that greater participation in cardiac rehabilitation programs can be achieved. Attention to such process issues has been inadequate in the past and now requires a greater focus. Assistance with transport and the provision of more locally based programs are also recommended.

The practice of automatic referral to programs is strongly recommended. If medical contraindications exist in individual cases, the doctor should indicate in the patient's hospital record that the patient should not be referred to a program.

The delivery of a structured cardiac rehabilitation program involves the need for multiple skills. Such expertise is usually beyond the capacity of one or few health professionals and in several areas, specific training is required. Thus, a multidisciplinary team is recommended. A designated co-ordinator is essential. Any

team member with adequate organisational and interpersonal skills and sufficient time may fulfil this role. An important function of the program co-ordinator is to ensure adequate communication between different team members, and especially with general practitioners. One health professional may suffice for small programs in poorly resourced rural or local communities, provided there is adequate back-up support.

A key principle of contemporary cardiac rehabilitation programs is flexibility. Thus, while nearly all patients should be encouraged to attend exercise and education groups, the duration of their attendance and the nature and amount of rehabilitation required will vary considerably, according to individual need.

Some patients will require slow progress and support through a gradual program of increasing activity, while others with little impairment of cardiac function or fitness may progress rapidly. Psychological and social support may also vary markedly in degree. While some patients may have a good understanding of their illness or procedure and have clearly defined goals for achievement in a cardiac rehabilitation program, others may have little idea of the nature of their condition or what may be achieved or desirable through such a program. It is therefore essential that the individual needs of each patient are understood and discussed between the patient and program staff. Patients should be able to see that their particular needs are being addressed at all times in the program.

A rehabilitation plan devised to suit the individual patient needs to be agreed upon at the entry assessment. Specific individual behavioural goals should also be decided so that progress can be monitored. For best practice, a variety of program components or modules should be available to patients. It is now apparent that certain patient groups, such as those who have undergone coronary angioplasty, younger patients and those from non-English speaking backgrounds, require different kinds of programs or program modules. Some patient groups, such as those of aboriginal background, have rarely attended cardiac rehabilitation programs. Moreover, very little research has been conducted to identify their specific needs. Tailored programs for different patient populations such as the above need to be devised and evaluated.

The need for flexibility in the provision and delivery of services also arises from recommendations that programs should be offered to a broad range of patients, including older patients and those with considerable physical and functional limitations. It is further advocated that family members should also attend cardiac rehabilitation programs which thereby offer them an opportunity for primary prevention of cardiovascular disease.

## Recommendations

Cardiac rehabilitation and secondary prevention programs should:

- develop efficient referral procedures
- develop effective strategies to maximise program attendance and completion
- offer programs which are accessible
- provide flexible, multifactorial programs consisting of several modules
- offer programs which suit a broad range of patient groups as well as family members
- be delivered by a multidisciplinary team with a designated co-ordinator
- ensure adequate communication between hospital staff, program staff and general practitioners

## Evaluation

Evaluation is becoming an increasingly important aspect of cardiac rehabilitation and secondary prevention programs. There are some suitable measures available to assess functional, quality of life and behavioural outcomes. However, there is a definite need for further research to test the applicability of some generic tools to cardiac rehabilitation and to devise more sensitive measures. Outcome indicators have been included in the Best Practice Guidelines because it is difficult to monitor a number of outcomes which require longterm follow-up. Further testing of the recommended process and outcome indicators is required to identify suitable benchmarks. More detailed costings of best practice model programs are also required. Qualitative research is required to obtain a better understanding of patient attitudes and responses in areas which are less well understood.

It should be emphasised that multifactorial, comprehensive cardiac rehabilitation programs combining exercise training with education, counselling and behavioural interventions produce significantly greater benefits to patients than programs providing either exercise or education alone. Many of the studies reviewed contain education, counselling or behavioural interventions as well as exercise training and demonstrated favourable outcomes. However, it is difficult to determine which ingredients of multifactorial programs produce these benefits.

## Recommendations

All programs should:

- undergo outcome evaluation to determine their effectiveness upon patient outcomes
- undergo process evaluation to identify inadequacies and to assure program quality and to improve program delivery
- be evaluated following professional advice regarding appropriate evaluation methods

## Cost, cost saving and cost effectiveness

There is marked variation in the cost of programs throughout the world. This depends largely on the program duration, frequency of attendance and the intensity of rehabilitation exercise. Low cost programs are feasible provided that high intensity exercise is avoided, thereby obviating the need for technology in risk stratification and monitoring. The major cost is then related to the salaries of program staff. With a well attended program, approaching optimal size for exercise and education groups and for both group and individual counselling and support, it appears that the aims of the program may be generally achieved with twice weekly (possibly once weekly) sessions of group work lasting two hours per session over a period of six weeks. This type of twice weekly program can be reasonably conducted at a mean cost of approximately \$40 per session per patient and a total cost of \$480 per patient completing the program. A once weekly program would probably approach \$300 per patient.

There is now evidence that significant cost saving may be achieved through cardiac rehabilitation and secondary prevention programs. These savings are largely from reduced subsequent hospital admissions and reduced costs of medical care. There are additional savings that arise through pension, retirement and sickness benefits, provided that work resumption and remaining in work is achieved. These cost savings may be very large in an ageing population prone to development of preventable heart failure.

While cost benefit and effectiveness studies are so far not widely reported, it is apparent that cardiac rehabilitation programs have benefits and effectiveness similar to other successful interventions in the treatment of cardiac and vascular disease.

### Recommendations

Cardiac rehabilitation and secondary prevention programs should:

- Avoid high intensity exercise to assure low cost
- Assure educational and behavioural contents are sufficient for secondary prevention, thereby reducing future medical and hospital costs
- Assure continuation in gainful employment, thereby reducing pension, retirement and social security costs
- Be directed to assure the above and further to improve other patient outcomes, including longer life expectancy and improved quality of life such that the gains are apparent relative to the cost.

## Maintenance Programs

Although the primary focus of these Best Practice Guidelines has been upon producing recommendations for ambulatory outpatient programs conducted during early convalescence, much of the literature cited in support of recommendations was based upon longterm maintenance programs. It should be emphasised that behaviour change is a process which requires considerable time. Thus, participation in ongoing community based programs is recommended to encourage maintenance of behaviour change and modification of risk factors.

## Program structure

The basic structure of a simple, cost effective program of cardiac rehabilitation and secondary prevention, consistent with these Best Practice Guidelines, is set out in Table 2. All patients with cardiovascular disease and other forms of heart disease are eligible to attend. The key to patient attendance is the efficiency of the referral procedures. Patient assessment at entry to the program should include discussion of the benefits of rehabilitation so that patients will be motivated to complete the program and achieve their desired goals. The longterm effectiveness of the program is largely dependent upon the achievement of individual goals and referral of the patient to medical practitioners and other community programs to ensure continued care and support. Such care and support are desirable on a longterm basis to assure adherence to recommended health behaviours and prescribed medications. Thus, early ambulatory cardiac rehabilitation programs are an integral part of a continuum of patient care.

Table 2: Recommended cardiac rehabilitation program structure

Eligible patients	Myocardial infarction Revascularisation procedures Stable or unstable angina Controlled heart failure Other vascular or heart disease	Pre-program  1 week
Source of referral to program	Discharge plan from hospital Individual medical practitioners	
Entry assessment and goal setting	Demographic Diagnostic Physical Psychosocial Vocational Behavioural Risk factors	
Program content	Group low intensity exercise Home walking/ activity program Group education/ discussion Support/ counselling Behavioural interventions Program module options	Program  6–8 weeks (or 4 weeks for fast stream, eg angioplasty patients)
Program frequency and duration	Twice per week 4–8 weeks (usually 6 weeks)	
Discharge assessment	Physical Psychosocial Vocational Behavioural Risk factors Exercise test (optional)	
Referral from program	General practitioner Physician/ surgeon Other practitioners (optional) Maintenance program Special clinic (optional)	
Follow-up	Telephone Recall and review Maintenance program Ongoing general practitioner attendance	Post program  years

## References

- 1 World Health Organization Expert Committee. Rehabilitation after cardiovascular diseases, with special emphasis on developing countries. Technical report series No. 831. Geneva: World Health Organization; 1993
- 2 National Heart Foundation of Australia. Minimal standards for outpatient (phase 2) cardiac rehabilitation and cardiac rehabilitation policy statements. Canberra; 1994.
- 3 Wenger NK, Froelicher ES, Smith LK et al. Cardiac Rehabilitation. Clinical Practice Guideline No 17. Rockville, MD: US Department of Health and Human Services, Public Health Service, Agency for Health Care Policy and Research USA and the National Heart, Lung, and Blood Institute. AHCPR Pub No. 96-0672; 1995.
- 4 Goble AJ, Worcester MUC. Best Practice Guidelines for Cardiac Rehabilitation and Secondary Prevention. Heart Research Centre. Melbourne, on behalf of Department of Human Services Victoria; 1999.